

Case 1. Tissue from a rhesus macaque

MICROSCOPIC DESCRIPTION:

Colon **(1 pt.)**: Arising in the mucosa, and transmurally infiltrating **(1 pt.)** the wall of the colon there is an unencapsulated poorly demarcated, poorly cellular, cystic **(1 pt.)** neoplasm composed of cuboidal to columnar **(1 pt.)** epithelial cells arranged in disorganized cords, nests and dilated acini **(1 pt.)** surrounded or expanded by lakes of mucin **(1 pt.)** containing small amounts of cellular debris and degenerate neutrophils. Neoplastic cells have abundant eosinophilic vacuolated cytoplasm **(1 pt.)** which often contains large apical mucus vacuoles. **(1 pt.)** which displaces the nucleus peripherally. Nuclei are irregularly round with stippled chromatin and 1-2 nucleoli **(1 pt.)**. Mitoses average 3 per 10 hpf's **(1 pt.)**. There is extensive apoptosis within neoplastic epithelium **(1 pt.)**. The mucosal surface is multifocally eroded **(1 pt.)** and replaced with a serocellular crust with incorporated food particles. Adjacent to the neoplasm, non-neoplastic glands are mildly dilated and contain sloughed epithelium admixed with abundant cellular debris (crypt abscesses). **(1 pt.)** The colonic epithelium adjacent to the neoplasm has large nuclei as well as epithelium devoid of mucous (regeneration/hyperplasia). **(1 pt.)** The lamina propria is diffusely expanded by moderate numbers of lymphocytes and plasma cells. **(1 pt.)** In infiltrated areas of the muscularis, smooth muscle fibers are expanded by small to moderate amounts of fibrous connective tissue, throughout which are scattered small to moderate aggregates of neutrophils, macrophages, and lymphocytes, with fewer plasma cells. A small lymph node within the adjacent mesocolon is mildly hyperplastic.

MORPHOLOGIC DIAGNOSIS: Colon: Mucinous **(1 pt.)** adenocarcinoma **(2 pt.)**.

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

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Case 2. Tissue from an African green monkey.

MICROSCOPIC DESCRIPTION: Jejunum: Over 90% of the submucosa, muscularis, and serosa is diffusely replaced by granulation tissue **(2 pt.)** which extends into the adjacent mesentery **(1 pt.)** , separating, surrounding, and replacing mesenteric adipose tissue. Within this granulation tissue is a focally extensive area of pyogranulomatous inflammation **(1 pt.)** , composed of variable combinations and concentrations of viable and degenerate neutrophils **(1 pt.)** admixed and often surrounded by large foamy macrophages **(1 pt.)** , and fewer lymphocytes and plasma cells, abundant cellular debris, aggregates of polymerized fibrin **(1 pt.)**, and hemorrhage **(1 pt.)** . Scattered throughout these areas are large numbers of 2-3um **(1 pt.)** intra-and extracellular bacilli **(1 pt.)** , which are widely separated by clear space. This inflammation and hemorrhage extends into the surrounding granulation tissue. Similar inflammatory changes, however, with fewer bacilli, effaces 50% of the adjacent hyperplastic **(1 pt.)** mesenteric lymph node in a multifocal to coalescing fashion, primarily within the medulla of the affected node. There are small aggregates of lymphocytes and fewer histiocytes surrounding vessels throughout the mesentery **(1 pt.)** . there are moderate numbers of lymphocytes, often in aggregates, within the overlying jejunal mucosa.

MORPHOLOGIC DIAGNOSIS: 1. Mesentery: Peritonitis, pyogranulomatous and necrotizing, focally, extensive, severe **(3 pt.)** .

2. Mesenteric lymph node: Lymphadenitis, pyogranulomatous and necrotizing, focally extensive severe, with diffuse follicular hyperplasia. **(2 pt.)**

3. Jejunum: Enteritis, lymphoplasmacytic, diffuse, mild to moderate.

CAUSE: Klebsiella pneumoniae **(2 pt.)**

O/C: (1pt)

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Case 3. Tissue from a sheep.

MICROSCOPIC DESCRIPTION: Large vessel (likely vein): The vessel wall is markedly expanded **(1pt)** up to 0.75 cm, with centripetally maturing granulation tissue **(2pt)**. At the luminal surface, blood vessels are oriented perpendicularly **(1pt)** to the vessel lumen and lined by hypertrophic endothelium. They are separated by large numbers of neutrophils **(1pt)** and lymphocytes **(1pt)**, fewer macrophages **(1pt)**, edema, multifocal hemorrhage **(1pt)** and polymerized fibrin **(1pt)** and cellular debris. These components are present in decreasing amounts with increasing distance from the vascular lumen. The vascular endothelium is absent **(1pt)**, and a large organizing vascular thrombus **(2pt)** is incorporated to the vessel wall. The thrombus is composed of abundant polymerized fibrin, with multiple lamellations **(1pt)** of hemorrhage and largely degenerate neutrophils **(1pt)** admixed with cellular debris, which meshes which is adherent to the underlying vascular wall. Scattered throughout the fibrin clot are colonies of 2-3um rod-shaped bacilli **(1pt)**. The fibrous septa separating adjacent adipose tissue is moderately edematous and contains small numbers of neutrophils with fewer lymphocytes and histiocytes. **(1pt)**

MORPHOLOGIC DIAGNOSIS: Large vein: Phlebitis **(1pt)**, chronic-active **(1pt)**, diffuse, moderate to severe, with thrombosis, abundant mural granulation tissue **(1pt)**, and multiple bacterial colonies.

(Note: If you described the thrombus first, not to worry – perfectly acceptable.)

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

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Case 4. Tissue from a dog.

MICROSCOPIC DESCRIPTION: Liver: Expanding and replacing approximately 80% of the hepatic parenchyma is a degenerate **(1 pt.)** multilocular hydatid cyst **(1 pt)** composed of irregular, intact and ruptured **(1 pt.)**, often collapsed, 5-25 mm diameter cysts surrounded and separated by bands of fibrosis **(1 pt.)** containing numerous large fibroblasts that replace hepatic parenchyma. **(1 pt)** Cysts are diffusely degenerate, often collapse, and lack differential staining **(1 pt.)**. Degenerate, ruptured cysts are often infiltrated by low to moderate numbers of viable and degenerate neutrophils **(1 pt.)** and fewer macrophages and rare eosinophils, admixed with cellular debris and variable amounts of mineral **(1 pt.)**. Occasionally, the 3µm wide hyaline capsule of daughter cysts is surrounded by a layer of epithelioid macrophages **(1 pt.)** and occasionally multinucleated giant cell macrophages **(1 pt)** and the fibrous connective tissue surrounding the cysts contains variable combinations and concentrations of lymphocytes, plasma cells, macrophages, hemorrhage, and remaining hyperplastic, compressed, or ectatic bile ducts **(1 pt)**. In the viable liver adjacent to the cyst, cords are compressed and hepatocytes are mildly atrophic **(1 pt)**. There is multifocal moderate sinusoidal congestion, dilation of sublobular lymphatics **(1 pt.)**, and hepatocytes often contain one or more small discrete vacuoles (lipid). The capsule is moderately undulant, and there is moderate loss of subcapsular hepatocytes with fibrosis. There is mild fibrosis of portal areas.

MORPHOLOGIC DIAGNOSIS: 1. Liver: Hydatid cyst, multiloculated, with multifocal granulomatous hepatitis. **(3 pt.)**

2. Liver: Atrophy, focally extensive, moderate. **(1 pt.)**

CAUSE: Echinococcus multilocularis **(2 pt.)**

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