

WSC 2015-2016, Conference 15

Case 1. Tissue from a cardinal.

**MICROSCOPIC DESCRIPTION** Glabrous skin and subcutis: Elevating the overlying multifocally ulcerated epidermis are multiple pseudocysts **(1 pt.)** which range up to 6mm in diameter. The pseudocysts each contain a pair of 5mmx2.5mm adult trematodes **(2 pt.)** with have a thin serrated tegument **(1 pt.)** lined by a thin layer of somatic cell nuclei, lack a pseudocoelom, have a spongy body cavity, paired ceca, a large dilated uterus **(1 pt.)** filled with numerous ovoid 20x10um brown eggs **(1 pt.)**, and numerous cross-sections of a testis containing spermatozoa **(1 pt.)**. The pseudocyst wall is composed of dense lamellations of fibrous connective tissue with numerous small capillaries with few infiltrating heterophils, histiocytes, and lymphocytes. The adjacent dermis is expanded by more loosely arranged vascularized fibrous connective with a more intense infiltrate of heterophils **(1 pt.)** and histiocytes which often form aggregates. There is a large granuloma **(1 pt.)** in the superficial dermis centered on an aggregate of trematode eggs admixed with hemoglobin crystals (likely a previously thrombosed vessel). Trematode eggs are also present within vessels in the deep dermis. **(1 pt.)** The fibrous connective tissue infiltrates the underlying mildly atrophic skeletal muscle. Several myocytes are expanded by a 250um apicomplexan schizont **(1 pt.)** with large numbers of 2-3um oval bradyzoites. Within blood vessels, erythrocytes often contain a single amphophilic protozoal gametocytes which peripheralize their nuclei. **(1 pt.)** There is multifocal hyperplasia and hyperkeratosis of the overlying epithelium; other areas are ulcerated and covered with a serocellular crust which contains numerous colonies of cocci.

**MORPHOLOGIC DIAGNOSIS:** 1. Glabrous skin and subcutis: Trematode pseudocysts, multiple, with mild heterophilic and granulomatous dermatitis. **(2 pt.)**

2. Skeletal muscle: Sarcocysts, multiple. **(1 pt.)**

3. Erythrocytes: Intracytoplasmic apicomplexan gametocytes, numerous. **(1 pt.)**

**CAUSE:** *Collyriclum faba* **(1 pt.)**, *Sarcocystis* sp **(1 pt.)**, *Hemoproteus* or *Leucocytozoon*. **(1 pt.)**

O/C: **(1 pt.)**

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Case 2. Tissue from an opossum.

**MICROSCOPIC DESCRIPTION:** Kidney: Multifocally, scattered throughout the cortex are numerous, round apicomplexan schizonts **(1pt)** measuring up to 1.5m in diameter **(1pt)** that compress adjacent renal parenchyma, and have a 10-30 um thick, hyaline capsule **(1pt)** that surrounds a thin rim of host cell cytoplasm with multiple nuclei which in turn surrounds numerous, densely packed crescentic 3-5 um zoites **(1pt)**. In the remaining kidney, there is extensive fibrosis **(1pt)** of the renal interstitium (especially within the medulla), throughout which are scattered low numbers of histiocytes, eosinophils **(1pt)**, lymphocytes **(1pt)** and plasma cells throughout the interstitium, as well as aggregates of immature leukocytes (including numerous bands) and fewer islands of erythropoietic precursors (EMH) **(1pt)**. There is marked loss of tubules **(1pt)**, and remaining tubules are often atrophic **(1pt)** (in areas of fibrosis), ectatic and filled with proteinaceous fluid, lined by swollen epithelial cells with marked cytoplasmic vacuolation (degeneration) or have pyknotic or karyorrhectic nuclei (necrosis) **(1pt)**. Multifocally, tubules are mildly dilated and contain an admixture of sloughed epithelium, neutrophils, and cellular debris in their lumina. **(1pt)** Glomeruli exhibit one or more of the following changes: parietal epithelial hyperplasia, hypercellularity, thickened capillary loops, or diffuse glomerular fibrosis **(1pt)**. Multifocally, within the medulla, tubules are separated and surrounded by a waxy, eosinophilic, homogenous material (amyloid) **(1pt)**.

**MORPHOLOGIC DIAGNOSIS:** 1. Kidney: Apicomplexan cysts, multiple. **(1pt)**  
2. Kidney: Nephritis, tubulointerstitial, necrotizing and lymphocytic, chronic, diffuse, marked, with multifocal medullary amyloidosis. **(2pt)**  
3. Kidney: Extramedullary hematopoiesis, multifocal, mild.

**CAUSE:** *Besnoitia darlingi* **(2pt)**

**O/C:** **(1pt)**

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Case 3. Tissue from an iguana.

**MIROSCOPIC DESCRIPTION:** Heart **(1pt)**: Centrally, the endocardium is markedly expanded by abundant loosely to densely arranged fibrous connective tissue which infiltrates, surrounds and replaces myofibers of the stratum spongiosum and contains numerous several variably sized heterophilic granulomas **(1pt)** which range up to 1.5cm in diameter. Granulomas are centered on medium sized colonies of small coccobacilli **(2pt)**, which are surrounded by abundant brightly eosinophilic amorphous cellular debris with admixed basophilic nuclear debris. **(1pt)** The debris is surrounded by large numbers of heterophils **(1pt)** admixed with activated macrophages **(1pt)** and moderate numbers of foreign body-type giant macrophages **(1pt)**, hemorrhage, and fibrin, and surrounded by loosely arranged vascularized fibrous connective tissue **(1pt)** which contains low to moderate numbers of lymphocytes and rare plasma cells. **(1pt)** The ventricle is partially occluded by an organized fibrinocellular thrombus **(1pt)** composed of large amounts of cellular debris, moderate amounts of polymerized fibrin **(1pt)**, loosely arranged collagen, and infiltrates of moderate numbers of heterophils and macrophages at the periphery. At the edges of the advancing endocardium, myofibers of the stratum spongiosum are pale and shrunken (atrophy) **(1pt)**, with increased cytoplasmic vacuolation (degeneration) and rare pyknotic nuclei (necrosis). **(1pt)**

**MORPHOLOGIC DIAGNOSIS:** Heart: Endocarditis and myocarditis, heterophilic and granulomatous, focally extensive, severe with ventricular thrombosis and numerous colonies of bacilli. **(4pt)**

**CAUSE:** *Neisseria iguanae* **(2pt)**

**O/C:** **(1pt)**

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CASE 4. Tissue from a harbor seal.

**MICROSCOPIC DESCRIPTION:** Lung: Diffusely, airway epithelium shows changes ranging from swelling and vacuolation (degeneration) **(1pt.)** with nuclear pyknosis and karyorrhexis (necrosis) **(1pt)** to mild hyperplasia and infiltration by low numbers of heterophils . Airway lumina are partially to completely filled by various combinations and concentration of sloughed epithelium, heterophils **(1pt.)**, macrophages, fibrin, and cellular debris. **(1pt.)** Epithelium which lines submucosal glands is largely necrotic **(1pt.)**, with occasional remaining swollen and degenerate cells, as well as flattened and attenuated cells. Peribronchial and perivascular tissues are infiltrated by moderate numbers of neutrophils **(1pt.)** and histiocytes **(1pt.)**, as well as fewer numbers of lymphocytes and plasma cells which extend into the surrounding alveolar interstitium **(1pt.)**. Diffusely, alveolar walls are expanded by marked congestion, edema and small amounts of fibrin **(1pt.)**. There is mild patchy type II pneumocyte hyperplasia. Alveolar lumina **(1pt.)** are often filled with variable combinations and concentrations of neutrophils, macrophages, edema fluid, and polymerized fibrin, which regionally forms thick hyaline membranes **(1pt.)**. Multifocally, vessels are partially or totally occluded by variably organized fibrin thrombi **(1pt.)** which range from aggregates of fibrin to clusters of occlusive fibroblasts interspersed with few histiocytes and small amounts of collagen **(1pt.)**. Multifocally and randomly, interlobular septa and pleural surfaces are markedly expanded by emphysema **(1pt.)**, and several random areas within the alveolar parenchyma as well. Scattered randomly through the parenchyma are rare cross sections of metastrongyle nematode larvae measuring 15-20um in diameter with a thin cuticle and numerous internal nuclei. **(1pt.)**

**MORPHOLOGIC DIAGNOSIS:** Lung: Pneumonia, bronchointerstitial, necrotizing, diffuse, moderate with submucosal gland necrosis, vascular thrombosis, and multifocal emphysema. **(4pt.)**

**CAUSE:** Influenza A, various bacteria causing a secondary bronchopneumonia

**O/C: (1pt.)**