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**Zoo/Exotic Pathology Service**  
2825 KOVR Drive  
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<b>Doctor:</b> -	<b>Date:</b> November 25, 2009
<b>Clinic:</b> Bat World Sanctuary 217 N. Oak Avenue Mineral Wells, TX 76067	<b>Access:</b> V093668-4 <b>Species:</b> Chiroptera <b>Breed:</b> Mastiff Bat <b>Sex:</b> Male <b>Name:</b> Hooch
<b>ISIS:</b> -	<b>Age:</b> 3-5 Years <b>Type:</b> Post mortem jar, ID, recut

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**CLINICAL INFORMATION**

This bat has been lethargic and incontinent with partial lameness in the back leg. There are elevated liver enzymes and a high white blood cell count. Photophobia was present with apparent neck pain. Tick fever is suspected, and the bat was treated with doxycycline for four months. There was some improvement, but he declined. There were bladder stones and anemia identified before death.

**MICROSCOPIC**

Submitted is the entire bat preserved for examination.

Cerebellum: Within the cerebellum, there are, in the meninges, nematodes. These nematodes have a somewhat spiculated to smooth amphophilic cuticle that supports a low coelomyarian musculature around a pseudocoelomic body cavity. There are bilateral cords. The digestive tract is lined by a low cuboidal cell. There are focal areas in the apparent brainstem, which have foci of microgliosis. There is some vacuolization of the neurons.

Testes: No lesion recognized.

Large intestine: No lesion recognized.

Stomach: Examined is a section of stomach with a squamous epithelial portion. There are small numbers of oval yeast structures with very rare budding noticed along the mucosal epithelium.

Urinary bladder: Examined are sections through the urinary bladder, which is supporting multifocal areas of erosions and ulcerations with inflammation of neutrophils and occasional lymphocytes into the submucosa. There is edema and some fibrin deposition noted. Hemorrhage is prominent into the areas where there are erosions and ulceration.

Haired skin: Examined are several sections of haired skin. Some of the sections are supporting some foci of underlying cartilage, which may represent parts through the ears. There are yeast organisms identified within the keratin of some of the follicles, particularly in this section and into what appears to be the ear canal. These are oval structures with occasional pseudohyphae formation.

Pancreas: No lesion recognized.

CONTINUED

Intestines: Examined are multiple sections of the intestines at various levels. There are lymphoplasmacytic and neutrophilic infiltrates into the lamina propria of the intestines. There are occasional glands with cellular debris within the lumen and some mild necrosis of the gland identified.

Tongue: There are focally extensive areas of inflammation, primarily suppurative inflammation, into the mucosa with erosions. This is also present in the submucosa and extending into the underlying skeletal muscle of the tongue. This is a focal lesion.

Spleen: The spleen is supporting multiple areas of neutrophilic infiltrates with associated hemorrhage, fibrin, and congestion.

Lung: The lung is flooded with proteinaceous fluid into the alveolar spaces. There are increased numbers of macrophages identified. Many of these are supporting intracytoplasmic basophilic debris. Others are vacuolated and filling the lumen. There are multifocal areas of neutrophilic infiltrates with hemorrhage and fibrin, which is partially effacing many of the alveolar spaces.

Heart: Examined is a longitudinal section through the ventricle, atria, and great vessels of the heart. The great vessels are supporting intramural mineralization. These large mineralized plaques are present within the tunica media. There are foci of myocardial degeneration characterized by vacuolization of myocardial cells and some mild inflammatory infiltrates of macrophages.

Kidney: Examined is a section through the cortex and medulla of the kidney. There are lymphocytes in nodular aggregates within the interstitium. These are occasionally associated with some plasma cells and neutrophils.

Adrenal gland: No lesion recognized.

Eye: No lesion recognized.

Nasal sinuses: No lesion recognized.

Liver: There are focal areas of biliary hyperplasia within the portal triads.

Glottis: In the skeletal muscle of the glottis, there are extensive lymphocytes, plasma cells, and numerous neutrophils that are infiltrating into the musculature. These are also present within the submucosa. Neutrophils can be identified transmigrating across the epithelium.

Salivary gland: The salivary gland is supporting lymphoplasmacytic and neutrophilic infiltrates multifocally within the interstitium but closely associated with intralobular ducts.

### **DIAGNOSIS**

- 1) **MENINGES: MENINGEAL NEMATODES**
- 2) **CEREBELLUM: MILD MULTIFOCAL MICROGLIOSIS**
- 3) **LUNGS: SEVERE DIFFUSE SUBACUTE TO CHRONIC PNEUMONIA**
- 4) **LARYNX: FOCALLY EXTENSIVE MODERATE ACUTE RHABDOMYOSITIS AND LARYNGITIS**
- 5) **LIVER: MULTIFOCAL PORTAL BILIARY HYPERPLASIA**
- 6) **SALIVARY GLAND: MODERATE SUBACUTE INTERSTITIAL ADENITIS**
- 7) **URINARY BLADDER: MULTIFOCAL MODERATE ACUTE TO SUBACUTE EROSIIVE AND ULCERATIVE CYSTITIS**
- 8) **KIDNEY: MULTIFOCAL MILD TO MODERATE SUBACUTE INTERSTITIAL NEPHRITIS**

CONTINUED

- 9) **SPLEEN: MODERATE ACUTE SUPPURATIVE SPLENITIS**
- 10) **STOMACH: GASTRIC YEAST**
- 11) **TONGUE: FOCAL ACUTE GLOSSITIS**

**COMMENT**

This bat has multiple inflammatory lesions in many of the organs. A definitive cause is not determined for most of them, as no specific microorganisms are identified. There are yeast identified in the gastric sections, and these may be secondary to the chronic antimicrobial therapy. There is one significant lesion, which would account for the clinical signs, and that is of nematode parasites that are migrating through the meninges. These appear most consistent with an ascarid-type parasite. If further identification is of interest, please contact the service.

**ADDENDUM 2/6/10**

The recut sections of the brain have been examined by Dr. Ellis C. Greiner, Department of Pathobiology, College of Veterinary Medicine, University of Florida. There are small cross sections of adult nematodes with internal ridges associated with the lateral cords. These features are present in species of *Dirofilaria*. Dr. Greiner does not know of any species of this genus in bats. It may be these are in an aberrant host.

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DRR:br\*

Q1 KW CNS, infection (metazoan)