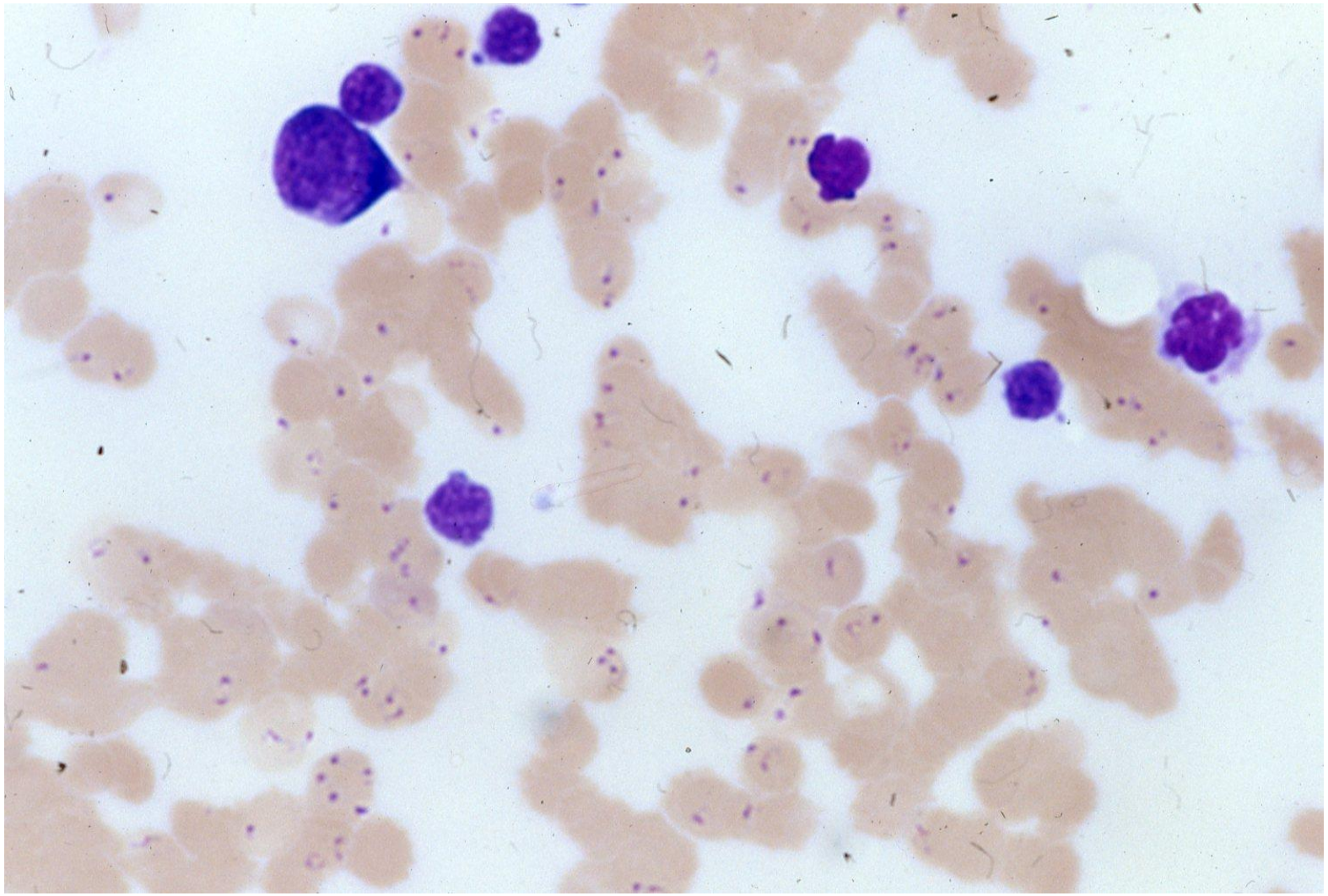
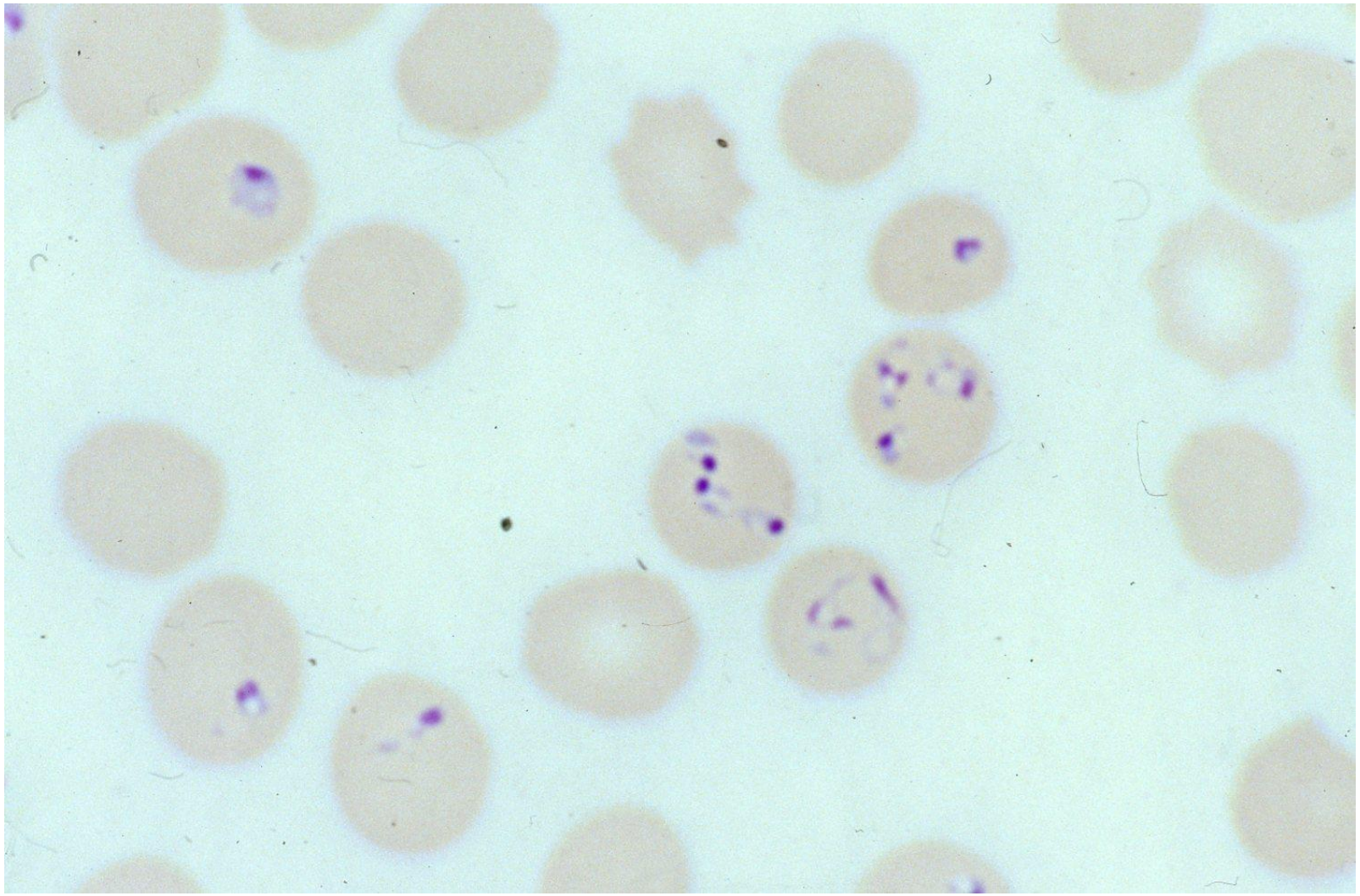
Cerebral malaria, an autopsy case

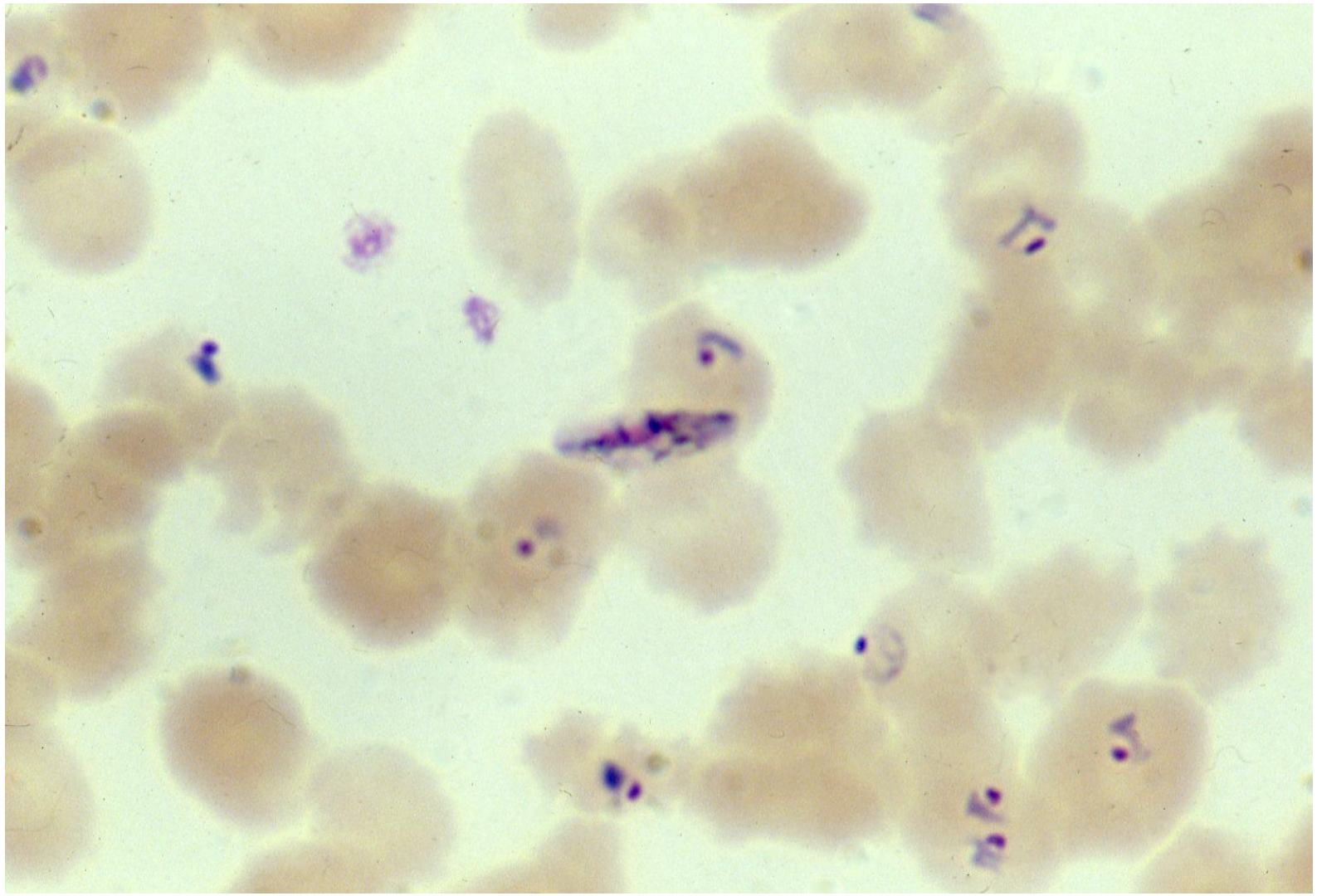
A Japanese male professional photographer aged 67 years suffered from falciparum malaria in Kenya. Just after coming back to Japan, he complained of high fever, splenomegaly, jaundice and consciousness disturbance. He had taken chloroquine for malaria prevention. Chloroquine-resistant malaria killed him. Red cells in the peripheral blood contained numerous ring-form parasites. At autopsy, the black-colored enlarged spleen and petechial hemorrhage in the brain were impressive. We call this type of fulminant disease as malignant malaria or cerebral malaria.



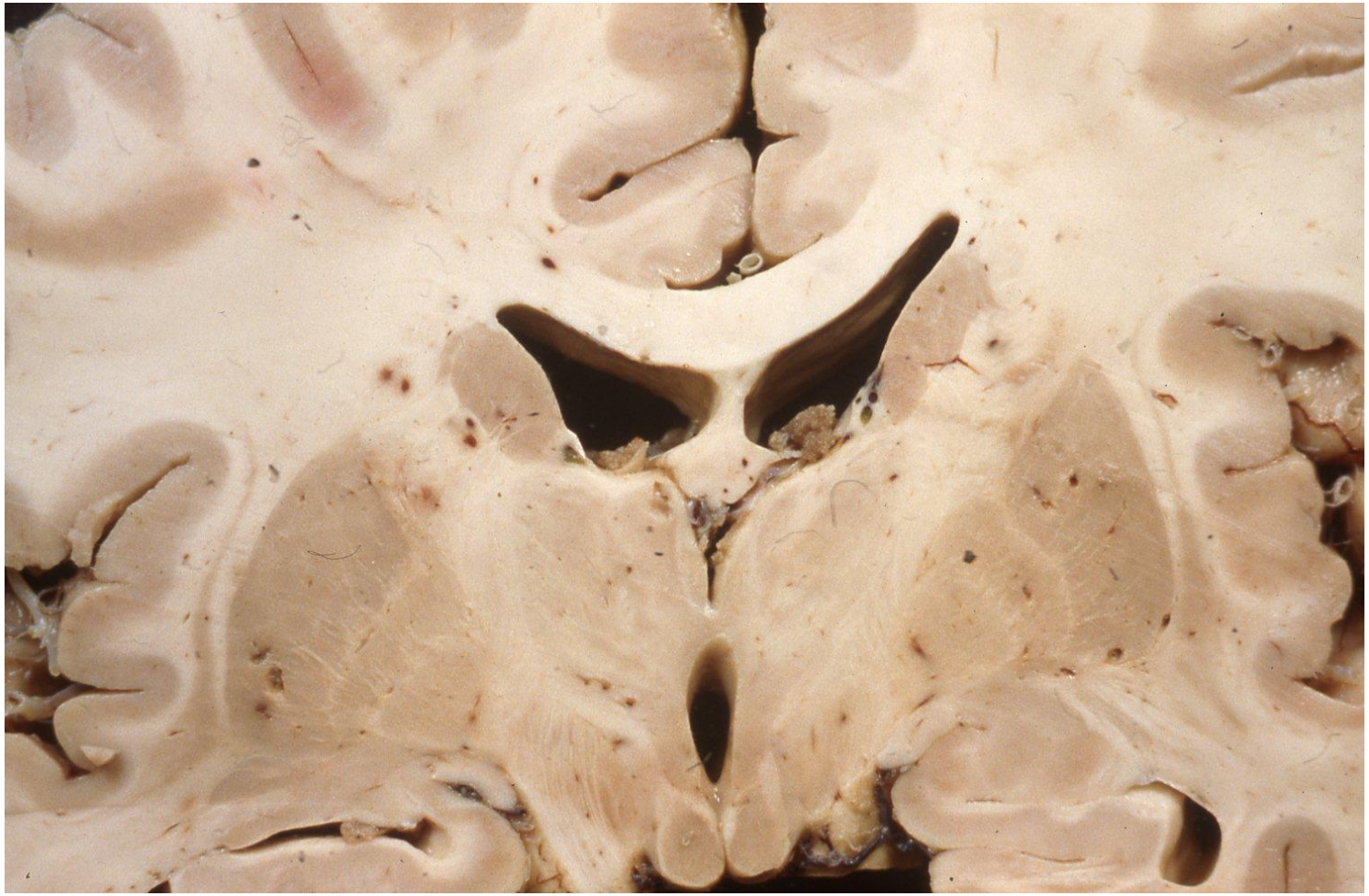
In the peripheral blood sampled at autopsy, more than half of the red cells are infected with the ring form, and two or three ring forms are seen in the single red cell. May-Giemsa-1



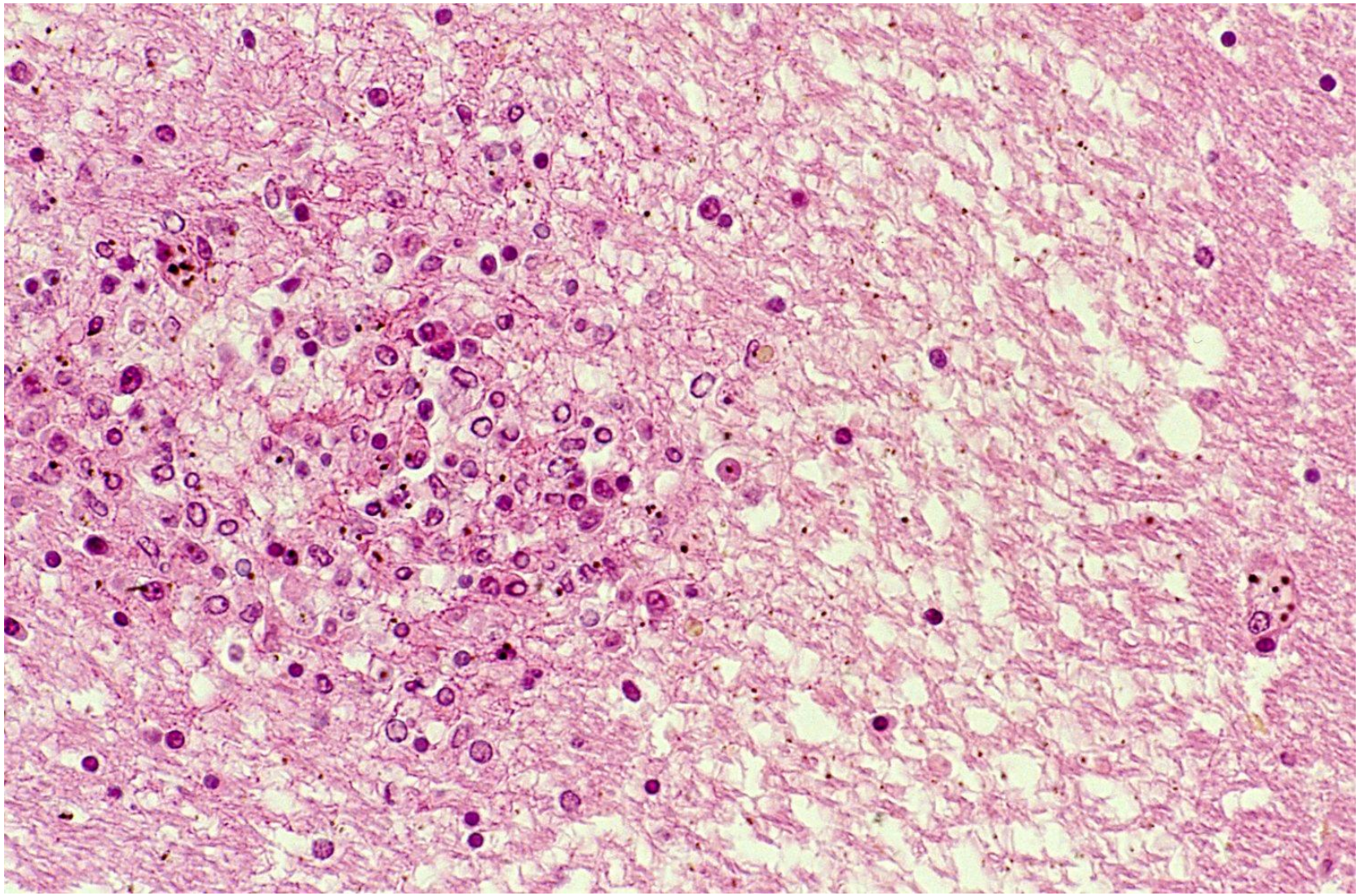
In the peripheral blood sampled at autopsy, more than half of the red cells are infected with the ring form, and two or three ring forms are seen in the single red cell. May-Giemsa-2



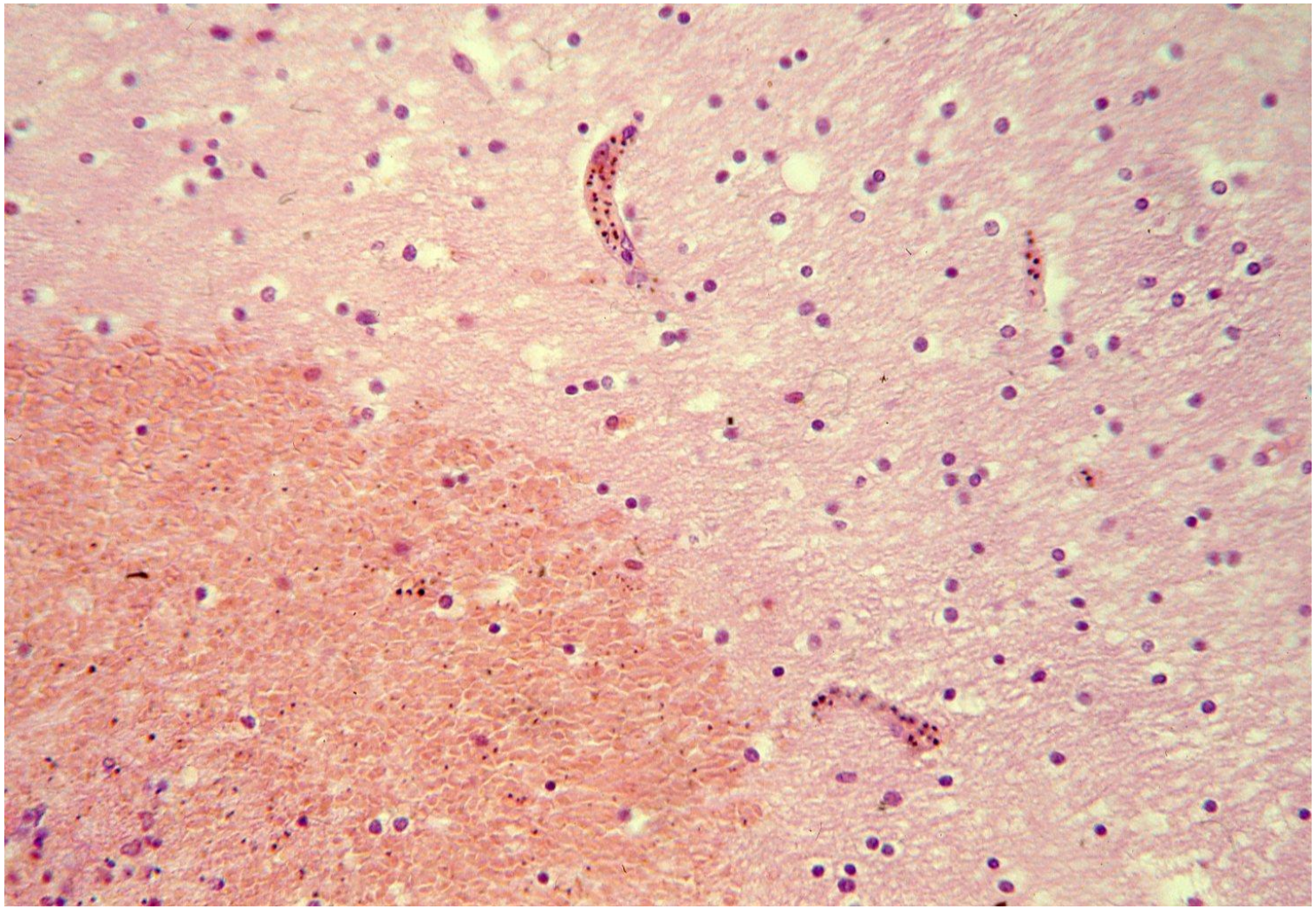
In the peripheral blood sampled at autopsy, more than half of the red cells are infected with the ring form, and two or three ring forms are seen in the single red cell.　A crescent-shaped gametocyte is seen.
May-Giemsa-3



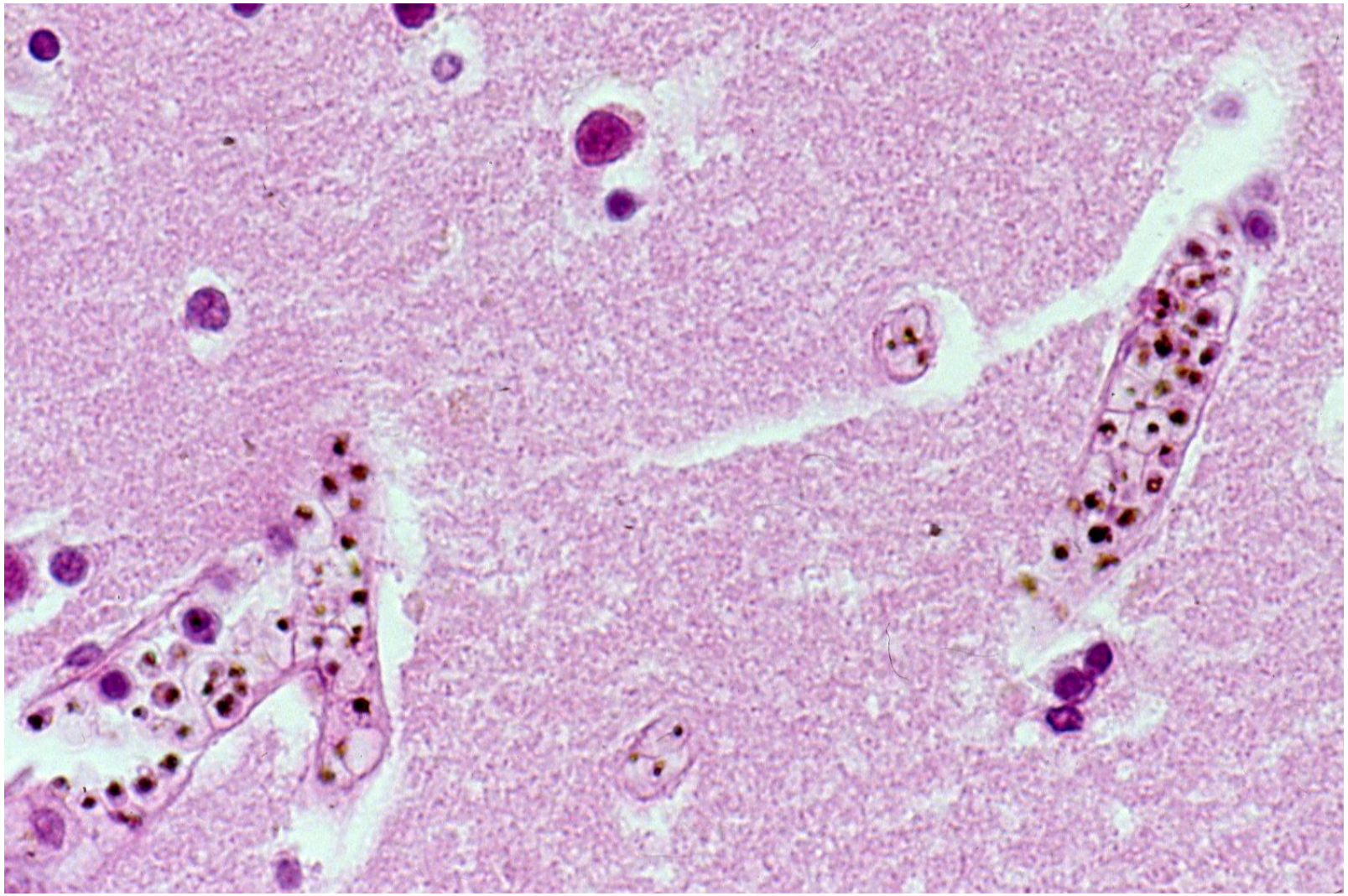
Cerebral malaria seen in a male photographer aged 67 years. The cut surface of the brain reveals small petechial hemorrhage. A blackish color of the brain is discerned.



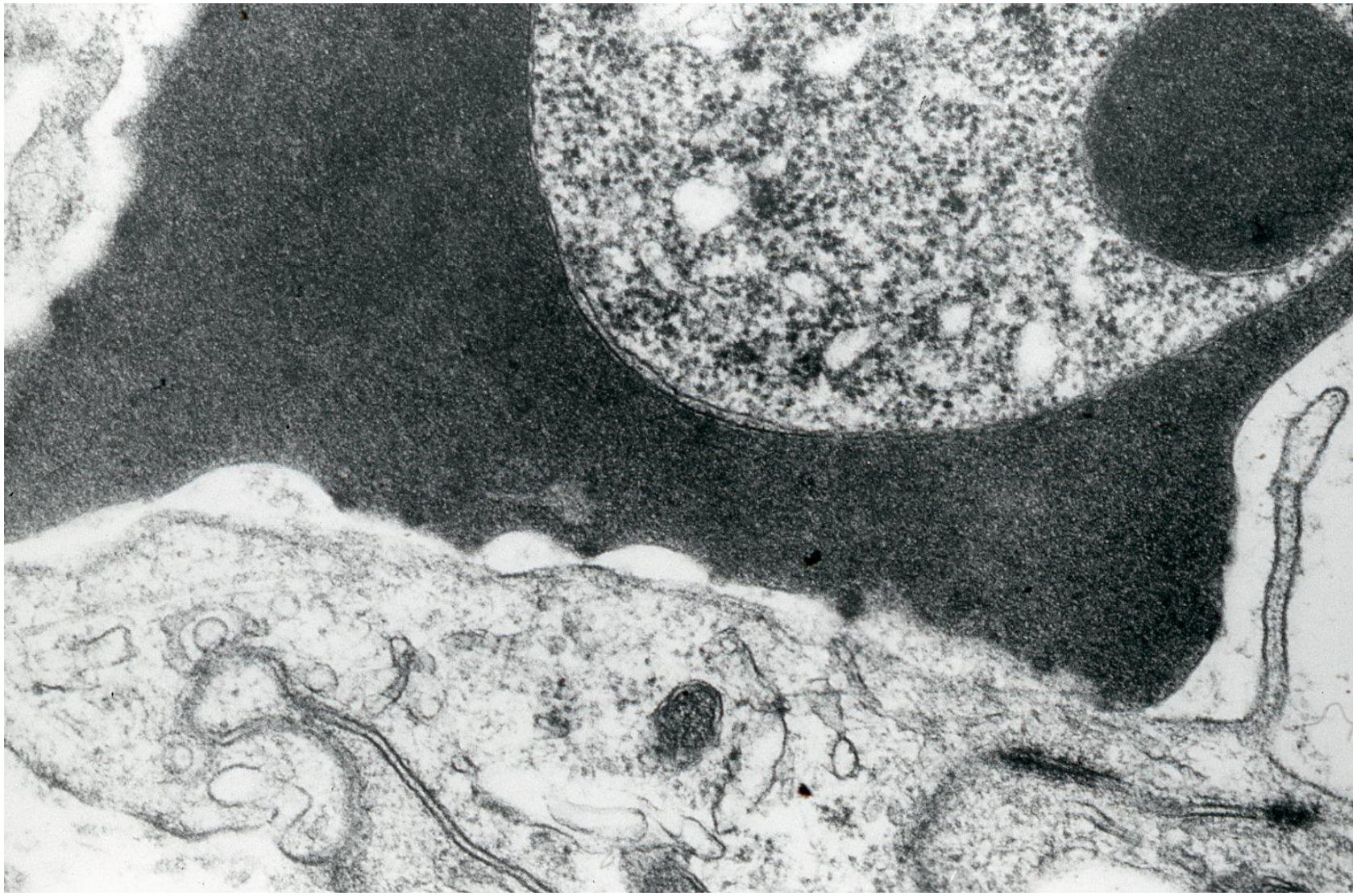
Cerebral malaria seen in a male photographer aged 67 years. Microscopic appearance of the white matter of the brain shows perivascular accumulation of macrophages. H&E-1



Cerebral malaria seen in a male photographer aged 67 years. Microscopic appearance of the white matter of the brain shows perivascular hemorrhage and stagnation of malaria pigment-containing red cells in the capillary vessels. H&E-2

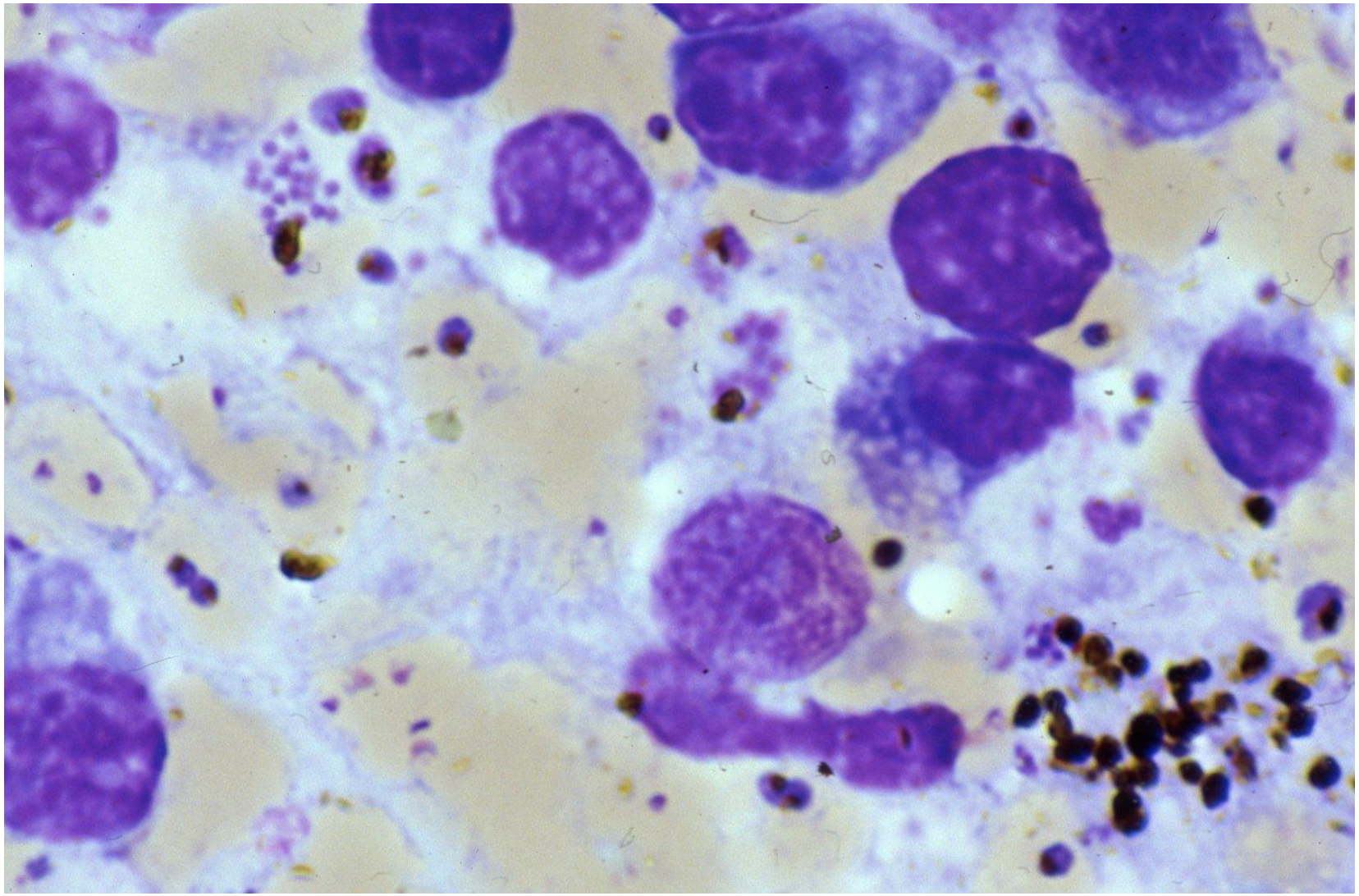


Cerebral malaria seen in a male photographer aged 67 years. Microscopic appearance of the white matter of the brain shows stagnation of malaria pigment-laden red cells in the capillary vessels. H&E-3

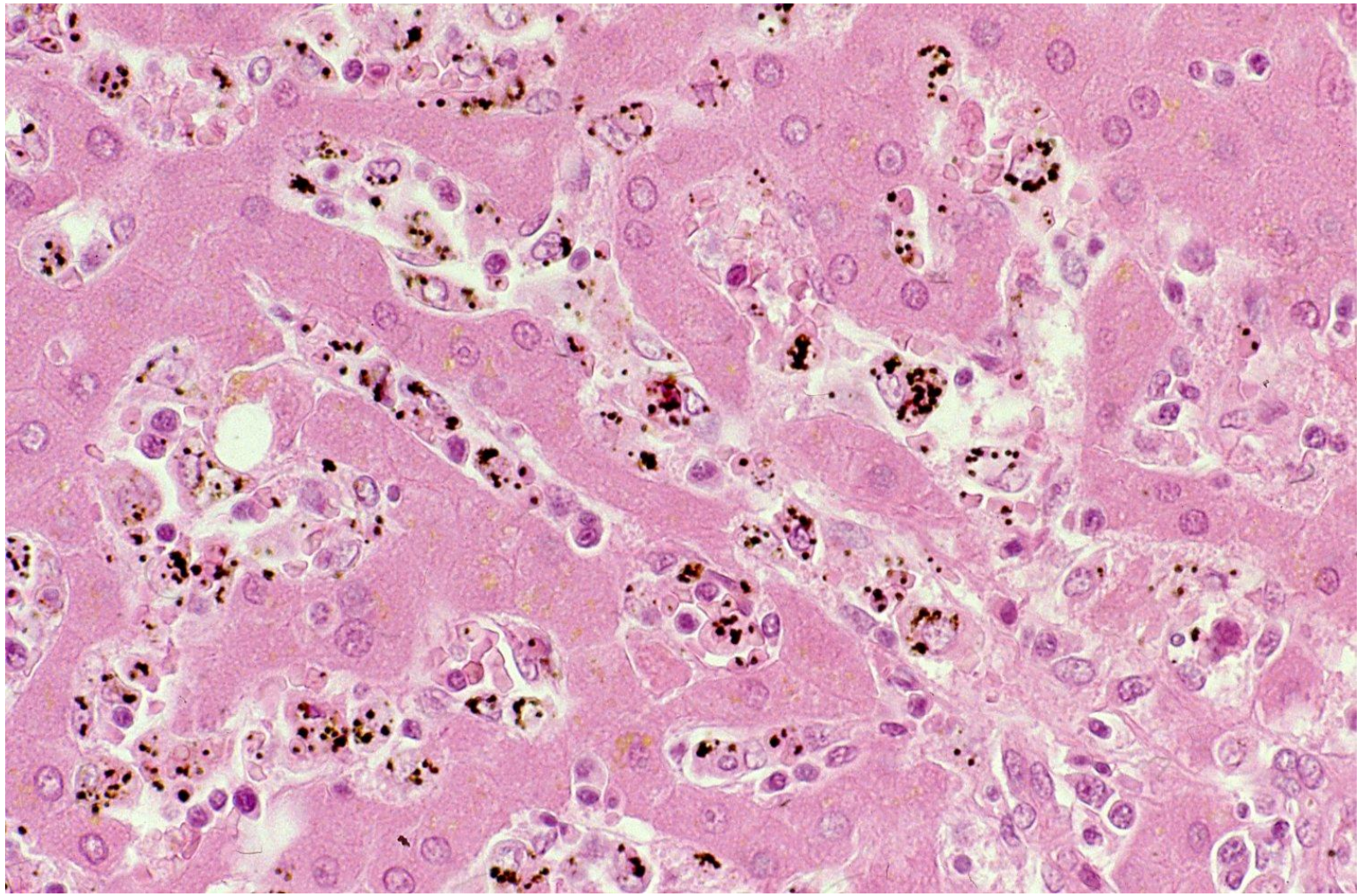


EM features of a red cell infected by an ameboid form parasite in the capillary of the brain. Knobs (100 x 60 nm in size) are formed on the red cell. Via cell adhesion molecules expressed on the knobs, the infected red cell adheres to the endothelial cell, causing capillary obstruction-based brain ischemia. The absence of ameboid form in the peripheral blood is explained by this phenomenon.

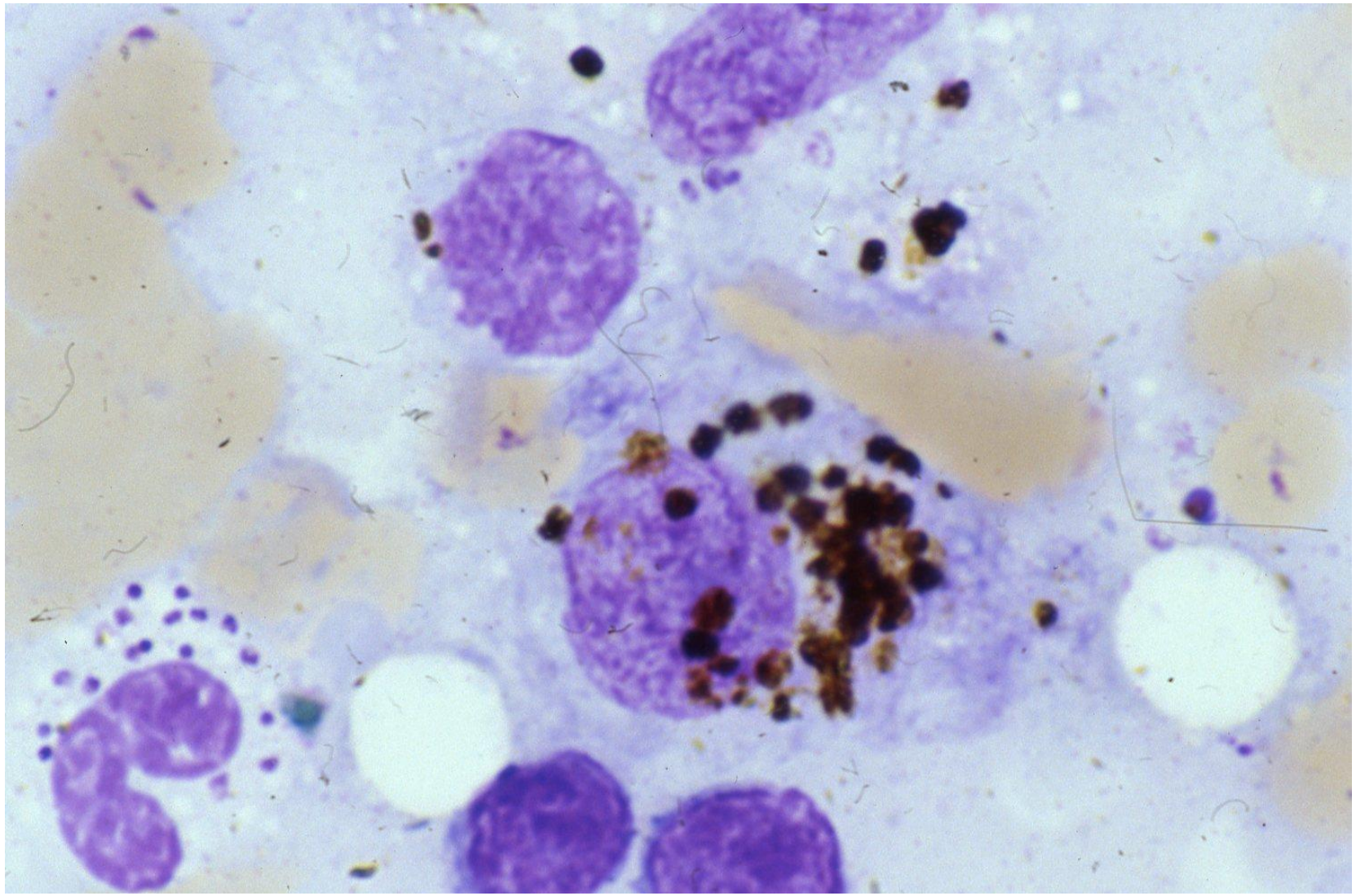
A male photographer aged 67 years with cerebral malaria. The cut surface of the enlarged spleen is markedly black-colored.



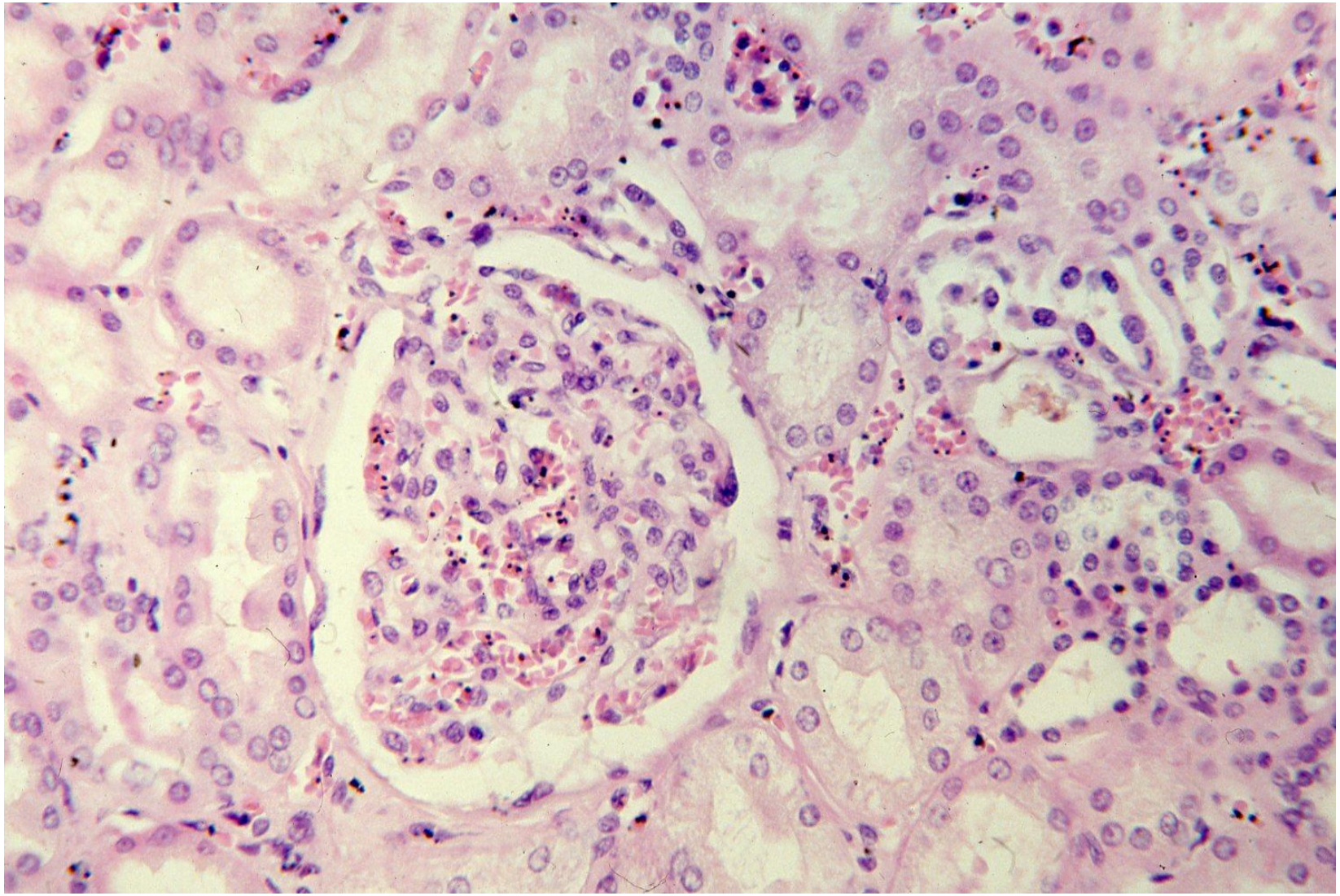
A male photographer aged 67 years with cerebral malaria. Giemsa-stained touch smear preparations from the spleen reveal deposition of coarse malaria pigments and intracytoplasmic growth of schizonts in macrophages. Giemsa



A male photographer aged 67 years with cerebral malaria. In the liver, Kupffer cells are activated, and contain coarse malaria pigments. H&E



A male photographer aged 60’s with cerebral malaria. Giemsa-stained touch smear preparations from the liver reveal deposition of coarse malaria pigments and intracytoplasmic growth of schizonts in macrophages. Giemsa



A male photographer aged 67 years with cerebral malaria. In the kidney, red cells containing coarse malaria pigments are seen in the capillary vessels. H&E