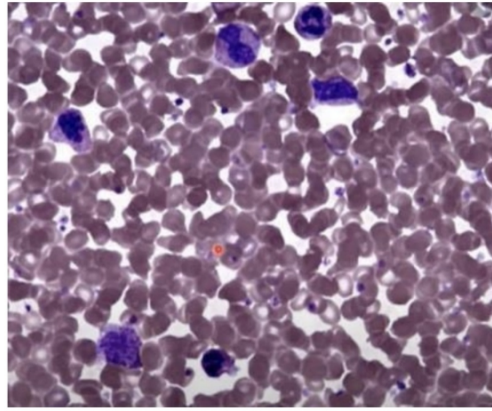




## Polycythemia



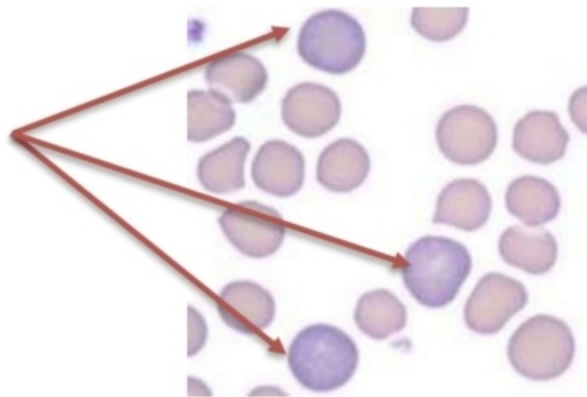
Compact, crowded, dense RBCs. A single RBC's contouring and biconcave shape cannot be seen.

- Peripheral blood smear in polycythemia: packed RBCs, boundaries can't be seen

15/12



These are Reticulocyte they are large and blue in color because of streaks of DNA so you can count them from blood film



14/11

## CLINICAL SYMPTOMS IN SPECIAL TYPES OF ANEMIA

- Chronic hemolytic anemia:

The RBCs are degraded, the concentration of hemoglobin will increase and will be metabolized into bilirubin (it's an insoluble compound eliminated through the biliary system), if the concentration of bilirubin is increased the liver can't handle it and will be deposited in the tissues.

jaundice, pigmented gall bladder stones, red urine



The sclera of the eye will be yellow



Because of the insolubility of bilirubin it will accumulate in the biliary system and cause black bile stones



The hemoglobin will reach the kidney and will go with so its color will be red like blood

14/11

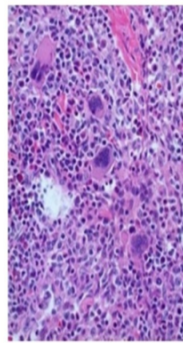




# Symptoms of Spher Thalassemia



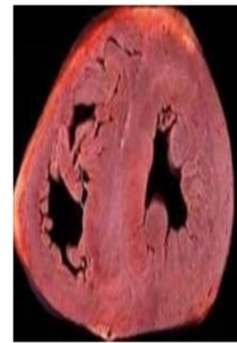
Large abdomen due to hepato/splenomegaly. Growth retardation; they're short. Skeletal deformities.



Bone biopsy: erythropoietic cells.



Protrusion of facial bones

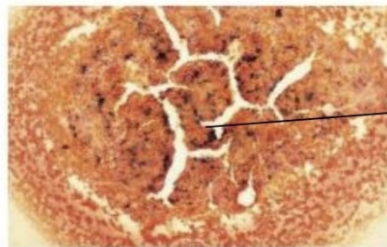


Very thick wall

د. طارق العديلي

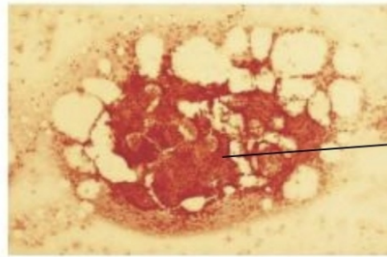
19/5

## Iron Deficiency Anemia



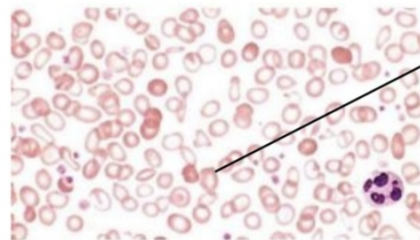
Aspirate of normal bone marrow (BM): bluish-black iron (hemosiderin) in macrophages in a fragment. Perl's stain x40.

These black dots represent normal hemosiderin levels in the bone marrow aspirate, which is stained using the Prussian blue stain.



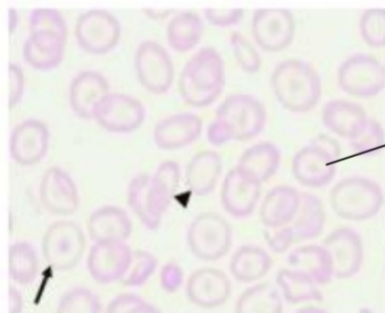
Aspirate of normal BM: a fragment with no stainable iron. Perl's stain x40.

In this picture, the absence of the black dots—which represent hemosiderin—indicates a severe iron deficiency.



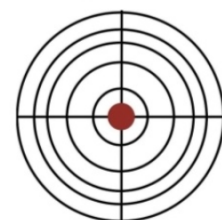
IDA: note the hypochromia and poikilocytosis

Here, RBCs are microcytic and hypochromic, with central pallor exceeding one-third of the cell diameter, notice also the existence of abnormal RBCs shapes which is known as poikilocytosis.

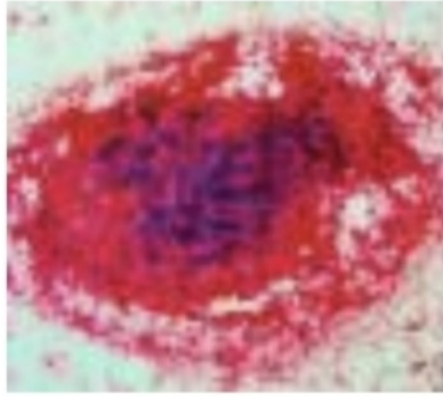


IDA: note the target cells (arrow)

Target cells

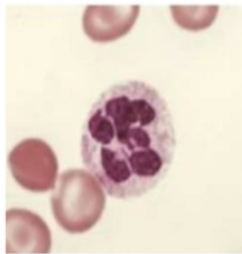


which  
can be seen  
in case of  
Chronic inflammatory  
anemia

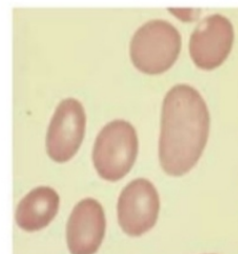


Bone marrow aspirate shows markedly increased iron stores, which can be identified using Prussian blue stain.

## Morphology of megaloblastic anemia

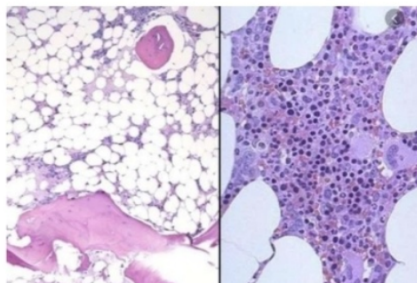


Hypersegmented neutrophils → the earliest sign of megaloblastic anemia (seen in vitamin B12 or folate deficiency) due to delayed nuclear maturation.



Macro-ovalocytes: large, elongated RBCs; MCV > 110 fL; hyperchromatic → typical of megaloblastic anemia.

## Aplastic Anemia

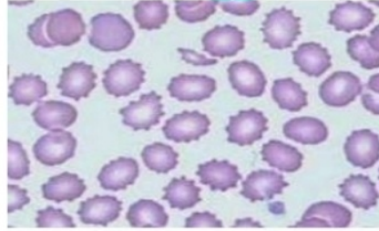


Normally (in the figure to the right) the bone marrow has a mixture of fat cells and stem cells, in condition of aplastic anemia, predominance of fat cells (the figure to the left) occurs in the bone marrow.



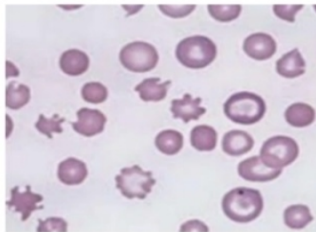
## Anemia of Renal Disease

- RBCs shape gets affected, echinocytes (Burr cells) appear; small spines appear all around the surface of the cell.

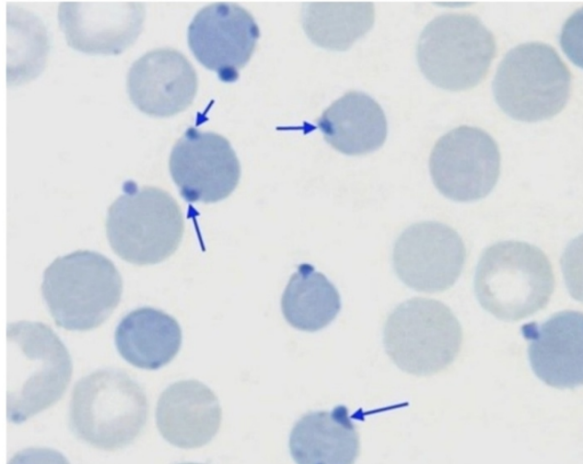


## Anemia of Liver Disease

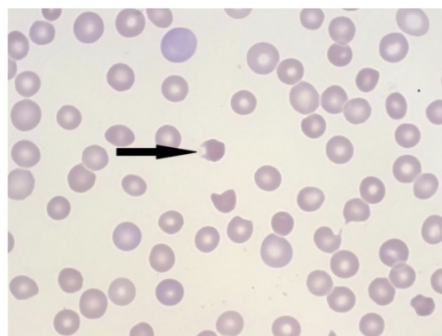
- Acanthocyte (spur cell) appears. Here, the spikes are taller than those seen in anemia of renal disease, and it's difficult to distinguish between them so we depend on the history of the patient.



## G6P dehydrogenase deficiency

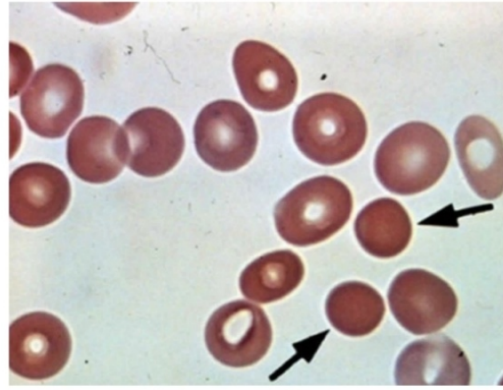
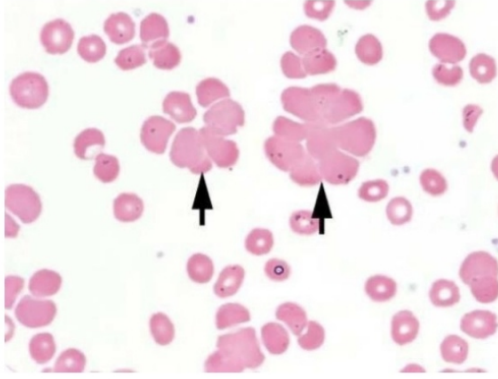


- Supravital special stain highlights Heinz bodies as membrane-bound, dark spots representing condensed and denatured Hg (hemoglobin).
- Heinz bodies make RBCs less flexible and harder to circulate, leading macrophages to remove these inclusions and form characteristic 'bite cells'. (See the following slide)



- Bite cells:** appears as indented defect in part of cell membrane of RBCs
- After these cells are bitten by splenic macrophages during their first circulation, they undergo complete hemolysis (either intravascular or extravascular) in subsequent circulations.

# Autoimmune Hemolytic Anemia



- Left: RBC agglutination: RBC clumps in different directions
- Right: spherocytes appear as small, round hyperchromatic RBC

## ➤ So, Findings in immune hemolytic anemia:

1. Presence of **spherocytes** on peripheral blood smear (seen in warm and cold types).
2. **Agglutinated RBCs** are seen only in cold IHA (IgM-mediated).

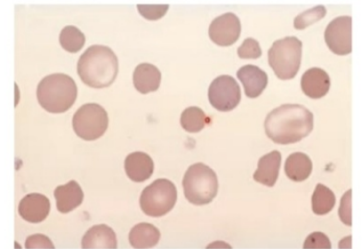
27/12

## Hereditary Spherocytosis

### LABORATORY FINDINGS

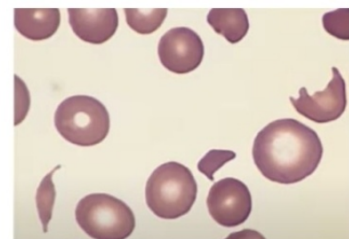
- ✓ MCH: Mean Cell Hemoglobin
- ✓ MCV: Mean Cell Volume
- ✓ MCHC (MCH/MCV): Mean Cell Hemoglobin Concentration

- Appearance of **spherocytes** in peripheral blood
- Spherocytes have a **smaller size** (low MCV)
- Little cytoplasm is lost, **normal amount of Hg** (normal MCH)
- **A defining characteristic is that** MCHC is increased, as **(MCH/MCV) ratio rises**.



## Traumatic Hemolysis

- Hallmark of traumatic hemolysis: **schistocytes** ("split cells").



27/12





اللهم ادفع الفتن والمحن والبلايا والأذايا والحروب  
والشدائد عنا وعن أهل السودان وعن المسلمين،  
واحفظ على المسلمين في السودان أموالهم  
وأعراضهم ودماءهم، وادفع الشرور والآفات والفتن  
عنا وعنهم وعن المسلمين في المشارق والمغارب.

