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Case report: Common clonal origin of concurrent langerhans cell histiocytosis and acute myeloid leukemia

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Langerhans cell histiocytosis (LCH) and acute myeloid leukemia (AML) are distinct entities of blood neoplasms, and the exact developmental origin of both neoplasms are considered be heterogenous among patients. However, reports of concurrent LCH and AML are rare. Herein we report a novel case of concurrent LCH and AML which shared same the driver mutations, strongly suggesting a common clonal origin.An 84-year-old female presented with cervical lymphadenopathy and pruritic skin rash on the face and scalp. Laboratory tests revealed pancytopenia with 13% of blasts, elevated LDH and liver enzymes, in addition to generalised lymphadenopathy and splenomegaly by computed tomography. Bone marrow specimens showed massive infiltration of MPO-positive myeloblasts, whereas S-100 and CD1a positive atypical dendritic cell-like cells accounted for 10% of the atypical cells on bone marrow pathology, suggesting a mixture of LCH and AML. A biopsy specimen from a cervical lymph node and the skin demonstrated the accumulation of atypical cells which were positive for S-100 and CD1a. LCH was found in lymph nodes, skin and bone marrow; AML was found in peripheral blood and bone marrow (AML was predominant compared with LCH in the bone marrow).

Next generation sequencing revealed four somatic driver mutations (*NRAS*-G13D, *IDH2*-R140Q, and *DNMT3A*-F640fs/-I715fs), equally shared by both the lymph node and bone marrow, suggesting a common clonal origin for the