Traumatic reticuloperitonitis in feedlot cattle

Case History

July: placed at 905 lbs
Treated multiple times

August 12: First pulled for treatment
August 29: Found dead in pen

Differential Diagnoses?

- Atypical interstitial pneumonia
- Bronchointerstitial pneumonia
- Chronic bronchopneumonia
- Necrotic laryngitis
- Traumatic reticuloperitonitis/pericarditis
- Congestive heart failure

Heart exterior
Enlarged heart with dilation of the right ventricle

Heart interior
Thick fibrotic pouch in caudal myocardium.

Anatomy

Thick fibrotic pouch in caudal myocardium.
Thank you Dr. ___ and thank you to all those attending for the opportunity to speak today about traumatic reticuloperitonitis in feedlot cattle.

Erik Burow, 2018-01-12

So let’s set the scene. It’s August 29th, 2017. I’m at a southern alberta feedlot, where I’m about perform a postmortem on a steer. The steer was placed in early july, at 905 pounds. It was first pulled for treatment on august 12th for the presumptive diagnosis of Atypical intersitial pneumonia. It was then treated a total of 6 times over the course of August with ceftiofur and dexamethasone. The steer was found dead on the morning of August 29th.

Erik Burow, 2018-01-12

With that presentation in mind, we could all come up with a list of differentials similar to this: Atypical intersitial pneumonia, Bronchointerstitial pneumonia, chronic bronchopneumonia, necrotic laryngitis, traumatic reticuloperitonitis/pericarditis, congestive heart failure

Erik Burow, 2018-01-12

Upon extracting the contents of the pericardial sac, ie the heart. it was immediatley observed that the heart was drastically enlarged. This can be appreaciated by the size of the heart in relation to a standard feedlot ear tag. this enlargement was due to cor pulmonale and associated dilation of both the left and right ventricles. At this point in the necropsy it is important to determine if this hypertrophy is attributed to primary CHF or secondary to another disease process, which may sometimes be elucidated by further dissection of the caridac tissue.

BR, 2018-01-12

we proceeded with dissection and immediatley observed a thick fibrotic pouch in the caudal myocardium.

BR, 2018-01-12

BR, 2018-01-12

Now im going to take everyone back on a brief detour to first year vet school anatomy. As depicted in the illustration here, the caudodorsal aspect of the heart is in close proximity to the
reticulum, separated only by the diaphragm.
Reticulum surface
- Perforation noted in reticulum

Right caudal lung lobe
- Large abscess filled with brown watery purulent material, centred around a metal small-diameter foreign body.

The foreign body
- 10 cm long, slightly curved, small diameter metal fragment with a pointed tip

Diagnosis
- Traumatic reticuloperitonitis/peri carditis
- Atypical interstitial pneumonia
- Bronchointerstitial pneumonia
- Chronic bronchopneumonia
- Necrotic laryngitis
- Congestive heart failure

Sources of hardware
- Pen environment
- Frayed feed bunk cables
- Fencing and windbreaks
- Access/proximity to junk piles
- Debris in footing
- Mixed into ration
- Baling wire in hay
- Feed truck
- Stored feed contamination
- Pre-Arrival Sources

Peritonitis "Outbreak"
- 42,000 hd capacity finishing feedlot
- Eastern Colorado, USA
- Beef and dairy-influenced cattle
- Anecdotally have experienced a seasonal "increase" in peritonitis cases
Slide 7

EB11 Working on that suspicion, I inspected the reticulum and found a small perforation on the diaphragmatic surface of the reticulum, along with adhesions between the reticulum and the diaphragmatic wall. No foreign bodies were recovered from the reticulum contents.
Erik Burow, 2018-01-12

Slide 8

EB12 Looking back at the right caudal lung lobe, a small diameter metal foreign body was present protruding from the lung parenchyma, surrounded by a large abscess filled with watery brown purulent material.
Erik Burow, 2018-01-12

Slide 9

EB13 Removed from the lung, the foreign body was a roughly 10cm long slightly curved small diameter metal fragment with a pointed tip.
Erik Burow, 2018-01-12

Slide 10

B3 returning to our differential list we may now confidently put Traumatic reticulopericarditis at the top of our differential list.
BR, 2018-01-12

Slide 11

EB16 Though we never definitively revealed the source of this particular piece of hardware, this is a list of potential sources of metallic foreign bodies for feeder cattle. My interest in this case lead me down the path of working with the veterinarians at feedlot health management services to try and understand an "outbreak" of peritonitis that they were investigating occurring at a client feedlot.
Erik Burow, 2018-01-12

Slide 12

EB17 The feedlot in question is a 42,000 head capacity finishing feedlot located in eastern Colorado, that feeds out both beef and dairy influenced cattle. For the past 5-6 years they had anecdotally noted seasonal increases in peritonitis cases.
Erik Burow, 2018-01-12
The graphs show the cumulative peritonitis cases by date for Feedlot X. The data is compared against the database for 2015, 2016, and 2017 (Q1 and Q2). The incidences are given as a percentage of animal population.

Feeding Lot X - Cumulative Peritonitis Cases by Date

- 2015/2016
- 2016/2017

Dates of interest:
- 07-Dec-16
- 05-Jan-17
- 11-Jan-17
Next are photos from the feedlot site, each a different periotnitis mortality.
Erik Burow, 2018-01-12
18-Jan-17
Reticulum perforation

29-Jan-17
10cm metal foreign body

Delivery chute magnets on feed truck

Debris removed from feed truck magnets
Out of the 4 cases of peritonitis observed during the locum at the feedlot, 2 of them had hardware present in the reticulum.

These photos are of the hardware perforations found in the reticulum.

Following these post mortems, a site-wide audit was conducted to locate sources of hardware contamination. As part of that, standard equipment on all feed trucks are large magnets adjacent to the delivery chute which are intended to keep metal debris from exiting the mixer, and entering the feed bunk.

This, is one of 5 feed trucks operating at the feedlot. Here we can see a functional magnet next to the delivery chute. On the left, we can appreciate a large "musculoskeletal injury" on the feed truck, which has completely removed one of the debris-trapping magnets.

The same day that was discovered, the feed truck was pulled off the line and repaired, and all the debris from the magnets on the remaining feed trucks was collected and displayed here, with a ballpoint pen for scale. We have a nice cocktail of washers, exacto blades, sawsall blades, nuts, nails and bolts.
Thorough necropsies are critical to determine exact cause of mortality.
- Critical appraisal of historical mortality records to detect epidemiological trends.
- Comprehensive site audit to remove sources of hardware.
Following this discovery, further history taking revealed construction had been occurring on-site for the past 12-16 months, constructing stationary batch mill mixers, in place of truck-based mixers. This construction is a purported source for the bulk of the metallic debris collected in the feed trucks.  

Erik Burow, 2018-01-12

Through this investigation we have learned that thorough necropsies are critical to determining the exact cause of mortalities, that examination of historical mortality trends can help predict future mortality, and identify the best time to intervene, and lastly that a comprehensive site audit is required to limit the sources of hardware contamination in the feedlot environment... Thank you! ~questions~

Erik Burow, 2018-01-12