Acute Myeloblastic Leukemia (Type M_0 through M_2 in the FAB Classification). Morphologically, the cell populations that dominate the CBC and bone marrow analyses (Fig. **31**) more or less resemble myeloblasts in the course of normal granulopoiesis. Differences may be found to varying degrees in the form of coarser chromatin structure, more prominently defined nucleoli, and relatively narrow cytoplasm. Compared with lymphocytes (micromyeloblasts), the analyzed cells may be up to threefold larger. In a good smear, the transformed cells can be distinguished from lymphatic cells by their usually reticular chromatin structure and its irregular organization. Occasionally, the cytoplasm contains crystalloid azurophilic needle-shaped primary granules (Auer bodies). Auer bodies (rods) are conglomerates of azurophilic granules. A few cells may begin to display promyelocytic granulation. Cytochemistry shows that from stage M_1 onward, more than 3% of the blasts are peroxidase-positive.

Characteristics of Acute Leukemias

Age of onset: Any age.
Clinical findings: Fatigue, fever, and signs of hemorrhage in later stages.
Lymph node and mediastinal tumors are typical only in ALL.
Generalized involvement of all organs (sometimes including the meninges) is always present.
CBC and laboratory: Hb ↓, thrombocytes ↓, leukocytes usually strongly elevated (~ 80%) but sometimes decreased or normal.
In the differential blood analysis, blasts predominate (morphologies vary).
Beware: Extensive urate accumulation!
Further diagnostics: Bone marrow, cytochemistry, immunocytochemistry, cytogenetics, and molecular genetics.
Differential diagnosis: Transformed myeloproliferative syndrome (e.g., CML) or myelodysplastic syndrome.
Leukemic non-Hodgkin lymphomas (incl. CLL).
Aplastic anemias.
Tumors in the bone marrow (carcinomas, but also rhabdomyosarcoma).
Course, therapy: Usually rapid progression with infectious complications and bleeding.
Immediate efficient chemotherapy in a hematology facility; bone marrow transplant may be considered, with curative intent.

Fundamental characteristic of acute leukemia: variable blasts drive out other cell series

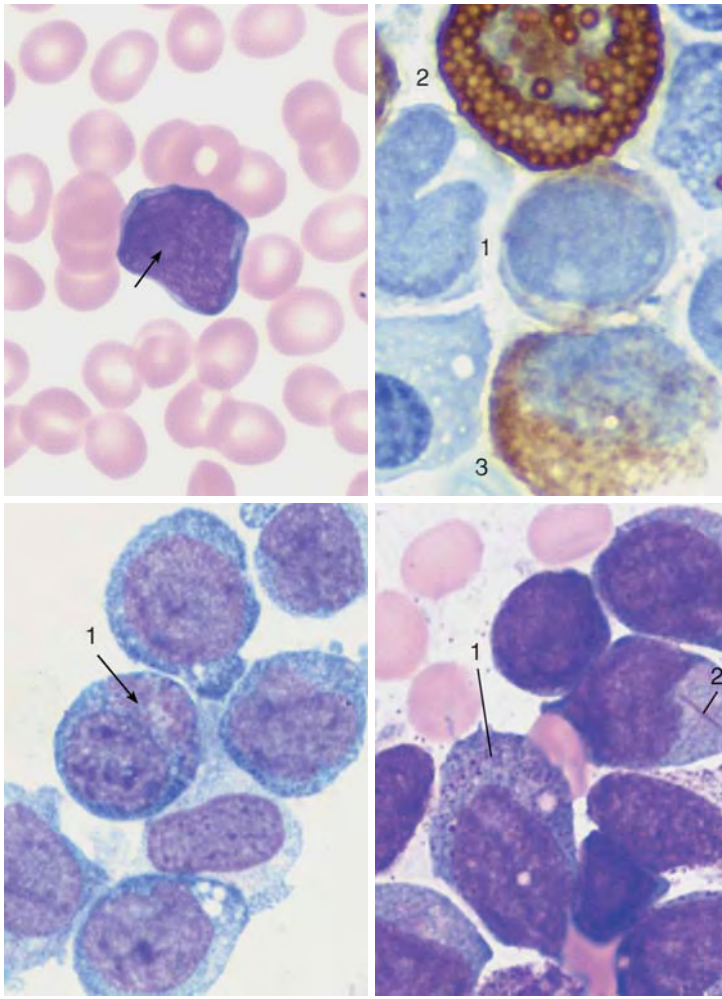

Fig. **31** Acute leukemia, M_0–M_2. **a** Undifferentiated blast with dense, fine chromatin, nucleolus (arrow), and narrow basophilic cytoplasm without granules. This cell type is typical of early myeloid leukemia (M_0–M_1); the final classification is made using cell surface marker analysis (see Table **14**). **b** The peroxidase reaction, characteristic of cells in the myeloid series, shows positive ($\geq 3\%$) only for stage M_1 leukemia and higher. The image shows a weakly positive blast (1), strongly positive eosinophil (2), and positive myelocyte (3). **c** and **d** Variants of M_2 leukemia. Some of the cells already contain granules (1) and crystal-like Auer bodies (2).