

WSC 2020-2021

Conference 20, Case 1.

Tissue from a ferret.

**MICROSCOPIC DESCRIPTION:** Sagittal section of cerebrum (with hippocampus), cerebellum and brainstem **(1pt.)**: There is a dense inflammatory infiltrate expanding the choroid plexus and occupying the lumen of the 3<sup>rd</sup> and 4<sup>th</sup> ventricle, effacing the ependyma and infiltrating the periventricular parenchyma of the 3<sup>rd</sup> and 4<sup>th</sup> ventricle, and multifocally, the meninges of the cerebellar folia, brainstem, and cerebral sulci. This predominantly perivascular **(1pt.)** infiltrate is composed of large numbers of lymphocytes **(1pt.)** and macrophages **(1pt.)** admixed with fewer plasma cells, neutrophils **(1pt.)**, and abundant cellular debris. The infiltrate extends outward from the choroid plexus **(1pt.)** of the third and 4th ventricles into the ventricular lumina **(1pt.)** where it is admixed with protein-rich fluid, hemorrhage, and polymerized fibrin. **(1pt.)** Multifocally within the meninges and in the periventricular space, the walls of veins **(1pt.)** are expanded by extruded protein and cellular debris and infiltrated by low to moderate numbers of lymphocytes and histiocytes with neutrophils which often efface the outer layers of smooth muscle and the adventitia. **(1pt.)** There is segmental ependymal loss, **and** the periventricular neuropil is expanded by expanded by clear vacuoles as well as clear space (edema) **(1pt.)** well as infiltrating lymphocytes and macrophages, and there is moderate gliosis **(1pt.)**, with increased numbers of microglia and astrocytes. Meninges **(1pt.)** overlying the brainstem, cerebellum, and the cerebral sulci are segmentally expanded by numerous lymphocytes, macrophages in fewer lymphocytes and plasma cells, which extend downwards along Virchow-Robin's spaces **(1pt.)** and multifocally infiltrate the adjacent perivascular neuropil. **(1pt.)**

**MORPHOLOGIC DIAGNOSIS:** Brain: Phlebitis **(1pt.)**, lymphohistiocytic **(1pt.)**, multifocal, severe, with lymphohistiocytic meningoencephalitis, choroiditis, and ventriculitis **(1pt.)**

Cause: Ferret coronavirus infection **(2 pt.)**

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

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Conference 20 Case 2.

Tissue from a harbor seal.

**MICROSCOPIC DESCRIPTION:** Spinal root ganglion **(1pt.)**: Multifocally, aggregates of moderate numbers of lymphocytes **(1pt.)** with fewer plasma cells **(1pt.)** and macrophages that surround and separate neurons. There is diffuse mild satellite cell (amphicyte) hyperplasia (Nageotte bodies). **(1pt.)** Multifocally, neuronal cell bodies are mildly expanded by numerous 1-2um clear cytoplasmic vacuoles **(1pt.)** which are often present at the periphery. Diffusely, neuronal cell bodies contain aggregates of brownish pigment (lipofuscin) **(1pt.)**. There are focal aggregates of lymphocytes and plasma cells in perivascular areas of the perineurium and occasional 25um mineral concretions within the meninges.

Spinal cord: Diffusely, within both the gray and white matter **(1pt.)**, Virchow-Robin spaces **(1pt.)** and perivascular areas are expanded by multiple layers of lymphocytes **(1pt.)** and plasma cells **(1pt.)** which multifocally extend into the surrounding parenchyma. There is multifocal hemorrhage **(1pt.)** within the gray matter. There is multifocal infiltration of the meninges **(1pt.)**, often perivascular areas, by low numbers of lymphocytes and plasma cells neuronal cell bodies within the gray matter. Diffusely, neuronal cell bodies contain moderate amounts of lipofuscin pigment. There are rare spheroids within the white matter.

Cerebellum: The meninges and subjacent Virchow-Robin spaces are multifocally expanded by low to moderate numbers of lymphocytes and plasma cells, primarily in perivascular areas. **(1pt.)**

**MORPHOLOGIC DIAGNOSIS:** 1. Ganglion: Ganglioneuritis, lymphoplasmacytic **(1pt.)**, multifocal, moderate with mild neuronal degeneration and satellite cell hyperplasia. **(1pt.)**

2. Spinal cord: Meningomyelitis, lymphoplasmacytic, diffuse, mild to moderate. **(1pt.)**

3. Cerebellum: Meningitis, lymphoplasmacytic, multifocal, mild. **(1pt.)**

**CAUSE:** West Nile virus **(3pt.)**

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

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Conference 20, Case 3.

Tissue from a dog.

**MICROSCOPIC DESCRIPTION.** Brainstem **(1pt.)**: Predominantly within the gray matter **(1pt.)**, there is perivascular cuffing **(1pt.)** of larger diameter veins by moderate numbers of lymphocytes **(1pt.)**, macrophages **(1pt.)**, fewer plasma cells **(1pt.)** neutrophils. There are necrotic cells within perivascular cuffs and small amounts of necrotic debris. **(1pt.)** Inflammatory cells extend into the surrounding neuropil. There is diffuse mild gliosis of the gray matter **(1pt.)**, and there are widely scattered aggregates of astrocytes **(1pt.)** and fewer microglia scattered throughout the gray matter (glial nodules) **(1pt.)**. Occasional mitotic figures are present within the glial population. Rarely, 4-5 glial cells border mildly swollen chromatolytic **(1pt.)** neurons (satellitosis) **(1pt.)**. In dorsal white matter tracts, there are numerous dilated myelin sheaths **(1pt.)** which rarely contain swollen axons (spheroids) **(1pt.)**, Gitter cells **(1pt.)**, and axonal debris. Vessels within the meninges **(1pt.)** are or occasionally cuffed by multiple layers of lymphocytes and plasma cells and similar cells occasionally or present diffusely an expand the meninges.

**MORPHOLOGIC DIAGNOSIS:** Brainstem: Meningoencephalitis **(1pt.)**, lymphohistiocytic **(1pt.)**, diffuse, moderate, with gliosis **(1pt.)**, glial nodules and rare spheroids.

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

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Conference 20, Case 4.

Tissue from an ox.

MICROSCOPIC DESCRIPTION: Cerebrum: There is marked cuffing **(2pt.)** of larger diameter veins by up to 10 layers of lymphocytes **(2pt.)**, macrophages **(2pt.)**, fewer plasma cells **(1pt.)** and neutrophils. **(1pt.)** Inflammatory cells do not extend into the surrounding neuropil. There is diffuse mild to moderate gliosis of the grey matter **(1pt.)**, and there are widely scattered aggregates of astrocytes **(1pt.)** and fewer microglia scattered throughout the gray matter (glial nodules), primarily within the external granular and pyramidal layers. **(2pt.)** Vessels within the meninges **(2pt.)** are or occasionally cuffed by multiple layers of lymphocytes and plasma cells and similar cells occasionally or present diffusely and expand the meninges. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Cerebrum: Meningoencephalitis **(1pt.)**, lymphohistiocytic **(1pt.)**, diffuse, moderate, with gliosis **(1pt.)** and rare glial nodules.

CAUSE: Bovine astrovirus (but viral encephalitis that does not have viral inclusions is ok – so this one is wide open) **(1pt.)**

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