Diagnostic Exercise
From the CL Davis/ Foundation

Case #: 144  Month: May  Year: 2020

Answer Sheet

Title: Equine salmonellosis

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Clinical History: A 14-year-old Warmblood gelding was admitted to the hospital with a 4-day history of colic and dehydration. The horse was treated with intravenous fluids, gentamicin and flunixin meglumine, but died soon after.

Follow up Questions: Gross and microscopic description, morphologic diagnosis (gross and microscopic), and three possible etiologies.

Figure 1
**Gross Description:** The small intestinal mucosa is diffusely yellowish, dull and multifocally covered by a thin fibrinonecrotic pseudomembrane. The wall of the intestine is thickened and edematous.

**Morphologic Diagnosis:** Enteritis, fibrino-necrotizing, diffuse, severe.

![Microscopic Description](image)

**Microscopic Description:** Small intestine: There is diffuse necrosis of the superficial mucosa characterized by loss of differential staining but retention of the architecture of the mucosal epithelium and lamina propria, with villous blunting and fusion. The submucosa is expanded by edema and fibrin, the vessels are markedly congested, and the lymphatics are dilated. The lamina propria and submucosa are densely infiltrated by predominantly large number of lymphocytes and plasma cells, and fewer neutrophils, eosinophils and macrophages.

**Morphologic Diagnosis:** Enteritis, fibrino-necrotizing, diffuse, severe.

**Possible Etiologies:** *Salmonella* sp., *Clostridium difficile*, *Clostridium perfringens* type C (less likely as this is an adult horse).

**Etiology in this case:** *Salmonella enterica* serovar Oranienburg was cultured.
The genus *Salmonella* is comprised of 2 species: *Salmonella bongori* and *Salmonella enterica*. Currently, 6 subspecies of *S. enterica* are described, i.e.: *enterica, salamae, arizonae, diarizonae, indica, and houtenae*. Furthermore, more than 2,400 antigenically distinct serotypes or serovars exist. Salmonellosis in horses is most frequently associated with *Salmonella enterica* ssp. *enterica* serovar Typhimurium, although other serovars may be associated with sporadic cases of disease. Diarrhea and fever are the main clinical signs of equine salmonellosis and the pathogenesis consists of several stages: entry of the bacteria into the host and establishing the primary site of infection (usually the enterocyte), attachment to the surface (colonization), and invasion of enterocytes. The subsequent mucosal inflammation leads to the accumulation of inflammatory mediators, such as prostaglandin E2, capable of causing hypersecretion of chloride by enterocytes and consequent passive osmotic movement of water into the lumen. Loss of enterocytes, dying as a sequela to *Salmonella* invasion and neutrophil-induced tissue injury, results in reduction of the absorptive surface area. The gross lesions of the enteric form of salmonellosis are very similar to those produced by other bacteria causing enterocolitis, such as *Clostridium perfringens* type C and *Clostridium difficile*.

**References:**


The Diagnostic Exercises are an initiative of the **Latin Comparative Pathology Group** (LCPG), the Latin American subdivision of The Davis-Thompson Foundation. These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the CL Davis website [http://www.cldavis.org/diagnostic_exercises.html](http://www.cldavis.org/diagnostic_exercises.html) Editorial Committee.

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