

Last Month's Slides

August 2020 Slide Summaries

Slide 1

Generally normal film – all 5 normal WBC cell types make it a good training slide

Slide 2

Generally normal film – some platelet aggregates

Slide 3

Generally normal blood film, mild basophilia

Slide 4

Lymphocytosis with large granular lymphocytes and some atypical lymphocytes in a 19- year old male. Glandular fever screening recommended

Slide 5

Basophilia, myelocytes and occasional blast. Possible myeloproliferative disorder

Slide 6

Patient in intensive care
Leukoerythroblastic blood film.
Thrombocytopenia, anisocytosis, schistocytes, polychromasia and the occasional spherocyte.
Basophilic RBC inclusions



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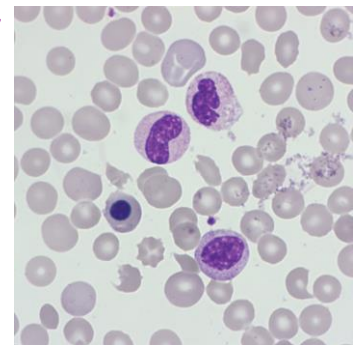
Monthly Digital Case study August 2020 Slide 6

Presentation

Female (65 years old)
In Intensive Care Unit

FBC Results

WBC	14.8 (10³/mm³)	Neutrophils	53.0%
RBC	3.06 (10⁶/mm³)	Lymphocytes	17.4%
HGB	91(g/L)	Monocytes	6.1%
HCT	27.5(%)	Metamyelocytes	12.2%
MCV	90 (fL)	Myelocytes	8.7%
MCH	29.9 (pg)	Promyelocytes	0.9%
MCHC	33.3 (g/dL)	Blasts	1.7%
PLT	57 (10³/mm³)		



NRBCs 20/100WBCs

Slide review

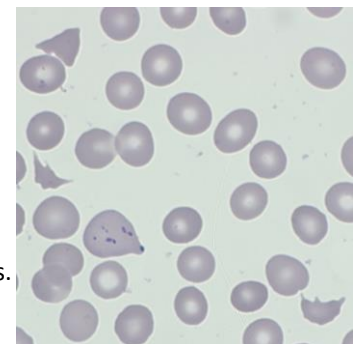
Leucoerythroblastic blood film with an occasional blast. Neutrophils are generally left shifted but without toxic granulation.

The red cells show a variety of dyscrasia. Schistocytes and the occasional spherocyte indicative of haemolysis. Basophilic stippling and the occasional Howell-Jolly Body.

The blood film confirms the thrombocytopenia

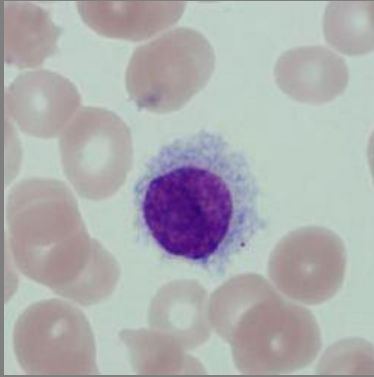
Diagnosis

No clinical details however, given the patient's location and in the absence of any other clinical details, the blood film is suggestive of Sepsis with potential haemolysis, possible DIC.



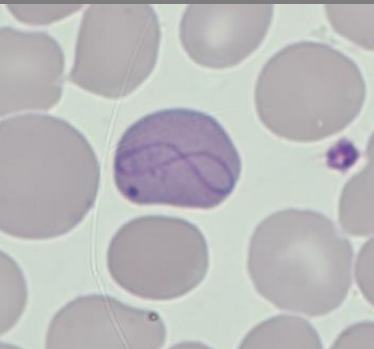
Monthly Morphology Quiz

Can you identify this cell?:



What does this Indicate?

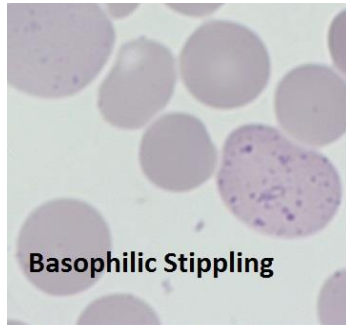
Last month's cells:



The blood film shows a red cell with a Cabot ring and a Howell-Jolly body

In this case, the patient was displaying a myelodysplastic picture with abnormalities in all cell lines and circulating micromegakaryocytes.

For more on red cell inclusions, see the main article.



Basophilic Stippling

Red Cell Inclusions in Peripheral Blood

An overview of laboratory findings

Introduction

Red blood cells or Erythrocytes, are the most common cell type. The morphology of a normal red cell is a bio-concave disc, lacking a nucleus or organelles, with a central area of pallor. In general, red cells viewed under a microscope will have a fairly uniform variation in size, shape and colour. A variation in any of these features could indicate an abnormal red cell morphology.

Red cell inclusions may arise in various sources. The correct identification of these inclusions is extremely important for providing information on metabolic, physiological and also pathogenic conditions which may be effecting the patient.

The most commonly seen red cell inclusions are:

Basophilic Stippling

Basophilic stippling, or punctate basophilia, appears in red cells as blue, fairly evenly spread fine dots throughout the cytoplasm of the cell. The stippling can be described as "fine" or "coarse".

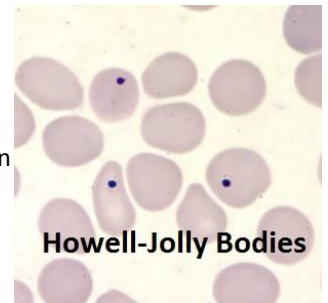
The stippling is due to spontaneous aggregation of ribosomal RNA in the cytoplasm of red cells. These aggregates then stain and are visible when using routine haematology stains.

Basophilic stippling commonly arises due to one of two pathological processes: Dyserythropoietic states- infiltrated Bone marrow, Haemoglobinopathy, Pathways of RNA breakdown are impaired- due to poisoning by heavy metals, classically lead or arsenic, or pyrimidine 5' nuclease deficiency.

Howell-Jolly bodies

Identified by small blue/purple fragments which are generally rounded in shape. Howell-jolly bodies are usually single and centrally placed within the red cell with a relatively large size compared to other inclusions. The colour and position reflects their origin as non-functional nucleus fragments which have Remained in the cell when it left the bone marrow.

The presence of these inclusions is commonly associated with the absence of the spleen or if the function of the spleen is impaired.in cases such as coeliac disease, bone marrow transplant or pregnancy.



Howell-Jolly Bodies

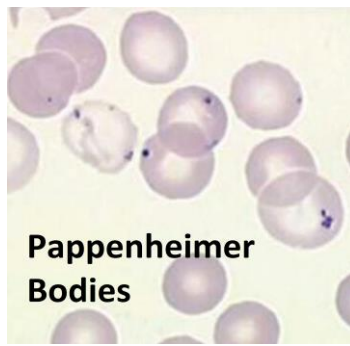
Pappenheimer Bodies

Pappenheimer bodies are basophilic iron-containing granules. Non-nucleated red cells containing pappenheimer bodies are known as siderocytes. These inclusions occur because of aggregates of iron from the cytoplasm, or within the mitochondria. A nucleated cell with the same inclusion is known as a sideroblast. Pappenheimer bodies differ from basophilic stippling in that they are a denser blue and the granules are courser and there are usually less of them and they are usually seen at the edge of the cell

(see over for illustration).

Red Cell Inclusions in Peripheral Blood

Continued from page 2...



Pappenheimer Bodies

Staining with Prussian blue will confirm the presence of siderocytes with a blue reaction, if in sufficient amounts.

The presence of siderocytes may be connected to haemolytic anaemia- increased iron turnover can lead to siderocyte formation, or abnormal haem synthesis, where iron accumulates in the RBC if haemoglobin production is hindered.

Heinz Bodies

Heinz bodies appear as small, round inclusions within the red cell, but are not visible when using Romanowski dyes. They are visualised more clearly with the use of supravital staining such as methylene blue.

Their presence on a blood film indicates oxidative damage to the haemoglobin component molecules, often through oxidant damage by administered drugs.

Conditions associated with Heinz bodies include alpha-thalassaemia or haemolytic anaemia and G6PD deficiency. Heinz bodies can also be present in chronic liver disease.

Conclusion

In conclusion, red cell inclusions are nuclear or cytoplasmic aggregates which can be stained. The presence of these inclusion bodies is almost always indicative of some pathological abnormality and is therefore crucial that the correct identification.



Heinz Bodies Methylene Blue

Morphology Posters – Free of charge

HORIBA Medical have produced two posters; Haematopoiesis, an illustrated chart of cell development, and Morphological abnormalities of red blood cells.

These are available Free of Charge as high-resolution PDF files for printing locally – they look particularly good in A2 size.

If you would like to receive the files, please contact International Marketing Communications at webmaster.med@horiba.com



Other News

QSP 2.0 Available now!

Options for a single operator or site license which allows up to 10 concurrent users

Bibliography

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Hoffbrand's Essential Haematology 7th edition Wiley Blackwell

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