

January Slides

Slide 1

Nothing to report.

Slide 2

Nothing to report.

Slide 3

Neutrophilia, myeloma.

Slide 4

Hyperleucocytic AML (sometimes granular blasts, monoblasts, blasts: All pictures classified in the column "Blasts"). Expert's comments: AML appearance with monocyte component. Presence of "cup like" blasts and promonocytes. Note fragments of circulating blasts. (Small bluish spots the size of a platelet).

Slide 5

Microcytic anaemia. See slide review to right.

Slide 6

Clinical Haematology Unit, CLL follow up.



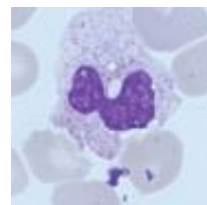
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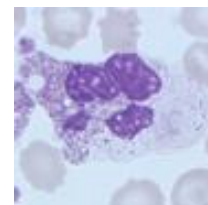
Monthly Digital Case Study Presentation January 2023, Slide 5

FBC Results

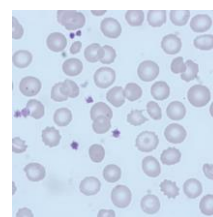
WBC 29.13 ($10^3/\text{mm}^3$)
 RBC 3.76 ($10^6/\text{mm}^3$)
 HGB 8.3 (g/dL)
 HCT 27.4 (%)
 MCV 73 (fL)
 MCH 22.1 (pg)
 MCHC 30.3 (g/dL)
 PLT 607 ($10^3/\text{mm}^3$)
 Neutrophils 74.4%
 Lymphocytes 22.4%
 Monocytes 1.6%
 Eosinophils 0.8%
 Basophils 0.8%



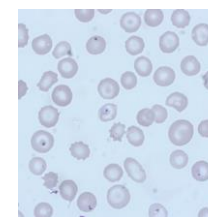
Slide A



Slide B



Slide C



Slide D

Clinical Details

Female 14 years-old, paediatric unit.

Slide Information

Microcytic anaemia. Hypochromic RBCs. Aniso-poikilocytosis (Elliptocytes, Acanthocytes/Echinocytes, target RBCs, and basophilic inclusions in RBCs). Thrombocytosis (See slides C and D above).

Expert's comments: Search aMPS? Very abnormal neutrophil morphology. Abnormalities of granulation and nucleus (see slides A and B).

Cell Quiz

Look at the haematology results below:

Hb 10.9

WBC 161.1

Platelets 162

Hct 37.1

MCV 110

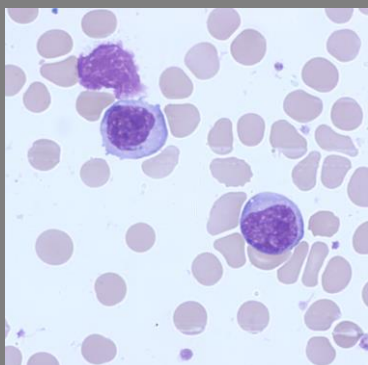
MCV 110 (fl)

Neutrophil 6.5%

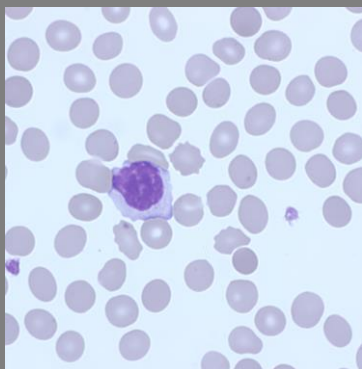
Lymphocyte 93.5%

Which of the slides below would fit with these results?

Slide 1



Slide 2



Last Month's Quiz

Question:

What cells colour is the same as Santa's clothes?

- a) Platelet
- b) Red Cell
- c) White cell

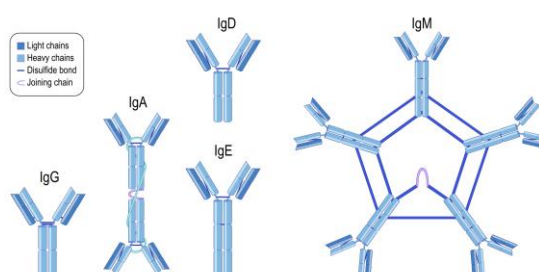
Answer:

Red Cell

Multiple Myeloma

Multiple Myeloma or Myeloma is a cancer caused by the abnormal proliferation of plasma cells within the bone marrow. The term "multiple" is used as it affects multiple parts of the body. Myeloma is the 14th most common of all cancers. Myeloma is more commonly diagnosed in the over 65's but can be diagnosed in younger patients. It is more common in males than females and is twice as common among individuals of African origin than Caucasian origin. Prolonged exposure to petrochemicals, agricultural chemicals and radiation is known to be a risk factor. Abnormal plasma cells release large amounts of abnormal monoclonal immunoglobulin (Paraprotein) which can be detected in the blood and urine of myeloma patients. Immunoglobulins are the antibodies produced by the immune response to help fight infection. There are 5 main types of Immunoglobulin: **IgG**, **IgA**, **IgE**, **IgM**, and **IgD**. All contain 2 identical heavy chains and 2 identical light chains. The antigen binding site is the variable region on the heavy and light chain.

Types of antibodies



Classification

Myeloma can best be classified according to the type of abnormal Immunoglobulin (Antibody) produced (IgG, IgA, IgD, IgM, IgE) which can be further subdivided by the type of light chain (kappa or lambda). IgG kappa is the most common type of myeloma. **IgA** myeloma can sometimes be associated with extramedullary plasmacytoma – myeloma deposits outside of the bone marrow. **IgD** myeloma is associated with plasma cell leukaemia (>20% plasma cells). In approximately 20% of myeloma patients only light chains (not the full immunoglobulin) are produced and are known as free light chains or Bence Jones Proteins. As the plasma cells increase in numbers, they crowd out the normal haemopoietic tissue in the marrow causing anaemia, excessive bleeding, and reduced inability to fight infection. Myeloma causes structural bone changes leading to bone pain and potential fractures.

Symptoms

Bone pain especially in spine or chest, nausea, constipation, loss of appetite, fatigue, frequent infections, and weight loss.

Laboratory findings

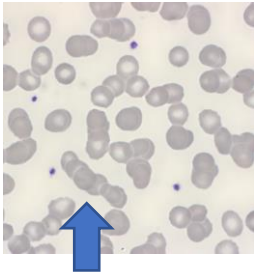
FBC

Low Haemoglobin, Platelets, WBC, raised ESR

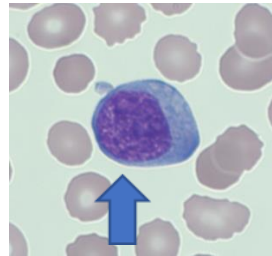
Blood film

The blood film can show RBC rouleaux formation (where the red cells appear to stack together like a stack of coins, due to the increase in plasma proteins). The Erythrocyte Sedimentation Rate (ESR) will be much greater than normal value. The space between the cells may show a blue background stain due again to the increased concentration of plasma proteins.

Plasma cells may be seen and are characterised by their dark blue cytoplasm and the nucleus being on one side of the cell.



Red Cells showing Rouleaux formation



Plasma Cell

Bone Marrow

Bone marrow aspirate and biopsy are essential in evaluating if abnormal cells are present and if so the proportion of abnormal plasma present. Genetic analysis can also be performed as genetic subtypes have important prognostic value.

Other blood tests

Protein electrophoresis and immunofixation to detect and identify the amount and type of monoclonal immunoglobulin (paraprotein) present. Serum free light chains assay is performed to measure the kappa: lambda ratio. Other tests include Creatinine, Albumin, Calcium, and total Protein to assess kidney and liver function.

Beta 2 Microglobulin (B2M) – this protein is increased in Myeloma patients and is one of the most important indicators of both the amount and activity of Myeloma. The B2M level is used in the staging of patients.

Treatment

If treatment is deemed necessary, then combination therapy using 3 anti myeloma drugs which usually consist of a chemotherapy drug, a steroid (dexamethasone, prednisolone), and another drug such as thalidomide, bortezomib, and lenalidomide. Intensive therapy may also be given e.g. high dose therapy and stem cell transplantation.

QSP 2.0

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Bibliography

- [Myeloma UK](#)
- [International Agency for Research on Cancer \(WHO\)](#)
- [Practical Haematology, Dacie & Lewis 10th Edition](#)

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