Diagnostic Exercise

From The Davis-Thompson Foundation*

Case #: **176**; Month: **November**; Year: **2021**

Answer sheet

Title: *multifocal to coalescent chronic, fibrosing, proliferative and necrotizing peritonitis in a cow*

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Clinical History: An 11-year-old, Nelore cow (*Bos indicus*) presented apathy, anorexia, and dry feces. The cow went through follicular aspiration 18 previous to death. Abdominocentesis revealed 15ml of turbid yellow foul-smelling fluid, which yielded the following lab results: protein: 4.7 g/dL (Ref. 1.2-6.3 g/dL), 2.300/µL of nucleated cell count (Ref. 2.000-5.000 cells/ µL)(Dirksen, 1993) with approximately 85% of neutrophils plus mesothelial cells and bacteria. Due to poor prognosis, the owner opted for euthanasia.

Necropsy findings: There was abundant fibrinous exudate (Figure 1)in the abdominal cavity, predominantly at the ventral portion. This exudate was focally extensively adhered on parietal peritoneum, hepatic capsule, and serosa of the gastrointestinal serosa, with a moderate amount of free blood-tinged fluid. Throughout the surface of the omentum there was multifocal to coalescent red and firm, well-demarcated, digitiform to multilobulated nodules. The size of the nodules was 1-5cm in diameter, and their cut surface was homogeneously red.
In the rectal mucosa, there was a well-defined 5x3cm focal depression with slightly elevated borders. The longitudinal cut section revealed a
focally extensive transmural fissure.

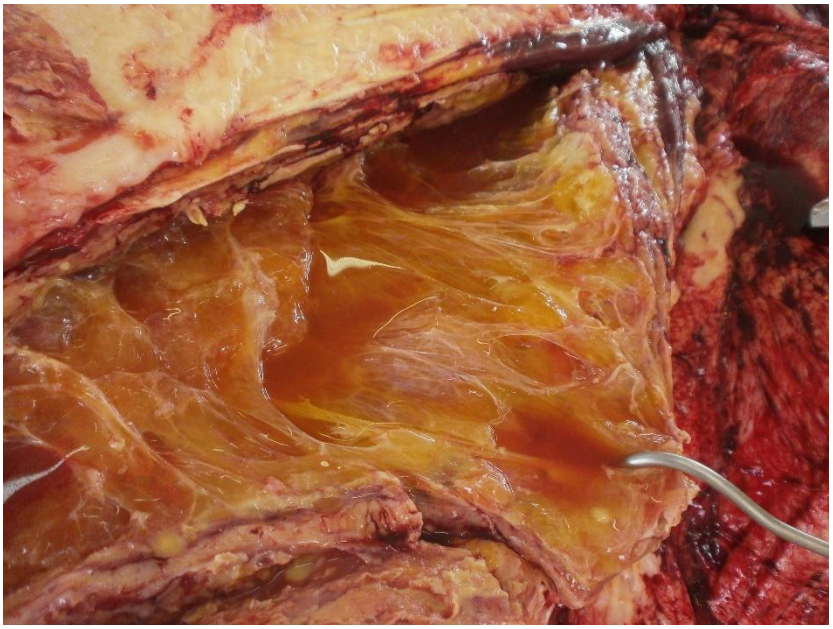

Figure 1. Abdominal cavity. Abundant fibrinous exudate

Figure 2. Omentum. Throughout the surface of the omentum there was multifocal to coalescent red and firm, well-demarcated, digitiform to multilobulated nodules.

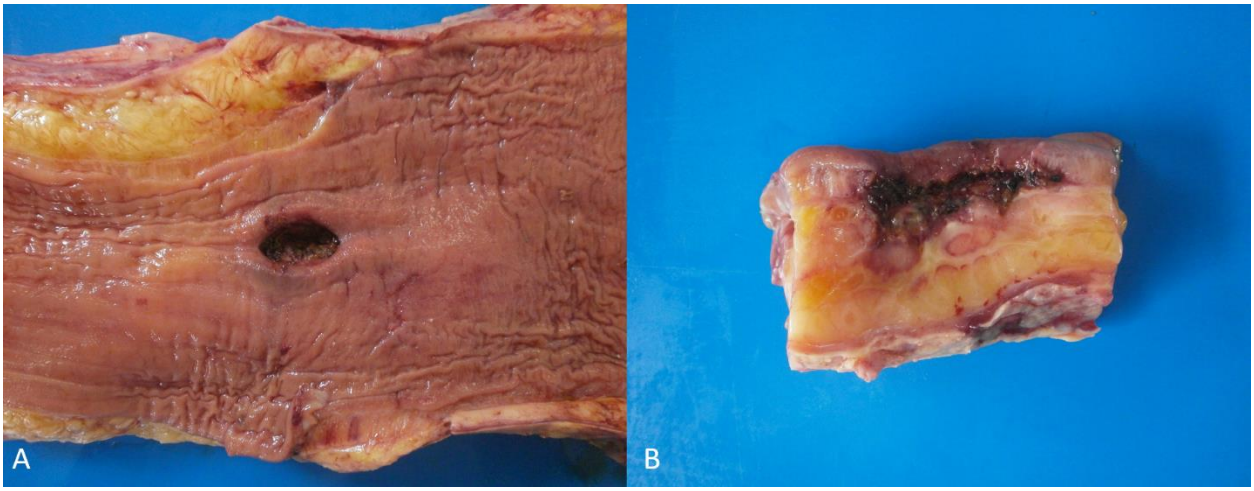

Figure 3. Rectal mucosa. **A.** There is a well-defined 5x3cm focal depression with slightly elevated borders. **B.** The longitudinal cut section reveals a focally extensive transmural area where normal tissue is absent, and there are abundant adipose tissue adhesions

Histopathololgy (peritoneum)

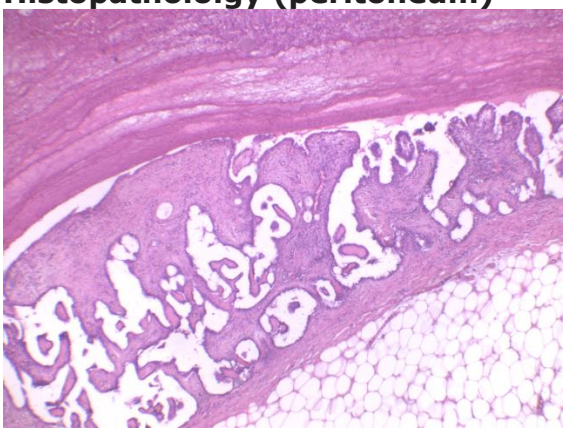

Figure 4.

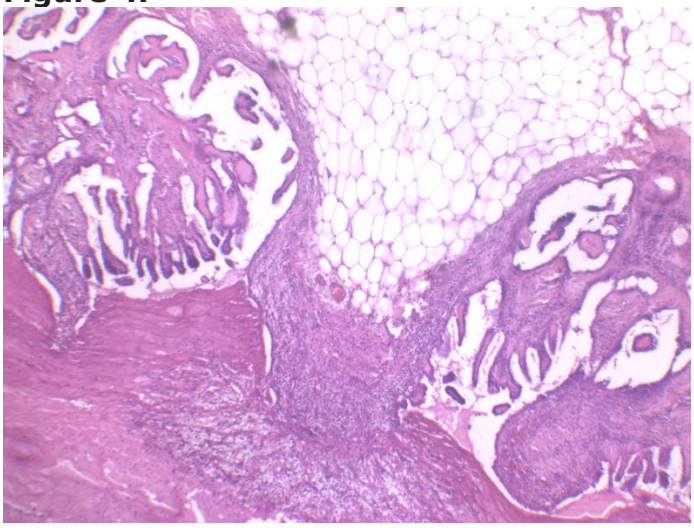

Figure 5.

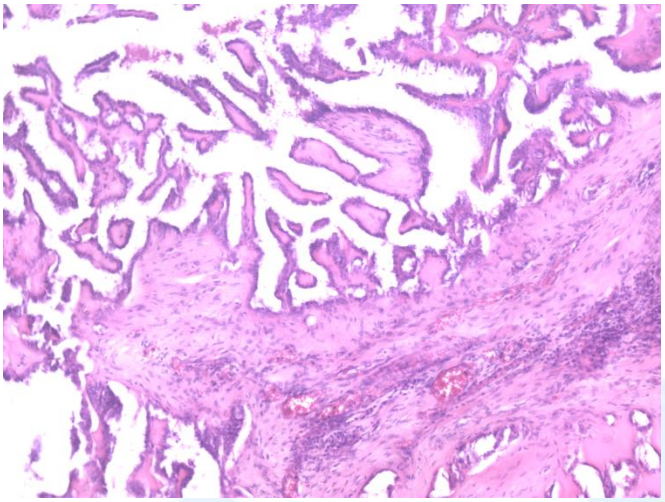

Figure 6.

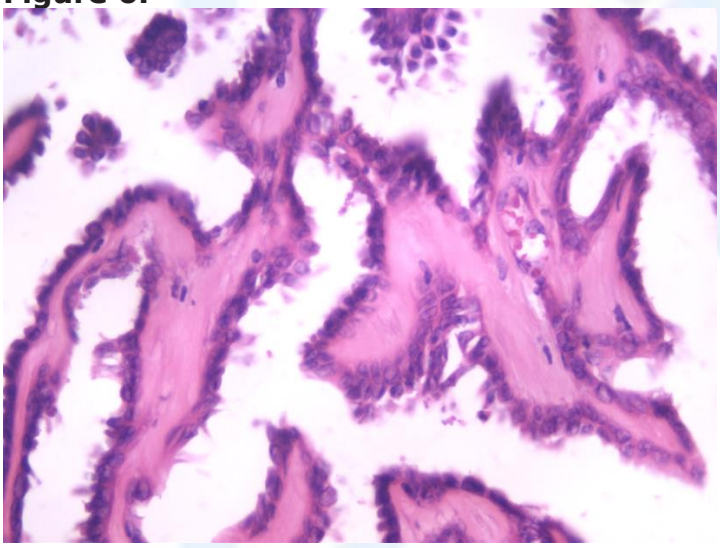

Figure 7. 100x. H&E.

Follow-Up Questions:
1) Give three morphologic diagnosis
2) Give three macroscopic differential diagnosis

Microscopy:
Omentum: severe, multifocal to coalescing thickening with exophytic growth in mesothelial surface due moderate fibroblastic proliferation. Those cells are among abundant dense and poorly vascular collagen matrix with scarce areas of intense eosinophilia (sclerosis). At superficial portions, severe mesothelial cells hyperplasia, resulting in multiple papillary projections, frequently piled up, and occasional arrangements similar to acini surrounded by collagen. Focal areas of severe necrosis with cellular debris, neutrophilic infiltration, and abundant fibrin diffusely cover proliferated mesothelial cells' foci.

1) Three morphologic diagnoses:
Omentum: multifocal to coalescent chronic, fibrosing and proliferative peritonitis with multifocal mild necrosis.

Peritoneum: diffuse severe fibrinous peritonitis.
Rectum: perfurative subacute focal and severe proctitis.

2) Three macroscopic Diferential diagnosis:
a. Mesothelioma
b. Multifocal granulomatous inflammation (e.g tuberculosis, actinobacillosis)
c. Carcinomatosis

Comments
Here we have a bovine with peritonitis due a rectal perforation. In fact, vegetal cells were observed microscopically in rectal perforation up to duodenal serosa and the result was a chronic peritonits with mesothelial proliferation and a unique microscopic feature as seen in figures 5 and 6.
In cattle, acute fibrinopurulent peritonitis is a common consequence of viscera perforation - as gastrointestinal tract, and may progress to granulation tissue (Uzal *et.* al. 2016). Peritonial adhesions and fibrosis implies poor prognosis and the course may evolve for several weeks (Constable; Hinchcliff; Grünberg, 2017).
Peritonitis chronicity is estimated by thickness of granulation tissue above the serosa and microscopic findings as: fibroblasts differentiation degree and mesothelial cells on the lesion surface (Uzal *et.* al. 2016). In our case, a 18 days of peritonitis was chronic enough to make early granulation tissue in dense fibrosis - and sclerosis; additionally to abundant mesothelial cells hyperplasia.

References:
Constable P.D., Hinchcliff K.W., Done S.H., Grünberg W. 2017. Diseases of the peritoneum. p. 215-217 In: Ibid (Eds.) Veterinary Medicine: A Textbook of the diseases of cattle, Horses, Sheep, Pigs, and Goats. 11th ed. Elsevier, St. Louis.
Dirksen G. 1993.Sistema Digestivo, p. 223-237. In: Rosenberger (Ed.) Exame Clínico dos Bovinos.3rd ed. Guanabara Koogan.
Uzal F.A., Plattner B.L., Hostetter J.M. 2016. Peritoneum and retroperitoneum, p. 244-257. In: Jubb, Kennedy and Palmer's Pathology of Domestic Animals. Vol. 2. 6th ed. St. Elsevier, Louis.

*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).

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