

**ZOOLOGICAL PATHOLOGY PROGRAM  
STRANDED CETACEAN NECROPSY REPORT**

**Field ID:** MCT-20101110-LA001  
**Additional Identifier:** LA 432  
**ZPP Accession Number:** 11-13Tt  
**Species:** *Tursiops truncatus*  
**Strand Date:** 11-12-10  
**Strand Location:** Raccoon Island, LA  
**Sex:** female  
**Age Class:** adult  
**Necropsy Date:** 11-12-10  
**Condition code:** 3  
**Total Length:** 234 cm  
**Weight:**  
**Blubber Depth:** 8 mm dorsal  
**Body Condition:** 2/7

**Gross Necropsy:** (on file)

**Slides/Tissues Received:** 27 regular slides and 2 oversize slides (1 duplicate each of slide 26 & 27)

**Microscopic Findings:** Vessels in all tissues have few to large numbers of large (postmortem) bacilli.

Slide 1:

Adrenal: No significant findings (NSF)

Kidney: Focally the pelvic submucosa contains a small accumulation of neutrophils with few macrophages and lymphocytes. Another calyx has similar, though minimal, changes.

Slide 2:

Cardiac atrium, pancreas, intestine: NSF

Slide 3:

Cardiac ventricle: Surrounding two small vessels, the interstitium has minimally increased quantities of dense collagenous fibrous tissue with rare to minimal separation of few myocytes.

Slide 4:

Intestine: NSF

Lymph node: Subcapsular sinuses and afferent lymphatics contain moderate numbers of neutrophils. Lesser numbers of neutrophils are in the cortical parenchyma and capsule. Cortical follicles are small and germinal centers are sparsely cellular with central hyaline material.

Medullary sinuses contain low numbers of hemosiderin-laden macrophages. Medullary cords contain moderate numbers of plasma cells.

Slide 5:

Lymph node: Similar to slide 4 except no plasmacytosis.

Lung: Many bronchi contain one or more cross sections of up to 400 micron diameter nematodes (Halocercus). The submucosa contains scattered low numbers of eosinophils, plasma cells, lymphocytes, macrophages, and rare neutrophils. Smaller caliber bronchioles have no nematodes but have few to many luminal neutrophils, foamy macrophages and few eosinophils. The submucosa is mildly to moderately thickened with dense collagenous fibrous tissue containing low numbers of similar inflammatory cells. Bronchioles are also often encircled by similar fibrous tissue that also extends into the immediately surrounding alveolar interstitium.

Slide 6:

Tongue: NSF

Slide 7:

Liver and large bile duct: The liver immediately adjacent to the duct has mild lobular collapse.

Spleen: PALs have small follicles with hyaline material centrally and no visible germinal center.

Slide 8:

Lymph node: Similar, though lesser, changes as for slide 4.

Liver: NSF

Slide 9:

Esophagus: NSF

Duodenum: GALT aggregates are small.

Slide 10:

Trachea: The submucosa has scattered low numbers of plasma cells and lymphocytes.

Large intestine: NSF

Slide 11:

Uterus & intestine: NSF

Slide 12:

Ovaries: One ovary has two large corpora albicans.

Slide 13:

Urinary bladder: NSF

Lymph node (presumed mesenteric): Diffusely sinuses contain moderate numbers of eosinophils; the cortical parenchyma contains lesser numbers of eosinophils.

Slide 14:

Uterus: the endometrium is mildly congested. The lumen contains few extravasated erythrocytes.

Slide 15:

Glandular (fundic and pyloric) stomach: NSF

Slide 16:

Uterus: NSF

Slide 17:

Skeletal muscle: NSF

Lymph node: Similar to slide 4.

Slide 18:

Adipose and connective tissue, melon, per gross report: Adipose tissue contains a large, focal cavitation. Within and along the margin of the cavitation are few macrophages and the margin of the cavitation also has few thin spindle cells. Surrounding the cavitation is a moderate accumulation of dense collagenous sparsely cellular (mature) fibrous tissue which replaces and separates adipocytes. Within the connective tissue are low numbers of macrophages and fewer multinucleated giant cells, neutrophils, plasma cells and lymphocytes, and rare eosinophils.

Slide 19:

Skin with blubber: Blubber layer adipocytes are reduced in size to inapparent and the interstitium is composed of increased wispy to lacy pale basophilic matrix (serous atrophy).

Slide 20:

Cerebrum: The meninges diffusely contain low to moderate of neutrophils with few macrophages and apparent plasma cells. Scattered vessels in the superficial parenchyma are cuffed by rare to low numbers of foamy macrophages with yellow pigment as well as occasional lymphocytes, plasma cells and rare neutrophils. Few neurons of superficial lamina are surrounded by mildly increased numbers of glial cells (satellitosis).

Slide 21:

Cerebrum (no meninges in section): There are scant parenchymal changes as for slide 20.

Slide 22:

Cerebrum: The neuropil contains a large focal cavitation containing many foamy macrophages, neutrophils and lesser erythrocytes, as well as necrotic cellular debris and scattered individualized fragments/islands of neuropil with necrotic neurons and glial cells. Some macrophages contain phagocytosed erythrocytes. Throughout the cavitation are numerous large bacilli (consistent with postmortem overgrowth as for other tissues) as well as numerous long

slender bacilli, small coccobacilli that are also occasionally within macrophages, and few 3-4 micron diameter ovoid structures suggestive of yeasts. The surrounding intact neuropil contains many similar inflammatory cells and regionally vessels are lined by plump (reactive) endothelial cells and cuffed by few to moderate numbers of lymphocytes, plasma cells and lesser macrophages and neutrophils. Focally the cavitation extends to the meninges and multifocally meninges contain low to moderate numbers of macrophages and neutrophils.

Slide 23:

Brain (Thalamus, presumptive): The meninges contain moderate numbers of neutrophils and few macrophages. Some macrophages contain phagocytosed coccobacilli as for Slide 22.

Additionally there are few small aggregates of fibrin in the meninges. Superficial neuropil has few vessels with small perivascular cuffs of lymphocytes, plasma cells and macrophages and there is a small region of fragmented neuropil with few foamy macrophages.

Slide 24:

Spinal cord: The meninges have severe diffuse accumulation of neutrophils with few macrophages, frequent aggregates of fibrin, and mixed bacteria as for Slide 22. Few small coccobacilli are apparently within neutrophils. A pia mater vessel is 80% occluded by a fibrin thrombus with few enmeshed necrotic neutrophils. A second section of cord has no dura mater but there are low to moderate numbers of neutrophils and lesser lymphocytes and plasma cells in the pia mater.

Slide 25:

Cerebellum: The meninges have moderately severe, multifocal accumulations of neutrophils including one with neutrophils extending into the choroid plexus. In much of the remainder of the meninges, vessels are cuffed by low numbers of plasma cells, lymphocytes and fewer neutrophils.

Slide 26:

Eye - NSF

Slide 27:

Bone & bone marrow: Extensive autolysis obscures detail. The marrow appears sparsely cellular, and is composed primarily of myeloid precursors. Only rare segmented and band neutrophils are noted.

**Final Diagnoses:**

1. Moderately severe, multifocal, subacute, suppurative meningitis with intralesional coccobacilli; Regionally extensive, necrotizing and granulomatous encephalitis with intralesional coccobacilli
2. Poor body condition (gross diagnosis) and moderately severe serous atrophy of fat, blubber
3. Focal cystic cavitation with mild granulomatous steatitis (presumptive old parasitic cyst), melon

4. Mild, multifocal, chronic granulomatous bronchitis with intralesional nematodes (consistent with *Halocercus*)
5. Mild lymphoid depletion, lymph nodes and spleen; drainage reaction, lymph nodes

**Ancillary Test Results:**

*Brucella* PCR of brain was negative.

Aerobic bacterial culture of lung yielded heavy growth of *Aeromonas hydrophila*, *Plesiomonas shigelloides* and *Flavobacterium odoratum*.

**Comments:**

Cause of death was bacterial meningoencephalitis given the intralesional, intracellular coccobacilli. Abundant large bacilli, slender bacilli and rare apparent yeasts were also noted in the lesions, but only the coccobacilli were observed intracellularly and were thus known to be present antemortem. The slender bacilli could also have been a pathogen in this case though this is less certain. Large bacilli and the apparent yeasts were consistent with postmortem colonizers.

*Brucella* as a differential was not likely given negative PCR and the nature of the lesion, with the cavitory lesion. Another common cause of cavitory cerebral lesions is *Nasitrema* migration; this remains a differential even though trematodes/fragments/ova were not noted. Additionally, secondary bacterial infection is not uncommon in cases of *Nasitrema* migration.

Other significant lesions included grossly noted poor body condition, and serous atrophy of the blubber layer was a consistent histologic finding.

The cavitory lesion in the melon was most consistent with an old parasite (cestodes commonly in dolphins) cyst though no intralesional parasite/parasite remnants were noted histologically.

Lymph node changes reflected drainage of areas of inflammation. Low numbers of lymphocytes (spleen also) was consistent with generalized debilitation.

Lungworm infection and associated bronchitis were mild and not of clinical significance.

Reported By:

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