

Latin Comparative Pathology Group

The Latin Subdivision of the CL Davis Foundation

Diagnostic Exercise

Case #: 9 Month: May Year: 2011

Answer Sheet

Diagnosis:

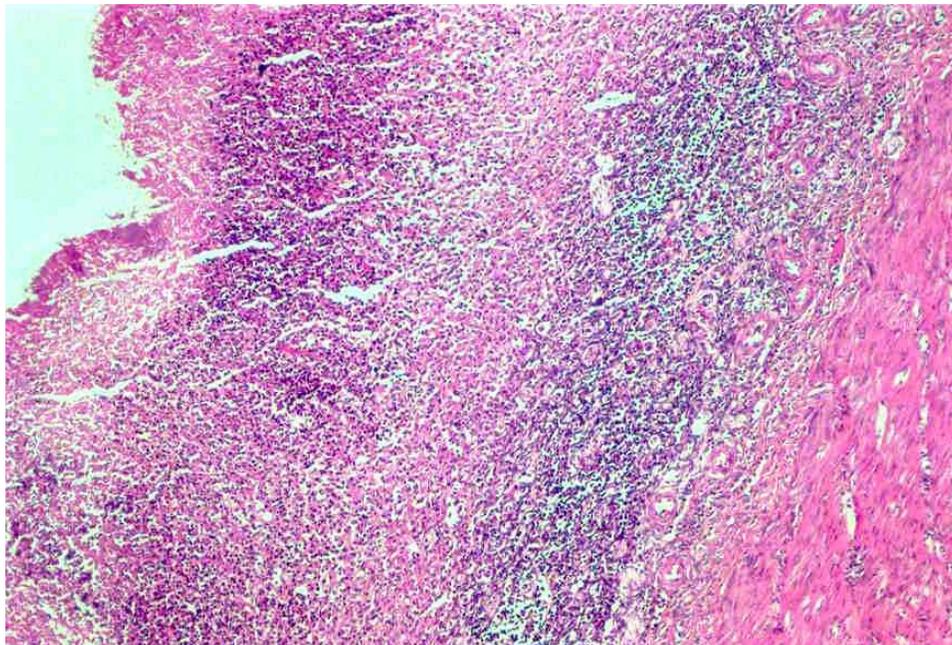
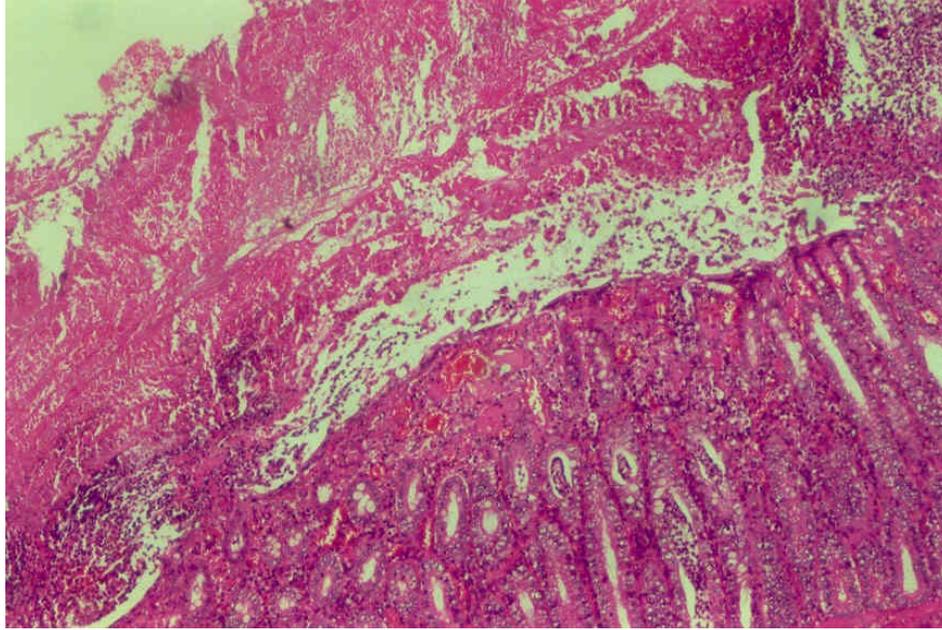
Morphologic Diagnosis:

Intestines: Diffuse chronic fibrinonecrotizing transmural and circumferential enterocolitis



Gross findings: Intestinal lesions were observed mainly in the large intestine. Lesions were similar among animals, but differed regarding severity. Most of the lesions in the large intestine were observed in the cecum and spiral colon with multifocal to diffuse areas of subacute fibrinonecrotic (diphtheric) or chronic necrotizing transmural and circumferential colitis. Five younger pigs showed marked transmural necrotizing enteritis in the jejunum, ileum, cecum and colon. Acutely infected animals had linear, circular or even diffuse areas of necrotic mucosa with yellowish friable material forming a diphtheric membrane firmly adhered to the intestinal wall. Two eight-month-old animals had circular ulcers, ranging between 0.5 and 2.0 cm in diameter, in the cecum. Tubular casts of fibrin and necrotic material were seldom observed in the lumen of the large intestine.

Microscopic findings: Histologically, there was superficial necrosis of the mucosa with fibrinonecrotic membrane in acute and subacute cases. In some samples, the mucosa and submucosa were deeply affected with necrosis of lymphoid nodules, and fibrinoid degeneration and necrosis of blood vessel with thrombosis. In more chronic lesions, moderate infiltration of macrophages, lymphocytes and plasma cells were observed in the lamina propria and submucosa. Intestinal glands in the mucosa and lymphoid nodules in the submucosa were replaced by necrotic debris and extensive fibrosis.



Discussion:

Salmonella enterica was isolated from two samples of affected areas of the large intestine submitted for microbiology analysis. Determination of this strain performed at the Oswaldo Cruz Institute showed it to be the Saintpaul serovar. There was no isolation of pathogenic bacteria from spleen, mesenteric lymph nodes, liver and lung submitted for bacteriology. According to Barker et al. (1993) and Schwartz (1999), bacteria do not usually spread to mesenteric lymph nodes in cases of enteric form of salmonellosis, and the

inflammation is restricted to the intestine. The serovar Saintpaul infection and isolation have been reported in several animals' species such as humans (Taylor et al., 2000), camels (Wernery, 1992), horses (Hird et al., 1984), sheep (McInnes, 1971) and turkeys (Baggesen et al., 1996). Langenegger et al. (1983) have identified the Saintpaul serovar in Brazil and other Latin-American countries in 2.08% of the isolated *Salmonella* serovars. However, these reports were based on isolation and typification only, with no characterization of lesions.

Sections of affected areas of small and large intestines were stained by immunohistochemistry using monoclonal antibody specific for *Brachyspira* species (Fisher et al., 1997) or polyclonal antibody specific for *Lawsonia intracellularis* (Guedes and Gebhart 2003). DNA was extracted from three 5 µm sections of four different paraffin blocks with intestinal lesions representative of those describe above. The primers used were targeting *Clostridium perfringens* type C toxin genes (Buogo et al., 1995). All PCR and immunohistochemistry results were negative for the tested samples. Based on these results, it seemed unlikely that these enteropathogenic agents were involved in the pathologic process.

Poultry and other wild small birds are possible sources of *Salmonella* infections for humans and other domestic animal species. Epidemiological investigations have shown the presence of *S. enterica* serovar Saintpaul in poultry and other wild bird species (Irwin et al., 1994, Reche et al., 2003). The serovar Saintpaul has been reported in humans with no clinical signs of diarrhea (Ferreira et al., 1984, Leal et al., 1987) and also in clinical cases when the water was the source of infection (Baggesen et al., 1996). It was not possible to determine the source of infection in this present case. However, the introduction of wild boar originated from a farm that used them in sow (*Sus scrofa*) and the timing of the outbreak in the wild pig farm, just after their arrival, is suggestive that these wild boars had been carriers and introduced the bacteria in the wild pig farm. The carrier condition is very common in pigs infected with *Salmonella*, and the bacteria can be shed in the feces, mainly when these animals are stressed, in cases of transport for instance (Barker et al., 1993, Schwartz, 1999).

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