

Latin Comparative Pathology Group

The Latin Subdivision of the CL Davis Foundation

Diagnostic Exercise

Case #: 5 Month: January Year: 2011

Answer Sheet

Diagnosis:

Morphologic Diagnosis: Diffuse subacute necrotizing, fibrinohemorrhagic, and emphysematous abomasitis

Two possible causes: *Sarcina ventriculi* (this case), *Clostridium perfringens*, type A

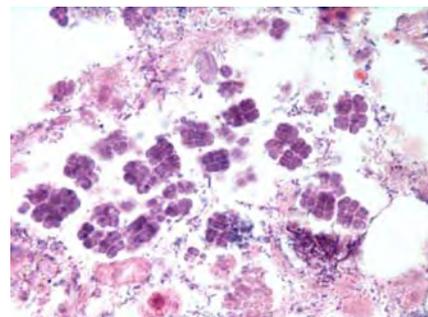
Typical Gross findings:

- Abdominal bloat
- Emphysema and edema of the abomasal wall
- Mucosal hyperemia and hemorrhage, fibrinous exudation, necrosis, ulceration, and rupture (mostly abomasum but occasionally proximal small intestine)



Typical microscopic findings:

- Abomasitis and, to a lesser extent, enteritis
- Necrosis of the superficial mucosa, congestion, hemorrhage, emphysema, and edema



- Intralesional gram-positive bacteria, arranged in peculiar cubical packets of 4-8 cells along the mucosal surface

H&E, 100x

Discussion:

Sarcina spp. are fastidious gram-positive, anaerobic, carbohydrate-fermenting, CO₂ and ethanol producing bacteria that are able to grow at a pH as low as 2^{2,3}. Sarcinae cluster in peculiar packets of four to eight cells (“tetramers and octamers”), which in turn can combine in more complex even-numbered arrangements (see picture above). These organisms are known to be conspicuous in the environment.

This gas-producing organism has been associated with emphysematous abomasitis in calves and lambs², emphysematous gastritis in humans³, and related to gastric dilatation in goats¹, dogs, and horses⁴. Even though the pathogenesis of *Sarcina ventriculi* abomasitis has not been fully elucidated, a predisposing gastric environment and individual susceptibility factors are thought to play a role.

S. ventriculi represents an important differential for clostridial emphysematous abomasitis in young ruminants, mainly bovine and ovine. In this case, a clostridial etiology was ruled out by negative anaerobic culture of the abomasum and absence of bacteria compatible with *Clostridium* on H&E.

References and Recommended literature:

1. DeBey BM, Blanchard PC and Durfee PT. (1996). **Abomasal bloat associated with *Sarcina*-like bacteria in goat kids.** J Am Vet Med Assoc 209(8):1468-9.
2. Edwards G.T., Woodger N.G.A., Barlow A.M, et al. (2008). ***Sarcina*-like bacteria associated with bloat in young lambs and calves.** Veterinary Record; 163:391-393.
3. Laass M.W., Pargac N., Fischer R., et al. (2010). **Emphysematous gastritis caused by *Sarcina ventriculi*.** *Gastrointestinal Endoscopy*; 72, 5:1101-1103
4. Vatn S, Gunnes G, Nybø K and Juul HM. (2000). **Possible involvement of *Sarcina ventriculi* in canine and equine acute gastric dilatation.** Acta Vet Scan 41(3):333-7.

Please send your comments/questions to (Vinicius.carreira@mpiresearch.com).

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