

Acute Myelomonocytic Leukemia (AML-M4)

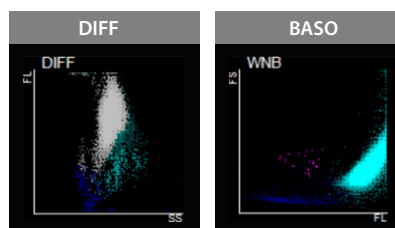
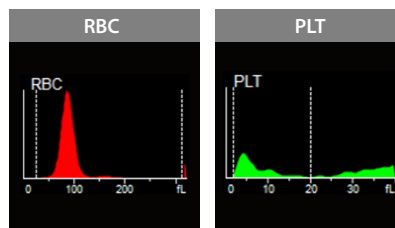
03/2023
Date

Clinical information

A 56-year-old female patient was admitted to the hospital due to dizziness, asthenia, and pyrexia.

CBC results from Mindray BC-6000 Series

Parameter	Flag	Results	Delta...	03-19	03-17	Unit
WBC	& H	83.49	72.030	11.46		10 ⁹ /L
Neu#	& R	2.70	0.980	1.72		10 ⁹ /L
Lym#		****		****		10 ⁹ /L
Mon#		****		****		10 ⁹ /L
Eos#	L	0.01	0.000	0.01		10 ⁹ /L
Bas#		0.00	0.000	0.00		10 ⁹ /L
IMG#	R	1.38	1.280	0.10		10 ⁹ /L
Neu%	& R L	3.2	-11.80	15.0		%
Lym%		****		****		%
Mon%		****		****		%
Eos%	L	0.0	-0.10	0.1		%
Bas%		0.0	0.00	0.0		%
IMG%	R	1.6	0.70	0.9		%
RBC	L	2.04	-0.070	2.11		10 ¹² /L
HGB	L	62	-1.0	63		g/L
HCT	L	17.9	-0.40	18.3		%
MCV		87.5	0.40	87.1		fL
MCH		30.2	0.20	30.0		pg
MCHC		345	1.0	344		g/L
RDW-CV		14.4	0.30	14.1		%
RDW-SD		46.0	0.40	45.6		fL
PLT	L	18	-21.0	39		10 ⁹ /L
MPV		7.4	-1.80	9.2		fL
PDW		16.9	0.90	16.0		%
PCT	L	0.013	-0.0230	0.036		%
P-LCC	L	2	-5.0	7		10 ⁹ /L
P-LCR		13.4	-5.40	18.8		%
NRBC#		0.046	0.0460	0.000		10 ⁹ /L
NRBC%		0.06	0.060	0.00		/100WBC



Flag	
-WBC Abn Scattergram	-Neutrophilia
-Blasts?	-Anemia
-Abn. Lymph/blast?	-Thrombocytopenia
-Immature Gran?	

Supplementary results of inflammatory markers						
Parameter	Flag	Results	Delta...	03-19	03-17	Unit
FR-CRP	H	103.81	16.520	87.29	111.37	mg/L
CRP	H	103.81	16.520	87.29	111.37	mg/L
SAA	H	163.31	-22.610	185.92	134.51	mg/L

- High WBC and RBC indicating moderate anemia; low PLT was observed.
- The DIFF scattergram was abnormal with unclear and indistinguishable boundaries of cell groups; the overall scattergram was torch-like; the Monocyte area was dense and shifted up significantly; Neutrophil diffused upwards, with unclear boundaries from the Monocyte group. In the WNB channel, WBC shifted to the right, indicating the presence of a large number of promyelocytes.
- The re-examination rules were triggered, so the slides were prepared and being reviewed.

Scan the QR code or visit

<https://www.youtube.com/watch?v=3N7famdPxmW&t=94s>

to watch the video and learn more about how the Mindray digital cell morphology analyzer MC-80 empower the re-examination of blood cells.



To learn more about Mindray laboratory solutions, please visit:

<https://www.mindray.com/en/index.html>

Scan the QR code to download the latest HemaBook Chapter 19: Have You Noticed Neutrophil Inclusions in the Thrombocytopenia Smear?

<https://www.mindray.com/en/contact/asset?assetPath=/content/dam/xpace/en/resources/ebook/hemabook/have-you-noticed-neutrophil-inclusions-in-the-thrombocytopenia-smear.pdf>



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Peripheral blood morphology examination

Pre-classification by the Mindray digital morphology analyzer MC-80

Sample information

Sample ID 012176678300 Date & Time 2022/3/21 10:12

WBC

WBC	110	110%
L Monocyte	1	0.9
! promyelocytes	9	8.2
! Blast cells	99	90.0
Reactive lymphocytes	1	0.9
Non-WBC	100	%
NRBC	1	0.9
Giant platelets	1	
Smudge cells	96	87.3
Artefacts	2	

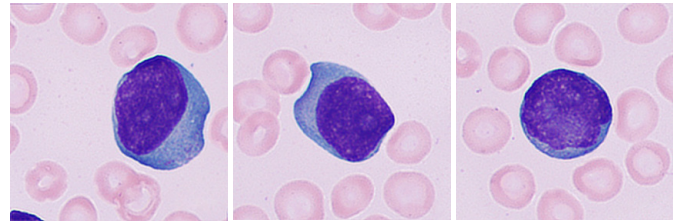
RBC

Color	Level	%
• Polychromasia	0	0.2
! • Hypochromic	3+	56.9
Size	Level	%
• Anisocytosis	0	0
• Microcytes	0	8.9
• Macrocytes	0	0.5
Shape	Level	%
! • poikilocytosis	3+	
! * Schistocytes	3+	3.1

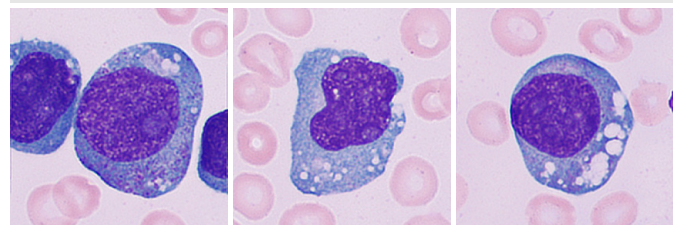
PLT

PLT Estimate	Estimate result	Method
PLT Concentration	27*10 ⁹ /L	Automation
PLT Concentration	22*10 ⁹ /L	Manual
PLT-Pro	Level	Count
Clumps		

Group 1 Blast cells



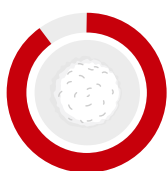
Group 2 Promyelocytes



Results from manual re-classification: Blast cells and promyelocytes accounted for 95.5%, roughly divided into 2 groups according to cell morphology:

- Group 1 were round with large size. Their nucleus was large, light purplish-red, round or oval shaped, and located in the center or slightly offset to the center. The chromatin were fine and evenly arranged, flat as a thin layer of sand. The nucleoli were light blue and easily identified. Little cytoplasm was observed, presented in transparent blue or dark blue, with few or no particles.
- Group 2 was large cells in an oval or irregular shape. Their cytoplasm was abundant, presented in light gray to grayish blue, containing vacuoles and dust-like fine particles. The nuclei were round or oval. The chromatin were loose, but slightly coarser than those in the first group. The nucleoli were large and pronounced.

Bone marrow cytology test



Myeloblasts and promyelocytes accounted for

90%

Cytochemical staining results showed:

POX
(+)

PAS
(+)

AS-DCE
(partial +)

a-NAE
(+)

NBE
(+)

NAF
inhibition

About Acute Myelomonocytic Leukemia (AML-M4)

- Acute myelomonocytic leukemia (AMML) is a form of acute myeloid leukemia resulting from the proliferation of myeloblasts and mono-blasts, and accounts for 20% of AML.
- Some patients may experience fatigue, abnormal bleeding, anemia, and thrombocytopenia.
- Criteria for AMML diagnosis is more than 20% myeloblasts and promonocytes in the bone marrow.
- From marrow differentiation, proliferation of erythrocytes and megakaryocytes are inhibited.

Case analysis

M4 is a type of acute granulocytic leukemia and is divided into four subtypes, i.e., M4a, M4b, M4c, and M4Eo.

M4a

Mainly the hyperplasia of myeloblasts and promyelocytes; with monocytic cells accounting for > 20% (non-erythroid cells).

M4b

Mainly the hyperplasia of monoblasts and promonocytes; with myeloblasts and promyelocytes accounting for > 20% (non-erythroid cells).

M4c

Myeloblasts with the morphological characteristics of both granulocytic cells and monocytic cells account for > 30% (non-erythroid cells).

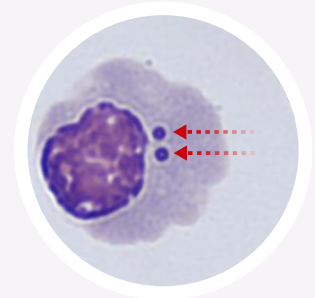
M4Eo

In addition to the above-mentioned characteristics, coarse and round eosinophilic particles and dark-stained basophilic particles are observed, accounting for 5%–30% (non-erythroid cells).

How much do you know?



Look closely at this red cell



What kind of morphological abnormalities of erythrocytes are indicated by the arrows?

A

Cabot ring

B

Döhle bodies

C

Howell-Jolly bodies

The answer will be announced in the next issue.

Invitation of Clinical Case Sharing

- *Do you want to share your case with us?* We will share your case in the **Upcoming issues** with acknowledgement.
- **IVD Cases:** You are recommended to submit any typical, misdiagnosed, special or rare cases that received definite diagnosis or successful treatment. Cases that involved the communication between laboratory and clinical department are especially recommended.
- **Format:** You are required to include four sections in your entry: "**Case Introduction, Case Details, Case Analysis, and an Executive Summary**". The Case Details section must include: main medical history, positive test results, negative test results that are helpful for diagnosis, and diagnosis and treatment process.
- Please submit your entry in a Word document (**in English**). You must send your entry by email to hoishan.kwok@Mindray.com by April 30th 2023.
- **The email should come in a subject that reads:** country+name of the entry + name of the applicant.