PathMD™: Board Review Letter

Author: Philip Ferguson, M.D. **Peripheral Blood – Part 3** Volume 1, Number 39

Case #1 A 36 y/o Hispanic female presents to the ER seizing with an elevated creatinine, petechiae, and fever on the previous day. Representative images of the blood smear are shown. What is the most likely diagnosis?

A. Disseminated intravascular coagulation
B. Hemolytic uremic syndrome
C. Thrombotic thrombocytopenia purpura
D. Hereditary pyropoikilocytosis
E. Autoimmune hemolytic anemia

Case #2 A 40 y/o patient presents to his primary care physician's office complaining of fatigue. A routine CBC was performed, and representative images of the smear are shown. Based on the findings, what is the next best test for the physician to order?

A. Anti-i antibody
B. Anti-I antibody
C. Direct antibody test (DAT)
D. Serum protein electrophoresis (SPEP)
E. Haptoglobin

Case #3 A 35 y/o white female presents to her primary care physician to establish care. A routine CBC was performed, which showed a microcystic anemia with a slightly increased MCHC. Upon further questioning, the patient stated that a surgeon wanted to take her spleen out many years ago, but she did not return to see the "quack." Based on the clinical history, laboratory data, and peripheral smear images, what is the best diagnosis?

A. Iron deficiency anemia
B. Hereditary elliptocytosis
C. Alpha thalassemia
D. Beta thalassemia
E. Hereditary spherocytosis

Case #4 A 30 y/o African American patient admitted to the burn unit is found to have a decreased Hb and Hct. Peripheral smear review is shown. Haptoglobin is undetectable, and DAT is negative. Based on these findings, which of the following is the best diagnosis?

A. Iron deficiency anemia
B. Autoimmune hemolytic anemia
C. Acute transfusion reaction
D. Hereditary pyropoikilocytosis
E. Thermal injury

Case #5 A 35 y/o male is found to have thrombocytopenia. A bone marrow was performed and the aspirate showed sheets of cells (95% of the non-erythroid cells) shown in the image for this case. Myeloperoxidase was positive in 10% of the cells shown. Flow cytometry demonstrated that the cells expressed CD19, CD13, CD33, CD34, and CD117. Based on these findings, what is the best diagnosis?

A. Precursor B ALL
B. AML – M0
C. AML – M1
D. AML – M2
E. AML – M4
F. AML – M5

Case #6 A 72 year old man presents with fatigue. A CBC was drawn and shows: Hb 9.6 g/dL, TIBC 220 mcg/dL (250-450), iron 25 mcg/dL (50-150), and transferrin 180 mcg/dL (200-400). A representative image of the peripheral smear is shown. What is the best diagnosis?

A. Thalassemia
B. Anemia of chronic disease
C. Hemoglobinopathy
D. Iron deficiency anemia
E. Can not be determined

Case #7 An osmotic fragility test was performed on the blood specimen from a 45-year-old patient who has a microcytic anemia (MCV = 73, RBC = 3.8 x 10^6/mL, Hb = 11.0 g/dL, & Hct. = 33.4%). Based on these laboratory values and the findings on the osmotic fragility test, what is the most likely diagnosis?

A. Hereditary spherocytosis
B. Iron deficiency anemia
C. Alpha thalassemia
D. Beta thalassemia
E. All of the above are diagnostic possibilities

Case #8 An 18 y/o patient presents to his university's football physician for his annual sports physical. He has a CBC drawn for the first time, and representative images are shown. The CBC was repeated at the local hospital with similar findings, and a DAT was negative. If both parents had CBCs drawn, one would most likely have which of the following?

A. Hereditary spherocytosis
B. Autoimmune hemolytic anemia
C. Hereditary elliptocytosis
D. Hereditary pyropoikilocytosis
E. Thermal injury

Question #1 Which of the following would most likely give a spuriously low platelet count on an automated CBC analyzer?

A. Ethylenediaminetetraacetic aced (EDTA)
B. Citrate
C. Heparin
D. All of the above
E. None of the above

Question #2 What is the iron saturation in case #6?

A. 11%
B. 14%
C. 4%
D. 5%
E. Can not be determined

