

WSC 2010-2011, Conference 4, Case 1.

Tissue from a mouse.

**MICROSCOPIC DESCRIPTION: (Note: Each section has four sections of brain, but the locations will vary as a result of processing numerous slides. Each section should have, as a minimum, a section containing rostral telencephalon with lateral and third ventricles, diencephalon with hippocampus, and metencephalon with cerebellum.) As a result of the marked variation in slides, and due to the relatively few changes in any of the sections, I will not be “grading out” this slide. In short, review the lesion as it is an excellent depiction of the characteristic appearance of dead neurons, and go on to slide 2. The major teaching point in this slide is to be able to differentiate “red/dead” neurons, from viable “dark” neurons.**

Brain, multiple sections: Diffusely throughout multiple sections, most often within nuclei, but often in extensive areas within the hippocampus, thalamus, and scattered throughout the granular and pyramidal layers of the cerebral cortex, numerous neurons are shrunken and angular with bright pink cytoplasm (necrosis). Necrotic neurons have marked clumping of chromatin in the often hyperchromatic nucleus. There is no apparent cellular reaction in the areas of the dead neurons.

**MORPHOLOGIC DIAGNOSIS:** Brain, cerebrum, hippocampus, thalamus: Neuronal necrosis, acute, diffuse, moderate to severe.

For an excellent review of “dark neurons”, see: Jortner, BS. The return of the dark neuron. A histological artifact complicating contemporary neurotoxicologic evaluation. *Neurotoxicology*, 27(4): 628-634, 2006.

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

Tissue from a horse

**MICROSCOPIC DESCRIPTION:** Haired skin and mucous membrane (lip): The dermis and submucosa of the lip are mildly expanded by an interface and perivascular accumulation (**1 pt.**) of moderate numbers of histiocytes (**1 pt.**), lymphocytes, and lesser numbers of eosinophils (**1 pt.**) and plasma cells. There are low numbers of lymphocytes scattered among pilosebaceous units. There is mild perivascular edema in the superficial dermis. There is diffuse mild acanthosis of the epidermis, moderate formation of rete ridges (hyperplasia) and parakeratotic orthokeratosis (**1 pt.**). On the haired skin side, there is a focal ulcer extending down to the follicular level which is covered by a serocellular crust containing abundant necrotic cellular debris, fibrin, plant material, and small bacterial colonies. (**1 pt.**) The area subjacent to the ulcer contains moderate numbers of neutrophils in addition to the diffuse inflammatory infiltrate previously described.

**Pancreas (1 pt.):** There is diffuse severe fibrosis (**1 pt.**) which effaces (**1 pt.**) pancreatic architecture. Dense bands of fibrous connective tissue that contain large numbers of plump fibroblasts totally replace acinar and islet tissue. The fibrous connective tissue is infiltrated with large numbers of macrophages and lymphocytes, with lesser numbers of eosinophils and plasma cells. (**1 pt.**) Pancreatic ducts are diffusely hyperplastic (**1 pt.**) and markedly ectatic. Ductal epithelium is multifocally necrotic, and infiltrated by moderate numbers of neutrophils and low numbers of lymphocytes and macrophages, which are often admixed within the duct lumen with abundant mucus as well as sloughed epithelial cells. (**1 pt.**) Fibrous connective tissue and the aforementioned inflammatory cells expand the submucosa and wall of a large duct (pancreatic duct?) Bands of fibrous connective become more dense and less cellular at the periphery of the section, where they infiltrate and replace mesenteric adipose tissue.

**MORPHOLOGIC DIAGNOSIS:** 1. Haired skin and lip: Dermatitis and cheilitis, lymphohistiocytic and eosinophilic, with focal ulceration. (**2 pt.**)

2. Pancreas: Pancreatitis and dochtitis, lymphohistiocytic and eosinophilic, chronic, diffuse, severe, with duct ectasia and hyperplasia. (**2 pt.**)

**NAME THE CONDITION:** Equine multisystemic eosinophilic epitheliotropic disease (MEED) (**3 pt.**)

O/C – (**1 pt.**)

WSC 2009-2010, Conference 4, Case 3.

Tissue from an ox.

**MICROSCOPIC DESCRIPTION:** Cerebrum: Diffusely, the grey matter (**1 pt.**) is infiltrated by large numbers of macrophages (**1 pt.**) and lesser numbers of lymphocytes (**1 pt.**) and rare neutrophils which also form prominent cuffs around vessels (**1 pt.**). In areas of heavy cellularity, the grey matter is loosely arranged with abundant clear space (necrosis) (**1 pt.**). Within these areas, the grey matter contains numerous large reactive astrocytes (**1 pt.**) with vesicular nuclei and increased numbers of microglia (gliosis) (**1 pt.**). Neurons are often shrunken, angular, and hypereosinophilic, with karyorrhectic nuclei (**1 pt.**) (neuronal necrosis) (**1 pt.**). Multifocally, neurons and astrocytic nuclei (**1 pt.**) are swollen by a large eosinophilic intranuclear (**1 pt.**) viral inclusion (**1 pt.**) which is surrounded by a clear rim. Small vessels are often separated from surrounding neuropil by clear space (edema), and throughout the section, vessels are often lined by hypertrophic endothelial cells. (**1 pt.**) There is a diffuse infiltrate of moderate numbers of lymphocytes and histiocytes within the meninges, which often forms small cuffs in perivascular locations (**1 pt.**). Vessels are dilated, congested, and lined by hypertrophic endothelial cells.

**MORPHOLOGIC DIAGNOSIS:** Cerebrum: Meningoencephalitis, necrotizing and lymphohistiocytic, diffuse, moderate to severe, with astrocytic and neuronal intranuclear viral inclusion bodies. (**3 pt.**)

Cause: Bovine herpesvirus (Type 5) (**2pt.**)

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

WSC 2009-2010, Conference 4, Case 4.

Tissue from a cat.

**MICROSCOPIC DESCRIPTION:** Cerebrum, diencephalon with hippocampus: Diffusely, white matter is pale-staining and loosely arranged with numerous clear spaces (**2 pt.**), and small vessels are surrounded by moderate amounts of clear space (**1 pt.**) (edema) (**2 pt.**). There are low numbers of astrocytes with moderate amounts of eosinophilic cytoplasm (**1 pt.**) (gemistocytes) (**2 pt.**) scattered through the white matter. Multifocally, walls of small arterioles within the meninges (**1 pt.**) and to a lesser extent in the grey matter contain bright eosinophilic protein within the wall (**2 pt.**) and smooth muscle nuclei are pyknotic (**2 pt.**) (hyaline degeneration or fibrinoid necrosis) (**2 pt.**). Rarely, the adventitia of some affected vessels is expanded by 1-3 layers of fibroblasts and small amounts of collagen.

**MORPHOLOGIC DIAGNOSIS:** 1. Cerebrum, white matter: Edema, diffuse, mild to moderate with gemistocytes. (**2 pt.**)

2. Meninges and grey matter arterioles: Fibrinoid necrosis, multifocal, mild. (**2 pt.**)

**NAME AN ASSOCIATED CLINICAL FINDING:** Systemic hypertension (**1 pt.**)