Hemepath Case 19: 63-Year-Old Female

HISTORY

A 63-year-old female presents with fatigue and “reduced energy” for two weeks. She complains of being out of breath from taking a stroll in the park, and notices that her heart races when she watches TV.

On physical exam, the patient appears pale and has a fever of 38.5°C. Her gingivae are swollen and hemorrhagic, and a petechial rash is noted on her left arm. Both liver and spleen are found to be enlarged.

CBC

Hgb (g/L)	Low
MCV	N
Reticulocyte Count	Low
WBC	High
Plt	Low

DESCRIPTION OF SLIDE

Peripheral Blood Smear

The peripheral blood smear shows a marked blast infiltrate. Despite this, the patient is still properly referred to as “pancytopenic” given the deficiency of all normal cell lines. Blasts (see circles) are large with abundant granular cytoplasm and vacuolations, as well as fine nuclear chromatin and prominent nucleoli. No Auer rods are seen.

*** To see the slide annotations in Imagescope, click on VIEW, then ANNOTATIONS, and then on the "eye" icon adjacent to the word "Layers". In the “Layer Attributes” box, a brief description of the annotations is provided. You may also click on individual layer region (e.g. region 1) in the “Layer Regions” box to locate each annotation – this is especially helpful in identifying annotations when the slide is not zoomed in. ***

MORPHOLOGICAL DIAGNOSIS

Acute leukemia, favor acute myelogenous leukemia (AML)

DISCUSSION

As Auer rods are not easily found in the blood smear, a diagnosis of acute myelogenous leukemia would require flow cytometry. By itself, this peripheral smear is essentially diagnostic of acute leukemia (although of course we still require a bone marrow aspirate to firmly establish this diagnosis).

Acute myelogenous leukemia (AML) occurs when genetic mutations lead to malignant transformation of a hematopoietic stem cell. Among other consequences is a maturation arrest at the blast cell stage. AML (like ALL) is diagnosed when blasts constitute ≥20% of nucleated cells in the bone marrow. Blasts in AML most frequently exhibit some differentiation into granulocytes or monocytes. The massively expanded blast population leads to a resultant decreased production of normal blood cells, yielding symptoms associated with anemia (e.g. pallor, fatigue, dyspnea on exertion, palpitations) and thrombocytopenia (e.g. gingival bleeding, petechiae). Malignant cells can accumulate not only in the bone marrow, but also in other organs – this is evident in our patient as hepatosplenomegaly and gingival hypertrophy. If there is a solid mass of leukemic AML blasts, this is referred to as a “chloroma”.