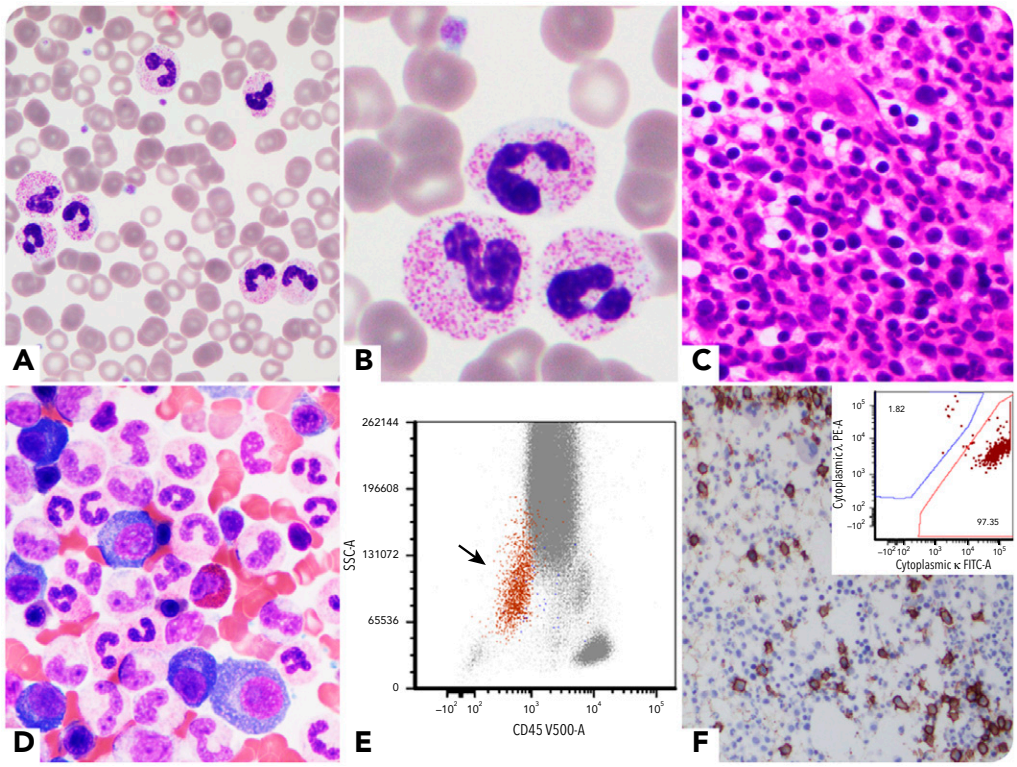
blood work
images in hematology

Neutrophilic leukemoid reaction associated with plasma cell neoplasm mimicking chronic neutrophilic leukemia

Wei Xie and Jie Xu, The University of Texas MD Anderson Cancer Center



A 60-year-old man presented with persistent leukocytosis (white blood cell [WBC] count, 26 × 10^9/L; panel A, original magnification ×400, Wright-Giemsa stain). Peripheral blood showed increased neutrophils (80%; absolute neutrophil count, 21 × 10^9/L) with toxic granules but no dysgranulopoiesis or blasts (panel B, original magnification ×1200, Wright-Giemsa stain); neutrophil precursors were <10% of WBCs, and monocytes were <1 × 10^9/L. Bone marrow biopsy revealed hypercellular (>90%) marrow with marked neutrophilic proliferation (panel C, original magnification ×400, hematoxylin and eosin stain; panel D, original magnification ×1000, Wright-Giemsa stain) with no increased blasts, raising a concern for chronic neutrophilic leukemia (CNL). Interestingly, plasma cells were aberrant (panel E arrow [SSC-A, side scatter area]) and increased (10% of cellularity; panel F, original magnification ×200 [PE, phycoerythrin; FITC-A, fluorescein isothiocyanate area]); they expressed CD38, CD138, CD56, and monotypic cytoplasmic κ light chain (panel F insert) but lacked CD45 and CD19. Conventional cytogenetic study showed hyperdiploid karyotype 53~54,XY,+3,+5,+6,+7,+8,+11,+15,+mar[cp2]/46,XY[18], most likely representing plasma cell neoplasm (PCN). Molecular studies of 81 genes commonly seen in myeloid neoplasms (including *CSF3R*) revealed no mutations. No *BCR-ABL1* rearrangement was detected by cytogenetic or molecular studies. He was diagnosed with PCN with neutrophilic leukemoid reaction.

PCN-associated neutrophilic leukemoid reaction is rare, likely resulting from granulocyte colony-stimulating factor produced by neoplastic plasma cells. Concurrent PCN and CNL is rare but has been reported. In a case of PCN with neutrophilia, clonality of the neutrophil lineage should be demonstrated by cytogenetic or molecular studies before making a diagnosis of CNL.

ASH Image Bank

For additional images, visit the ASH Image Bank, a reference and teaching tool that is continually updated with new atlas and case study images. For more information, visit http://imagebank.hematology.org.

DOI 10.1182/blood-2018-10-881532