

Case 1. Tissue from a foal

MICROSCOPIC DESCRIPTION: Small intestine **(1pt.)**. There is diffuse coagulative **(1pt.)** necrosis **(1pt.)** of the intestinal mucosa, characterized by loss of differential staining and retention of the cellular architecture, which includes the muscularis mucosae and multifocally extends down into the submucosa **(1pt.)**. 1-2 x 3-7um bacilli line the remnants of villi and crypts. **(2pt.)** Along much of the length of the section, the superficial submucosa is expanded by a linear band of necrotic debris **(1pt.)**, and in deeper, still vital, areas, there is marked edema, **(1pt.)** multifocal hemorrhage, and an infiltrate of moderate numbers of viable and degenerate neutrophils **(1pt.)**, admixed with lesser concentrations of debris. Submucosal vessels are dilated and congested, and often contain occlusive fibrin thrombi. **(1pt.)** Multifocally, the tunica intima and media of small and medium sized blood vessels are expanded and disrupted by fibrin, edema, karyorrhectic debris and hemorrhage (vasculitis) **(1pt.)**, Submucosal lymphatics are often markedly dilated. **(1pt.)** There are individual and aggregated areas of clear space within the submucosal connective tissue (emphysema). **(1pt.)** Edema and hemorrhage extends into the tunica muscularis, serosa, and adjacent mesentery.

MORPHOLOGIC DIAGNOSIS: Small intestine: Enteritis, necrohemorrhagic **(1pt.)**, diffuse, severe, with marked edema, emphysema **(1pt.)** vasculitis and fibrin thrombi **(1pt.)**.

CAUSE: *C. perfringens type C* or *Clostridium difficile* **(3 pt.)**

O/C: (1pt)

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Case 2. Tissue from a dog.

(NOTE: There is mild autolysis in this slide.)

MICROSCOPIC DESCRIPTION: Colon: There is diffuse necrosis **(2pt.)** of the superficial 1/3-1/2 of the mucosa **(1pt.)** which is characterized by loss of surface epithelium **(1pt.)**. Epithelial necrosis extends down into colonic glands. Remnants of necrotic lamina propria elements are characterized by maintenance of structure and loss of differential staining (coagulative necrosis) **(1pt.)**. Large numbers of robust 1 x 3 bacilli are adherent to the necrotic mucosa **(2pt.)**. There is a minimal infiltrate of viable and degenerate neutrophils **(2pt.)** within the areas of necrosis. There is multifocal hemorrhage **(2pt.)** which is most prominent at the interface of the necrotic and viable mucosa, and scattered hemorrhage within the necrotic mucosa. Necrotic glands often contain moderate amounts of fibrillar mucin. There is multifocal mild submucosa hemorrhage and low numbers of neutrophils. **(1pt.)**

DIAGNOSIS: Colon: Colitis, necrohemorrhagic, **(2pt.)**, diffuse, moderate with submucosal fibrin thrombi. **(2pt.)**

NAME THE CONDITION: Canine hemorrhagic gastroenteritis **(2pt.)**

CAUSE: *Clostridium perfringens* type A **(1pt.)**

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

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Case 3. Tissue from a calf.

MICROSCOPIC DESCRIPTION: Abomasum **(1pt)**: The submucosa is markedly expanded **(1pt)** up to ½ centimeter by large clear spaces (emphysema) **(1pt)**, which occasionally contain variable amounts of cellular debris, viable and degenerate neutrophils **(1pt)**, fibrin, and hemorrhage. The intervening submucosal connective tissue contains innumerable viable and degenerating neutrophils, cellular debris, edema **(1pt)**, hemorrhage, and polymerized fibrin **(1pt)**. Lymphatics are markedly dilated. In the overlying mucosa, there are multifocal to coalescing areas of both coagulative and lytic necrosis **(1pt)** which often traverse the muscularis mucosa into the underlying submucosa. Within these areas, glands are effaced by large numbers of degenerate neutrophils admixed with fibrin, hemorrhage, and abundant cellular debris. Visible within areas of coagulative necrosis, there are low numbers of clustered tetrad **(1pt)** packets of 2-3 μ cuboidal bacilli. **(1pt)** Additionally, there are large colonies of 1-2 μ coccobacilli **(1pt)** scattered throughout necrotic areas, as well as abundant cellular debris and embedded plant material. There is multifocal hemorrhage throughout the adjacent mucosa, and infiltration of low to moderate numbers of neutrophils. Edema and moderate to large numbers of neutrophils expand the connective tissue of the muscularis and serosa. **(1pt)** The serosa is covered by a thick matter polymerized fibrin and abundant viable and degenerate neutrophils admixed with cellular debris. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Abomasum: Abomasitis, necrosuppurative **(2pt)**, transmural, **(1pt)** diffuse, severe, with marked submucosal emphysema **(1pt)** and edema, and numerous mucosal bacterial tetrads **(1pt)** and colonies of robust bacilli.

CAUSE: *Sarcina ventriculi*. Also likely clostridium perfringens **(3pt)**

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

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Case 4. Tissue from an ox.

MICROSCOPIC DESCRIPTION: Colon **(1pt.)**: There is diffuse and severe loss of colonic glands **(1pt.)**. There is necrosis **(1pt.)** of the luminal epithelium which extends down into the colonic glands **(1pt.)**. Remaining colonic glands are often devoid of epithelium **(1pt.)**, dilated **(1pt.)**, and contain sloughed epithelial cells, occasional neutrophils, and cellular debris **(1pt.)** (crypt abscesses) **(1pt.)**. The lamina propria separating remaining glands is expanded by large numbers of neutrophils **(1pt.)**, histiocytes, **(1pt.)**lymphocytes, and rare preexistent plasma cells. There are numerous mitotic figures within remaining glands (hyperplasia) **(2pt.)**. There is multifocal moderate hemorrhage **(1pt.)** throughout the section, primarily in deeper reaches of the mucosa. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Colon: Colitis, necrotizing **(1pt.) (1pt.)**, diffuse, severe, with marked loss of glands **(1pt.)** and numerous crypt abscesses. **(1pt.)**

CAUSE: Bovine coronavirus **(2pt.)**

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