

Case 1. Tissue from a dog.

**MICROSCOPIC DESCRIPTION:** Testis: Replacing approximately 50% of the section is an unencapsulated, infiltrative, well-demarcated, moderately cellular, multilobular neoplasm **(2pt)**. Neoplastic cells fill and expand pre-existent tubules **(1pt)** palisading along the tubular border **(1pt)**; these tubules are separated by a dense fibrous stroma. Neoplastic cells are polygonal to pyramidal, have indistinct cell borders with a moderate amount of a finely granular, often wispy, eosinophilic cytoplasm **(1pt)**. Nuclei are irregularly round with finely stippled chromatin and 2-4 small basophilic nucleoli **(1pt)**. Mitotic figures average 1 per 400XHPF. **(1pt)** There is extensive single cell necrosis throughout the neoplasm, and mild anisokaryosis and anisocytosis. The adjacent seminiferous tubules are shrunken **(1pt)** with undulant basement membranes and lack spermatogonia **(1pt)**, with only Sertoli cells and rare giant cell spermatids remaining. Lobules of seminiferous tubules are separated by abundant edematous fibrous stroma; interstitial cells are severely atrophic **(1pt)**. Capsular lymphatics are mildly dilated.

Prostate gland: Prostatic glands are markedly dilated and lined by 3-7 layers of abruptly keratinizing squamous epithelium **(1pt)**. Glands are filled with aggregates of nucleate and anucleated squamous epithelial cells, rarely mixed with cellular debris and cholesterol clefts **(1pt)**. Glands are separated by moderate amounts of fibrous connective tissue which diffusely contains low numbers of lymphocytes and multifocally, small aggregates of low to moderate numbers of neutrophils **(1pt)**.

**MORPHOLOGIC DIAGNOSIS:** 1. Testis: Sertoli cell tumor. **(3 pt)**

2. Testis, seminiferous tubules and interstitial cells: Hypoplasia, diffuse, severe. **(1pt)**

3. Prostate: Squamous metaplasia, diffuse moderate to severe. **(2pt)**

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

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Case 2. Tissue from a cat.

**MICROSCOPIC DESCRIPTION:** Lung: Approximately half of the section demonstrates extensive coagulative parenchymal necrosis as demonstrated by diffuse lack of differential staining affect alveolar septa, airways, and vasculature. **(2pt)** Within the remainder of the section, alveolar septa are moderately expanded by variable combinations and concentrations of edema **(1pt)**, congestion, type II pneumocyte hyperplasia **(1pt)**, fibrin, neutrophils and histiocytes, as well as cellular debris, and there is multifocal septal necrosis **(1pt)**. Alveoli within these area contain variable amounts of polymerized fibrin **(1pt)**, degenerate alveolar macrophages and neutrophils, edema fluid, and cellular debris. There is multifocal alveolar emphysema, as well as collapsed alveoli. Airway epithelium is often diffusely necrotic **(1pt)** and lumens are filled with edema fluid, fibrin, and sloughed necrotic airway epithelium, as well as abundant cellular debris **(1pt)**. Necrosis often extends into submucosal glands **(1pt)** and fibrous connective tissue within the submucosa of airways as well peribronchiolar and perivascular tissue is markedly expanded by edema **(1pt)**, as well as moderate numbers of macrophages and fewer neutrophils **(1pt)** (which often fill lymphatics in these areas). Similar changes are present within intralobular septa as well as the pleura. **(1pt)** Moderate numbers of type II pneumocytes, alveolar macrophages, airway epithelium and remaining submucosal gland epithelium contain a single 2-4um eosinophilic intranuclear viral inclusions **(2pt)** which are often surrounded by a clear halo.

**MORPHOLOGIC DIAGNOSIS:** Lung: Pneumonia, bronchointerstitial, necrotizing, multifocal to coalescing with numerous intranuclear viral inclusions. **(3pt)**

**CAUSE:** Feline herpesvirus-1 **(2pt)**

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

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Case 3. Tissue from a cat.

**MICROSCOPIC DESCRIPTION:** Spleen: Effacing over 50% of the splenic white pulp **(1pt)** and extending into the surrounding red pulp are multiple coalescing nodules of lytic necrosis **(2pt)** , up to 2 mm in diameter, that are composed of abundant eosinophilic cellular and karyorrhectic necrotic debris **(1pt)** and variable amounts of eosinophilic finely beaded fibrillar material (fibrin) **(1pt)** admixed with few lymphocytes, macrophages, and erythrocytes **(1pt)**. The remaining white pulp is mildly hypocellular **(1pt)** and contains lymphocytes with pyknotic to karyorrhectic nuclei **(1pt)** and occasionally aggregated pink protein within the center of the follicle. There is diffuse mild to moderate extramedullary hematopoiesis within the red pulp **(1pt)**. Multifocally, vessels are lined by plump, reactive endothelial cells, and occasionally contains fibrin thrombi **(1pt)** and necrotic cellular debris within their lumens. Multifocally, the capsule is lined by a disordered single layer of hypertrophic mesothelial cells. **(1pt)**

**MORPHOLOGIC DIAGNOSIS:** Spleen: Splenitis, necrotizing, multifocal to coalescing, moderate to severe, with mild lymphoid depletion and thrombosis. **(3pt)**

**CAUSE:** *Francisella tularensis* **(3pt)**

Name two other affected organs: Ileum, mesenteric lymph nodes **(2pt)**

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

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Case 4. Tissue from a dog.

**MICROSCOPIC DESCRIPTION:** Subcutis and panniculus with hyperplastic ductal tissue (presumptive mammary gland) **(1pt)**: Throughout the densely fibrotic section of subcutis and panniculus **(1pt)**, there are multifocal to coalescing poorly defined granulomas **(2pt)**. These granulomas often have a central core of necrotic amorphous cellular debris **(1pt)** admixed with moderate numbers of neutrophils **(1pt)**. The necrotic cores are surrounded by lamellations of fibrous connective tissue **(1pt)** which contain moderate numbers of pleomorphic **(1pt)** epithelioid macrophages **(1pt)** ranging up to 30 um in diameter, as well as lymphocytes, plasma cells, eosinophils **(1pt)** and fewer multinucleated foreign body type macrophages **(1pt)**. Within the necrotic cores as well as engulfed by macrophages are numerous cross sections and tangential outlines of a 4-12um **(1pt)** wide, pauciseptate fungal hyphae with non-parallel walls and non-dichotomous branching. **(2pt)**. Granulomas are separated by abundant, loosely arranged edematous collagen which is infiltrated by numerous lymphocytes and macrophages, with fewer plasma cells and eosinophils. Remaining mammary ducts are lined by markedly hyperplastic epithelium.

**MORPHOLOGIC DIAGNOSIS:** Haired skin and mammary gland: Cellulitis and panniculitis, granulomatous and eosinophilic, chronic-active, diffuse, severe, with numerous fungal hyphae. **(3pt)**

**CAUSE:** *Zygomycetes sp.*, *Pythium insidiosum*, *Lagenidium sp.* a **(3 pt.)**

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