

Case 1 – Tissue from a mouse.

**MICROSCOPIC DESCRIPTION:** Lung: Multifocally, effacing the pulmonary parenchyma, compressing and infiltrating adjacent alveoli, and elevating the pleura, **(1pt)** are several unencapsulated, well demarcated, moderately cellular neoplasms ranging up to 3mm. **(1pt)** These neoplasms are composed of epithelial cells of solid nests which fill alveoli, **(1pt)** occasionally form tubules, and extending along alveolar septa at the periphery in a lepidic growth pattern. **(1pt)** Neoplastic cells are cuboidal to columnar, have indistinct cell borders, and moderate amounts of a neosinophilic finely granular cytoplasm. **(1pt)** There are 1-2 round to oval nuclei per cell, and moderate anisocytosis and anisokaryosis. **(1pt)** The chromatin is lacy to vesicular and there is 1 variably distinct nucleolus per cell; occasional nuclei are distended by cytoplasmic vacuoles. Mitotic figures are rare. **(1pt)** There is multifocal single cell necrosis throughout the neoplasms, rare central degeneration and necrosis of neoplastic cells, and low numbers of neutrophils are scattered throughout the nodules. Adjacent alveoli contain small amounts of hemorrhage, minimally increased numbers of macrophages (some which contain eosinophilic specular material within their cytoplasm, and the alveolar septa often contains low numbers of siderophages.

Haired skin: The panniculus and skeletal muscle deep to the dermis is markedly expanded by well-delimited clear pseudocysts **(1pt)** ranging up to 600um in diameter, which separates skeletal muscle bundles and fibrous connective tissue. **(1pt)** The cysts are bounded by fibrous connective tissue, and adjacent skeletal muscle exhibits degenerative characteristics, including variation in fiber size, loss of cross striations and stain affinity (atrophy) **(1pt)**, and as well as vacuolation and swelling (degeneration). Perimysial and epimysial fibrous connective tissue is expanded by varying combinations and concentrations of neutrophils, macrophages, lymphocytes and plasma cells, as well as edema, granulation tissue and both immature and mature collagen. **(1pt)** There is multifocal acute and subacute hemorrhage **(1pt)** into pseudocysts and adjacent tissue, evidence by the multifocal presence of moderate numbers of siderophages in areas of hemorrhage.

**MORPHOLOGIC DIAGNOSIS:**

1. Lung: Pulmonary adenomas, multiple. **(3pt)**
2. Haired skin: Emphysema, diffuse, subacute, severe. **(2pt)**

**PATHOGENESIS:** Development of neoplasm in proximity to bronchus or pleura => rupture=> leakage of air =>cutaneous emphysema **(2pt)**

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

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Case 2 – Tissue from a mouse.

**MICROSCOPIC DESCRIPTION:** Uterus: Diffusely expanding the fornix and body and infiltrating and replacing the uterine wall, **(1pt)** is a 600um diameter unencapsulated, infiltrative, well-demarcated, moderately cellular, vaguely nodular neoplasm **(1pt)**. The neoplasm is arranged in short streams and bundles **(1pt)** on a fine fibrillar matrix **(1pt)**. Neoplastic cells are spindled to polygonal with indistinct cell borders and a moderate amount of finely fibrillary cytoplasm. **(1pt)** Nuclei are spindled with coarsely clumped chromatin and 1-3 nucleoli, **(1pt)** and there is mild anisokaryosis **(1pt)**. Mitotic figures are rare. **(1pt)** Scattered throughout the neoplasm are low numbers of multinucleated histiocyte-like cells **(1pt)** with up to six nuclei which are occasionally arranged in a ring-like pattern **(1pt)** which range up to 30um. There is moderate amounts of single cell necrosis within the neoplasm **(1pt)** as well as small areas of hemorrhage **(1pt)** with low numbers of siderophages. Adjacent endometrium is compressed, and distant from the tissue, glands are expanded up to 400um with an accumulation of luminal granular proteinaceous secretory material (cystic hyperplasia) **(1pt)**.

**MORPHOLOGIC DIAGNOSIS:** Uterus: Histiocytic sarcoma **(5pt)**.

**NAME TWO OTHER TISSUES THAT MAY CONTAIN TUMOR:** Liver, spleen. **(1pt)**

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

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Case 3 – Tissue from a mouse.

**MICROSCOPIC DESCRIPTION:** Liver: Multifocally and randomly (with a portal predomination) **(1pt)** replacing hepatocytes and compressing adjacent parenchyma, there are numerous coalescing up to 0.5 mm diameter granulomas **(2pt)**, often centered upon one or more schistosome eggs **(1pt)**. Eggs are 100 x 50  $\mu\text{m}$  **(1pt)**, irregularly oval, have a 2-3  $\mu\text{m}$  thick yellow-brown shell **(1pt)**, a prominent lateral spine, and contain a multinucleated miracidium **(1pt)**. Eggs are surrounded by concentric rings composed of moderate numbers of large numbers of neutrophils **(1pt)** and eosinophils **(1pt)**, surrounded in turn by numerous epithelioid macrophages **(1pt)** with fewer lymphocytes and plasma cells and occasional multinucleated giant cell macrophages **(1pt)**. These inflammatory cells are admixed with fibroblasts and moderate amounts of collagen, which in more mature granulomas forms well-defined lamellae **(1pt)**. In one area of the section, a granuloma extends into and partially occludes a sublobular vein **(1pt)**. Centrilobular veins are often markedly dilated and surrounded by numerous neutrophils and eosinophils. **(1pt)** There is extensive extramedullary hematopoiesis **(1pt)**, and Kupffer cells are diffusely activated and often contain a dark black pigment (iron pigment) **(1pt)**.

**MORPHOLOGIC DIAGNOSIS:** Liver: Hepatitis, granulomatous **(1pt)** and eosinophilic **(1pt)**, random to portal, with numerous schistosome eggs **(1pt)**.

**CAUSE:** *Schistosoma* sp. (*truly you can't really speciate them in this section.*)

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

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Case 4 – Tissue from a mouse.

**MICROSCOPIC DESCRIPTION:** Multiple sections of brain, including telencephalon, diencephalon, cerebellum, and brainstem. **(1pt.)** Affecting all levels of the brain, but most prominently in the telencephalon **(1pt.)**, deeper vessels **(1pt.)** are surrounded by numerous viable and degenerate neutrophils **(2pt.)** and rare histiocytes. Occasionally, these inflammatory cells efface the wall of these vessels which are reduced to eosinophilic debris, extruded protein, and cellular debris **(1pt.)** (vasculitis) **(2pt.)** Surrounding neuropil contains numerous degenerate neutrophils **(1pt.)** which are often in close proximity with necrotic astrocytes **(2pt.)** and/or neurons **(2pt.)**. The meninges are also expanded with low to moderate numbers of neutrophils**(1pt)**

**MORPHOLOGIC DIAGNOSIS:** Brain, multiple levels: Meningoencephalitis **(1pt.)**, necrotizing and neutrophilic **(1pt.)**, diffuse, moderate with marked neuronal and glial necrosis. **(1pt.)**

**CAUSE:** Viral is about all you can say here, but say a virus that causes brain lesions in mice. This one was Zika – the pathology is characteristic, but there hasn't been much in the literature yet. **(2pt.)**

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