WSC 2009-2010. Conference 2, Case 1.

Tissue from a macaque.

MORPHOLOGIC DESCRIPTION: Brain – level and thalamus, lateral ventricle. Multifocally, there are variably-sized areas of necrosis and loss **(1pt)** of white matter **(1pt)** which extends into the gray matter and deep into the ependyma **(1pt)** lining the third ventricle. These areas of cavitation contain large numbers of macrophages **(1pt)** with foamy cytoplasm (gitter cells) **(1pt)**, plump astrocytes with abundant eosinophilic cytoplasm (gemistocytes) **(1pt)**, dilated axons spheroids **(1pt)**, dilated empty axon sheaths, and abundant perivascular and interstitial clear space (edema or spongiosis) **(1pt)**. Within the adjacent grey matter, there are rare neurons with dissolution of Nissl substance (central chromatolysis) shrunken, angular eosinophilic neurons with hyperchromatic or karyorrhectic nuclei (neuronal necrosis) **(1pt)**. At the periphery of these areas, astrocyte nuclei are enlarged and contain a single smudgy amphophilic **(1pt)** viral inclusion body **(1pt)** which peripheralizes chromatin. There is multifocal separation of the ependyma from underlying white matter tracts, hyperplasia and hypertrophy of ependymal cells, and individual cell necrosis. Vessels in inflamed areas are surrounded by low to moderate numbers of lymphocytes, plasma cells, and gitter cells and lined by reactive endothelium **(1pt)**.

MORPHOLOGIC DIAGNOSIS: Brain: Encephalitis (leukoencephalitis ok), necrotizing, multifocal to coalescing, moderate to severe, with gliosis and astrocytic intranuclear viral inclusions. **(3pt)**

CAUSE: Simian papovavirus (SV40 virus) **(3pt)**

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

Name another organ you would like to sample: Kidney **(1pt)**

Notes: Due to slide variation, some slides contained one or more of the following landmarks: caudate nucleus, putamen, globus pallidus, substantia nigra.

WSC 2009-2010. Conference 2, Case 2.

Tissue from an ox.

MORPHOLOGIC DESCRIPTION: Cross section of brainstem at level of pons: Multifocally, the cytoplasm of neurons within the periventricular nuclei contains aggregates of a greenish-brown pigment. (5pt.) Rare neurons are shrunken and are surrounded by 3-5 microglia (satellitosis). (2 pt.) Rare vessels are surrounded by small to moderate numbers of lymphocytes and rare plasma cells.There is spongiosis of the white matter tracts along the ventral surface of the brainstem, and a mild increase in microglia. (2 pt.)

MORPHOLOGIC DIAGNOSIS: Brainstem nuclei: Interneuronal pigmentation, with multifocal minimal neuronal degeneration. (5 pt.)

Cause: *Phalaris* sp. toxicity (5 pt.)

Organization and Clarity - **(1 pt.)**

WSC 2009-2010. Conference 2, Case 3.

Tissue from a dog.

MORPHOLOGIC DESCRIPTION: Heart: Diffusely, the tunica media **(1 pt.)** and adventitia **(1 pt.)** of arterioles and arteries within the epicardium, epicardial fat, and to a lesser extent the myocardium **(1 pt.)** are expanded by an infiltrate of moderate numbers of macrophages, **(1 pt.)** neutrophils **(1 pt.)** and lesser numbers of lymphocytes admixed with abundant brightly eosinophilic protein, **(1 pt.)** hemorrhage, edema and cellular debris **(1 pt.)** (fibrinoid necrosis) **(2 pt.)**. There is multifocal thickening of the media in some arterioles by prominent smooth muscle hypertrophy which have prominent nuclei. The adventitia contains a similar cellular infiltrate but also numerous fibroblasts **(1 pt.)**which are separated by abundant basophilic ground substance **(1 pt.)**and lesser amounts of collagen. There is multifocal mild to moderate shrinkage, hyalizinization and atrophy of myocyes in the ventricular and atrial myocardium, with hypertrophy of satellite nuclei, low numbers of interstitial macrophages and lymphocytes. Multifocally, adipocytes within the pericardial fat are slightly shrunken and basophilic (serous atrophy) **(1 pt.)**.

MORPHOLOGIC DIAGNOSIS: Heart, epicardial myocardial arteries: Arteritis, proliferative necrotizing, multifocal, severe with multifocal mild myocardial degeneration and serous atrophy of fat. **(4 pt.)**

Note – there is variation in slides as the submission came from multiple animals.

WSC 2009-2010. Conference 2, Case 4.

Tissue from a cat.

MORPHOLOGIC DESCRIPTION: Brain, telencephalon: Within both the gray and white matter, there are multifocal to coalescing areas of necrosis and pyogranulomatous **(1 pt.)** inflammation centered on numerous, brightly eosinophilic 10-12um wide **(1 pt.)** non-septate, non-dichotomously branching fungal hyphae which lack parallel walls **(1 pt.)** and have bulbous swellings**(1 pt.)** ranging up to 25um in diameter.. Surrounding these hyphae are moderate numbers of macrophages **(1 pt.)**, neutrophils **(1 pt.)** foreign-body type multinucleated macrophages **(1 pt.)**, and lymphocytes, admixed with hemorrhage, edema, and cellular debris. In inflamed areas of white matter, there are also numerous swollen axons (spheroids) **(1 pt.)** , abundant Gitter cells **(1 pt.)** , gemistocytes **(1 pt.)**, and increased numbers of microglia. Similar changes are present within the inflamed grey matter, in which the increase in microglia **(1 pt.)** is more evident, and there are focal aggregates of macrophages, neutrophils and lymphocytes (glial nodules) **(1 pt.)** Occasionally, fungal hyphae are seen within vessels which contain varying amounts of neutrophils, macrophages, edema, hemorrhage, and cellular debris within the wall, and occasionally, luminal fibrin thrombi (vasculitis), and are lined by reactive endothelial cells. **(1 pt.)** Thoughout the section, vessels are cuffed by varying combinations and concentrations of neutrophils, lymphocytes, and macrophages and similar cells are scattered throughout the meninges, often in perivascular areas**(1 pt.)**.

Heart (no points assigned) : At the apex, within the myocardium, there is a transmural area of pyogranulomatous inflammation which separates and replaces cardiomyoctyes. This area is compased of large numbers of neutrophils, macrophages and lymphocytes, with lesser numbers of plasma cells and foreign body macrophages which contain numerous, brightly eosinophilic 10-12um wide, non-septate, non-dichotomously brainching fungal hyphae which lack parallel walls. Remaining myofibers are shrunken (atrophic), hyalinized, and occasionally replaced by reactive fibroblasts and loosely arranged fibrous connective tissue. The epicardium contains inflammatory cells as previously described; the endocardium is focally thickened by inflammatory cells and fungal hyphae as previously described.

MORPHOLOGIC DIAGNOSIS: 1. Brain: Encephalitis, pyogranulomatous and necrotizing, multifocal to coalescing, severe, with vasculitis and numerous fungal hyphae. **(3 pt.)**
2. Heart: Myocarditis, pyogranulomatous, transmural, focally extensive, severe, with myocardial degeneration and necrosis and numerous fungal hyphae.

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

CAUSE: Zygomycete fungus (any species ok). **(2 pt.)**