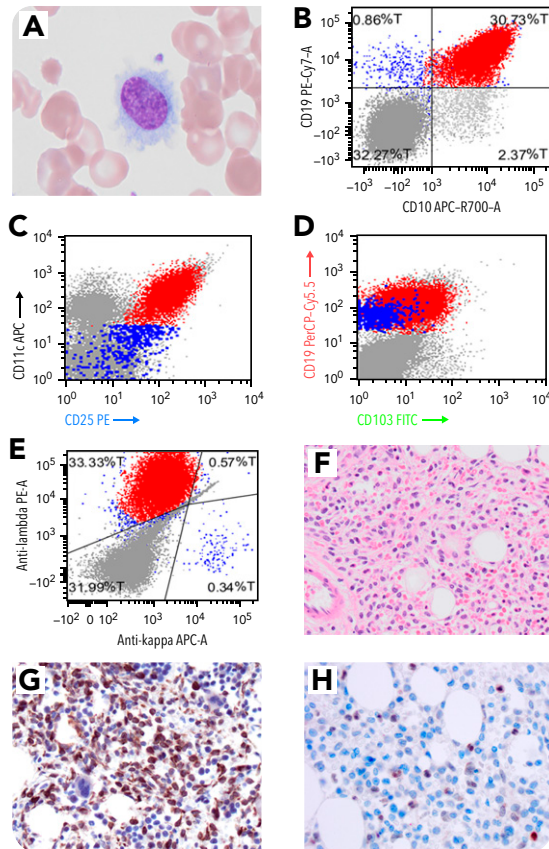


Annexin A1⁻ but CD10⁺ hairy cell leukemia

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A 42-year-old woman with hypothyroidism presented with new onset leukocytosis with a white blood cell count of $11.5 \times 10^9/L$ with 37% atypical lymphoid cells. Wright-Giemsa staining of the peripheral blood (PB) showed frequent small- to medium-sized atypical lymphoid cells with relative ample cytoplasm exhibiting circumferential cytoplasmic projections (panel A; objective 100 \times with total magnification [TM] $\times 1000$). Flow cytometry of the PB showed the atypical cells ($\sim 30\%$ to 33%) were positive for CD10 (panel B), CD11c (panel C), CD19 (panel B), CD20, CD25 (panel C), CD103 (partial and dim) (panel D), and λ -restricted (panel E). A bone marrow biopsy showed extensive interstitial infiltrate with atypical lymphoid cells exhibiting “fried egg” appearance (panel F; objective 40 \times with TM $\times 400$). By immunohistochemistry, these B cells were positive for BCL1, CD10, CD79a, DBA44, and

TRAP (panel G; objective 40 \times with TM $\times 400$) (rest not shown) but negative for annexin A1 (panel H; objective 40 \times with TM $\times 400$). Next-generation sequencing of the PB showed *BRAF* V600E with a variant allele frequency of 24%. Ultrasound of the abdomen showed 20 cm heterogeneously enlarged spleen with multiple hypoechoic areas (not shown). The overall findings are consistent with hairy cell leukemia (HCL). The patient was treated with cladribine and achieved complete remission.

This HCL has several atypical features, namely partially and dimly positive for CD103 and positive for CD10 but negative for annexin A1. While $\sim 10\%$ to 20% of HCLs are positive for CD10, lack of annexin A1 is extremely rare, and this is a rarely documented HCL with no annexin A1.