

47th ANNUAL DIAGNOSTIC SLIDE SESSION, 2006
REFERENCES AND DIAGNOSES

MODERATOR: E. Tessa Hedley-Whyte, M.D.

EDITOR: Leroy R. Sharer, M.D.

Case 2006-3

Submitted by: Patricia A. Kirby, M.D. and Matthew Karafin M3, Department of Pathology, University of Iowa, Iowa City, IA

Diagnosis: Cerebral malaria, *Plasmodium falciparum*

Comment: This young woman did not take anti-malarial prophylaxis when visiting Mozambique, reportedly for religious reasons. The Dürck's granulomas contained CD68 positive cells, and they were associated with swollen axons, with expression of Alzheimer precursor protein (APP). Hemozoin promotes release of TNF- α and both MIP-1 α and MIP-1 β in cerebral malaria.

From the Presenter: The diagnostic procedure performed was a peripheral blood smear which demonstrated numerous ring forms of Plasmodium schizonts in red blood cells. The gross finding of extensive subcortical petechial hemorrhages is characteristic of cerebral malaria, with these classical histological features of the disease:

1. Extensive sequestration of parasitized red blood cells in capillaries.
2. Petechial hemorrhages, especially in subcortical white matter.
3. Subcortical perivascular ring hemorrhages.
4. Within the capillary lumina, punctuate black malarial pigment, hemozoin, a product of parasitic hemoglobin metabolism (this is not formalin pigment). In the vessels, this black pigment is adjacent to a pale, mauve, spherical structure which is in turn within a ghost red blood cell. The pale mauve structure is the Plasmodium schizont.
5. Dürck's granulomas are seen in the white matter, often deep to the ring hemorrhages. These "granulomas" consist of microglia, astrocytes and macrophages.

References:

Combes V, Coltel N, Faille D, et al: Cerebral malaria: role of microparticles and platelets in alterations of the blood-brain barrier. Int J Parasitol 2006, in press.

Idro R, Jenkins NE, Newton CRJC: Pathogenesis, clinical features and the neurological outcome of cerebral malaria. Lancet Neurol 2005; 4:827-840.

Sakai O, Barest GD: Diffusion-weighted imaging in cerebral malaria. J Neuroimaging 2005; 15:278-280.

Turner G: Cerebral malaria. Brain Pathol 1997; 7:569-582.