

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Hematology-Cell Morphology – Case 22

- Formed mainly in abnormal promyelocytes (also called blastic cells)
- Nuclei of different size and shape
- Usually a bilobed nucleus
- Cytoplasm with large granules
- Small tendency to maturation
- Clusters of Auer bodies
- Many smudge cells.

The majority of cells are abnormal promyelocytes with the characteristic heavy granulation (figures 1 to 6), reddish, containing simple or multiple Auer bodies (faggots) (fig. 16). The cytoplasm of promyelocytes with many Auer bodies usually contains a few azurophilic granules (figures 5 to 7). Some cells have a cytoplasm full of fine granules, while often the granulation is quite large and heavy, overlapping the nucleus. Rarely the abnormal promyelocytes or more mature cells, with or without Auer bodies, mature to abnormal cells of the granulocytic series often assuming a pseudo-Pelger appearance. The characteristic promyelocytes are present more frequently in bone marrow than in the peripheral blood. Abnormal myelocytes and metamyelocytes are present mainly after differentiation, as a result of all-trans retinoic acid (ATRA) treatment and are usually dysgranulopoietic with perturbations or nuclei and mild hypogranular cytoplasm.

Morphologically the blasts are of large size, with a round,

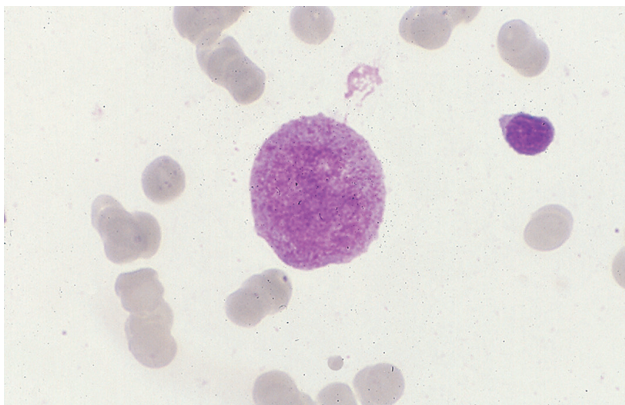


Figure 1

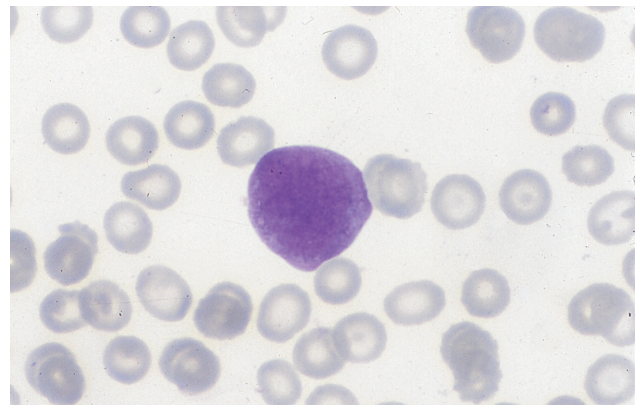


Figure 2

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2023, 40(6):858–861

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irregular, renal shaped, multilobed or folded nucleus, well visible nucleoli in each lobe, abundant cytoplasm with many azurophilic granulations and absence of hypergranulation and Auer body formation in the majority of promyelocytes (figures 10 to 16). Rarely, blastic cells may have a regular shape, and round nucleus. In the bone marrow and peripheral blood the smears of this type

of cells reminds us of an acute monoblastic leukemia of type M5a FAB. In some cases, blastic cells in the peripheral blood are typical of M3 variant type (hypogranular or microgranular M3), while in the bone marrow there are cells with heavy granulation and both types of cells are present. Characteristically, in the M3

variant there is an intense leucocytosis in the peripheral blood, while in the usual type of M3 the number of white blood cells (WBC) are usually low (figures 8 to 10, 13).

The subtype of M3 with basophilia (basophilic differentiation), as well as that of the hyperbasophilic type, with blasts

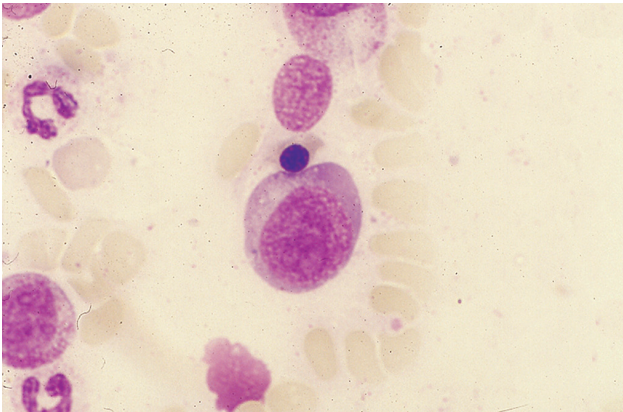


Figure 3

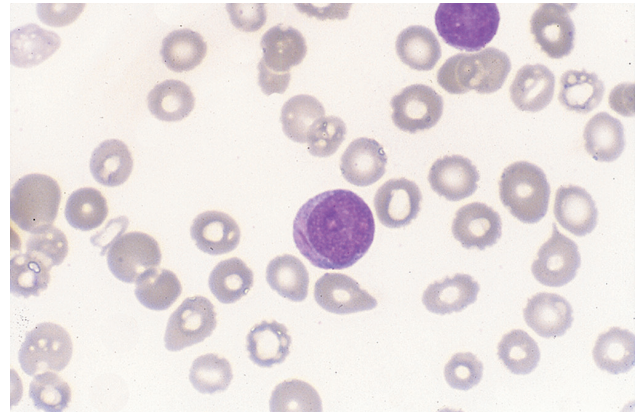


Figure 6

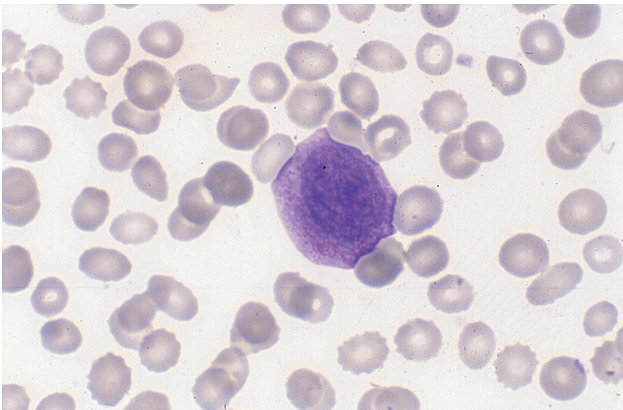


Figure 4

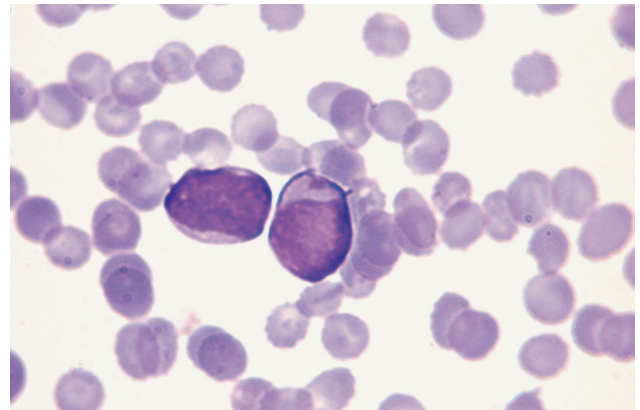


Figure 7

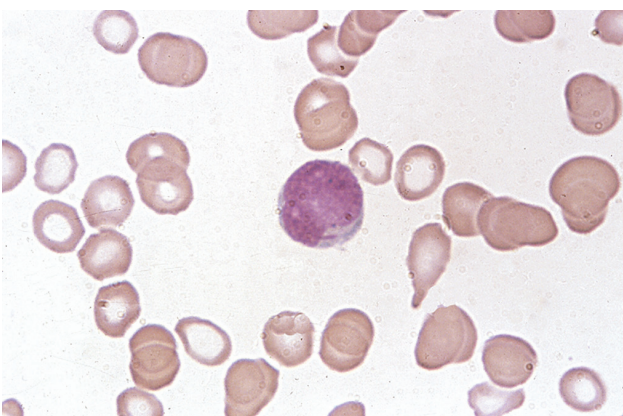


Figure 5



Figure 8

containing a very dense nucleus with non-well visible chromatin pattern, and a small quantity of cytoplasm with projections (may be differentiated from AML M7 blasts).

It is a more aggressive form of acute myeloid leukemia (AML)

and in the majority of cases it appears in translocation $t(15;17)$ and the presence of hybridic gene *PML/RAR α* in two thirds of the patients.

Peroxidase and specific esterase staining: Heavy positive

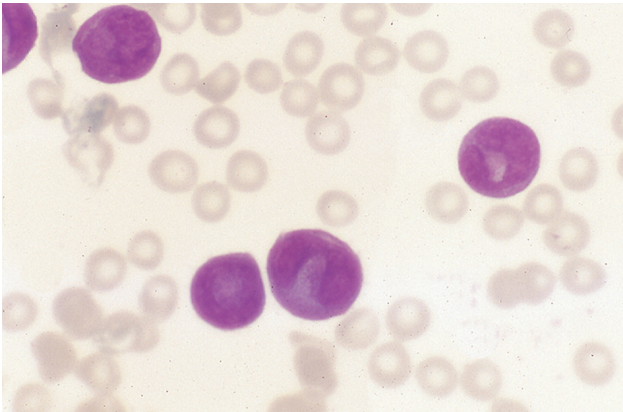


Figure 9

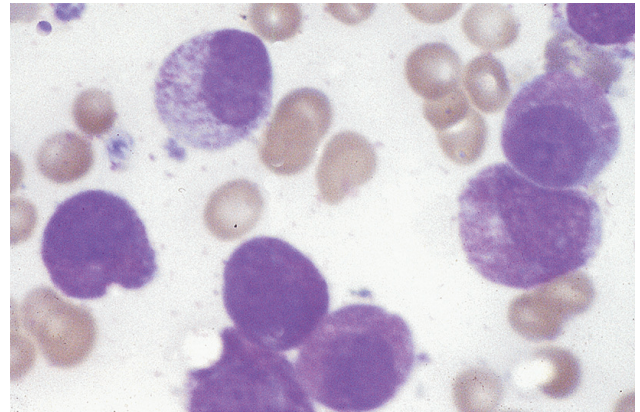


Figure 12

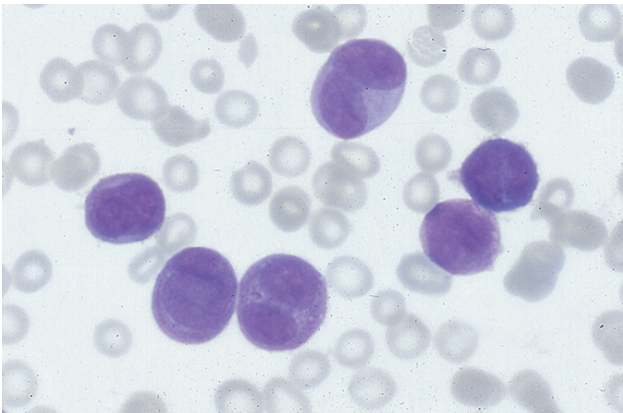


Figure 10

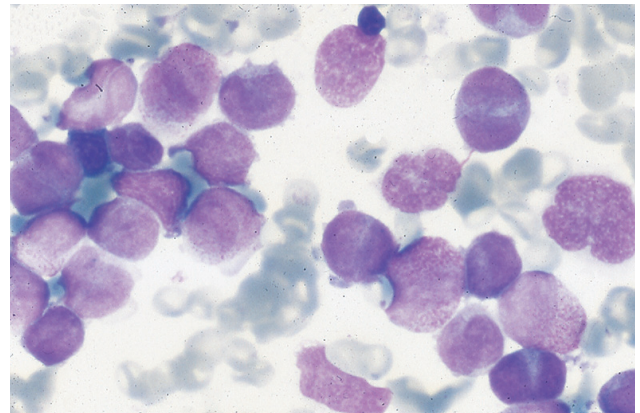


Figure 13

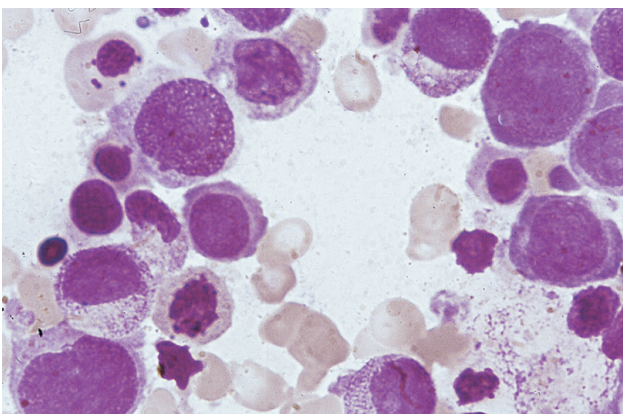


Figure 11

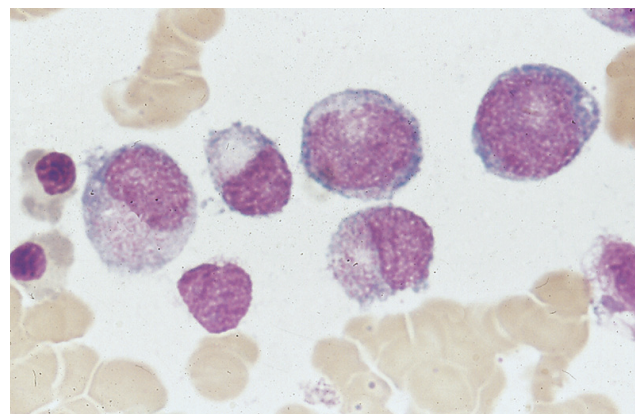


Figure 14

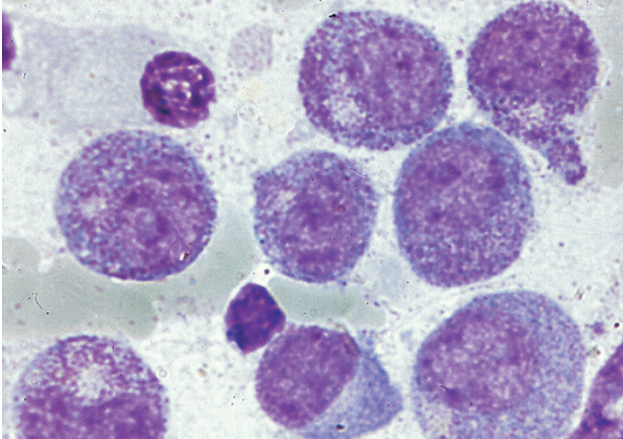


Figure 15

(positivity of Auer bodies, lysosomal source). PAS staining: Fine cytoplasmic positivity network. Acid phosphatase staining: Heavy granular positivity. Non specific esterase staining (alpha-naphthyl acetate, ANAE): Weak positivity. Microgranular type: Blasts of different size and shape with a monocytoid appearance, well visible nucleoli, abundant cytoplasm containing small azurophilic granular aggregations. The peroxidase and acid phosphatase staining are positive, while the non specific esterase reaction is negative or weakly positive.

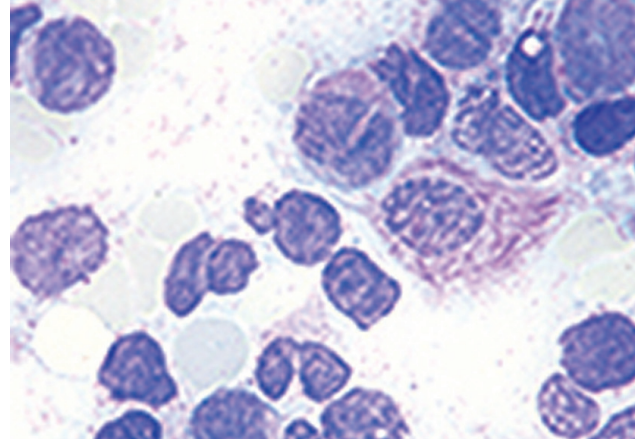


Figure 16

References

1. MELETIS J. *Atlas of hematology*. 3rd ed. Nireas Publ Inc, Athens, 2009:345–354

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