WSC 2016-2017, Conference 20

Case 1. Tissue from a horse.

MICROSCOPIC DESCRIPTION: Cerebellum and choroid plexus: Randomly **(1pt.)** within both the grey and white matter **(1pt.)**, there are well-demarcated foci of neuropil necrosis **(1pt.)** with replacement by brightly eosinophilic cellular and karyorrhectic debris **(1pt.)**, infiltrated by moderate numbers of foamy gitter cells **(1pt.)**, fewer lymphocytes and multinucleated giant cell macrophages **(1pt.)** of the foreign body- and Langhans types, rare eosinophils and increased numbers of hypertrophic astrocytes as **(1pt.)** well as microglia. There is marked edema within and adjacent to affected areas in both the white matter (spongiosis). **(1pt.)** Foci in the white matter and adjacent neuropil contain numerous dilated myelin sheaths and swollen, degenerate eosinophilic axons (spheroids) **(1pt.)**, which are present in lesser numbers in areas of gray matter necrosis. Older areas of grey matter necrosis contain numerous astrocytes (early glial scar) **(1pt.)**. Blood vessels in both grey and white matter lesions are prominent with reactive endothelium and surrounded by low to moderate numbers of lymphocytes, plasma cells, and fewer histiocytes, which expand Virchow-Robin spaces. **(1pt.)** Within the affected areas, there are numerous tangential and cross sections of adult rhabditid nematodes **(1pt.)** that are 10-25 um in diameter with a smooth cuticle, platymyarian-meromyarian musculature, an esophagus with terminal bulb, and numerous deeply basophilic 2-3 um internal structures within the pseudocoelom **(1pt.)**. as well as 10-15um diameter larvae **(1pt.)** with a thin cuticle and numerous somatic nuclei. Meninges in proximity to areas of necrosis are expanded by low to moderate numbers of histiocytes and lymphocytes as well as congestion. The interstitium of the choroid plexus is markedly expanded by mature fibrous connective tissue.

MORPHOLOGIC DIAGNOSIS: Cerebellum: Encephalitis, granulomatous **(1pt.)** and necrotizing **(1pt.)**, multifocal and random, moderate with numerous adult and larval rhabditid nematodes. **(1pt.)**

CAUSE: *Halicephalobus gingivalis* **(2pt.)**

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

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Case 2. Tissue from a dog.

(Note: The staining on this slide is very uneven, but that is part of the fun!)

MICROSCOPIC DESCRIPTION: Cerebrum: Arising from the meninges **(1pt.)**, and compressing **(1pt.)** and multifocally infiltrating the underlying superficial cortex, there is an encapsulated, moderately cellular, multilobular neoplasm **(2pt.)**. Neoplastic cells are arranged in well-defined nests and packets **(1pt.)** on a moderate fibrovascular stroma **(1pt.)**. Neoplastic cells are polygonal to spindled **(1pt.)** with indistinct cell borders and a moderate amount of a finely granular eosinophilic cytoplasm **(1pt.)**, and nests have a distinct whirling orientation with most peripheral cells having an elongate appearance **(1pt.)**. Nuclei are oval with finely clumped chromatin and 1-2 prominent basophilic nuclei. **(1pt.)** Mitotic figures are rare. **(1pt.)** The neoplasm is largely surrounded by a rim of compressed neuropil and fibrovascular tissue **(1pt.)**. At the advancing front of the neoplasm, the neuropil is loosely arranged, especially in perivascular areas (edema) **(1pt.)**, and there is mild hemorrhage and a focus of hemosiderin-laden macrophages. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Cerebrum: Meningioma **(4pt.)**, transitional type. **(1pt.)**

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

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Case 3. Tissue from a calf.

MICROSCOPIC DESCRIPTION: Cerebrum, telencephalon. There is extensive cavitation necrosis **(1pt.)** which affects the superficial and submeningeal cortex **(1pt.)** most prominently along gyri but also within the perivascular areas **(1pt.)** Areas of necrosis are infiltrated with innumerable macrophages and Gitter cells **(1pt.)**, admixed with large numbers of lymphocytes **(1pt.)** and fewer plasma cells as well as rare neutrophils, admixed with moderate amounts of cellular debris **(1pt.)**. There is multifocal mineralization **(1pt.)** of necrotic neurons (ferrugination). Vessel walls are multifocally infiltrated and expanded **(1pt.)** by low numbers of neutrophils and histiocytes and small amounts of cellular debris and protein and surrounded by moderate hemorrhage (vasculitis) **(1pt.)**. Throughout the affected area, both cortical and meningeal vessels are surrounded by up to 10 layers of lymphocytes, plasma cells **(1pt.)**, and moderate numbers of histiocytes. **(1pt.)** There is marked congestion of vessels within the cortex and overlying meninges, as well as expansion of the meninges by hemorrhage. **(1pt.)** Within less affected areas, there is a marked increase in astrocytes and microglia (gliosis) **(1pt.)** and rarely, astrocyte nuclei contain a single poorly demarcated eosinophilic viral inclusion. **(1pt.)** Diffusely throughout the section, the neuropil is hypercellular (gliosis), endothelial cells are prominent, and the meninges are expanded by low to moderate numbers of histiocytes, macrophages, and lymphocytes.

MORPHOLOGIC DIAGNOSIS: Cerebrum, telencephalon: Meningoencephalitis, necrotizing **(1pt.)**, multifocal to coalescing, severe, with marked gliosis, multifocal vasculitis **(1pt.)**, and rare intraglial intranuclear viral inclusions. **(1pt.)**

CAUSE: *Bovine herpesvirus-5 (BoHV-1 OK)* **(2pt.)**

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

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CASE 4. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Cerebrum. Primarily within the superficial cortex **(1pt.)**, subjacent to the meninges and within perivascular areas **(1pt.)**, astrocytes **(2pt.)** are markedly increased in number **(1pt.)**. Astrocyte processes are tangled, swollen **(1pt.)**, and brightly eosinophilic **(1pt.)** and range up to 10um in diameter, and cell bodies are expanded up to 25um **(1pt.)** and contain brightly eosinophilic granules and globules. **(1pt.)** Rosenthal fibers often project onto and outline vessels in the grey matter and the overlying meninges. **(1pt.)** Similar changes are seen to a much lesser extent in the white matter. **(1pt.)** There is marked edema of the neuropil within this region (spongiosis) **(1pt.)**, and mild perivascular edema in the adjacent tissue. There is mild gliosis of the adjacent neuropil. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Cerebrum, superficial cortex: Astrocytosis **(1pt.)**, focally extensive, diffuse with marked astrocyte hypertrophy **(1pt.)** and perivascular axonal swelling (Rosenthal fibers) **(1pt.)**.

(This is a pretty tough morphologic to figure out – while some people would call this an "astrocytopathy" or "astrodystrophy"- remember that you are trying to come up with a MORPHOLOGIC diagnosis – which describes the MORPHOLOGY of what you see, and –opathy or –dystrophy doesn't really do that.)

NAME THE CONDITION: Alexander's disease **(3pt.)**

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