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LETTER TO THE EDITOR

Plasma cell leukemia masquerading as lymphoplasmacytic lymphoma: a diagnostic challenge

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Dear Editor,

We read with interest the case report by Larson et al. [1] in the *Journal of Hematopathology* and would like to share a similarly challenging case of plasma cell leukemia encountered in a young patient at our center.

A 36-year-old lady presented with a history of backache and generalized weakness for 3 months. She had severe pallor; however, there was no localized bony tenderness, lymphadenopathy, or organomegaly. Investigations revealed hemoglobin 51 g/L (reference range 120–160 g/L), total leukocyte count 243×10^9/L (reference range 4–11 $\times 10^9$/L), and platelets 119×10^9/L (reference range 150–400 $\times 10^9$/L). A peripheral blood smear showed marked lymphocytosis with absolute lymphocyte count of 206.6×10^9/L (reference range 1.0–4.0 $\times 10^9$/L) and 3% cells showing lymphoplasmacytic morphology (Fig. 1, left image). Biochemistry revealed normal renal function, albumin-corrected serum calcium (10.3 mg/dL, reference range 9–11 mg/dL), and elevated lactate dehydrogenase (375 U/L, reference range 140–271 U/L). There was marked hypergammaglobulinemia and serum protein electrophoresis identified a monoclonal band (5.6 g/dl). Urine protein electrophoresis and immunofixation did not reveal an M-band and Bence Jones proteins were undetectable. Serum-free light chain assay showed $\kappa = 12{,}400$ mg/L (reference range 3.3–19.4 mg/L), $\lambda = 6.11$ mg/L (5.7–26.3 mg/L) with κ/λ ratio = 2029.46 (reference range 0.26–1.65). Bone marrow aspiration revealed massive infiltration by small lymphocytes (91%) and lymphoplasmacytic cells (5%) (Fig. 1, central image). Overall, the findings appeared consistent with lymphoplasmacytic lymphoma, and flow cytometry was performed using a standard lymphoproliferative disorder panel of antibodies.

Flow cytometrically, however, the lymphoid-appearing cells were $CD19^{negative}$, $CD45^{negative}$, $CD20^{positive}$, and $CD38/CD138^{bright\ positive}$ and did not express surface immunoglobulin light chains (Fig. 2). Extended testing using plasma cell markers revealed expression of CD81, CD27, and CD56 with cytoplasmic κ-light chain restriction and were negative for CD28. CD200 was negative to dim positive. Immunofixation results were also now available (IgG-κ) and PET-CT identified multiple FDG-avid lytic skeletal lesions, corroborating plasma cell leukemia. Immunohistochemistry on bone marrow trephine biopsy highlighted strong cyclin D1 expression in the tumor cells (Fig. 1, right image). The patient was started on a combination regimen of lenalidomide, bortezomib and dexamethasone along with acyclovir and aspirin prophylaxis. However, she succumbed to progressive disease within 1 month of initiating therapy.

Myeloma can pose morphological challenges [2]. Small lymphocytic morphology is rare and may carry a better prognosis [3]. However, the index case had a leukemic presentation which usually portends a grim outcome despite combination chemotherapy. Although morphologically confusing, immunophenotypic distinction from B cell lymphoma is straightforward due to $CD45^{negative}/CD138^{positive}$phenotype. Despite genetic and morphological similarities to mature B cell lymphomas, there is no definite evidence that patients benefit from lymphoma-type therapy [4, 5]. This uncommon case illustrates well the diagnostic process in modern hematopathology that integrates clinical inputs as well as data from multiple ancillary investigations. It also highlights the growing and often central role that flow cytometry plays in the diagnosis of plasma cell dyscrasias and related disorders today.

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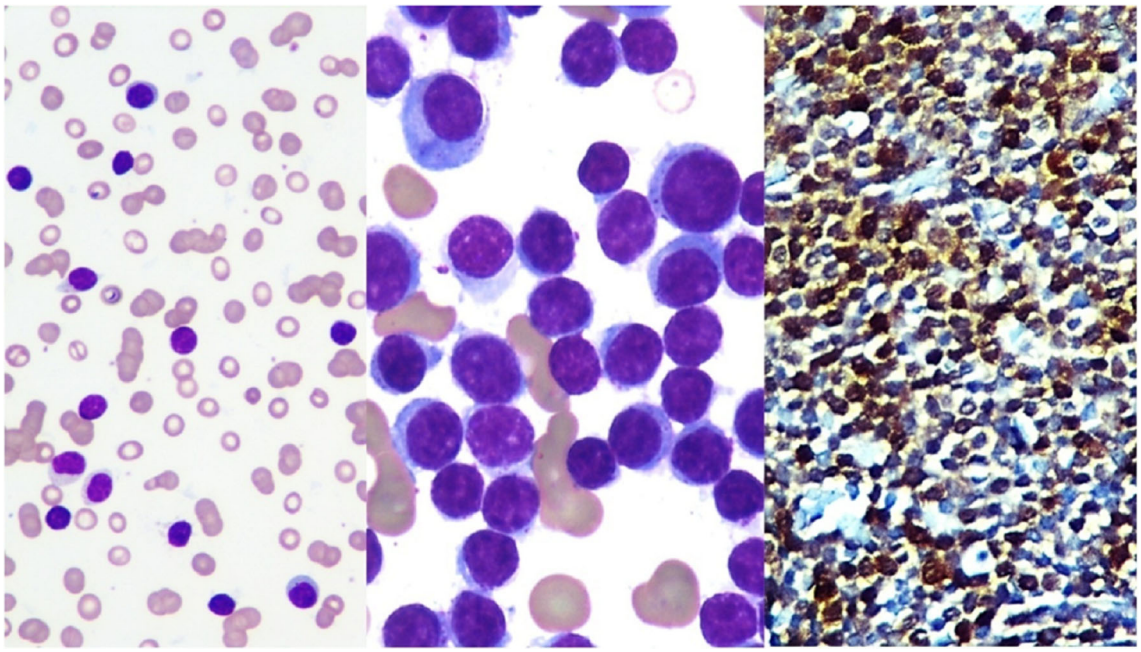

Fig. 1 Left: Peripheral blood shows rouleaux formation with mature lymphocytes and occasional lymphoplasmacytic cells (May-Grünwald Giemsa, × 200). Middle: Bone marrow aspirate shows similar cells (May-Grünwald Giemsa, × 1000). Right: Strong cyclinD1 expression in tumor cell nuclei (immunoperoxidase stain, hematoxylin counterstain, × 400)

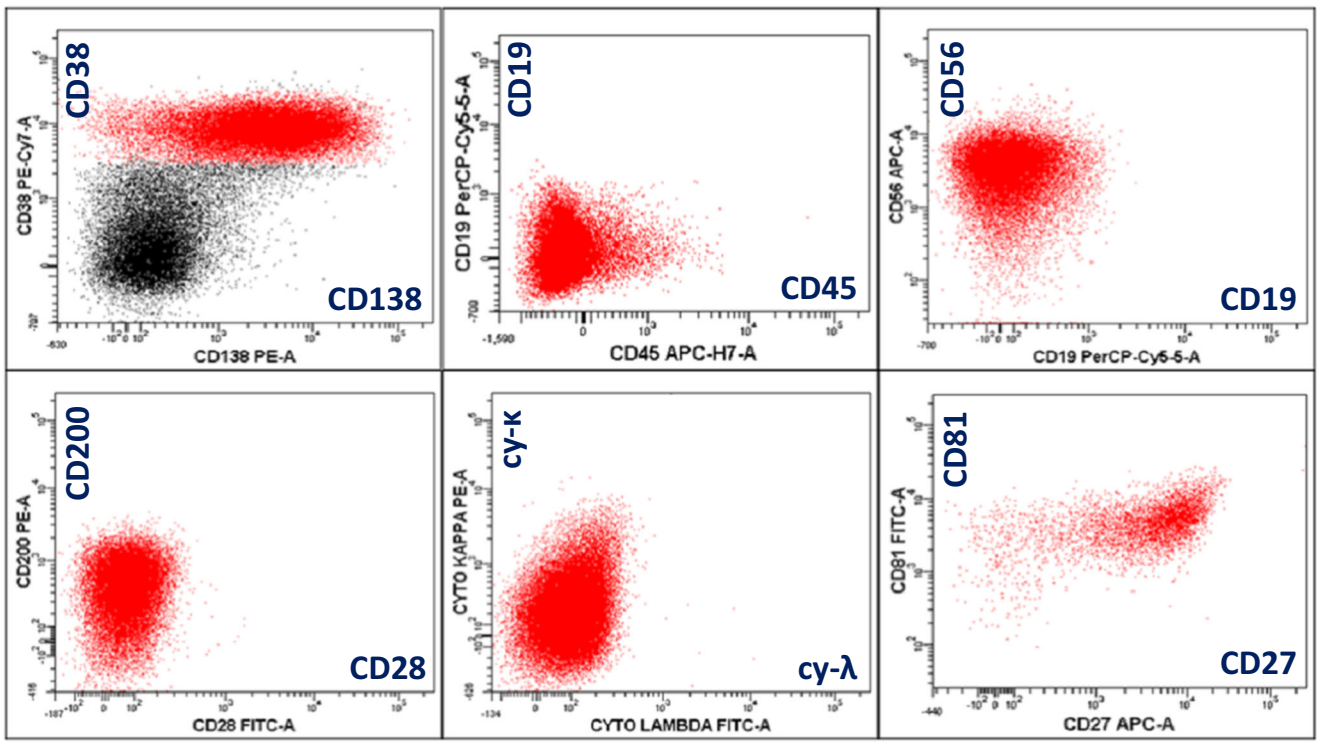

Fig. 2 Flow cytometric scatter plots reveal CD138 and CD38 bright plasma cells that also express CD81, CD27, CD200 (dim), and CD56 with cytoplasmic κ-light chain restriction. The cells are negative for CD19, CD45, and CD28 and did not express surface immunoglobulin light chains

Compliance with ethical standards

Conflicting interest The authors declare that they have no conflict of interest.

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