Hemorrhagic disease in dogs infected with an unclassified intraendothelial piroplasm in southern Brazil

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Abstract

A hemorrhagic disease affecting dogs in Brazil, referred to popularly as "nambiuví" (bloody ears) and believed to be transmitted by ticks, has been observed in animals infected with an organism described originally in 1910 as a piroplasm, and known locally as Rangelia vitalli. In this series of 10 cases, the disease was characterized by anaemia, jaundice, fever, spleno- and lymphadenomegaly, hemorrhage in the gastrointestinal tract, and persistent bleeding from the nose, oral cavity and tips, margins and outer surface of the pinnae. The ixodid ticks Rhipicephalus sanguineus and Amblyomma aureolatum infested affected dogs from suburban and rural areas, respectively. Laboratory findings included regenerative anaemia, spherocytosis, icteric plasma and bilirubinuria. Those intracellular organisms were found in bone marrow smears but not in blood smears. Microscopically, zoites were seen within the cytoplasm of blood capillary endothelial cells. Parasitized and non-parasitized endothelial cells were positive immunohistochemically for von Willebrand factor (vWF). Langhans-type multinucleate giant cells were observed in the lymph nodes and choroid plexus. There was prominent erythropagocytosis by macrophages in the lymph node sinuses and infiltration of the medullary cords by numerous plasma cells. Ultrastructurally, this organism had an apical complex that included a polar ring and rhoptries but no conoid. This parasite was contained within a parasitophorous vacuole that had a trilaminar membrane with villar protrusions and was situated in the cytoplasm of capillary endothelial cells. This organism tested positive by immunohistochemistry for Babesia microti. This pathogen was also positive by in situ hybridization for B. microti. Tentative clinical diagnosis in these cases was based on the history, clinical picture, haemogram and favorable response to therapy, and confirmed through microscopic examination of smears from the bone marrow or histological sections of multiple tissues, especially lymph nodes where zoites were most frequently found. The disease was reproduced by intravenous inoculation of blood from a naturally infected dog into an experimental dog. The authors demonstrate in this study that this organism is a protozoa of the phylum Apicomplexa, order Piroplasmonida. This piroplasm seems to be different from...