

WSC 2015-2016, Conference 10

Case 1. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Cerebellum: Segmentally and affecting 75% of the cerebellar folia **(1 pt.)**, the Purkinje cell and underlying granular cell layer **(1 pt.)** are markedly hypocellular **(2 pt.)**. There is distinct loss of up to 50% of Purkinje cells and in some areas **(1 pt.)**. Remaining Purkinje cells **(1 pt.)** and their axons **(1 pt.)** are often swollen by an accumulation of a granular brown pigment **(1 pt.)** (lipofuscin) **(2 pt.)**. The hypocellularity and clear space of the granular cell layer is most severe at the tip of the cerebellar folia **(1 pt.)**. Dilated axons (spheroids) are present both within the granular cell layer as well as the cerebellar white matter. In the superficial folial grey matter, overlying areas of Purkinje cell loss, there is mild increase in astrocytes **(1 pt.)** (Bergmann's astrocytes). There is mild sclerosis of the choroid plexus (which contains numerous overgrowth bacilli of no clinical significance).

MORPHOLOGIC DIAGNOSIS: Cerebellum, Purkinje cell degeneration and loss, diffuse, moderate with granular cell loss and marked intracellular ceroid accumulation. **(3 pt.)**

NAME THE CONDITION: Neuronal ceroid-lipofuscinosis **(3 pt.)**

NAME AN AFFECTED BREED: English Setter, Staffordshire Terrier, Border Collie, Dachshund **(1 pt.)**

O/C: (1 pt.)

(Note that necrosis is not part of the morphologic diagnosis – in my section, I didn't see any of the remaining Purkinje cells with changes consistent with necrosis- and the interpretation of cytoplasm clogged with lipofuscin is more along the lines of degeneration.)

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Case 2. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Spinal cord: Effacing approximately 50-60% of the gray matter **(1pt)** and extending into the adjacent white matter **(1pt)**, there are bilateral, asymmetrical **(1pt)** well-defined areas of necrosis **(1pt)** which measure up to 5mm in diameter **(1pt)**. These areas of necrosis are cavitated **(1pt)**, with abundant clear space, populated by large numbers of Gitter cells **(1pt)** with foamy cytoplasm and rare remaining gliovascular strands, and small amounts of hemorrhage. Rare occasionally mineralized swollen axons are also present in areas of necrosis. Multifocally, vessels within the areas of necrosis and rarely the adjacent remaining neuroparenchyma as well as in the meninges are often occluded by a pale, amphophilic, acellular material **(1pt)** (fibrocartilaginous emboli) **(1pt)**. Some of the emboli are surrounded by endothelial cells (early attempts at recanalization). White matter adjacent to areas of cavitation contain variable combinations and concentrations of spongiosis **(1pt)**, dilated myelin sheaths **(1pt)**, swollen eosinophilic axonal cross sections (spheroids) **(1pt)**, infiltration of low numbers of Gitter cells **(1pt)**, and an increase in microglia. Multifocally, there is pallor **(1pt)** of the surrounding peripheral nerves, with extensive demyelination **(1pt)** or shrunken, and the endomysium is expanded by edema and Gitter cells **(1pt)**. In affected peripheral nerves, Schwann cells are increased in number with hypertrophic nuclei. There is low numbers of lymphocytes within the peripheral nerves, primarily in perivascular locations.

MORPHOLOGIC DIAGNOSIS: Spinal cord: Poliomyelomalacia, extensive, multifocal to coalescing, with cavitation, spinal nerve root demyelination and intravascular fibrocartilaginous emboli. **(3 pt)**

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

(NOTE: Vascular issues often hit gray matter a lot harder than white matter, as this slide shows very nicely.)

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Case 3. Tissue from a cat.

MICROSCOPIC DESCRIPTION: Cerebrum: At one edge of the section, there is a focal area of pallor affecting both the grey and white matter. Within these areas, there are several areas of perivascular hemorrhage **(1pt)** which either obscures the underlying arteriole or markedly expands the perivascular space (ring hemorrhage). In a focal area of the deep cortical grey matter, walls of arterioles **(1pt)** are necrotic, with loss of endothelial and smooth muscle nuclei and replacement by abundant homogenous hyaline eosinophilic protein **(1pt)** throughout which is scattered small amounts of cellular debris (fibrinoid necrosis) **(2pt)**. Surrounding grey matter contains numerous discrete vacuoles and oligodendroglia are often surrounded by a clear halo (edema) **(2pt)**. Neurons within this area are shrunken and hypereosinophilic with pyknotic to karyorrhectic nuclei (necrosis) **(2pt)** Shrunken neurons are occasionally surrounded by three or more lymphocytes (satellitosis) **(1pt)**, and some are replaced by cellular debris. Affected areas are infiltrated by low numbers of neutrophils **(1pt)** and macrophages admixed with small amounts of cellular debris, and there are increased numbers of astrocytes within the affected area, and microglia are increased in number with hypertrophic nuclei (gliosis) **(1pt)**. There is mild edema within the underlying white matter, and rare oligodendroglia are shrunken with karyorrhectic nuclei (necrosis) **(1pt)**. Vessels within the white matter are cuffed with low numbers of macrophages and lymphocytes **(1pt)**. The meninges overlying the area of necrosis are expanded by small amounts of edema, and infiltrated by low to medium numbers of neutrophils, histiocytes, and plasma cells. **(1pt)**

MORPHOLOGIC DIAGNOSIS: Cerebrum, arterioles: Fibrinoid necrosis, focally extensive, with extensive neuronal degeneration and necrosis. **(3pt)**

CAUSE: Hypertension (cerebrovascular accident OK) **(1pt)**

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

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CASE 4. Tissue from an ox.

MICROSCOPIC DESCRIPTION: Cerebellum and brainstem: Within the cerebellar white matter **(1pt)** and scattered randomly throughout the brainstem white matter **(1pt)** are numerous roughly circular **(1pt)** plaques of densely packed small fibrils **(2pt)** which range up to 100um in diameter. **(1pt)** There are moderate numbers of clear vacuoles **(2pt)** which are occasionally surrounded by oligodendroglia. The remainder of the white matter is loosely arranged with frequent dilated myelin sheaths **(1pt)** . Oligodendroglia are increased in number and mildly hypertrophic **(2pt)** . There is mild chromatolysis of brainstem neurons (actually I may have made this up, as I don't have much more to say about this slide.) **(1pt)**

MORPHOLOGIC DIAGNOSIS: Cerebellum and brainstem white matter: Dysmyelination, diffuse, moderate with myelin plaques and mild oligodendroglial hypertrophy. **(4 pt.)**

NAME THE CONDITION: Hereditary neuraxonal dystrophy of Charolais cattle **(3pt)**

O/C: (1pt.)