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实用血液学及细胞学图谱

Atlas of Practical Hematology and Cytology

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一、骨髓及血细胞形态学

(一)非淋巴细胞白血病

1. 急性粒细胞白血病未分化型(M₁)

图1 原始粒细胞,胞体约18—20微米,规则多为圆形;核染色质细致,可见核仁;胞浆量少,着色深浅不一;无颗粒。

2. 急性粒细胞白血病分化型(M_{2a})

图2 原始及早幼粒细胞,胞体圆形,规则或略不规则;胞核圆形或有凹陷。早幼粒细胞染色质较原始粒细胞粗,排列较致密,部分可见核仁;浆呈蓝或紫红色,可见嗜天青颗粒。

3. 急性粒细胞白血病分化型亚型(M_{2b})

图3,4 示病理性中幼粒细胞增多。胞体较大,形态不规则,核浆发育不平衡;核畸形,染色质似早幼粒细胞阶段,可见核仁;浆丰富可见嗜天青颗粒及空泡。图4右方为二个原始粒细胞。

4. 急性多颗粒早幼粒细胞白血病(M₃)

图5 M₃ 细颗粒型 细胞大小不等,胞体不规则;胞核多呈畸形,褶皱,分叶,核有染色质外溢,染色质细致,核仁明显;浆灰蓝分内外浆,颗粒细小靠内浆部分。

图6 M₃ 粗颗粒型 胞体大小不等,不规则;核畸形,呈凹陷、肺叶状;浆灰蓝分内外浆,颗粒粗大弥散在内浆部分及核上;部分可以呈嗜碱性,染色质结构不清楚,胞浆可见瘤状突起,Auer's小体呈柴薪状排列。

一、Bone Marrow and Blood Cell Morphology

(一)Non-Lymphocytic Leukemia

1, Acute Myelocytic Leukemia Undifferentiated (M₁)

Fig. 1, Myeloblasts of uniform size are characterized by regular round forms (diameter 18-20 μm). Chromatin is fine with visible nucleoli. Cytoplasm stained discordantly is scanty and contains no granules.

2, Acute Myelocytic Leukemia with Differentiation (M_{2a})

Fig. 2, Hyperplasia of round myeloblasts and promyelocytes. Nuclei are regular or irregular and displaying indented. Promyelocytic chromatin is slightly coarse and condense. Nucleoli can be seen. Cytoplasm is blue or purple-red with azurophilic granules.

3, Acute Myelocytic Leukemia with Differentiation (subtype M_{2b})

Fig. 3-4, Hyperplasia of marked abnormal myelocytes with marked asynchrony of nucleocytoplasmic maturation. Nuclei have deformity with distinct nucleoli. Cytoplasm is abundant with azurophilic granules. Fig. 4, On the right there are two myeloblasts.

4, Acute Hypergranular Promyelocytic Leukemia (M₃ Fine G)

Fig. 5, Hypergranular promyelocytes are variable in size with irregular shape. Nuclear outline is irregular displaying indented, folded or lobulated. Chromatin is fine and contains clear nucleoli. Cytoplasm is grey-blue. There are fine granules in the inner cytoplasm.

Fig. 6, M₃ (Coarse G) These cells are variable in size with indented, folded or lobulated nuclei. Cytoplasm is grey-blue, divided into inner and outer cytoplasm and filled with coarse granules. The granules can be seen at nuclei. Tumor-like protrusion of cytoplasm also can be seen. In cytoplasm Auer's Bodies can be seen as bundles of firewood.

图 7 M_3 甲苯胺蓝染色 颗粒染呈紫红色,提示颗粒含酸性粘多糖。瑞氏染色呈嗜碱性紫黑色颗粒。

图 8 M_3 氯醋酸酯酶染色(AS-D-CE) M_3 型细胞呈强阳性或弱阳性反应。

5. M_3 维甲酸治疗后血细胞改变

图 9 M_3 维甲酸治疗后 1 周骨髓片 粒细胞颗粒消失,中间有 2 个晚幼红细胞,右方是 2 个中幼红细胞,呈巨型变,核畸形。

图 10 M_3 维甲酸治疗后 2 周骨髓片 粒细胞颗粒消失,核畸形,呈肺叶状,凹陷,染色质细致,可见核仁。

6. 急性粒——单核细胞白血病伴嗜酸粒细胞增多(M_4E_0)及细胞化学染色

急性粒——单核细胞白血病(M_4)伴嗜酸性粒细胞增多称 M_4E_0 ,是 M_4 的一种亚型。其主要特征为:形态学符合 M_4 并伴有嗜酸性粒细胞增多 ≥ 0.05 (不计算有核红细胞 NEC)。嗜酸性粒细胞形似单核细胞,大多为中、晚幼嗜酸性粒细胞,成熟型呈低分叶状。浆中含嗜酸、嗜碱两种颗粒;PAS 染色阳性。细胞呈 16 号染色体异常。表现为臂间倒位—— $inv(16)(p^{13}q^{22})$;长臂部分缺失—— $del(16)(q^{22})$;同源染色体易位—— $t(16;16)(p^{13.1}q^{22})$ 。见图 11—17。

图 11 M_4E_0 示原始粒细胞、幼稚单核细胞及 4 个嗜酸性粒细胞。

图 12 正常嗜酸性粒细胞过碘酸——雪夫氏(PAS)反应 嗜酸粒细胞颗粒呈阴性反应,浆呈粉红色,看似泡沫状。左方是一中性分叶核粒细胞 PAS 呈强阳性反应。

Fig. 7, M_3 Toluidine blue staining This figure shows hypergranular promyelocytes containing acid mucopolysaccharide granules, staining purple-red in color. These granules present darkpurple basophilic reaction with Wright's stain.

Fig. 8, M_3 AS-D-Chloroacetate Esterase (AS-D-CE) This figure shows strong or weak positive reaction in leukemic cells.

5. Change of Blood cell after Ritotic Acid Treatment

Fig. 9, M_3 Bone marrow smear after treatment with ritotic acid for one week Granules disappear in leukemic cells. In the center two cells are orthochromatic normoblasts. On the right two cells are polychromatic normoblasts with megaloblastoid changes and abnormal nuclei.

Fig. 10, M_3 Bone marrow smear after treatment with ritotic acid for two weeks Granules disappear and nuclei get deformity, indented or lung-lobe shaped. Chromatin is fine with distinct nucleoli.

6. Acute Myelomonocytic leukemia with Eosinophilia and Cytochemical Staining

Acute myelomonocytic leukemia (M_4) with hyperplasia of eosinophils(M_4E_0). M_4E_0 is a subtype of M_4 , having the characteristics of M_4 with hyperplasia of eosinophils ≥ 0.05 (NEC) which are mainly composed of monocyte-shaped eosinophilic myelocytes, eosinophilic metamyelocytes and lower-lobulated eosinophils. Chromosome 16 appears to have $inv(16)(P^{13}q^{22})$, $del(16)(q^{22})$ or $t(16;16)(p^{13.1}q^{22})$. Fig. 11-17

Fig. 11, M_4E_0 The figure shows myeloblasts, promonocytes and four eosinophils.

Fig. 12, Normal eosinophilic Periodic Acid-Schiff (PAS) reaction Eosinophils are negative. On the left, one cell is polymorphonuclear neutrophil with strongly positive reaction.

图 13 M₄E₀ 嗜酸性粒细胞 PAS 反应 图中示 4 个嗜酸性粒细胞 PAS 反应颗粒呈红紫色,粗大。右上粒细胞浆呈弥散性红紫色

图 14 正常嗜酸性粒细胞 AS-D-CE 染色 细胞浆中呈弥散性粉红色。左方是一中性粒细胞浆呈深红色。

图 15 M₄E₀ AS-D-CE 染色 图中心示嗜酸性粒细胞颗粒着深红棕色,粗大。

图 16 M₄E₀ 甲苯胺蓝染色 图中心示嗜酸性粒细胞含酸性粘多糖颗粒,染呈深紫红色,瑞氏染色呈嗜碱性紫黑色颗粒。

图 17 M₄E₀ 过氧化酶(POX)染色 图中酸性粒细胞浆中粗大圆形颗粒染呈蓝色。

7. 急性单核细胞白血病(未分化型)(M_{5a})

图 18,19, 急性单核细胞白血病未分化型(M_{5a})

原始单核细胞呈圆形或椭圆形,直径约 15—20 微米;胞核圆或稍凹陷,着色较浅,染色质呈细网状,核仁 1—3 个,清晰;胞浆丰富,灰蓝或淡蓝色。

Fig. 13, M₄E₀ Eosinophilic PAS reaction This figure shows four eosinophils with red-purple coarse granules. A granulocyte (upper right) has diffuse red-purple granules in the cytoplasm.

Fig. 14, Normal eosinophilic AS-D-CE staining This figure shows one normal eosinophil with diffusive pink cytoplasm. On the left, there is one neutrophil with deeply red-purple cytoplasm.

Fig. 15, M₄E₀ Bone marrow AS-D-CE staining At the center there is an eosinophil with deeply red brown granules.

Fig. 16, M₄E₀ Bone marrow toluidine blue staining At the center there is an eosinophil containing acid mucopolysaccharide granules, staining deeply purple-red in color. These granules present dark-purple basophilic reaction with Wright's stain.

Fig. 17, M₄E₀ Bone marrow peroxidase reaction (POX) This figure shows eosinophils with blue coarse granules in the cytoplasm.

7. Acute monocytic leukemia (Undifferentiated) (M_{5a})

Fig. 18-19, There are round or ellipsoidal monoblasts (diameter 15-20 μ m). The nuclei are round or indented, and stained lighter than the other primitive cells. Chromatin is fine reticular with 1-3 prominent nucleoli.

Abundant cytoplasm is grey-blue or light blue.

图 20, 21, α -醋酸萘酯非特异性酯酶 (NAE) 染色 M_{5a} 白血病细胞呈深棕或淡棕色, 能被氟化钠抑制。

图 22 M_{5a} 治疗后部分缓解, 骨髓片中出现多量小巨核细胞。

8. 急性单核细胞白血病(分化型)(M_{5b})

图 23 原始, 幼稚单核细胞; 浆中可见细长 Auer 氏小体及细小嗜天青颗粒。

9. 急性红白血病(M_6)

图 24 示红血病期, 骨髓及外周血见多量原始及早幼红细胞, 呈巨幼变。其他细胞受抑制。

Fig. 20-21, M_{5a} Bone marrow α -naphthyl acetate nonspecific esterase (NAE) reaction The leukemic cells present deeply brown reaction which can be inhibited by sodium fluoride.

Fig. 22, After treatment, M_{5a} partially remittent bone marrow has a large number of small megakaryocytes.

8, Acute monocytic leukemia (Differentiated)(M_{5b})

Fig. 23, The figure shows monoblasts and promonocytes. The cytoplasm contains thin and long Auer's rods with fine azurophilic granules.

9, Acute Erythroleukemia

Fig. 24, Erythroleukemia (M_6) This figure shows bone marrow of erythroblastemia. A large number of megakaryocytes and basophilic megakaryoblasts can be seen. The other cells are few.