

**ZOOLOGICAL PATHOLOGY PROGRAM
STRANDED CETACEAN NECROPSY REPORT**

Field ID: MCT-20110228-LA001
Additional Identifier: LA 455
ZPP Accession Number: 11-03Tt
Species: *Tursiops truncatus*
Strand Date: 2/27/2011
Strand Location: Grand Terre Island, LA
Sex: Male
Age Class: subadult
Necropsy Date: 2/28/2011 by Cara Field
Condition code: 2
Total Length: 203.2 cm
Weight: 120 kg estimated
Blubber Depth: 1.7 cm dorsal
Body Condition: 5 out of 7

Gross Necropsy: Report on File.

Findings include (from gross report):

Lungs: Mild to moderate lungworm infestation with multifocal granulomas (5-10 mm diameter).

Lymph nodes: Seem to have generalized moderate lymphadenopathy with enlargement of cervical, tracheobronchial, mesenteric, colonic, and inguinal nodes.

Testes: Small – approximately 10 cm in length.

Muscle/blubber: 4 X 3 cm irregular tan granuloma mid-peduncle left side between blubber and muscle, approximately 7 mm deep, containing small amounts of caseous material.

Slides/Tissues Received: 26 regular, 1 large slide

Microscopic Findings:

Slide 1:

Kidney: There is a focal moderate accumulation of lymphocytes and macrophages in the cortex surrounding an approximately 30-35 micron metazoan parasite within a dilated tubule. The parasite has a thin eosinophilic cutical, a coelom, and a small digestive tract (presumed larval nematode).

Liver: Hepatic portal triads are surrounded by small to moderate amounts of fibrous connective tissue and a few scattered lymphocytes. In one large triad there is mild biliary hyperplasia. A few

portal arterioles have walls that contain small accumulations of smudgy, pale basophilic to eosinophilic, acellular material (presumed amyloid).

Slide 2:

Lung: Diffusely alveolar spaces contain moderate amounts of pale, sometimes foamy eosinophilic fluid with small numbers of small coccobacilli. There are a few small accumulations of foamy macrophages and lymphocytes within collapsed alveolar spaces and the adjacent septae. Also there are a few nodular accumulations of mineral surrounded by moderate numbers of macrophages and a rim of lymphocytes (mineralized granulomas). The subpleural interstitium is mildly thickened by fibrous connective tissue and there are scattered thickened arterioles.

Peribronchial lymph node: No significant findings (NSF).

Slide 3:

Thyroid gland: Regionally, basement membranes of thyroid follicles are moderately thickened by smudgy pale basophilic to eosinophilic acellular material (presumed amyloid) that mildly widens the space between follicles.

Thymus: A few blood vessel walls contain small accumulations of smudgy pale basophilic material (presumed amyloid).

Slide 4:

Cervical lymph node: NSF

Heart: NSF

Slide 5:

Heart, ventricle: NSF

Diaphragm: NSF

Slide 6:

Lymph nodes (3): In all three lymph nodes, there is mild follicular hyperplasia. Sinuses contain small numbers of histiocytes and erythrocytes (congestion). There are mildly increased numbers of plasma cells in the paracortex.

Slide 7:

Skin: NSF

Slide 8:

Skeletal muscle (labeled "caseous material"): Within muscle fascia and adjacent blubber are several, approximately 1 mm fragments of nematodes surrounded by abundant bright eosinophilic necrotic material, neutrophils, macrophages, multinucleated giant cells, and fibrous connective tissue. Parasites have a smudgy basophilic cuticle, occasionally apparent coelomyarian musculature, and contain and are surrounded by numerous eggs. Eggs are 30-40 microns diameter, round to oval, have a thick eosinophilic shell and are embryonated with small

larvae (*Crassicauda* sp.). Inflammation and fibrous connective tissue surrounds free eggs and mildly extends into the adjacent skeletal muscle.

Slide 9:

Trachea: There are small numbers of scattered lymphocytes and plasma cells in the submucosa. The mucosa basement membrane is mildly thickened by pale basophilic material (amyloid).

Prescapular lymph node: The sinuses are moderately congested. Blood vessel walls segmentally contain pale basophilic material (amyloid).

Slide 10:

Lymph node: NSF

Pancreas: In the connective and adipose tissue adjacent to the pancreas there is a large nodular accumulation of dense fibrous connective tissue containing several large blood vessels, many small reactive blood vessel, moderate numbers of eosinophils, and fewer macrophages and lymphocytes. Centrally there is a clear cavity containing necrotic debris, small numbers of eosinophils and moderate numbers of macrophages, many of which contain phagocytized debris and cellular remnants. Inflammation is more intense within the fibrous connective tissue adjacent to this cavity.

Slide 11:

Adrenal gland: NSF

Lung: See description under slide 2.

Hepatic lymph node: There is moderate lymphoid hyperplasia. Scattered blood vessel walls contain smudgy pale basophilic material (presumed amyloid).

Slide 12:

Testes: NSF – inactive

Slide 13:

Adrenal gland: NSF

Small intestine: NSF

Slide 14:

Tonsil: NSF

Pylorus: The superficial to mid mucosa contains small numbers of lymphocytes and plasma cells. Segmentally basement membranes surrounding glands are moderately thickened by smudgy, pale basophilic material (amyloid). A few small submucosal blood vessels also contain this material.

Slide 15:

Fundus: Focally the mucosa is thin and contains moderate numbers of lymphocytes, plasma cells and macrophages. Directly underlying this area within the submucosa is a nodular accumulation of dense fibrous connective tissue surrounding a central cavity containing up to 30 micron diameter, oval, yellow, thick walled eggs and an approximately 700 micron section of a trematode. The trematode has an eosinophilic integument with spines, a ventral sucker and loose basophilic parenchyma. The fibrous connective tissue surrounding the trematode and eggs contain moderate numbers of eosinophils, macrophages, and fewer lymphocytes and plasma cells. There are many small reactive blood vessels scattered throughout the fibrous connective tissue. Within the remaining submucosa are several follicular and perivascular accumulations of lymphocytes. One aggregate of lymphocytes surrounds a central accumulation of macrophages and multinucleated giant cells.

Slide 16:

Esophagus: NSF

Urinary bladder: NSF

Slide 17:

Intestine: The submucosa is markedly expanded by dense nodular accumulations of fibrous connective tissue surrounding central cavities containing either large numbers of trematode eggs or trematodes mixed with moderate numbers of neutrophils and fewer macrophages. Trematode eggs are up to 30 microns diameter, oval, operculated, and have a thick yellow shell. Trematodes are up to 1 mm diameter, have an eosinophilic integument, vitellaria, eggs, and testes with sperm. Fibrous connective tissue surrounding the cavities contains moderate numbers of eosinophils, macrophages, lymphocytes and fewer plasma cells. There are many small reactive blood vessels and follicular accumulations of lymphocytes. The intestine lumen contains a single 3 mm trematode. The walls of several small blood vessels in the submucosa contain smudgy pale basophilic material (presumed amyloid).

Slides 18 (frontal lobe), 19 (mid brain), 20 (temporal lobe):

Multifocally to segmentally meninges contain small to occasionally moderate numbers of lymphocytes and few macrophages. Meninges are congested. Some small blood vessels and capillaries in the superficial cortex are lined by reactive endothelium.

Slide 21:

Brain, pons: The meninges, especially adjacent to the presumed fourth ventricle are thickened by moderate to large numbers of lymphocyte and rarer macrophage, neutrophils, and plasma cells. Rarely inflammatory cells surround small stippled basophilic debris or apparent coccobacilli. Inflammatory cells occasionally extend into the adjacent parenchyma. Neurophil adjacent to affected meninges is pale staining and contains scattered vacuoles (edema).

Slide 22:

Brain, cerebellum: Meninges multifocally to segmentally are thickened by moderate to large numbers of lymphocytes and rarer macrophages, neutrophils and plasma cells.

Slide 23:

Brain stem/Cervical spinal cord: The meninges overlying the spinal cord and surrounding nerve roots is markedly thickened by large numbers of lymphocytes and fewer scattered plasma cells, neutrophils, and macrophages. Superficially, inflamed meninges also contain small amounts of fibrillar eosinophilic material (fibrin) and small to moderate numbers of neutrophils. Inflammatory cells surround rare stippled basophilic material. Adjacent white matter within the spinal cord is markedly vacuolated and contains scattered dilated axon sheaths.

Slide 24:

Connective tissue: NSF

Slide 25:

Eye: NSF

Slide 26:

Bone/bone marrow: NSF

Final Diagnoses:

1. Brain and spinal cord: Severe, segmental, chronic lymphocytic and neutrophilic meningitis
2. Peduncle: Marked, locally extensive, necrotizing and granulomatous fasciitis with intralesional spirurid nematodes (consistent with *Crassicauda* sp.)
3. Intestine: Moderate focally extensive mural fibrosis and neutrophilic enteritis with intralesional trematodes and trematode eggs
4. Peripancreatic connective tissue: Moderate focally extensive fibrosis and eosinophilic inflammation
5. Fundus: Focal mural chronic granuloma with intralesional trematode and trematode eggs (consistent with *Braunia* sp.)
6. Thyroid gland: Moderate, segmental basement membrane amyloid deposition
7. Pylorus: Moderate segmental basement membrane amyloid deposition
8. Body as a whole: Moderate multifocal vascular amyloidosis
9. Trachea: Minimal multifocal basement membrane amyloid deposition
10. Kidney: Mild focal granulomatous and lymphocytic nephritis with intralesional larval nematode
11. Lung: Few mineralized granulomas, moderate edema, and mild subplural fibrosis
12. Liver: Mild to moderate portal fibrosis
13. Lymph nodes (multiple unlabeled lymph nodes and hepatic lymph node): Mild lymphoid hyperplasia, congestion and sinus histiocytosis

Ancillary Diagnostics:

Aeromonas hydrophila cultured from peduncle lesion.

Comments:

The most significant finding in this dolphin was the severe chronic meningitis noted in all brain sections. Inflammation was most severe in the brain stem/spinal cord, cerebellum, and pons. A cause for the inflammation was not found, however, small amounts of stippled

basophilic material were noted in some areas and may represent bacteria. Special stains are pending to screen for bacteria and an addendum will be made to this report with any additional results. The top differential for this lesion is a chronic bacterial infection and *Brucella* sp. infection should be ruled out with molecular testing. Viral infection, for instance morbillivirus infection, is a less likely differential based on the lack of brain parenchymal involvement and the lack of viral inclusions in any of the examined tissues. The meningitis was severe enough to have caused significant adverse effects and death.

The lesions noted in the peduncle fascia, peripancreatic tissue, intestine, stomach, kidney, and lung were due to parasite infection. Parasites in the gastrointestinal tract were walled off by extensive fibrous connective tissue and appeared well tolerated by the animal. Parasitic lesions were not severe enough to have caused significant adverse effects.

An interesting finding was the presumed amyloid deposition noted in the thyroid gland, pylorus, and many blood vessels throughout the body. Confirmation that the material noted histologically is amyloid requires special histochemical stains that are pending. Results will be listed in an addendum to this report. Amyloid may be deposited secondary to chronic systemic inflammation.

The edema noted in the lungs may be an agonal change. Hepatic fibrosis has been noted in other bottlenose dolphins from this region and is considered an incidental finding. The lymphoid hyperplasia noted in several lymph nodes was mild and within acceptable limits for a free-ranging animal with mild chronic parasitism.

Reported By:

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