

Case 1. Tissue from a rhesus macaque.

MICROSCOPIC DESCRIPTION: Esophagus: There is multifocal loss of the mucosal lining (**1 pt**). In these areas, the denuded subepithelial fibrous connective tissue is infiltrated and occasionally expanded (**1 pt**) by moderate to large numbers of neutrophils (**1 pt**) and rare histiocytes which are admixed with cellular debris. This infiltrate extends through the muscularis mucosae into the underlying edematous (**1 pt**) submucosa and downward through the muscularis into the serosa (**2 pt**). Within the remaining mucosa, and multifocally and randomly scattered throughout the submucosal fibrous connective tissue, there are low to moderate numbers of oblong yeasts (**2 pt**) which measure 3 X 6µm (**1 pt**) with a clear nucleus, and occasionally form short pseudohyphae (**1 pt**).

MORPHOLOGIC DIAGNOSIS: Esophagus: Esophagitis, ulcerative and neutrophilic, with moderate numbers of extracellular yeasts and pseudohyphae. (**4 pt**)

CAUSE: *Candida albicans* (**3 pt**)

NAME A PREDISPOSING CONDITION: Previous antibiotic therapy or immunosuppression as a result of SIV/AIDS infection or radiation. (**2 pt**)

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

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Case 2. Tissue from a rhesus macaque.

(NOTE: Please read the following description with a grain of salt. I RARELY Look at bone marrow cores.)

MICROSCOPIC DESCRIPTION: Bone marrow (**1 pt**): The bone marrow is diffusely and moderately hypercellular (**2 pt**) with adequate amounts of marrow fat (**2 pt**) and iron stores (**2 pt**) in the form of brown hemosiderin granules. Representative cells of erythrocytic and myelocytic lines are present (**1 pt**), although erythroid cells outnumber myeloid cells by a 3:1 margin (**2 pt**), and distinct islands of erythroid cells are lacking. Numerous cells of erythroid lineage (**1 pt**) contain large intranuclear viral inclusions (**2 pt**) which expand the nucleus. The viral inclusions range from a smudgy amphophilic inclusion to a granular eosinophilic inclusion which is surrounded by a clear halo (**1 pt**) chromatin is peripheralized in all nuclei with inclusions, forming a dark and uneven ring around the nuclear membrane.

MORPHOLOGIC DIAGNOSIS: 1. Bone marrow: Erythrocytic hyperplasia, diffuse, moderate. (**2 pt**)

2. Bone marrow, erythrocytic precursors: Intranuclear viral inclusions, numerous. (**3pt**)

CAUSE: Simian parvovirus (**2 pt**)

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

Case 3. Tissue from a calf.

MICROSCOPIC DESCRIPTION: Middle and inner ear **(1 pt)**with mastoid bone: There is a proliferative and necrotizing process which affects the middle and inner ear, as well as expanding the tympanic cavity and encroaching on the adjacent mastoid bone. Within the tympanic cavity, there is a large, inflammatory polyp **(1 pt)** which is lined by multiple layers of squamous epithelium **(1 pt)** surrounding a core of heavily vascularized granulation tissue **(1 pt)**. The granulation tissue contains variably sized (up to 0.8 cm) wide areas of pyogranulomatous inflammation centered on cores of innumerable degenerate neutrophils **(1 pt)** admixed with cellular debris and small foci of mineral, which are in turn surrounded by large numbers of epithelioid macrophages **(1 pt)**. There is metaplastic change of the epithelial lining of the tympanic cavity, which is now lined by pseudostratified and ciliated epithelium with multifocal goblet cells **(1pt)**. The subepithelial tissue of the tympanic cavity is expanded **(1 pt)** by a similar accumulation of lytic necrosis and neutrophil-laden granulation tissue, which is resulting in remodeling **(1 pt)** of the adjacent mastoid bone. While the majority of the bony surfaces are undergoing resorption, there are multiple small areas of proliferation of woven bone. The inflammatory tissue extends upward and compresses the vestibular nerve. The vestibular system **(1 pt)** is filled by large numbers of degenerate neutrophils **(1 pt)** and polymerized fibrin **(1 pt)** with loss of the spiral lamina, necrosis of the spiral limbus, tentorial membrane, stria vascularis, and degeneration of neurons within the spiral ganglia.

MORPHOLOGIC DIAGNOSIS: 1. Middle and inner ear: Otitis media and labyrinthitis, necrosuppurative, chronic, diffuse, severe, with osteolysis of the mastoid bone. **(3 pt)**

2. Tympanic cavity: Inflammatory polyp. **(1pt)**

CAUSE: *Mycoplasma bovis* **(2 pt)**

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

Case 4. Tissue from a mouse.

MICROSCOPIC DESCRIPTION: Cross section of head at level of diencephalon **(1 pt)**: Unilaterally effacing the external ear canal, extending into and largely effacing the tympanic cavity and middle ear extending in to the cranium, are innumerable degenerate neutrophils **(1 pt)** and fewer macrophages which are admixed with abundant cellular debris edema, and fibrin (lytic necrosis) **(1 pt)**. Multifocally and primarily at the edges of necrosis, a few large macrophages **(1 pt)** contain 2-3um bacilli **(1 pt)** within their cytoplasm. The inflammatory infiltrate results in almost total resorption of the tympanic bulla and temporal bone on one side **(1 pt)**. It fills the tympanic cavity **(1 pt)**, which is lined by metaplastic columnar ciliated epithelium **(1 pt)** and infiltrates the ulcerated epithelium to the subepithelial tissue, surrounding and resorbing underlying bone. The eardrum and ossicles of the middle ear are lysed. Within the cochlea, the scala tympani and scala vestibuli contain low to moderate numbers of viable and degenerate neutrophils, proteinaceous fluid, and cellular debris **(1 pt)**. There is multifocal necrosis of cells within the spiral ligament and spiral ganglion. Semicircular canals appear unaffected. Inflammation progresses along and multifocal infiltrates the vestibular nerve **(1 pt)** and ganglion, and results in necrosis of the thalamus and approximately 30% of the cerebral hemisphere **(1 pt)**. The midline of the cerebrum is displaced laterally. The inflammatory process also infiltrates skeletal muscle **(1 pt)**, resulting in fiber hyalinization, fragmentation, and necrosis, and results in resorption of underlying cranial bone **(1 pt)**. There is moderate myeloid hyperplasia of intracranial bone marrow **(1 pt)**.

MORPHOLOGIC DIAGNOSIS: Cross section of head at level of diencephalon: Otitis externa, media, and labyrinthitis, neuritis, myositis, and osteomyelitis, necrosuppurative, focally extensive and unilateral, severe, with numerous intra- and extracellular bacilli. **(3pt)**

CAUSE: *Burkholderia sepaciae* (*Mycoplasma pulmonis*, *Pasteurella pneumotropica* probably more common and acceptable as well – although you wouldn't see *M. pulmonis* histologically) **(2 pt.)**

O/C: (1pt)

