WSC 2014-2015, Conference 21

Case 1. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Cerebellum and brainstem (level of pons); spinal cord: Within the granular and molecular layers of the cerebellum **(2pt.)** most prominently within the subpial areas **(1pt.)**, there is an extensive network of brightly eosinophilic **(1pt.)** astrocytic processes **(1pt.)** ranging up to 20um in diameter **(1pt.)** (Rosenthal fibers) **(1pt.)**. There is a marked decrease in nuclei of the granular cell layer, as well as Purkinje cell nuclei. There are increased numbers of astrocytes **(2pt.)** in these areas, and astrocytes associated with these fibers are enlarged **(1pt.)** up to 30 um, with abundant hyaline pink cytoplasm (gemistocytes). Occasional binucleated astrocytes are present. There are occasional vacuoles within folial white matter.

Within the section of cervical spinal cord **(1pt.)**, Rosenthal fibers are scattered throughout the section in subpial and perivascular locations but are concentrated in largest numbers within the dorsal funiculi. **(1pt.)** They are also prominent surrounding the central canal.

MORPHOLOGIC DIAGNOSIS: Cerebellum, granular and molecular layers: Hypertrophy of astrocytic processes, diffuse, severe with astrocytosis and marked loss of granular cell nuclei. **(3pt.)**

Name the condition: Alexander's Disease **(3pt.)**

Cause: GFAP mutation in astrocytes **(1pt.)**

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

WSC 2015-2015, Conference 21

Case 2. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Brainstem, thalamus and overlying cerebral cortex: Multifocally, primarily within the brainstem **(1pt)**, there is vasculitis **(1pt)** affecting small-to medium caliber vessels, primarily veins. Affected vessels are often surrounded by varying combinations and concentrations of macrophages **(1pt)** with fewer lymphocytes and neutrophils, admixed with necrotic inflammatory cells, cellular debris, hemorrhage, edema, and fibrin. Endothelial cells are often necrotic **(1pt)**, and remaining endothelial cells are often hypertrophic, with prominent nuclei. Occasional endothelial cell nuclei contain a large oblong eosinophilic intranuclear inclusion which distends the nucleus **(1pt)**. Ring hemorrhages **(1pt)** are prominent around affected vessels. There is extensive edema **(1pt)** surrounding affected vessels, and microglia and oligodendrocytes are often surrounded by clear halo ranging up to 60um and the intervening neuropil is mildly spongiotic. Oligodendroglial nuclei are often pyknotic. There are also increased numbers of microglia and astrocytes. **(1pt)** Multifocally, subependymal neuropil contains moderate numbers of histiocytes and rare lymphocytes.

Liver: There is diffuse distortion of hepatocellular plate architecture with loss of sinusoidal architecture, primarily within the centrilobular and midzonal areas. **(2pt)** There are multifocal to coalescing areas in which hepatocytes are diffusely swollen due to an accumulation of small discrete cytoplasmic vacuoles (degeneration) **(1pt)**, and often dissociated from other hepatocytes, rounded up, and hypereosinophilic with rrhectic nuclei (necrosis) **(1pt)**. Within these areas, sinusoidal architecture is lost and there is multifocal hemorrhage. Remaining hepatocytes at the edges of these areas often contain eosinophilic oblong intranuclear viral inclusions which distend the nucleus. **(1pt)** Within these areas, Kupffer cells often have numerous brown granular pigment (hemosiderin). Portal areas are mildly edematous with infiltration of low numbers of lymphocytes and plasma cells.

MORPHOLOGIC DIAGNOSIS: 1. Brainstem, thalamus: Vasculitis, necrotizing, diffuse, moderate with hemorrhage, edema, and numerous intraendothelial intranuclear viral inclusions. **(2pt)**

2. Liver: Degeneration and necrosis, multifocal to coalescing, severe, with numerous hepatocellular intranuclear viral inclusions. **(2pt)**

CAUSE: Canine adenovirus, Type 1 **(2pt)**

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

WSC 2015-2015, Conference 21

Case 3. Tissue from a cat.

MICROSCOPIC DESCRIPTION: Brain, sectioned through diencephalon **(1pt)** with hippocampus, thalamus, and pyramidal lobe: Randomly throughout the section in all areas, approximately 60% of arterioles **(1pt)** are expanded **(1pt)** by variably concentric and haphazardly arranged **(1pt)** spindle cells **(1pt)** which often efface the lumen **(1pt)**, or result in the formation of slit like blood filled spaces **(1pt)**. Proliferating spindle cells have a moderate amount of a finely granular amphophilic cytoplasm **(1pt)**, with large elliptical nuclei **(1pt)** with finely stippled chromatin and 1-2 small blue nucleoli. Mitoses are common. **(1pt)** Fibrin thrombi **(1pt)** are present within a small percentage of affected vessels. Rarely, the walls of vessels contain necrotic smooth muscle cells as well as cellular debris (vasculitis) **(1pt)**. Around affected vessels, there is a mild increase in astrocytes **(1pt)**, and neurons are occasionally bordered by two or more astrocytes (satellitosis). Within these areas, there is mild single cell necrosis of glial cells.

MORPHOLOGIC DIAGNOSIS: Diencephalon, arterioles: Endothelial proliferation, occlusive, diffuse, severe, with necrotizing vasculitis, thrombosis, and mild gliosis. **(3pt)**

NAME THE CONDITION: Feline systemic reactive angioendotheliomatosis **(2pt)**

WHAT OTHER ORGAN MAY HAVE A SIMILAR LESION? Heart **(1pt)**

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

WSC 2015-2015, Conference 21

Case 4. Tissue from a pig.

MICROSCOPIC DESCRIPTION: Cerebellar folia, vermis, and underlying brainstem : In a multifocal to coalescing pattern within the cerebellar vermis and folia **(1pt)**, there are large areas of coagulative necrosis **(1pt)** centered on necrotic blood vessels **(1pt)** (infarcts). Affected vessels have hyalinized walls which contain pyknotic smooth muscle cells and cellular debris; endothelial cells are necrotic **(1pt)**, and lumina are either severely congested, or often contain fibrinocellular thrombi **(1pt)** (vasculitis) **(1pt)**. These vessels contain mural hemorrhage which often extends and effaces the surrounding parenchyma. **(1pt)** Neuropil of the adjacent granular layer is markedly spongiotic**(1pt)** with mildly increased numbers of glial cells **(1pt)** which are often necrotic as well. In affected areas of the granular cell layer, there is diffuse severe loss of neuronal cell bodies, and moderate numbers of nuclei appear irregular or shrunken (necrosis) **(1pt)**, and the intervening neuronal processes are separated by clear vacuoles (edema) and hemorrhage and immediately adjacent to necrotic vessels, polymerized fibrin **(1pt)**. Purkinje cells are markedly decreased in number, and often swollen with vacuolated cytoplasm (degeneration), or shrunken, angular, and hypereosinophilic with loss of nuclei (necrotic.). **(1pt)** Vessels within the meninges **(1pt)** are necrotic as well, and the meninges are multifocally expanded by moderate numbers of histiocytes and fewer neutrophils and lymphocytes, admixed with hemorrhage, fibrin, and edema. Periventricular brainstem nuclei are mildly spongiotic with mild edema of the surrounding neuropil. The meninges of the ventral brainstem **(1pt)** are expanded with small to moderate amounts of hemorrhage edema and fibrin, and infiltrated by low numbers of macrophages, histiocytes, and neutrophils.

MORPHOLOGIC DIAGNOSIS: Cerebellum: Vasculitis, necrotizing, diffuse, severe, with thrombosis and loss of granular cell neurons and Purkinje cells. **(3pt)**

CAUSE: Acceptable: PCV-2, *Strep suis, Mycoplasma hyorhinis, Salmonella choleraesuis or typhisuis, porcine pestivirus.* **(2pt)**

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

(NOTE: This tissue is moderately autolytic, which may account for some, but not all of the nuclear loss within the granular cell layer.)