



Diagnostic Exercise

From The Davis-Thompson Foundation*

Answer Sheet

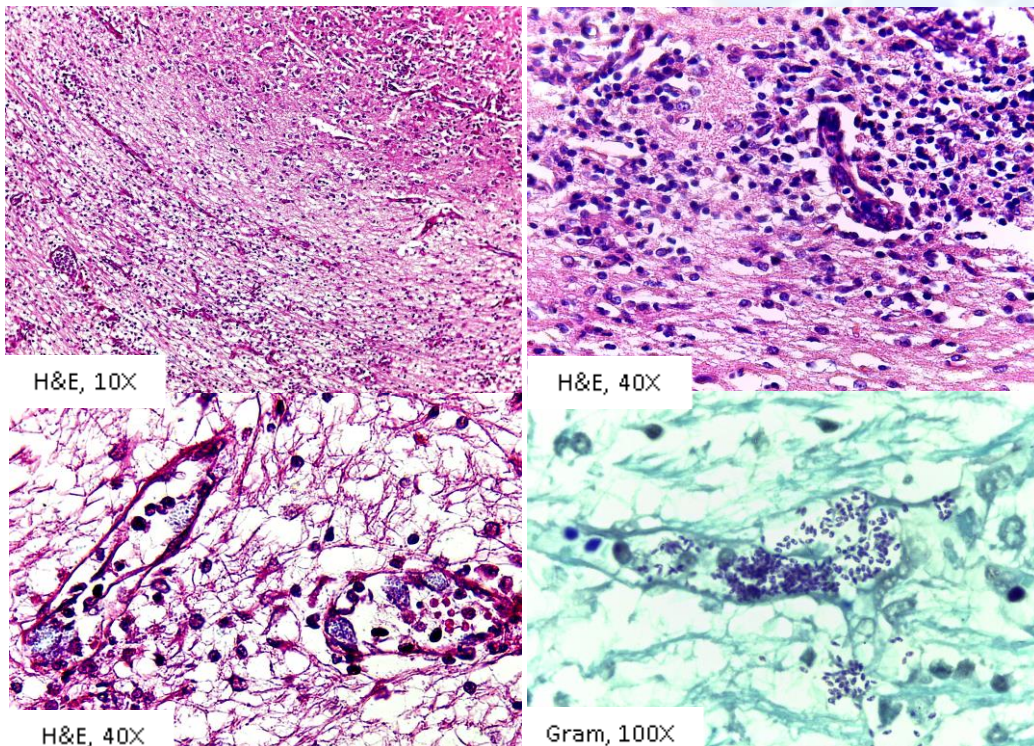
Case #: 147 Month: August Year: 2020

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Clinical History: A one-month-old female puppy was submitted for necropsy to the Pathology Veterinary Service of Buenos Aires University, Argentina. The clinical history was provided by the referring veterinarian. A pregnant stray bitch, with her litter of six puppies, was adopted from the street. One puppy died at the age of one month, presumably due to cranial trauma; it was not examined. Three other puppies became ill, showing neurologic signs. Clinical signs included reduced appetite, depression, constant crying, weight loss, weakness, convulsions and recumbency. Two of the sick puppies died spontaneously, one of which was submitted for necropsy.

Necropsy Findings: Grossly, the carcass was icteric with an orange liver and moderate splenomegaly. No other gross lesions were observed.

Histological Findings



1) **Histological description:** Brain: Severe, diffuse, lymphocytic encephalitis, affecting both gray and white matter. Multifocal infiltrates of lymphocytes, plasma cells and fewer macrophages are accompanied by diffuse gliosis. Occasional perivascular cuffing composed of plasma cells and lymphocytes are present. The endothelial cells are hypertrophied and protrude into the lumen, with large cytoplasmic vacuoles containing several small (approximately 1 µm in diameter), Gram-positive, rod-shaped spores with a characteristic posterior vacuole, morphologically compatible with *Encephalitozoon cuniculi*.

2) **Morphologic diagnosis:** Brain: Severe, diffuse, lymphocytic encephalitis with diffuse gliosis and endothelial vacuoles containing organisms compatible with *E. cuniculi*.

3) **Etiology:** *Encephalitozoon cuniculi*

Discussion:

The microscopic lesions are compatible with an acute and active infection by *E. cuniculi* because, in contrast, chronic cases usually present with a severe granulomatous encephalitis and nephritis. Moderate, multifocal, lymphocytic nephritis with numerous vacuoles with clusters of organisms in the cytoplasm of renal tubular epithelial cells and endothelial cells was also seen in this case. In addition, mild lymphoplasmacytic hepatitis with occasional small collections of spores in the cytoplasm of hepatocytes was present. In general, *E. cuniculi* organisms are absent in lesions at later stages of the disease. Other microscopic lesions included extensive splenic extra-medullary hematopoiesis and congestion. This was the first reported case of canine encephalitozoonosis in Latin America (Postma et al., 2018).

Antibody titers to *E. cuniculi* in the serum of the three surviving puppies and the dam were $\geq 1:200$. Antibodies for *Toxoplasma gondii* or *Neospora caninum* were not detected in any of the puppies. A titer of 1:400 for *T. gondii* was found in the dam. Serology for *N. caninum* was negative in the dam. A nested PCR reaction was positive for *E. cuniculi* in the kidney of the affected puppy. Serologic results in this case suggest that either intrauterine transmission or simultaneous infection of the puppies and the dam from the same unknown source had occurred.

Some authors suggest that encephalitozoonosis poses a zoonotic risk for humans, but the epidemiologic role of dogs as reservoirs of *E. cuniculi* has not yet been demonstrated.

References and Recommended literature:

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