Hemepath Case 8: 3-Year-Old Girl

HISTORY

A 3-year-old girl is brought in by her mother, having become increasingly drowsy and lethargic over the past week. The child has experienced chills, a mild cough, and a high fever of 40°C that has waxed and waned for the entire week. She also refuses to eat, and has vomited twice. The symptoms began approximately 2 weeks after the family returned from a vacation to Nepal. On the last day of their trip, their son pointed out that there was a hole in their mosquito net.

CBC

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

DESCRIPTION OF SLIDE

Peripheral Blood Smear

The peripheral blood smear shows anemia, thrombocytopenia, and reactive changes in neutrophils. There is marked mixed parasitemia (see circles): some parasites resemble *P. falciparum*, while others morphologically suggest *P. vivax*.

*** 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

Malaria

DISCUSSION

Parasites of the genus *Plasmodium* are transmitted via the female *Anopheles* mosquitoes in malaria endemic countries. Sporozoites are released from the mosquito’s saliva into the patient’s blood: they subsequently invade and multiply in hepatocytes. Infected liver cells rupture and release merozoites into the bloodstream, which penetrate and multiply within RBCs. At the same time, merozoites also secrete

enzymes that break down hemoglobin and lyse erythrocytes. This allows further release of merozoites into the bloodstream, resulting in infection of additional RBCs.

Different species of *Plasmodium* have distinct features on peripheral blood smears, such as the stages of parasites present, the morphology of the parasites, as well as the "ages" and sizes of RBCs affected. Malaria speciation is critical in diagnosis, because *P. falciparum* malaria is more likely to be resistant to chloroquine therapy.