Hemepath Case 4: 11-Year-Old Boy

HISTORY

An 11-year-old boy visits his family physician because of a sprained ankle. The physician, noting the boy to be thin and pale, conducts a full physical exam. The patient's spleen is grossly enlarged (palpable 8 cm below the costal margin) and firm, but non-tender. Lymph nodes are non-palpable.

Upon further questioning, the boy admits that he has felt weak for the past few months, and needs much more sleep than before. He also remarks that his gums frequently bleed when he brushes his teeth.

CBC

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

DESCRIPTION OF SLIDE

Peripheral Blood Smear

Erythrocytes are unremarkable, and rare nucleated RBCs are seen. There is a markedly elevated WBC count, with all stages of neutrophil maturation evident on the smear (see circles). Eosinophilia (see rectangles) and basophilia (see arrows) are also present. An increased number of platelets is evident.

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MORPHOLOGICAL DIAGNOSIS

Chronic myelogenous leukemia (CML)

DISCUSSION

Chronic myelogenous leukemia (CML) is a myeloproliferative disorder of pluripotent stem cells in the bone marrow. 95% of CML patients have a reciprocal translocation between chromosome 9q and chromosome 22q. The resultant hybrid BCR-ABL gene,

on chromosome 22 (termed the Philadelphia chromosome), encodes for a protein with altered tyrosine kinase activity, giving rise to malignant and abnormal myelopoiesis.

The peripheral blood findings in this case are essentially pathognomonic for chronic myelogenous leukemia. That being said, a bone marrow aspirate with cytogenetic evaluation is still required to make a diagnosis of CML.