WSC 2009-2010, Conference 17, Case 1.

Tissue from a chimp.

MICROSCOPIC DESCRIPTION: Cerebrum: There is a focally extensive 8mm area of lytic **(1 pt.)** and coagulative necrosis **(1 pt.)** affecting both the gray and white matter. Centrally within this area, the neuropil is replaced by innumerable degenerate neutrophils **(1 pt.)**, abundant cellular debris **(1 pt.)**, hemorrhage **(1 pt.)**, fibrin, and edema. Vessels within this area are occluded by fibrin thrombi **(1 pt.)** which contains degenerate neutrophils and edema. Vessel walls also contain degenerate neutrophils, cellular debris, brightly eosinophilic protein, degenerate smooth muscle cells (vasculitis) **(1 pt.)**, and are occasionally ringed with variable amounts of hemorrhage and clear space. Peripheral to the zone of lytic necrosis, the neuropil is brightly eosinophilic and remaining outlines of neurons and vessels can be visualized (coagulative necrosis) **(1 pt.)** . Within this area, there are numerous 20-30um **(1 pt.)** round amebic trophozoites **(1 pt.)** with foamy eosinophilic cytoplasm and a prominent centrally located karyosome. Peripheral to this, the neuropil is hypercellular (gliosis) **(1 pt.)**. Gray matter contains increased number of astrocytes **(1 pt.)**, hypertrophy of microglial nuclei **(1 pt.)**, and vessels are ringed by low to moderate numbers of lymphocytes and macrophages **(1 pt.)** and lined by plump endothelium. In the white matter, there are numerous dilated axon sheaths and occasional dilated eosinophilic axons. **(1 pt.)**

MICROSCOPIC DIAGNOSIS: Cerebrum: Encephalitis, necrotizing, focally extensive, severe with vascular thrombosis, gliosis, and numerous amebic trophozoites. **(3 pt.)**

Cause: *Balamuthia mandrillaris, Acanthamoeba sp., Naegleria fowleri* **(3 pt.)**

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

WSC 2009-2010. Conference 17, Case 2

Tissue from dog.

MICROSCOPIC DESCRIPTION: Lung: Approximately 40% of the section is replaced by multifocal to coalescing nodular areas of necrosis **(1 pt.)** and inflammation. Within these areas, alveoli are filled with numerous foamy macrophages **(1 pt.)**, lesser numbers of neutrophils **(1 pt.)**, lymphocytes, plasma cells, and varying amounts of cellular debris, fibrin, hemorrhage, and edema. Often, the center of these areas exhibits coagulative **(1 pt.)**necrosis, with the eosinophilic outlines of alveolar septa and alveolar contents remaining. Multifocally, both extracellularly and within the macrophage cytoplasm, there are numerous 15-25 um amebic trophozoites **(1 pt.)**characterized by granular basophilic cytoplasm and a nucleus with a prominent nucleolus (karyosome). Also scattered throughout the section are 20-30 um amebic cysts **(1 pt.)** characterized by the presence of an amphophilic refractile 2-4um cyst wall **(1 pt.)** and abundant granular eosinophilic cytoplasm. Multifocally within alveolae, there are multinucleated macrophages (viral syncytia) **(1 pt.)**, and occasionally, cytoplasm of these cells as well as uninucleated alveolar macrophages contain one to multiple small irregularly round eosinophilic inctracytoplasmic viral inclusions **(2 pt.)**, often located close to the nucleus. Rarely, intranuclear inclusions may be seen in alveolar macrophages or pneumocytes. In affected areas, airways are filled inflammatory cells as previously described. The remaining alveolar septa are markedly expanded **(1 pt.)** by numerous macrophages and lesser neutrophils,,\ lesser numbers of neutrophils, congestion, and small amounts of edema fluid and fibrin. There are large numbers of multinucleated cells compressed within alveolar septa (syncytial macrophages) **(1 pt.)**. There is diffuse marked congestion. There is multifocal mild mesothelial hyperplasia along the pleural surface.

MORPHOLOGIC DIAGNOSIS: 1. Lung: Pneumonia, necrogranulomatous, multifocal to coalescing, severe, with numerous intra- and extracellular amebic trophozoites and cysts. **(2 pt.)**

2. Lung: Pneumonia, interstitial, histiocytic, diffuse, moderate, with viral syncytial and numerous rare and intracytoplasmic viral inclusions **(2 pt.)**

CAUSE: Canine morbillivirus, *Acanthamoeba* sp. **(3 pt.)**

O/C – **(1 pt.)**

WSC 2009-2010, Conference 17, Case 3.

Tissue from a rhesus monkey.

MICROSCOPIC DESCRIPTION: Kidney: Diffusely, glomeruli are enlarged, lobulated **(1pt.)**, and markedly hypercellular **(1pt.)**, and often exhibit hypertrophy of parietal epithelium, periglomerular fibrosis, and occasionally, synechia between the tuft and Bowman's capsule **(1pt.)**. There are moderate numbers of lymphocytes and plasma cells in the periglomerular interstitial tissue adjacent to many glomeruli **(1pt.)**. Throughout the cortex, there are numerous linear areas of interstitial fibrosis radiating downward from the capsule **(1pt.)**, in which there are moderate numbers of lymphocytes and plasma cells **(1pt.)**, atrophic tubules, rare tubules with prominent open-faced nuclei and basophilic cytoplasm (regeneration), and plump fibroblasts. In other areas, interstitial tissue is markedly congested with small amounts of scattered hemorrhage. Multifocally within the cortex, there are numerous foci of suppurative **(1pt.)**inflammation which are primarily centered on glomeruli **(1pt.)**, which range up to 1.5mm in diameter. These foci are composed of large numbers of viable and degenerate neutrophils admixed with abundant cellular debris and small amounts of hemorrhage **(1pt.)**. At one edge of the section, adjacent to several suppurative foci (previously glomeruli), tubules exhibit diffuse coagulative **(1pt.)** necrosis (infarct) **(1pt.)**. There are moderate numbers of lymphocytes and plasma cells within the ureteral submucosa **(1pt.)**.

MORPHOLOGIC DIAGNOSIS: 1. Kidney: Glomerulonephritis, membranoproliferative, diffuse, moderate.
2. Kidney: Nephritis and glomerulitis, suppurative, multifocal, moderate with focal acute renal infarct.
3. Ureter: Ureteritis, lymphoplasmacytic, focally extensive, moderate. **(5 pt.)**

PATHOGENESIS: Systemic septiciemia => glomerulitis and repeated septic cortical infarction => chronic antigenemia => type III hypersensitivity => membranoproliferative glomerulonephritis **(2pt.)**

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

WSC 2009-2010, Conference 16, Case 4.

Tissue from a pig.

MICROSCOPIC DIAGNOSIS: Small intestine **(1pt.)**: Within the electron micrograph, there are cross sections of up to 5 columnar epithelial cells **(1pt.)** and a single goblet cell **(1pt.)**. Columnar epithelial cells have an even microvillar border **(1pt.)**, tight junctions **(1pt.)**, desmosomes, basilar nuclei, abundant smooth and rough endoplasmic reticulum **(1pt.)**, , mitochondria with prominent cristae, and rare fat droplets **(1pt.)**. The cytoplasm of the goblet cells contains numerous membrane-bound mucus droplets **(1pt.)** in the apical cytoplasm. In the center of the photomicrograph, three contiguous epithelial cells exhibit the following evidence of acute cell degeneration – cell swelling **(1pt.)**, cytosolic lucency **(1pt.)**, dilated profiles of smooth endoplasmic reticulum and the nuclear membrane **(1pt.)** low amplitude swelling of mitochondria, chromatolysis, and degranulation of rough endoplasmic reticulum. Within the dilated smooth endoplasmic reticulum (inset), there are numerous viral **(1pt.)** particles with a dense nucleoid **(1pt.)** and occasionally, a thin clear nucleocapsid. **(1pt.)**

MICROSCOPIC DIAGNOSIS: Small intestine: Enterocyte degeneration, with intravesicular viral particles. **(2pt.)**

CAUSE: Porcine rotavirus **(2pt.)**

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