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Chemotherapy Induced Erythroid Dysplasia in a Patient with Acute Myeloid Leukemia

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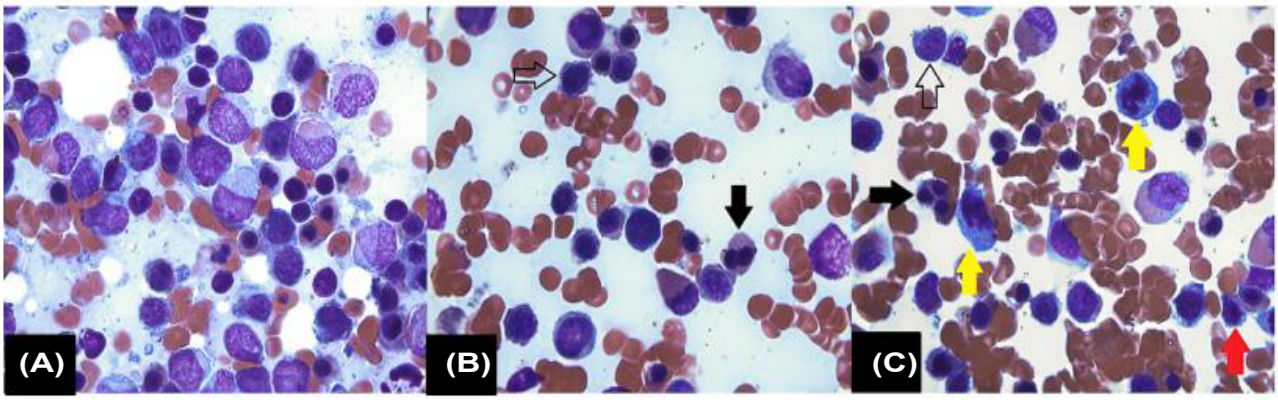

A 23 years old gentleman presented with a reduced appetite, weight loss and fatigue. CBC revealed anemia, thrombocytopenia and elevated WBC count with 75% blasts on peripheral blood. Bone marrow aspirate and biopsy showed hypercellular marrow with 60% involvement by myeloblasts and no dysplastic changes (Panel A). Flow cytometry identified a distinct blast population (68.8%) expressing myeloblastic markers. Cytogenetics showed no chromosomal abnormalities. The diagnosis was consistent with acute myeloid leukemia (AML) and the patient was started on chemotherapy. On day 22 he spiked fever. CBC showed persistent pancytopenia. His bone marrow biopsy showed a normocellular marrow with 25% involvement by myeloblasts. Dysplastic erythroid precursors were seen in the background. Morphologic features including nuclear budding (red arrows), karyorrhexis(yellow arrows), multinucleation (black arrows) and megaloblastoid changes(transparent arrow) (Panels B&C) were observed. Flow cytometry confirmed a distinct population of blasts (21%) with similar immunophenotype as previously, consistent with residual AML. This case highlights a dramatic change in erythroid precursor morphology highly suggestive of dysplasia occurring after chemotherapy. Though initial cytogenetic studies did not yield any evidence of underlying myelodysplasia, this method may not have detected minimal chromosomal errors like micro-deletions, which could explain the abrupt emergence of dysplastic features in normal bone marrow precursors. Additional studies, such as next generation DNA sequencing and chromosomal microarray analysis can potentially detect such minor chromosomal errors that would otherwise remain undiagnosed by conventional cytogenetics. We did not perform these additional tests at initial presentation. However, we conclude, in this clinical context and with the short time frame, that the dyspoietic changes are most likely secondary to chemotherapy effect.

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