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Diagnostic Exercise
From the Latin Comparative Pathology Group and the Davis-Thompson Foundation

Acute colic secondary to sand enteropathy (sablosis) in a horse

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History: A 24–year-old Stockhorse gelding presented for veterinary assessment after developing profuse watery diarrhea. The horse presented with a distended abdomen, decreased gut sounds on both quadrants on the left-hand side, absent gut sounds on the right-hand side and was hypothermic (36.8°C) with a heart rate of 44 bpm. The horse was drenched with water, paraffin oil and electrolytes via a nasogastric tube. No net reflux was obtained. Despite the administration of pain relief and sedation, the gelding's heart rate continued to increase to 68 bpm. The gelding was transported to a referral service but died upon arrival.

Follow-Up Questions:

- *Gross descriptions.*
- *Histopathological descriptions*.
- *Morphologic diagnosis*.

ANSWERS

Gross description:

Focally located in the jejunum is a collection of approx. 2 mL of gritty material (sand; foreign body ingestion). The caecum contains approx. 8 L approx. of 90% well-masticated, green fibrous organic material and yellow grain fragments and about 10% sand; the latter found only at the apex. The right dorsal colonic mucosa is diffusely discoloured dark green and contains approx. 8 L of 70% watery green fluid admixed with well-masticated, green fibrous organic material and yellow grain fragments, ca. 30% sand and tens of up to 5 mm in diameter, black, hard, irregularly shaped stones (colitis, intraluminal foreign body material) (Fig. 1).

**The Diagnostic Exercises are an initiative of the Latin Comparative Pathology Group (LCPG), the Latin American subdivision of The Davis-Thompson Foundation and published in cooperation with the Brazilian Journal of Veterinary Pathology. 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: https://davisthompsonfoundation.org/diagnostic-exercise/*

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Histological description:

Right dorsal colon (Figs. 2 and 3): In one section, infiltrating and separating the muscularis mucosa fibres and extending into the lamina propria is a moderate infiltrate of primarily lymphocytes, plasma cells and eosinophils (lymphoplasmacytic colitis). Multifocally scattered throughout the submucosa and often abutting the muscularis mucosa are tens of macrophages containing intracytoplasmic brown and often refractile, irregular-shaped particles (putative sand silicates).

Jejunum (Fig. 4): Multifocally within the submucosa are tens of foamy macrophages containing particles similar to that described in the colon (intramural submucosal histiocytosis).

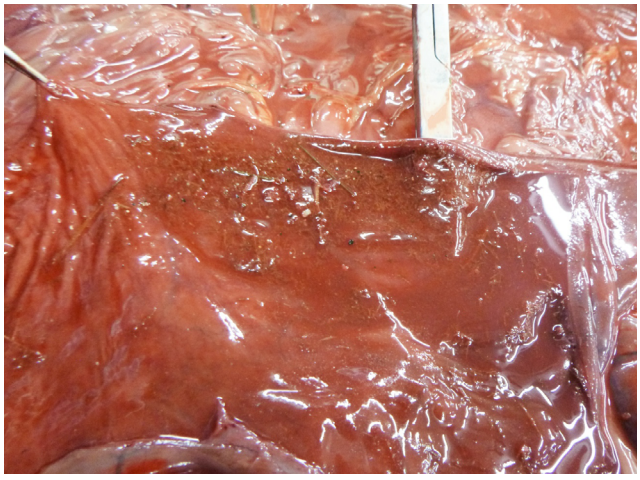

Figure 1. The right dorsal colonic mucosal surface is segmentally covered with sand particles (white arrows) and tens of up to 5 mm in diameter, black, hard, irregularly shaped stones.

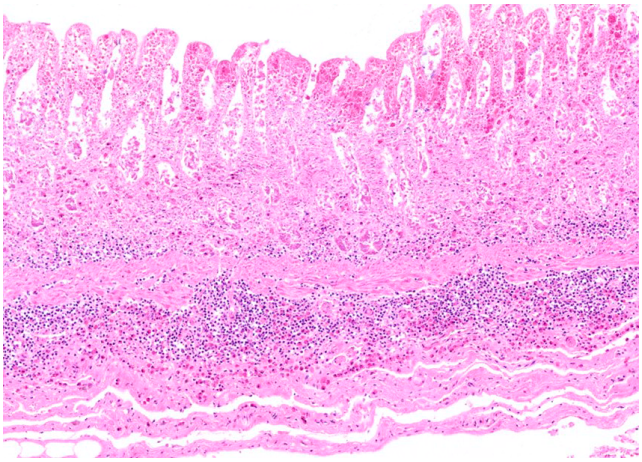

Figure 2. Right dorsal colon, H&E: Low power micrograph of colon demonstrating a moderate inflammatory infiltrate of lymphocytes, plasma cells, eosinophils and macrophages.

Morphologic diagnosis:

1. Right dorsal colon: Colitis, lymphoplasmacytic, chronic, segmental, mild. Intramural submucosal histiocytosis, subacute, segmental, mild with intrahistiocytic particles (putative sand silicates)
2. Jejunum: Histiocytosis, intramural, submucosal, subacute, segmental, mild with intracytoplasmic brown to refractile particles (putative sand silicates)

Final Diagnosis: Acute colic secondary to sand enteropathy (sablosis)

Comments:

The cause of death in this horse is an acute colic secondary to sand enteropathy based on findings of significant quantities of sand in various segments of the gastrointestinal

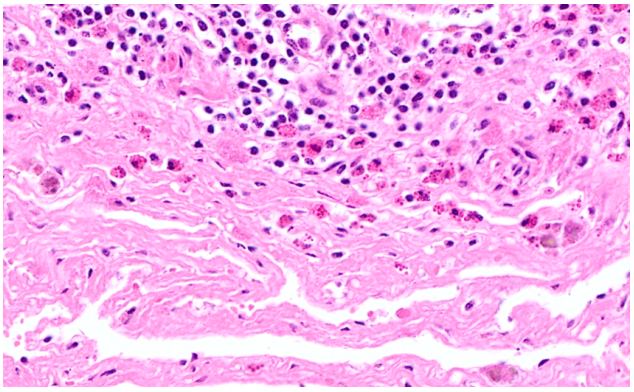

Figure 3. Right dorsal colon, submucosa, H&E. Multifocally scattered throughout the submucosa and often abutting the muscularis mucosa are tens of macrophages containing intracytoplasmic brown and often refractile, irregular-shaped particles (black arrows).

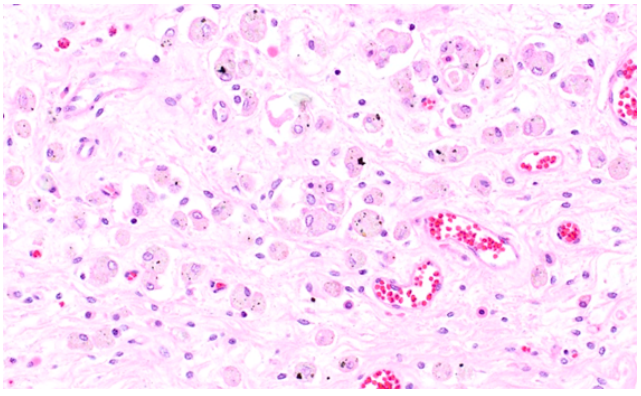

Figure 4. Jejunum, H&E. Hundreds of foamy macrophages containing similar intracytoplasmic material as seen in the colon infiltrate the jejunal submucosa.

tract (GIT). Horses with sand colic, also known as 'sablosis', present with clinical signs typical of colic, such as tachycardia, diarrhoea and abdominal distention (1, 2), as was seen in this case. As no impaction was identified through the assessment of GIT, the primary mechanism of death in this animal is a bacterial toxaemia. Sand acts as an irritant to the mucosa and can result in alterations to GIT motility. Once ingested, sand particles either accumulate or are passed through faeces, and it has been suggested that in horses where sand accumulates, its weight impedes the normal peristaltic movements of the colon (2), inhibiting appropriate mixing of content, disrupting normal fermentation and ultimately resulting in a dysbiosis and an accumulation of bacterial toxins which gains access to systemic circulation through the compromised mucosa. Horses can ingest sand accidentally or voluntarily, the latter a behavior known as geophagia (3). While geophagia in horses is poorly understood, horses at risk of accidental sand ingestion include horses that have a lower position within the herd hierarchy or are on sand pasture (3). Interestingly in this case, numerous macrophages that have phagocytised brown and refractile particles, primarily in the jejunum and colonic mucosal was observed, likely secondary to sand silicate or dirt ingestion.

References:

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