

Case 1. Tissue from a sheep.

**MICROSCOPIC DESCRIPTION:** Lung: Within multifocal areas affecting approximately 50% of the section, alveoli and adjacent airways are filled with a cellular exudate which consists of large colonies **(1pt.)** of 2µm diameter bacilli **(1pt.)** admixed with numerous degenerate neutrophils **(1pt.)**, fewer macrophages, and abundant cellular debris **(1pt.)**, and varying amounts of hemorrhage **(1pt.)**, edema **(1pt.)**, and polymerized fibrin **(1pt.)**. There is often lytic necrosis **(1pt.)** of the intervening septa, and many foci are bordered by a rim of dense basophilic cellular debris **(1pt.)**. Adjacent, less affected alveoli contain abundant flocculent pink edema fluid **(1pt.)**, varying combinations and concentrations of alveolar macrophages and neutrophils and septa are markedly congested. Bronchioles adjacent to necrotic areas often contain a reflux **(1pt.)** of similar bacilli, degenerate neutrophils, cellular debris, and hemorrhage, and occasionally there is necrosis of lining epithelium **(1pt.)** and/or regrowth of attenuated epithelium. There is multifocal necrosis of bronchiolar epithelium in larger airways and infiltration of low numbers of neutrophils. **(1pt.)** Affected larger airways have mild epithelial hyperplasia. There is marked expansion of the lobular interstitium **(1pt.)** with edema, moderate numbers of viable neutrophils, and polymerized fibrin; these changes are present to a lesser degree surrounding large airways and vessels.

**MORPHOLOGIC DIAGNOSIS:** Lung: Pneumonia **(1pt.)**, necrotizing and fibrinosuppurative **(1pt.)**, multifocal to coalescing, severe, with marked alveolar and septal edema and numerous colonies of bacilli. **(1pt.)**

**CAUSE:** *Trueperella pyogenes*. (Will accept *Corynebacterium pseudotuberculosis* and *Yersinia pseudotuberculosis* or *enterocolitica* as well, I guess.) **(2pt.)**

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

Case 2. Tissue from a cat.

MICROSCOPIC DESCRIPTION: Cerebellum and brainstem: Diffusely the meninges **(1 pt.)** are expanded by an infiltrate of large numbers of lymphocytes **(1 pt.)**, plasma cells,**(1 pt.)** and fewer histiocytes **(1 pt.)** and rare neutrophils that often center on and surround blood vessels **(2 pt.)**, and form perivascular cuffs up to 7 cell layers thick in Virchow-Robin spaces **(1 pt.)**. A similar infiltrate, with a higher density of lymphocytes expands the edematous **(1 pt.)** choroid plexus **(1 pt.)**. The fourth ventricle contains a moderate number of viable and degenerate neutrophils **(1 pt.)**, histiocytes, lymphocytes and plasma cells admixed with small amounts of cellular debris and flocculent amphophilic protein. **(1 pt.)** The ependyma is largely lost circumferentially around the fourth ventricle **(1 pt.)**, and this cellular infiltrate infiltrates the underlying parenchyma **(1 pt.)** which is mildly edematous.

MORPHOLOGIC DIAGNOSIS: Cerebrum, brainstem: Meningoencephalitis **(1 pt.)**, lymphoplasmacytic **(1 pt.)** and histiocytic, perivascular **(1 pt.)**, diffuse, moderate to marked with lymphoplasmacytic and lymphohistiocytic choroiditis **(1 pt.)**.

CAUSE: Mutated feline coronavirus **(2 pt.)**

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

Case 3. Tissue from a dog.

**MICROSCOPIC DESCRIPTION:** Lung: Approximately 50% of the section is effaced by nodular areas of parenchymal (occasionally lytic) necrosis **(1pt.)**. Within these areas, alveoli are filled by varying combinations and concentrations of viable and degenerate neutrophils **(1pt.)** and foamy macrophages **(1pt.)** (often with phagocytized debris), admixed with abundant cellular debris, hemorrhage **(1pt.)**, fibrin **(1pt.)**, and edema. Within this exudate, there are numerous 15-25um amoebic trophozoites **(1pt.)** with basophilic vacuolated cytoplasm, a 6um magenta nucleus with a prominent karyosome. Occasional amoeba have phagocytized erythrocytes. There are also small scattered amoebic cysts **(1pt.)** measuring up to 15um with a thick bilayered wall and a clear space surrounding the endocyst. Within these areas, alveolar septa are variably congested, necrotic **(1pt.)**, or expanded by fibroblasts and or collagen. **(1pt.)** Airway lumina often contain refluxed exudate and trophozoites and there is multifocal necrosis of lining epithelium. **(1pt.)** Vessel walls are multifocally necrotic (vasculitis), and or thrombosed and trophozoites may be seen in vascular lumina. **(1pt.)** Diffusely, alveolar septa are thickened up to twice normal by edema and fibrin **(1pt.)**, and aerated alveoli contain small numbers of amoebic trophozoites, foamy macrophages, neutrophils, hemorrhage, fibrin, and cellular debris. **(1pt.)** There is a circulating neutrophilia, and megakaryocytes are scattered throughout the section within alveolar capillaries. Within these areas there is patchy type II pneumocyte hyperplasia. The pleura is markedly thickened and expanded by moderate numbers of lymphocytes, plasma cells, and histiocytes, edema and dilated lymphatics, and is lined by hyperplastic mesothelium. **(1pt.)** Most prominently within areas of less affected parenchyma, there are small to moderate numbers of viral syncytia with up to 10 nuclei. **(1pt.)** Nuclei are occasionally expanded by 2-3um eosinophilic rhomboidal viral inclusions. **(1pt.)**

**MORPHOLOGIC DIAGNOSIS:** 1. Lung: Pneumonia, interstitial, fibrinous, diffuse, moderate, with low numbers of intra-alveolar viral syncytia and intranuclear inclusions. **(1pt.)**

2. Lung: Pneumonia, bronchointerstitial, necrotizing, multifocal, severe, with numerous amoebic trophozoites and cysts **(1pt.)**

**CAUSE(S):** *Acanthameba* sp. **(1pt.)**, canine morbillivirus **(1pt.)**

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CASE 4. Tissue from a horse.

(Not a descriptive slide. Not enough points on this one, and difficult to get to one answer.)

MICROSCOPIC DESCRIPTION: Cerebrum: The meninges are multifocally expanded by moderate numbers of lymphocytes and plasma cells, as well as fewer histiocytes and neutrophils and mild edema. This cellular infiltrate extends along Virchow-Robin's spaces where it forms perivascular cuffs up to 10 cell layers thick.

MORPHOLOGIC DIAGNOSIS: Cerebrum: Meningoencephalitis, lymphoplasmacytic, diffuse, marked.

CAUSE: This one is *Borrelia burgdorferi*, but the potential rule outs is very long – I would think about alphaviruses, rabies...a lot of things can cause this lesion.

O/C: