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QSP Monthly

HORIBA Medical

NEWSLETTER OF THE QUALITY SLIDE PROGRAM

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Last Month's Slides

Slide 1
Patient hospitalized in Clinical Haematology. Analyzer alarms: Lymphocytosis/atypical lymphs. Monomorphic hyperlymphocytosis associated with very many naked nuclei: Probable CLL. Immunophonotyping of circulating lymphocytes requested.

Slide 2
Neutrophilia. Eosinophilia. Basophilia. Expert comment: The morphology (platelet anisocytosis +++) requires an investigation for a chronic myeloproliferative syndrome, with molecular research (Jak2, MPL, CalR and especially Bcr_Abl). Myelogram + BMB. Note a double erythrocyte population.

Slide 3
See Case Study.

Slide 4
Intensive care unit and perioperative medicine. Neutrophilia. Polycythemia.

Slide 5
Macrocytic anemia: Anisocytosis (++). Macrocytosis (++). Hypersegmentation of neutrophils (++). Expert comments: Indicative of vitamin deficiency ?

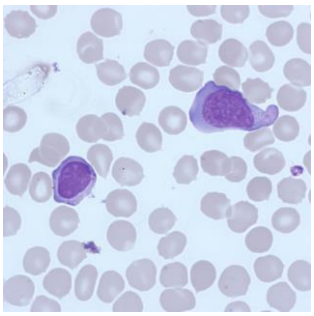
Slide 6
No clinical information. Nothing abnormal detected.

Monthly Digital Case Study January 2022 Slide 3

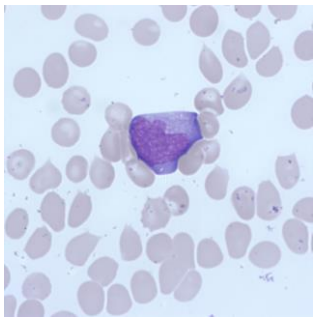
Presentation
3 January 2022 - Female, 20 years old, hospitalized in the gynecology unit. Polymorphic lymphocytes. Expert comment: Aspect in favor of infectious mononucleosis syndrome (lymphocytes with hyperbasophilic cytoplasm).

FBC Results

WBC	9.2 (10^3/mm3)
RBC	4.6 (10^6/mm3)
HGB	14.3 (g/dL)
HCT	42.4 (%)
MCV	92 (fL)
MCH	31.1 (pg)
MCHC	33.8 (g/dL)
PLT	196 (10^3/mm3)
Neutrophils	34.5%
Lymphocytes	**57.5**%
Monocytes	7.1 %
Eosinophils	0%
Basophils	0 %



Atypical Lymphocytes



Slide review
Expert comment: Aspect in favor of infectious mononucleosis syndrome (lymphocytes with hyperbasophilic cytoplasm). Lymphocytes are large, reactive cells with an abundance of cytoplasm. The cytoplasm is often blue or a deep blue colour.

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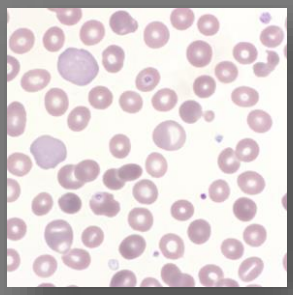
Cell Quiz:

The film below is from a patient with Haemolytic Anaemia. What feature do you see?



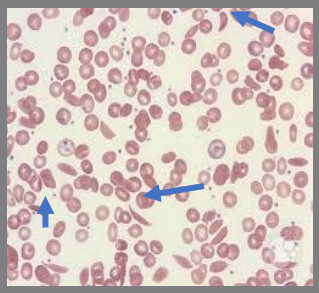
A) Target cells

B) Spherocytosis

C) Poikilocytosis

Last Month's Cell Quiz:

Name the cells highlighted in the film below:



Answer:

The cells indicated in the film by the blue arrows are **Sickle Cells**. These are red blood cells which have "sickled" forming the characteristic crescent shape. Sickling occurs when Haemoglobin-S is deoxygenated, forming long polymers which cross-link and cause the cell to sickle. The abnormality is due to a defect in the B-haemoglobin chain of the haemoglobin molecule due to a substitution of valine for glutamic acid in position 6 of the B-chain.
The shape change weakens the cells, promoting premature destruction, known as intravascular haemolysis, which leads to anaemia. This also leads to free haemoglobin in the plasma, which is then bound by haptoglobin. A low haptoglobin level can indicate intravascular haemolysis.

Slide 3 Review continued

Infectious Mononucleosis or glandular fever is caused by the Epstein-Barr Virus. It was commonly known as "kissing disease" as it primarily effected young adults. The virus targets the lymph tissue in the tonsils, infecting B-cells and inducing an immune response.
FBC results typically show a moderate rise in the WBC, with an absolute lymphocytosis. Large numbers of atypical lymphocytes are seen in the blood film (see above).

Possible Follow up tests:
Monospot Test is the standard to confirm the presence of heterophile antibodies, in conjunction with FBC results and blood film examination.

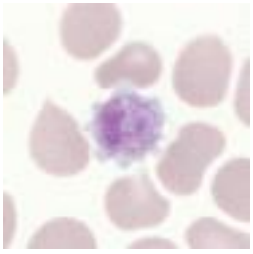
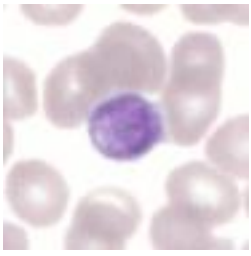
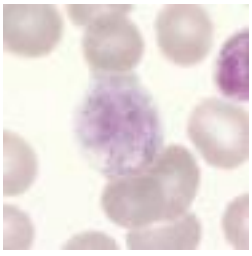
An interesting case presenting with Thrombocytopenia

A 41-year-old female attending her General Practitioner with a history of epistaxis (nose bleeds) and slight bruising. A FBC was taken, and a full clinical history was taken. The patient was not taking any anticoagulation or Aspirin. The FBC results were as follows:

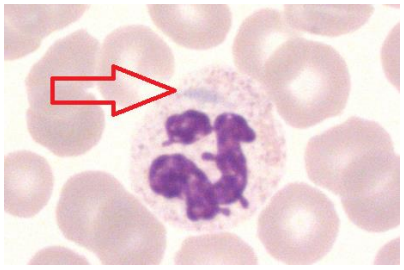
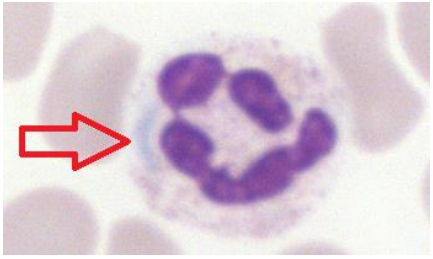
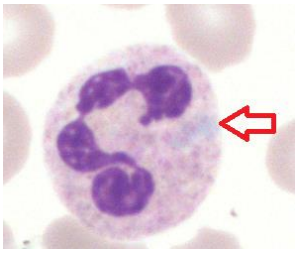
WBC 3.8	(10^3/mm3)
RBC 5.14	(10^6/mm3)
HGB 14.9	(g/dL)
HCT 43.3	(%)
MCV 84	(fL)
MCH 29	(pg)
MCHC 34.4	(g/dL)
PLT 23	(10^3/mm3)
MPV 13 fL	

The result indicated Thrombocytopenia with large platelets present (MPV high). A blood film was requested and confirmed the presence of very large Platelets as well as spindle like inclusions (Döhle bodies) in the cytoplasm of Granulocytes and Monocytes.

Platelets

Neutrophils showing the presence of Döhle bodies

A presumptive diagnosis of May-Hegglin Anomaly was made

May – Hegglin Anomaly (MHA)

MHA is the most common cause of inheritable giant platelet disorders and shows autosomal dominance inheritance and was first described by May in 1909 and later by Hegglin in 1945. Even though the actual platelet count is low not all patients present with bleeding. Since the Mean Platelet Volume is exceedingly high the actual circulating biomass of platelets is within the normal limits. The number of Megakaryocytes in the bone marrow is not increased and their volume is normal. Approximately half of the reported patients are asymptomatic but the other half have platelet counts less than 50 x10^3/mm3 and have abnormal bleeding in the form of epistaxis, gingival bleeding, easy bruising, menorrhagia, and excessive bleeding post surgery. MHA patients may complain of some non haematological symptoms, such as high-tone hearing loss, renal involvement, and cataracts.

The frequency of MHA is very low and as of about 10 years ago only 170 cases were reported in the literature. It occurs most often in people of Greek or Italian descent. MHA is caused by a genetic defect in the MYH-9 gene which is present at chromosomal region 22q12-13 and codes for non-muscle myosin heavy-chain IIA. Disorders of production of myosin heavy-chain IIA affect megakaryocyte maturation and platelet fragmentation causing the macrothrombocytes seen. The Döhle bodies seen should not be confused with the large azurophilic granules seen in Neutrophils of patients with severe infections. The Döhle bodies seen in MHA patients are composed of short segments of Rough Endoplasmic Reticulum, clusters of Ribosomes and a framework of parallel filaments.

MHA is 1 of 4 overlapping syndromes that all have in common a mutation on the MYH-9 gene, the other disorders being Epstein syndrome Fechtner syndrome, and Sebastian platelet syndrome. They all have in common the prescence of macrothrombocytes with Sebatian and Fechtner having the largest. MHA has both macrothrombocytes and large leucocyte inclusion (Döhle) bodies, whereas small leukocyte cytoplasmic inclusion bodies are observed in Fechtner syndrome and Sebastian platelet syndrome. No inclusion bodies can be seen with standard light microscopy in Epstein syndrome patients.

Since MHA is a genetic disorder family studies may reveal other family members unknowingly having MHA. Since bleeding episodes are rare in MHA patients platelet transfusion is rare and only indicated as and when necessary.

Other disorders associated with giant platelets are:

Bernard -Soulier Syndrome (BSS) – autosomal recessive disease with quantitative or qualitative defect of platelet GPIb-IX-V receptor. The platelet has reduced or no response to Ristocetin in platelet aggregometry tests. Patients have mild to moderate bleeding and require platelet transfusions for bleeding and surgery.

Platelet Type Von Willebrand disease is an autosomal dominant disorder resulting in a gain of function mutation in the GPIbα receptor causing increased binding of platelets to Von Willebrand Factor and platelet clumping. The response of platelets to Ristocetin is increased.

Mediterranean Macrothrombocytopaenia is an autosomal dominant disorder with mutations in *GP1BA* resulting in mild macrothrombocytopaenia.

Grey Platelet Syndrome is characterised by the absence of platelet alpha granules and can also result in large platelets with platelet dysfunction.

Bibliography

May Hegglin Anomaly - an overview | ScienceDirect Topics

Essential Haematology
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