A 53-year-old man presented with a 1-week history of the acute onset of low back pain and fatigue. Physical examination showed decreased breath sounds over both lower lungs. Chest radiography revealed bilateral pleural effusions. A full blood count showed leucocytosis (white cell count 11.5 × 10⁹/l), anaemia (haemoglobin concentration 80 g/l) and thrombocytopenia (platelet count 103 × 10⁹/l). Biochemical tests showed elevated serum creatinine (185.6 μmol/l) and lactate dehydrogenase (2518 iu/l). Bone marrow examination disclosed hypercellularity with increased myeloblasts. Flow cytometric immunophenotyping of bone marrow cells showed expression of CD34, CD33 and CD13, but not of CD14, CD3, CD10 or CD20. Cytogenetic study with a G banding technique showed t(8;21)(q22;q22) and loss of Y (top). Based on morphology, surface markers and cytogenetic studies, a diagnosis of acute myeloid leukaemia with recurrent genetic abnormality was made. He was treated with induction chemotherapy with idarubicin 12 mg/m² from day 1 to day 3, and cytarabine 100 mg/m² from day 1 to day 7. He achieved complete haematological remission as assessed by bone marrow and peripheral blood examination. His pleural effusion, however, did not resolve. Pleural fluid (bottom left) showed large blasts positive for CD34, CD33, and CD13 with homogenous salmon-colored granules and vacuoles. A normal karyotype of pleural effusion cells was shown by a G banding technique, but fluorescence in situ hybridization analysis using an AML1 (red)/ETO (green) dual-fusion probe was positive (bottom right), indicating t(8;21)(q22;q22) and RUNX1-RUNX1T1 fusion. After re-induction with high dose cytarabine the pleural effusion disappeared. Having a HLA-matched sibling donor, he underwent allogeneic haematopoietic stem cell transplantation with reduced intensity conditioning. One year later, he is now free of disease and has limited chronic graft-versus-host disease.

Leukaemic pleural effusion in acute myeloid leukaemia is rare. In this patient, leukaemic cells in the bone marrow and effusion fluid belonged to the same clone, as showed by presence of t(8;21)(q22;q22). Complete remission in the bone marrow with persistent disease in the pleural cavity is unusual.

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