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ATLAS OF CLINICAL HEMATOLOGY

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WEST CHINA UNIVERSITY OF MEDICAL SCIENCES

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圖1 原始紅細胞 幼稚紅細胞

- 1 ~ 5 原始紅細胞，細胞直徑 $15 \sim 20 \mu\text{m}$ 。
6 原始紅細胞核分裂象。
7、9、10 早幼紅細胞，直徑 $12 \sim 18 \mu\text{m}$ 。
8、11~21 中幼紅細胞，直徑 $12 \sim 15 \mu\text{m}$ 。
22~30 晚幼紅細胞，直徑 $8 \sim 12 \mu\text{m}$ 。

**Fig. 1 Pronormoblasts
Normoblasts**

- 1-5 Pronormoblasts (15 to 20 μm diameter).
6 Pronormoblast tends to produce multinucleated form.
7, 9, 10 Basophilic normoblasts (12 to 18 μm diameter).
8, 11-21 Polychromatic normoblasts (12 to 15 μm diameter).
22-30 Orthochromatic normoblasts (8 to 12 μm diameter).

圖 2A 紅細胞

- 1 正常紅細胞。
- 2 低色素性紅細胞。
- 3 異形紅細胞。
- 4 小細胞低色素性紅細胞。
- 5 小球形紅細胞。
- 6 橢圓形紅細胞。
- 7 大紅細胞。
- 8 嗜碱性點彩紅細胞。

Fig. 2A Erythrocytes (Red Blood Cells)

- 1 Normal erythrocytes
- 2 Hypochromic erythrocytes
- 3 Poikilocytes
- 4 Microcytic hypochromic erythrocytes
- 5 Microspherocytes
- 6 Elliptocytes (Ovalocytes)
- 7 Macrocytes
- 8 Basophilic stippled erythrocytes

圖 2B 紅細胞

- 1 嗜多色性紅細胞。
- 2 巨紅細胞。
- 3 紅細胞含豪—周氏小體，卡波氏環。
- 4 淚滴形紅細胞。
- 5 靶形紅細胞。
- 6 棘形紅細胞。
- 7 鐮刀形紅細胞。
- 8 鐵粒紅細胞。
- 9 網織紅細胞。

Fig. 2B Erythrocytes (Red Blood Cells)

- 1 Polychromatic erythrocytes.
- 2 Megalocytes.
- 3 Erythrocytes containing nuclear remnants: Howell-Jolly bodies (lower right), Cabot rings.
- 4 Tear drop cells.
- 5 Target cells.
- 6 Acanthocytes (Burr cells).
- 7 Sickle cells.
- 8 Siderocytes.
- 9 Reticulocytes.

圖 3 原始紅細胞

圖中央一個原始紅細胞，胞體大，不規則，直徑約 $18\mu\text{m}$ ，核漿比例大。胞核圓形、較大，呈紫紅色，染色質呈細粒網狀，排列疏鬆均勻，隱約可見兩個核仁，核仁四周染色質更致密。胞漿量少，有兩個偽足，漿邊緣着色深藍，靠核部着色淡稱核周淡染區。

圖 4 早幼紅細胞

圖上及右方各有一個早幼紅細胞，胞體較原始紅細胞小，約 $16\mu\text{m}$ ，規則無偽足，核漿比例較大。胞核圓形位於中央，核膜清楚，染色質較原始紅細胞排列致密，核仁消失，胞漿量少，邊緣着深藍色，核周淡染區明顯。

圖 5 中幼紅細胞

圖正中三個中幼紅細胞，胞體圓形較規則，直徑約 $12\sim 15\mu\text{m}$ 。胞核圓，核染色質粗、致密、呈塊狀，無核仁。胞漿中已開始出現血紅蛋白。

圖 6 早幼紅細胞 中幼紅細胞 晚幼紅細胞

片中見三個不同階段的幼稚紅細胞：正中為早幼紅細胞；上方為中幼紅細胞；下方為晚幼紅細胞早期，胞體大小與成熟紅細胞相似，圓形，核染色質較緊密呈碎塊狀結構，深紫色，胞漿呈粉紅色。

Fig. 3 Pronormoblast

Showing a pronormoblast of large size ($18\mu\text{m}$ diameter) with somewhat irregular margin. It possesses a relatively large nucleus which stains purple red and nucleoli are visible. The nucleus cytoplasm ratio is large. The nuclear chromatin presents fine reticul μm but coarser than in myeloblast. The cytoplasm is scanty with two pseudopodia on the lower and stains in deeper blue at the periphery. The perinuclear zone is distinct.

Fig. 4 Basophilic normoblast

Two basophilic normoblast are shown on the top and right. The cell usually is smaller than the pronormoblast ($16\mu\text{m}$ diameter) and the cytoplasm is regular without pseudopodia. Nucleus cytoplasm ratio is large. The nucleus is in the center with clear nuclear membrane. The chromatin is more condense than that of the pronormoblast and parachromatin is present. The nucleoli are no longer visible. The cytoplasm is scanty and deeply basophilic. The perinuclear clear zone is obvious.

Fig. 5 Polychromatic normoblast

Showing three polychromatic normoblast in the center. The cells are somewhat smaller ($12\sim 15\mu\text{m}$ diameter) and regular. The nucleus is round and the chromatin is coarse and dense. Irregular lumps of chromatin are formed. Parachromatin is present but nucleoli are not visible. At this time development hemoglobin begins to appear in the cytoplasm.

Fig. 6 Basophilic normoblast, polychromatic normoblast, and orthochromatic normoblast

This figure shows three normoblasts in different stages: basophilic normoblast on the center, polychromatic normoblast on the top and the early phase of orthochromatic normoblast on the lower. The early phase of orthochromatic normoblast is similar to that of mature erythrocytes in size. The chromatin is more condensed and lumps are formed which stain deep purple. The cytoplasm possesses more plentiful hemoglobin and presenting pink color.

圖 7 晚幼紅細胞

圖A示晚幼紅細胞（晚期），胞體小，直徑約 $10\mu\text{m}$ 。核漿比例小。胞核圓形，染色質固縮成團，呈紫黑色。漿量多，充滿血紅蛋白呈粉紅色。圖B左下為晚幼紅細胞（晚期），核欲脫出狀。

圖 8 網織紅細胞（煌焦油藍染色 瑞氏染劑複染）

圖顯示紅細胞中含深藍黑色網狀及點狀的各期網織紅細胞。

圖 9 嗜碱性點彩紅細胞

正中兩個紅細胞內有藍黑色大小不等的顆粒，為嗜碱性點彩紅細胞，正常人血片中偶見。

圖10 正常紅細胞

圖中見成熟紅細胞大小基本相等，直徑約 $6\sim 8\mu\text{m}$ ，呈粉紅色，中心較淡。

Fig. 7 Orthochromatic normoblast

- A. Shows the late phase of an orthochromatin normoblast. The cell is smaller ($10\mu\text{m}$ diameter) with lesser nucleus cytoplasm ratio. The round nucleus undergoes pyknotic degeneration. The chromatin becomes greatly condensed and the nucleus shrinks with deep purple color. The cytoplasm is full of hemoglobin.
- B. The late phase of orthochromatic normoblast on the lower left and the nucleus of which is almost lost.

Fig. 8 Reticulocyte (brilliant cresyl blue staining and counter staining with Wright's stain
showing navy blue reticulum and pinpoint substances in the erythrocytes. These cells are called reticulocytes.

Fig. 9 Basophilic stippling erythrocyte

In this micrograph, two basophilic stippling erythrocytes are seen on the center with fine and large blue granules in their cytoplasm.

Fig. 10 Erythrocyte

Showing normal mature erythrocytes with 6 to $8\mu\text{m}$ in diameter. They are stained in pink color with a pale area in the center.



圖 11 原始粒細胞 早幼粒細胞

1~8 原始粒細胞。
9~25 早幼粒細胞。

**Fig. 11 Myeloblasts
Promyelocytes**
1-8 Myeloblasts.
9-25 Promyelocytes.