

WSC 2015-2016, Conference 16

Case 1. Tissue from a rhesus monkey.

MICROSCOPIC DESCRIPTION Lumbar spinal roots (cauda equina) **(1pt.)**: Within the spinal nerve roots of the lumbar spinal cord, the perineurium **(1pt.)** and endoneurium, as well as the submeningeal space are expanded by large numbers of viable and fewer degenerate neutrophils **(1pt.)** which infiltrate the adjacent nerve fibers. Within these areas, axons sheaths are expanded and the axon is replaced by granular eosinophilic to basophilic debris **(1pt.)**. Rarely, Gitter cells replace axons in dilated myelin sheaths. Areas of axonal necrosis are infiltrated by low to moderate numbers of neutrophils and fewer debris-laden histiocytes **(1pt.)**, and remaining axons are surrounded by hemorrhage and small amounts of polymerized fibrin. **(1pt.)** Within affected areas, vessels are surrounded by large numbers of neutrophils, and often vessels walls are expanded by viable and degenerate neutrophils **(1pt.)**, admixed with extravasated fibrin and cellular debris (vasculitis) **(1pt.)**. The walls of other vessels are brightly eosinophilic and granular, but without cellular infiltration **(1pt.)**. Vessels are occasionally partially to totally occluded by fibrin or fibrinocellular thrombi **(1pt.)**. Scattered randomly throughout the section, Schwann cell and endothelial, **(1pt.)** are markedly expanded by a deeply basophilic intranuclear viral inclusion **(1pt.)** that is rarely surrounded by a clear space (cytomegalovirus) **(1pt.)**. The meningeal space contains variable combinations and concentrations of neutrophils, polymerized fibrin, hemorrhage, and cellular debris **(1pt.)**. Within the lumbar cord itself, there are mild numbers of dilated axon sheath at nerve root exits.

MORPHOLOGIC DIAGNOSIS: Lumbar spinal roots: Radiculitis, necrotizing and neutrophilic, multifocal to coalescing, with necrotizing vasculitis, fibrinohemorrhagic meningitis, and karyomegalic intranuclear viral inclusions. **(4pt.)**

CAUSE: *Macacine betaherpesvirus* **(2pt.)**

O/C: (1 pt.)

WSC 2015-2016, Conference 16

Case 2. Tissue from a patas monkey.

MICROSCOPIC DESCRIPTION: Lung: Multifocally, approximately 60% **(1pt)** of alveolar spaces (most often at the periphery) are filled and often expanded **(1pt)** by moderate numbers of macrophages **(2pt)** with foamy cytoplasm that contains one to multiple discrete clear lipid vacuoles **(2pt)** which are admixed with low numbers of lymphocytes **(2pt)** and rare multinucleated foreign body type macrophages **(1pt)**. Affected alveolar septa are often lined by proliferating type II pneumocytes, **(1pt)** and there is patchy expansion of alveolar septa **(1pt)** by circulating macrophages, edema, and fibrous connective tissue **(1pt)**. Aggregates of lymphocytes are scattered throughout the section, often in perivascular locations, and some have germinal centers. **(1pt)** Airways **(1pt)** contain small amounts of refluxed lipid laden macrophages and small amounts of protein. There is mild peribronchial anthracosis. Pleural lymphatics are diffusely and mildly dilated.

MORPHOLOGIC DIAGNOSIS: Lung: Pneumonia, interstitial, granulomatous, multifocal to coalescing, chronic, severe, with abundant intracytoplasmic lipid. **(4pt)**

CAUSE: Aspiration pneumonia (accidental pulmonary instillation) of lipid rich substance **(1pt)**

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

WSC 2015-2016, Conference 16

Case 3. Tissue from a rabbit.

MIROSCOPIC DESCRIPTION: Cerebrum, frontal cortex including lateral ventricle: There is extensive neuronal **(1pt)** necrosis **(1pt)** of the superficial cortical gray matter. Neurons exhibit one or more of the following changes: shrinkage **(1pt)**, hypereosinophilia **(1pt)**, pyknosis **(1pt)**, karyorrhexis, and are often abutted by one or more glial cells **(1pt)** (satellitosis) **(1pt)**. Areas of significant neuronal necrosis are often strewn with small amounts of basophilic cellular debris **(1pt)** and rare infiltrating heterophils. (In some sections, in severely affected areas, malacia of the gray matter has resulted in the “useful artifact” of linear separation of the submeningeal gray matter – a nice corroborative observation at low power.) Multifocally, the nuclei **(1pt)** of small numbers of degenerate neurons and glial cells **(1pt)** are expanded by a single, eosinophilic glassy viral inclusion **(2pt)**. Throughout the section, vessels are often cuffed by 1-3 layers of lymphocytes and fewer histiocytes **(1pt)**, and a similar infiltrate multifocally expands the meninges.**(1pt)**

MORPHOLOGIC DIAGNOSIS: Cerebrum: Neuronal necrosis, multifocal, with intranuclear inclusion bodies and mild lymphocytic meningitis.**(3pt)**

CAUSE: *Herpes simplex virus* (HSV-1) **(2pt)**

O/C: (1pt)

WSC 2015-2016, Conference 16
CASE 4. Tissue from a mouse.

MICROSCOPIC DESCRIPTION: Lung: Within approximately 60% of the section, there are multifocal to coalescing nodular aggregates of poorly formed pyogranulomas **(1pt.)** which markedly expand alveoli **(1pt.)** or efface pulmonary architecture. The pyogranulomas are composed of large numbers of viable and degenerate neutrophils **(1pt.)** and fewer macrophages which are often centered on aggregates of 1-2µm cocci **(1pt.)** enmeshed in a brightly eosinophilic protein matrix **(1pt.)** (Splendore-Hoeppli phenomenon) **(1pt.)**. Moderate numbers of histiocytes with foamy eosinophilic cytoplasm are present at the periphery of the pyogranulomas. **(1pt.)** Pyogranulomas contain variable amounts of cellular debris, with some featuring extensive lytic necrosis **(1pt.)**. Remaining intervening alveolar septa are expanded by fibrous connective tissue **(1pt.)**. In between pyogranulomas, less affected alveoli contain variable amounts of neutrophils, foamy macrophages, polymerized fibrin and edema fluid. **(1pt.)** Within these areas, macrophages often contain brightly eosinophilic spicular crystalline protein **(1pt.)** which measures up to 3x10µm and is occasionally extracellular. Airways **(1pt.)** are often filled by neutrophils and histiocytes which likely represent reflux from surrounding alveolar spaces. There is marked expansion of the medullary sinuses of a hilar node by large numbers of plasma cells with few degenerate neutrophils and macrophages admixed with cellular debris. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: 1. Lung: Pneumonia, pyogranulomatous, multifocal to coalescing, severe, with Splendore-Hoeppli material and numerous colonies of cocci. **(2pt.)**

2. Lung: Pneumonia, histiocytic, diffuse, moderate with extracellular and intrahistiocytic eosinophilic protein crystals. **(2pt.)**

CAUSE: *Staphylococcus aureus* **(2pt.)**

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