WSC 2009-2010, Conference 18, Case 1.

Tissue from a horse.

MICROSCOPIC DESCRIPTION: Spinal cord, cauda equina: Diffusely, intradural, and to a lesser extent, extradural **(1 pt.)** spinal nerve roots **(1 pt.)** are infiltrated and occasionally effaced **(1 pt.)**by numerous lymphocytes **(1 pt.)** and macrophages **(1 pt.)**, fewer plasma cells, multinucleated foreign body macrophages **(1 pt.)**, occasional aggregates of neutrophils, rare hemorrhage and hemosiderin-laden macrophages. Within the nerve roots there are numerous dilated, empty myelin sheaths **(1 pt.)** and swollen, hypereosinophilic axons (spheroids) **(1 pt.)**, and the endoneurium is often expanded by loosely arranged pink collagen **(1 pt.)**. These inflamed nerve roots are bounded by peripheral rings of fibrous connective tissue **(1 pt.)** which expand the perineurium and epineurium **(1 pt.)**and fuse into broad bands of collagen which separates nerve roots. Within the broad bands of fibrosis separating the nerve roots, there are large numbers of lymphocytes with lesser numbers of macrophages and plasma cells **(1 pt.)**and multifocal hemorrhage, fibrin, and edema. There is multifocal hemorrhage and small numbers of lymphocytes and macrophages within adjacent fibroadipose tissue.

MICROSCOPIC DIAGNOSIS: Spinal cord, cauda equina: Polyradiculoneuritis, granulomatous, chronic, diffuse, moderate, with marked fibrosis, and axonal degeneration. **(4 pt.)**

NAME THE CONDITION: Cauda equine syndrome **(3 pt.)**

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

WSC 2009-2010. Conference 18, Case 2

Tissue from a horse.

MICROSCOPIC DESCRIPTION: Ganglion (site unspecified) **(2 pt.)**: Multifocally, neurons exhibit various signs of degeneration **(2 pt.)** including shrinkage **(1 pt.)** with brightly eosinophilic cytoplasm **(1 pt.)** loss of Nissl substance **(2 pt.)** either *in toto* or centrally (central chromatolysis) **(1 pt.)**, and peripheralization **(1 pt.)**of hyperchromatic to pyknotic nuclei **(1 pt.)**. Other degenerating neurons are swollen **(1 pt.)** and have large numbers of discrete, variably size vacuoles within their cytoplasm **(1 pt.)**. Occasionally, degenerating neuron cell bodies are surrounded by low numbers of lymphocytes. **(1 pt.)** Neuronal cytoplasm often contains small amounts of lipofuscin. In the adjacent nerve roots, there are low numbers of dilated myelin sheaths which contain a large eosinophilic swollen axon (spheroids) **(1 pt.)**.

MORPHOLOGIC DIAGNOSIS: Ganglion: Neuronal degeneration, multifocal, moderate, with chromatolysis and marked cytoplasmic vacuolation. **(3 pt.)**

NAME THE CONDITION : Dysautonomia. **(1 pt.)**

O/C – **(1 pt.)**

WSC 2009-2010, Conference 18, Case 3.

Tissue from a sheep.

MICROSCOPIC DESCRIPTION: Cerebellum and brainstem (level of pons): Within the subependymal white matter **(2pt.)** surrounding the fourth ventricle, there is an extensive network of brightly eosinophilic **(1pt.)** astrocytic processes **(1pt.)** ranging up to 20um in diameter **(1pt.)** (Rosenthal fibers). These fibers are also present in slightly lesser numbers throughout the brainstem white matter in perivascular locations **(1pt.)**, as well as in circumferentially in subpial (submeningeal) areas **(1pt.)**. 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. Throughout the brainstem, there are occasional enlarged neurons with central to total loss of Nissl substance **(1pt.)**. Within the white matter layers of the cerebellum **(1pt.)**, as well as to a lesser extent in the granular layers**(1pt.)**, there are low to moderate numbers of Rosenthal fibers as well as prominent astrocytes.

MORPHOLOGIC DIAGNOSIS: Brainstem and cerebellum: Hypertrophy of astrocytic processes, bilaterally symmetrical, diffuse, severe with astrocytosis. **(3pt.)**

Name the condition: Alexander's Disease **(2pt.)**

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

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

WSC 2009-2010, Conference 18, Case 4.

Tissue from a dog.

MICROSCOPIC DIAGNOSIS: Kidney: Multifocally, tubules exhibit one or more of the following changes: necrosis **(1pt.)**, evidence by bright granular fragmented cytoplasm with karyolytic or pyknotic nuclei, sloughing into the lumen, mineralization, flattened attenuated epithelium **(1pt.)**, and presence of protein or cellular casts **(1pt.)** within the lumen. Rarely, and more commonly in the medulla, there is also proliferation of the epithelium with piling up, large vesicular nuclei, and basophilic cytoplasm (regeneration) **(1pt.)**, as well as either eosinophilic or amphophilic hyaline cast**(1pt.)** material within the lumen or dense aggregates of mineral filling the tubules. In association with these areas, there are often large numbers of plasma cells**(1pt.)** expanding the interstitium, associated with lesser numbers of lymphocytes, histiocytes, and rare neutrophils, as well as increased amounts of fibrous connective tissue **(1pt.)** and plump fibroblasts. In areas of interstitial fibrosis, there are atrophic tubules with prominent basement membranes**(1pt.)**. Rarely, tubular epithelium and/or endothelial cells are swollen by cytoplasmic accumulation of 2-4um intracytoplasmic spores **(1pt.)** (encephalitozoon).

Cerebrum: There is marked gliosis **(1pt.)** of the grey matter. Multifocally, there are aggregates of lesser numbers of lymphocytes**(1pt.)** admixed with small numbers of macrophages, hypertrophic astrocytes and hypertrophic microglial nuclei (glial nodules) **(1pt.)**. Multifocally there are aggregates of moderate numbers of lymphocytes and rare macrophages surrounding vessels within the grey matter and meninges (perivascular cuffing) **(1pt.)**. There is mild loss of neurons and vacuolation within the hippocampus. Multifocally, within rare swollen endothelial cells **(1pt.)**, there are small numbers of 2-4 um intracytoplasmic spores (encephalitozoon).

MICROSCOPIC DIAGNOSIS: 1. Kidney: Nephritis, lymphoplasmacytic and necrotizing, diffuse, moderate, with marked tubular degeneration, necrosis, and rare regeneration and intracytoplasmic microsporidia. **(2pt.)**

2. Cerebrum: Encephalitis, lymphocytic, multifocal, moderate, with lymphocytic perivascular cuffing, gliosis, and rare intraepithelial microsporidia. **(2pt.)**

CAUSE: *Encephalitozoon cuniculi* **(2pt.)**

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