blood work
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Blastoid plasma cell leukemia mimicking acute leukemia

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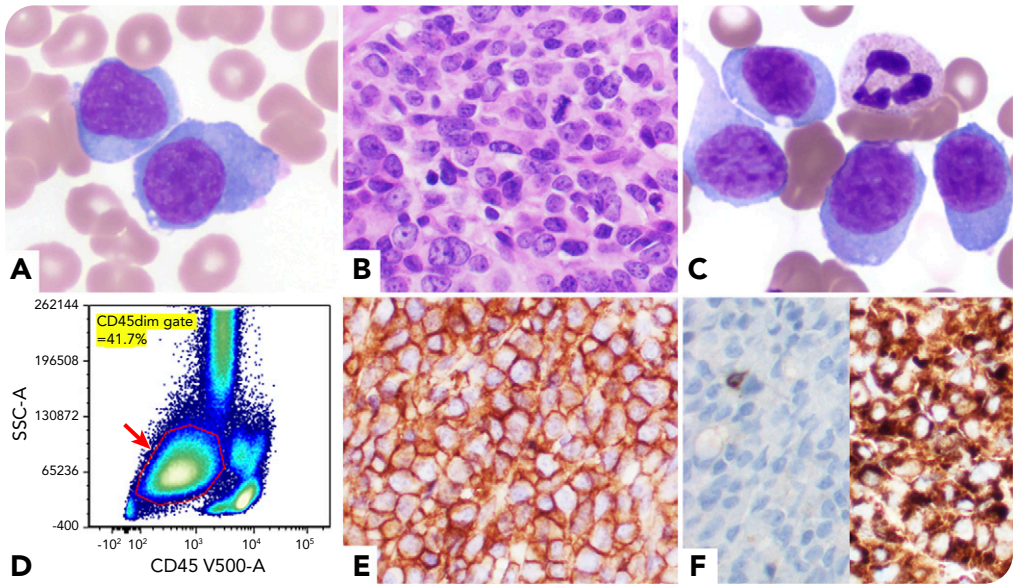

A 69-year-old man was admitted with an outside diagnosis of acute leukemia (white blood cells, 27.6 × 10^9/L; 36% circulating blasts) (see figure; panel A: original magnification ×1000, Wright-Giemsa stain). Bone marrow biopsy revealed diffuse malignant cells, many with distinct nucleoli (panel B: original magnification ×400, hematoxylin and eosin stain). Aspirate smear showed large blasts with round to slightly irregular nuclei, fine chromatin, and a moderate amount of cytoplasm (a subset having cytoplasmic vacuoles) (panel C: original magnification ×1000, Wright-Giemsa stain), consistent with acute leukemia. Flow cytometry showed a large population of CD45dim$^+$ cells (panel D: red arrow; SSC-A, side scatter area) that were negative for CD34, CD117, and myeloid or lymphoid markers, arguing against acute myeloid or lymphoid leukemia. By immunohistochemistry, the neoplastic cells were positive for CD138 (panel E: original magnification ×400, CD138 immunohistochemical stain) and monotypic cytoplasmic λ light chain (panel F: original magnification ×400 [left, κ, immunohistochemical stain; right, λ, immunohistochemical stain]). Serum electrophoresis and immunofixation showed immunoglobulin A λ monoclonal gammopathy. He was diagnosed with blastoid plasma cell leukemia (PCL). Chromosome analysis showed a highly complex karyotype. Fluorescence in situ hybridization revealed deletion of *TP53*, gain of *CKS1B* and *MYC*, and monosomy 13. Next-generation sequencing showed *TP53* mutation.

PCL with blastoid morphology is highly unusual and has not been reported. Blastoid PCL can pose a diagnostic challenge by mimicking acute leukemia. This case highlights the importance of integrated diagnosis using all diagnostic techniques.

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