Hemepath Case 7: 7-Year-Old Boy

HISTORY

A 7-year-old boy presents with a large abdominal mass and a 4-day history of fatigue and weakness. Past medical history is unremarkable.

Physical exam reveals a large, non-tender mass in the lower abdomen, hepatosplenomegaly, and multiple swollen, non-tender lymph nodes in the submandibular and cervical regions. Peripheral blood and bone marrow are studied.

CBC

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

DESCRIPTION OF SLIDES

Peripheral Blood Smear (Slide 7a)

The peripheral blood smear shows anemia, neutropenia, and thrombocytopenia. Burkitt's cells (see circles) are also evident: these are medium-sized blasts with vacuolated, deeply basophilic cytoplasm. Their nuclei show fine chromatin and prominent nucleoli.

Bone Marrow Aspirate (Slide 7b)

There is a marked infiltration of the marrow by monomorphic blasts (see rectangle), resembling those seen in the peripheral blood. Normal hematopoiesis is markedly reduced.

Bone Marrow Biopsy (Slide 7c)

Note the near total involvement of marrow space by a monomorphic blast cell population (see rectangle). Residual normal hematopoiesis is markedly reduced.

*** 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

Burkitt's leukemia

DISCUSSION

Burkitt's leukemia is an aggressive form of acute lymphoid leukemia, which is essentially the same disease as Burkitt's lymphoma (a non-Hodgkin lymphoma). This most often involves a translocation of the *c-myc* oncogene from chromosome 8 to the immunoglobulin heavy chain gene on chromosome 14. Less commonly, there is a t(2; 8) or a t(8; 22) translocation, linking *c-myc* to the lambda or kappa light chain genes. The resultant malignant B lymphocytes (Burkitt cells) undergo very rapid proliferation and spontaneous apoptosis, and are phagocytosed by macrophages; this gives rise to the histological "starry sky" pattern seen in lymph nodes and bone marrow biopsies. The endemic (African) form of Burkitt's leukemia frequently presents with involvement of the mandible or other facial bones, and has a strong association with Epstein-Barr virus (EBV) infection.