ZOOLOGICAL PATHOLOGY PROGRAM
STRANDED CETACEAN NECROPSY REPORT

Field ID: 84IMMS102610
Additional Identifier: D-0034
ZPP Accession Number: 11-053Tt
Species: *Tursiops truncatus*
Strand Date: 10-26-10
Strand Location: Long Beach, MS
Sex: female
Age Class: Adult
Necropsy Date: 10-26-10
Condition code: 3
Total Length: 199 cm
Weight:
Blubber Depth:
Body Condition:

Gross Necropsy: Oiled marine mammal necropsy report available.

Slides/Tissues Received: 23 regular slides.

Microscopic Findings: Autolysis is severe, impeding interpretation; also widespread colonization by large numbers of postmortem bacteria.

Slide 1:
Collagenous tissue with adjacent small fragment of bone: No Significant Findings (NSF).

Slide 2:
Lymph node: The paracortex contains moderately increased numbers of small lymphocytes.

Slide 3:
Lymph node: Diffusely sinuses contain large numbers of macrophages fewer neutrophils, and large cells compatible with metamyelocytes and myelocytes. Medullary sinuses are markedly increased in diameter and contain more cells than subcapsular or cortical sinuses. Scattered macrophages contain a single, large, distinct colorless vacuole. Few of these, as well as low numbers of other macrophages, contain a 2-4 micron, pale eosinophilic to basophilic ovoid structure. Some of the eosinophilic structures are slightly refractile and or have a small surrounding colorless halo. There are very rare, angular to polygonal, thin-walled, slightly refractile structures up to 7 micron diameter (rule out fragmented fungal hyphae). A single macrophage containing a cluster of phagocytozed large cocci is also observed. Cortical follicles contain small central accumulations of hyaline material and have small mantle zones (exhaustion). The paracortex has mildly increased small lymphocytes with low numbers of macrophages and myelocytes/metamyelocytes. The capsule contains moderate numbers of macrophages and lymphocytes with few plasma cells.

Slide 4:
Lymph node: The cortex contains few sparsely populated follicles. Sinuses diffusely contain low numbers of lymphocytes, neutrophils and macrophages.

Second lymph node: Similar to other node on this slide. Some sinus macrophages contain cytoplasmic yellow-brown pigment. Cortical follicles frequently contain central hyaline material.
Slide 5:
Adrenal (2): One adrenal has moderate focal cortical hemorrhage.

Pancreas: NSF

Slide 6:
Thyroid: NSF

Spleen (2): The red pulp contains large numbers of metamyelocytes and myelocytes, rare megakaryocytes, few plasma cells, eosinophils and rare neutrophils and erythrocytes. There are large numbers of follicles; most have a mildly hypocellular germinal center and a small mantle zone composed primarily of medium-sized lymphocytes. Each follicle is surrounded by a distinct small band of erythrocytes, separating it from the remaining markedly cellular red pulp.

Slide 7:
Skeletal muscle: NSF

Heart: Frequent myocytes have 2-4 large nuclei in closely apposed rows.

Lung: Regionally there is an inflammatory process centered on several bronchi/bronchioles and surrounding alveoli. Conducting airways are partially to completely filled with neutrophils, lesser macrophages and frequent clusters of large cocci. One bronchiole also contains abundant flocculent basophilic material. Few macrophages contain a discrete, slightly refractile, colorless vacuole. Lining epithelium is diffusely absent/ulcerated and similar inflammatory cells are diffusely within the submucosa and peribronchiolar interstitium. Alveoli contain similar inflammation including few macrophages with colorless vacuoles; regional alveolar interstitium also contains similar inflammatory cells. Adjacent to the severely affected area, most alveoli contain abundant pale eosinophilic (proteinic) material, few foamy macrophages, few macrophages with a discrete colorless vacuole, and rare eosinophils and or neutrophils. Multifocally the interstitium contains low numbers of macrophages, neutrophils, eosinophils and or lymphocytes.
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Slide 8:
Pyloric stomach (rule out ampulla): NSF

Lymph node: There is a mild, diffuse, sinus histiocytosis.

Second lymph node: Sinuses contain large numbers of neutrophils, few macrophages and eosinophils, and moderate numbers of metamyelocytes and myelocytes. Few macrophages contain granular tan pigment. Cortical follicles are mildly hypocellular with central hyaline material.

Heart (atrium): NSF

Slide 9:
Heart: Nuclear rowing as for slide 7.

Kidney: NSF

Slide 10:
Small and large intestine: NSF

Slide 11:
Lymph node: Sinuses contain low numbers of myelocytes/metamyelocytes and neutrophils.
Heart (atrium): NSF

Esophagus: NSF

Great vessel: NSF

Slide 12:
Intestine (intussusception): There are no vascular or other changes (NSF) and intussusception is presumed postmortem. The lamina propria contains low numbers of plasma cells and eosinophils.

Slide 13:
Large intestine: GALT follicles contain central hyaline material. The lamina propria contains low numbers of eosinophils and plasma cells.

Slide 14:
Lung: Few alveoli contain scant proteinic material. A rare alveolus contains one to few foamy and or debris-filled macrophages. The interstitium contains few scattered macrophages and lymphocytes.

Fundic stomach: NSF

Lymph node: Sinuses contain occasional metamyelocytes/myelocytes, neutrophils, macrophages and eosinophils. Follicles are moderately hypocellular.

Tonsil: NSF

Slide 15:
Tongue: NSF

Urinary bladder: NSF

Slide 16:
Skin (2): One section of skin is NSF. In the second, there is a moderate-sized ulcer with extensive mixed bacterial colonization of necrotic surface debris. A moderate-sized portion of the subjacent dermis is necrotic. The necrotic tissue is bounded by large numbers of neutrophils and few macrophages which often widely separate deep dermal collagen bundles and superficial blubber layer adipocytes and collagen bundles. A large arteriole at the junction of dermis and blubber layer is surrounded by and contains large numbers of mural neutrophils. Lining endothelial cells are markedly enlarged (hypertrophy). The deeper blubber layer dermis contains numerous small to moderate-sized accumulations of similar inflammatory cells, sometimes with few lymphocytes. Inflammation is both random and perivascular, and there is similar, mild to moderate suppurative vasculitis. These vessels are also lined by plump/reactive endothelial cells. Lateral to the ulcer, the epithelium has moderate intercellular edema.

Slide 17:
Skin (2): One section of skin has a small ulceration with necrosis of the superficial dermis. Additionally, several dermal papilla lateral to the ulcer contain few neutrophils and macrophages. Within the epidermis along one margin of the defect are frequent epithelial cell nuclei contain a single, variably-sized, basophilic to occasionally eosinophilic, intranuclear inclusion and marginated chromatin (herpesvirus). In the second section of skin, the superficial stratum spinosum contains scattered small aggregates and individual epithelial cells that are mineralized. Basal layer and deep spinosum layers have moderate intracellular edema.

Slide 18:
Eye: NSF

Slide 19:
Trachea: The submucosa diffusely contains low numbers of neutrophils and plasma cells, as well as a small, discrete, nodular aggregate of low numbers of eosinophils. The mucosa contains widely scattered neutrophils.

Slide 20:
Brain: NSF

Slide 21:
Brain: NSF

Slide 22:
Brain: NSF

Slide 23:
Bone marrow: The bone marrow is comprised of at least 95% myeloid lineage with virtually no erythroid cells noted. The vast majority of myeloid cells are myelocytes and metamyelocytes with some myeloblasts, few eosinophils, and a rare band or segmented neutrophil.

Final Diagnoses:

1. Moderate, regional, suppurative and histiocytic bronchointerstitial pneumonia with intralesional cocci
2. Severe drainage reaction, (presumptive) thoracic node
3. Severe myeloid hyperplasia and left shift and with multifocal extramedullary myelopoiesis
4. Moderate to marked, multifocal, ulcerative and suppurative dermatitis with vasculitis
5. Multifocal cutaneous epithelial cell intranuclear inclusion bodies; herpesvirus, presumptive

Comments:

There were multiple processes at play in this case.

Traumatic insult (shark predation) was perimortem and could have been the proximate cause of death. If shark predation was in fact postmortem (uncertain, see gross report), then death was due to combined effect of other processes including poor body condition and pneumonia (these could have also rendered this animal more susceptible to predation).

Perhaps the most important histologic finding was bacterial pneumonia. Large intralesional cocci were observed, and a coagulase-negative Staphylococcus was isolated from the lung. There was no evidence in the reviewed sections of underlying paramyxoviral infection, though additional testing modalities (immunohistochemistry or PCR) could be employed if viral infection remains a concern in this case. Secondary bacterial infection in lungworm cases does occasionally occur, though these are generally limited in scope and severity. Given poor body condition it is possible that this animal was significantly debilitated and therefore more susceptible to secondary and severe bacterial infection. If the lung in general was affected as for the section in slide 7 (and gross report suggests it was), then significant respiratory compromise and secondary systemic effects would have resulted. Also, this animal had few macrophages with discrete lipid-like colorless vacuoles in the lung and this has been observed in few other Gulf dolphin submissions.

The lymph node in slide 3 had relatively severe inflammation/drainage reaction and given rare intralesional cocci, was presumed a thoracic node, draining the affected lung. There were several slightly refractile structures suggestive of fungi, and few unidentified ovoid structures, and multiple infectious etiologies could not be definitively excluded based on routine-stained sections. Further work up including additional special stains of this lymph node and also lung are strongly recommended.

Dermatitis with vasculitis may have been solely due to conspecific traumatic wounds, though this would be somewhat unusual. Some (though mild) vasculitis was deeper/more distant from superficial necrotizing lesions and while no thrombi were noted in the reviewed sections, septic embolism and vasculitis resulting in dermatitis and or cutaneous infarction should not be excluded, and special stains of skin are also strongly suggested.

Severe myeloid hyperplasia and left shift were secondary to multiple inflammatory processes. Immature cells were evident in lymph node sinuses. Immature cells in the spleen and possibly also lymph node parenchyma (cortex) were considered extramedullary myelopoiesis. Follicular accumulation of hyaline material and scant cortical lymphocytes in some nodes and

GALT, particularly in the face of multiple severe inflammatory processes, suggested exhaustion. Atrophy secondary to cachexia is also common, and poor body condition was noted grossly.

Cutaneous epithelial cell intranuclear inclusions were compatible with herpesviral infection. While PCR of several other tissues for herpesvirus yielded negative results, skin was not among the tested samples. If fresh-frozen skin is available for follow up PCR, this could be pursued if desired, though it should be noted that inclusions were noted in only 1 of 4 sections reviewed histologically and a negative result, even on the appropriate tissue, may not ensure a positive finding on additional testing. Herpesviral expression could have been due to recrudescence in an animal with declining immune function as suggested above, though infection in immune competent hosts also commonly occurs.

The intestinal intussusception occurred postmortem.

Reported By:

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