

WSC 2011-2012, Conference 19

Case 1. Tissue from a cat.

MICROSCOPIC DESCRIPTION: Cerebrum: Multifocally within the cerebrum, there are large areas of necrosis **(1pt)** in which the neuropil is infiltrated and replaced by large numbers of neutrophils **(1pt)** and macrophages **(1pt)**, and fewer lymphocytes and plasma cells admixed with cellular debris. The adjacent neuropil is spongiotic **(1pt)**, and contains numerous foamy macrophages (Gitter cells) **(1pt)**, swollen axons (spheroids) **(1pt)**, dilated empty axon sheaths, increased numbers of glial cells (gliosis) **(1pt)**. Rarely, neurons are swollen and eosinophilic (degeneration), and occasionally have pyknotic nuclei (necrosis) **(1pt)** and are surrounded by 2-4 lymphocytes (satellitosis). Astrocytes are hypertrophic, have abundant clear cytoplasm, and occasional have mitotic figures **(1pt)**. Areas of necrosis are centered on low numbers of 12-18 um **(1pt)** diameter yeasts **(1pt)** which have a 2-3 um thick wall **(1pt)**, a centrally located basophilic granular nucleus, and occasional broad-based budding. Virchow- Robins spaces are often expanded by large numbers of lymphocytes **(1pt)** and lesser numbers of histiocytes and plasma cells, which extend into the surrounding neuropil. The endothelium of vessels is diffusely hypertrophic (reactive), and vessels, even in areas lacking in inflammation, are often surrounded by clear space (edema). The meninges are multifocally expanded **(1pt)**, primarily in perivascular areas by low to moderate numbers of lymphocytes and fewer histiocytes and plasma cells.

MORPHOLOGIC DIAGNOSIS: Cerebrum: Meningoencephalitis, pyogranulomatous, multifocal, severe, with lymphocytic perivascular cuffing and budding yeasts **(3pt.)**

CAUSE: *Blastomyces dermatitidis* **(2pt.)**

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

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Case 2. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Liver: Portal areas are expanded by fibrous connective tissue and numerous clear spaces containing trematode **(2pt)** eggs **(1pt)**. Eggs are irregularly oval, up to 110 um in diameter, and are non-operculated **(1pt)**, with a 2um thick brown shell **(1pt)** and contain a miracidium **(1pt)**. Often, eggs are mineralized **(1pt)**. Eggs are often surrounded by epithelioid **(1pt)** or rarely multinucleated giant cell **(1pt)** macrophages, and the surrounding fibrous connective tissue contains low numbers of lymphocytes **(1pt)**, histiocytes, and plasma cells **(1pt)**. Portal veins are often markedly congested, and lymphatics are dilated. There is mild diffuse biliary hyperplasia (ductular reaction) **(1pt)**. Portal fibrous connective tissue often extends into the surrounding hepatic parenchyma, surrounding and compressing hepatic plates. Expanding Kupffer cells and macrophages within portal areas and also scattered randomly within nodular aggregates of macrophages **(1pt)**, is a granular dark brown to black pigment **(1pt)**.

Small intestine: Multifocally within the lamina propria and submucosa, there are numerous trematode eggs within clear spaces. The eggs are surrounded by epithelioid macrophages and occasionally multinucleated giant cell macrophages, admixed with moderate numbers of plasma cells and fewer lymphocytes. Eggs are irregularly oval, up to 110 um in diameter, and are non-operculated, with a 2um thick brown shell and contain a miracidium. Vessels and lymphatics within the serosa are surrounded by low numbers of lymphocytes and plasma cells.

MORPHOLOGIC DIAGNOSIS: 1. Liver: Hepatitis, portal, granulomatous, diffuse, moderate with numerous trematode eggs and nodular hemosiderosis. **(3 pt)**

2. Small intestine: Enteritis, granulomatous, multifocal, moderate with numerous mucosal and submucosal trematode eggs.

CAUSE: *Heterobilharzia americana* **(2 pt)**

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

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Case 3. Tissue from a rhesus macaque.

MICROSCOPIC DESCRIPTION: Colon. The colon is diffusely and transmurally thickened **(1pt)** by large numbers of foamy macrophages **(1pt)**, neutrophils **(1pt)**, and lymphocytes **(1pt)**, with lesser numbers of plasma cells and rare multinucleated macrophages, mixed with fibrin and cellular debris. Inflammatory cells surround and separate colonic glands, and form a dense band which replaces glands immediately above the muscularis mucosa **(1pt)**. Rare glands are dilated and contain necrotic epithelial cells, cellular debris, and small amounts of proteinaceous material (crypt abscess) **(1pt)**, and glandular epithelium contains numerous mitotic figures **(1pt)**. The inflammatory infiltrate traverses the muscularis mucosa and markedly expands the submucosa **(1pt)** where it surrounds large lymphoid follicles, and is also present in the muscularis in perivascular areas. The serosa is thickened up to 1 cm **(1pt)** in some areas by the inflammatory infiltrate against a background of heavily vascularized granulation tissue **(1pt)** and scattered lymphoid follicles. Scattered throughout the serosa are nodular aggregates of viable and degenerate neutrophils and admixed with abundant cellular debris (abscesses) **(1pt)**. Lymphatics within the submucosa and serosa are markedly expanded **(1pt)** and contains moderate numbers of neutrophils, foamy macrophages and proteinaceous fluid. Throughout all layers of the intestine, both extracellularly and within macrophages, as well as in colonic glands, are innumerable 2-4 um **(1pt)** pyriform **(1pt)** protozoa **(1pt)** with a dark round basophilic nucleus.

MORPHOLOGIC DIAGNOSIS: Colon: Colitis, necrosuppurative, transmural, diffuse, severe, with innumerable protozoan trophozoites. **(3pt)**

CAUSE: *Spironucleus sp.* **(2pt)**

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

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Case 4. Tissue from a mandrill.

MICROSCOPIC DESCRIPTION: Glabrous skin (mucous membrane): Within the submucosa and extending multifocally to the ulcerated mucosa **(1pt)**, there are multiple, often coalescing poorly-formed granulomas **(1pt)** ranging up to 1 cm in diameter. The granulomas are composed centrally of numerous epithelioid macrophages **(1pt)** and multinucleated giant cell macrophages of the foreign body and Langhans type **(1pt)**, admixed with moderate numbers of eosinophils **(1pt)**, fewer viable and degenerate neutrophils **(1pt)**, and at the periphery, low to moderate numbers of lymphocytes and plasma cells **(1pt)** enmeshed in concentric rings of fibrous connective tissue. Contiguous granulomas are often separated by dense bands of fibrous connective tissue. Primarily within the cytoplasm of macrophages, there are numerous oval, 2-6 um **(1pt)** yeasts **(1pt)** with a 1um cell wall and dense basophilic cytoplasm. Yeasts of line up to form pseudohyphae **(1pt)**. There are also pauciseptate hyphae **(1pt)** with bulbous swellings which range up to 20 um in diameter. The granulomas efface the submucosa, and result in atrophy of underlying skeletal muscle **(1pt)**. The overlying mucosa is focally ulcerated **(1pt)** and replaced with a serocellular crust containing innumerable degenerate neutrophils, fibrin, abundant cellular debris, keratin and rare bacterial colonies.

MORPHOLOGIC DIAGNOSIS: Mucous membrane: Stomatitis (or rhinitis, vulvitis, balanitis, etc.) granulomatous, multifocal to coalescing, severe, with ulceration and numerous intracellular yeasts, pseudohyphae, and hyphae. **(3pt)**

CAUSE: *Candida albicans* **(2pt)**

LIKELY PREDISPOSING CONDITION: Simian lentivirus infection (SIV) **(1pt)**

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