

# Case Study: Therapy-related Acute Myeloid Leukemia: A Three-case Review

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## ABSTRACT

Three patients were diagnosed at our facility with therapy-related acute myeloid leukemia (t-AML) but had differing etiologies. Patient A was a 30-year-old male with a history of acute lymphoblastic leukemia in remission. The patient was admitted to the hospital in early 2019 for pain control and concurrent pancytopenia. A bone marrow biopsy was performed because of the concern for relapsed disease. The bone marrow showed 96.6% blasts and was 95% cellular. The blasts showed a different immunophenotype in comparison to his original diagnosis and were now monocytic in nature. Patient B was a 63-year-old male with a complex medical history who was admitted with severe thrombocytopenia. A bone marrow biopsy was performed to determine the cause of cytopenia. The bone marrow biopsy report came back initially as acute myeloid leukemia with myelodysplastic changes but was later changed to therapy-related acute myeloid leukemia after it was discovered the patient had been taking a cytotoxic agent after kidney transplant. Patient C had started monitoring for

cytopenia in 2016 after a distant history of B-cell non-Hodgkin's lymphoma. Monitoring was recommended after repeated bone marrows until late 2017 when a diagnosis of therapy-related myelodysplastic syndrome was made. The patient then evolved to therapy-related acute myeloid leukemia in fall 2019 after the bone marrow blast count passed 20%. Therapy-related acute myeloid leukemia is thought to make up 5%–20% of all myelodysplastic syndrome/acute myeloid leukemia (AML) cases according to the National Comprehensive Cancer Network Acute Leukemia guidelines. A number of different diseases can proceed t-AML, including breast cancer, gynecologic cancers, and lymphoproliferative disorders. Certain drug classes are also known to cause t-AML. t-AML is known to have reduced rates of relapse-free survival and overall survival in comparison to de novo cases of AML.

**ABBREVIATIONS:** AML - acute myeloid leukemia, t-AML - therapy-related acute myeloid leukemia.

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