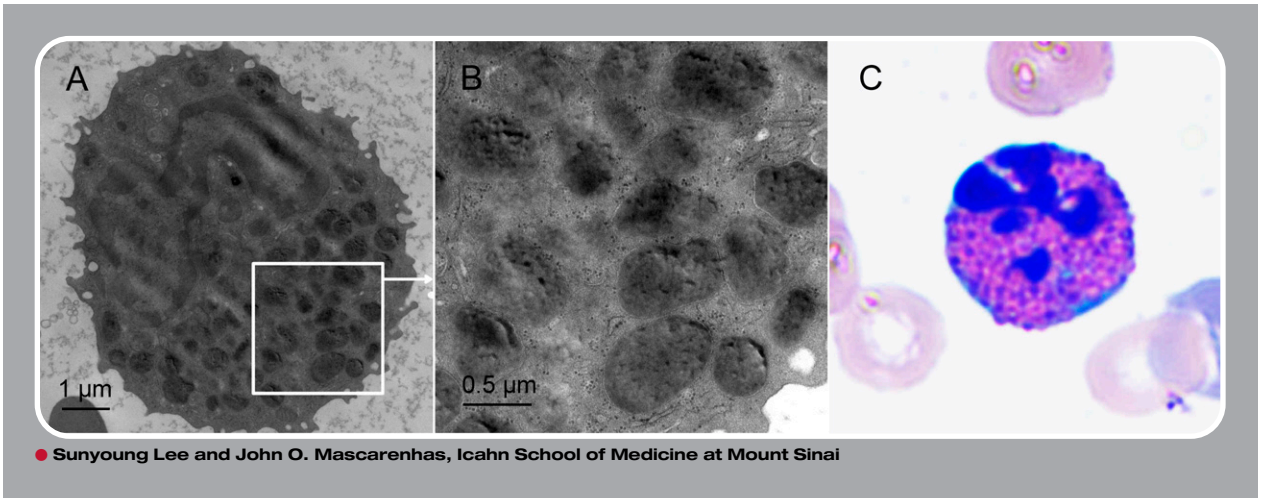
bloodwork
IMAGES IN HEMATOLOGY

Dysplastic changes of peripheral eosinophils in acute myeloid leukemia with myelodysplastic syndrome–related features



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A 41-year-old man presented with epistaxis for 1 day and was found to have leukocytosis (23 200/μL) with 38% blasts, anemia (9.3 g/dL), and thrombocytopenia (7000/μL). Bone marrow aspiration and biopsy showed sheets of blasts comprising 90% of the overall cellularity. Flow cytometry and immunohistochemical stains demonstrated a population of cells that expressed $CD13^+$, $CD33^+$, CD34 partial$^+$, CD45 partial$^+$, $CD117^+$, myeloperoxidase$^+$, and $HLA\text{-}DR^+$. Monosomy 7 and FMS-like tyrosine kinase 3–internal tandem duplication were detected. Acute myeloid leukemia with myelodysplastic syndrome (MDS)–related features was diagnosed based on an MDS-related cytogenetic abnormality (monosomy 7).

Peripheral smears revealed dysplastic features of eosinophils. Cytoplasmic granules of eosinophils imaged on transmission electron microscopy (TEM) revealed a high degree of heterogeneity in size with totally shattered electron-rich cores (panels A-B). This finding on TEM is a different morphologic feature from that shown in piecemeal degranulation recognized in eosinophils during inflammatory responses. Karyorrhexis is a fragmentation of the nucleus, listed as a dysplastic feature in the erythroid lineage (dyserythropoiesis) in the World Health Organization classification, but the smear results from this patient revealed a rare finding of karyorrhexis of eosinophils (dysgranulopoiesis, panel C).