A 65-year-old woman was diagnosed with myelodysplastic syndrome (MDS) with extra blasts-2 with 10% myeloblasts without any evidence of a mast cell disorder. She received azacitidine without response. Thirteen months after the initial diagnosis, she developed worsening pancytopenia and increasing (10%) circulating immature cells (panel A; Wright stain, original magnification ×500). A bone marrow biopsy showed mast cell leukemia involving >50% of the cellularity by aspirate differential and immunostains for CD25 (panel B; original magnification ×400) in addition to persistent MDS. Striking hemophagocytosis by both mast cells (panel C; Wright stain, original magnification ×500) and histiocytes (panel D; Wright stain, original magnification ×1000) was also seen. Next-generation sequencing again identified stable mutations in ASXL1, RUNX1, CDKN2A, and EZH2 (variant allele frequency [VAF] 43% to 51%) but also a new KIT D816V mutation (VAF 10%). Serum tryptase was markedly elevated at 989 μg/L but mediator symptoms were absent. Unfortunately, the patient died before further treatment could be initiated.

Mast cell leukemia is an aggressive form of systemic mastocytosis that can be associated with a concurrent hematologic neoplasm. In this case, the increasing numbers of blasts in the peripheral blood were initially worrisome for progression of MDS to acute myeloid leukemia. However, their atypical spindly shape was concerning for a different process, which was confirmed to be mast cell leukemia. Mast cell leukemia can rarely exhibit hemophagocytic features, which may contribute to worsening cytopenias or other unusual clinical features.
Mast cell leukemia and hemophagocytosis in a patient with myelodysplastic syndrome

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