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Last Month's Slides



Slide 1

Patient on ICU.
 Monocytosis, large blasts
 with large nuclei.

Slide 2

Anisocytosis, Echinocytes,
 Monocytosis

Slide 3

NAD

Slide 4

Anaemia. NAD

Slide 5

See Slide Review

Slide 6

No clinical information.
 NAD

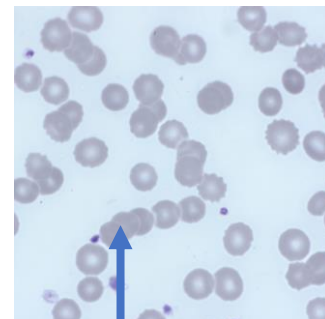
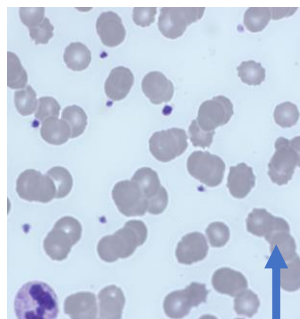
Monthly Digital Case study December 2021 Slide 5

Presentation

Male, aged 66

FBC Results

WBC 10.5 ($10^3/\text{mm}^3$)
 RBC 2.3 ($10^6/\text{mm}^3$)
 HGB 8.0 (g/dL)
 HCT 23.8 (%)
 MCV 103 (fL)
 MCH 34.2 (pg)
 MCHC 33.8 (g/dL)
 PLT 264 ($10^3/\text{mm}^3$)
 Neutrophils 85.2 %
 Lymphocytes 7.4 %
 Monocytes 7.4%
 Eosinophils 0.0 %
 Basophils 0.0 %
 Metamyelocytes %



Red cells show rouleaux pattern, stacked up like penny's.

Slide review

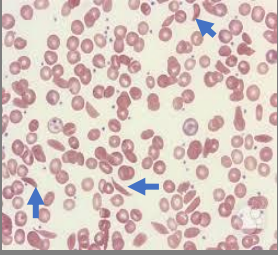
Patient in intensive care. Anaemia.

Rouleaux pattern formation of red blood cells.

Rouleaux formation is a term describing groups of red blood cells that form stacks, resembling stacks of coins. The formation is due to the unique discoid shape of red cells. The flat surface of the discoid RBCs gives them a large surface area to allowing them to contact and stick to each other; thus, forming a rouleau. Rouleaux occurs when the plasma protein concentration is high, specifically, gamma proteins in Multiple Myeloma.

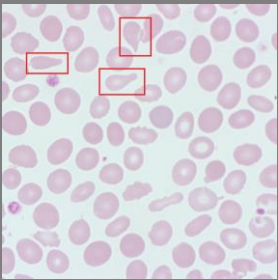
Cell Quiz:

Name the cells highlighted in the film below:



Last Month's Cell Quiz:

What is the name of the cells highlighted in red box:



- A) Acanthocyte
- B) Dacrocyte
- C) Schistocyte
- D) Drepanocyte

Answer:

A Dacrocyte is a type of poikilocyte, shaped like a teardrop. Hence, the common name teardrop poikilocytosis. Dacrocytes occur when the BM is infiltrated with fibrosis, granulomatous infiltration or haemopoietic metastatic neoplasm. They may be seen in megaloblastic anaemia and splenic abnormalities (the numbers will decrease post splenectomy).

Slide 5 Review continued

There is an alteration in the electrostatic charges of the red cells, which results in the cells stacking on top of each other, instead of repelling. This is a non-specific indicator of the presence of disease.

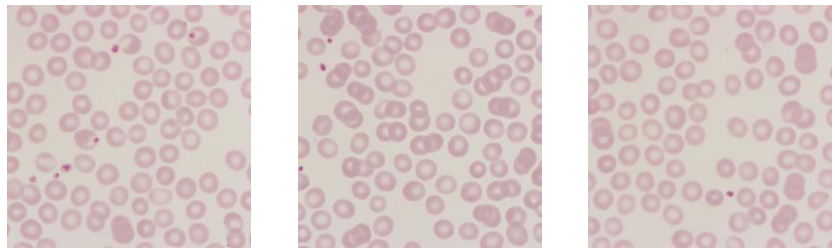
Possible follow-up tests:

ESR if not already would be increased. Urine screen Bence-Jones urine test is often used in suspected Multiple Myeloma cases.

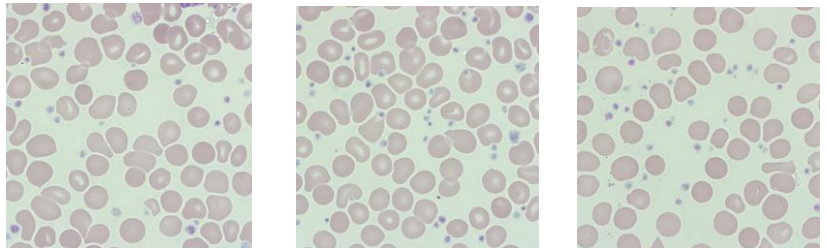
Red Cell Morphology Terminology part 2

Variation in shape

Normal red cells are biconcave discs which, when viewed microscopically, appear as small disc shaped cell with a diameter of 6-8 um. The biconcave shape allows the red cell to easily traverse through the circulation. Normal red cells showing uniform shape.

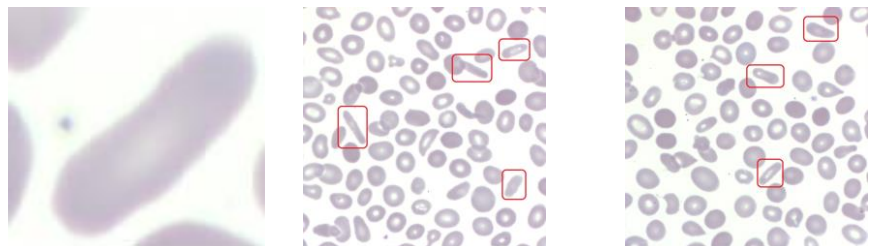


If red cells are displaying a degree of abnormal shape, then they are described as showing **Poikilocytosis** e.g.



Slight Poikilocytosis on its own is not very specific and can be caused by production of abnormal cells by the bone marrow or from damage to normal cells whilst in the circulation.

Elliptocytes are a specific form of Poikilocyte where the red cells elongated oval shaped red cells with the long axis more than twice the short axis.

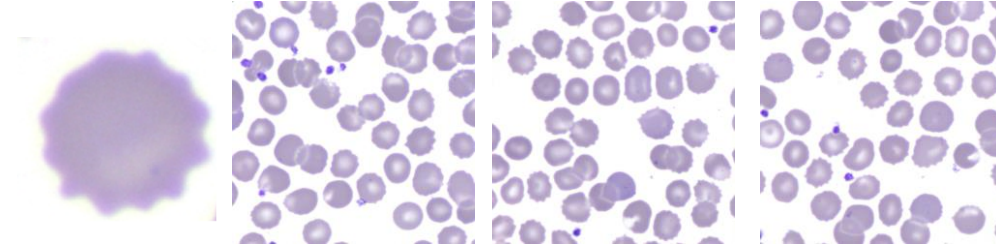


Elliptocytes can be seen in hereditary elliptocytosis, megaloblastic anaemia, iron deficiency (see below regarding Pencil cells), post chemotherapy and thalassaemia.

RBC Terminology continued...

Pencil Cells: are very similar to elliptocytes, apart from the fact that their length is more than 4 times their width, they are hypochromic and are considered a more specific finding in cases of iron deficiency.

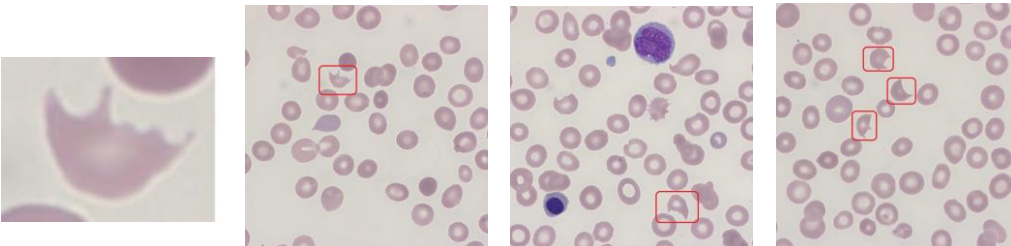
Echinocyte is a red cell which is covered with regularly distributed equally sized rounded projections



Echinocytes are associated with numerous disorders such as in-vitro artefact from storage (sometimes called red cell crenation), liver disease, Pyruvate Kinase deficiency, burns, and renal failure.

Acanthocytes are red cells, which unlike Echinocytes, have irregularly distributed variably sized pointy projections. Causes of severe acanthocytosis can be hereditary abetalipoproteinemia, McLeod red cell phenotype, high red cell membrane phosphatidylcholine haemolytic anaemia or acquired infantile pyknocytosis, Liver disease, hyposplenism.

Schistocytes are fragments of red cells from which part of the cytoplasm has been lost. They are seen in thrombotic thrombocytopenia purpura (TTP) and Haemolytic Uraemic Syndrome (HUS), and as such the presence of schistocytes is a very important early diagnostic factor. A count of the number of schistocytes present is often requested in such patients and expressed as a percentage from a count of no less than 1000 red cells. Schistocytes can also be caused by structural/mechanical abnormalities of red cells e.g. malfunctioning prosthetic heart valve, metastatic cancer, and HELLP.



Schistocytes may be differentiated into:

Keratocytes (or horned cells): have a single pair of spicules (sometime between 4-6 pairs).

Bite Cells (or Bitten out cells): appear as if the red cell has a bite taken out of it, with the edges tending to be smooth and rounded. These cells are formed when the spleen removes an aggregate of haemoglobin (Heinz Body) produced secondary to oxidant drug injury (Dapsone). Other causes of Bitten out cells are G6PD deficiency NADPH deficiency and thalassemia.

Helmet Cells: they tend to have a linear edge and have the appearance of an army type helmet.



Keratocyte (Horn Cell)



Helmet Cell

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Bibliography

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