NDSU Veterinary Diagnostic Laboratory

Spring 2019, Vol. 3, No. 2

In This Issue

A newsletter about diagnostic trends at the laboratory, animal health topics, interesting cases and new test offerings.

www.vdl.ndsu.edu

We welcome comments, questions and suggestions. Please email us at vetlab.ndsu@ndsu.edu or call the laboratory at (701) 231-8307.

Welcome! It's a relief to see green grass after the challenging weather of this past winter and spring. The poor weather coincided with increased numbers of postmortem submissions, which have kept VDL faculty and staff busy through the spring season. Please be sure to look through a new feature of the newsletter that provides an overview of the type of cases seen lately at the lab.

A major initiative at the lab this summer is updating and expanding the VDL website to include more user-friendly features and additional information, and beginning the process of replacing the laboratory's aged information system.

I look forward to seeing many of you at the annual NDVMA meeting this August in Minot. Have a wonderful summer!

Sincerely,

Brett T. Webb, DVM, PhD, DACVP
VDL Director and Veterinary Pathologist

Spring/Summer Calendar

July 4 – Independence Day – Laboratory closed

August 8-10 – N.D. Veterinary Medical Association (NDVMA) Annual Meeting at the Clarion Hotel in Minot

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

Bench Notes

The VDL does not routinely perform antimicrobial sensitivity testing on ***Trueperella (Arcanobacterium pyogenes)*** due to the poor correlation between in vitro susceptibility, in which most isolates are found to be predictably sensitive to a variety of antibiotics, and in vivo treatment response.

Brucella canis is a potentially zoonotic disease that can be transmitted from an infected dog to humans. Those in close contact with infectious body fluids and tissues (e.g., veterinarians and technicians, kennel workers, laboratory staff) are at increased risk. There are two serological tests performed at the VDL to test for *B. canis* antibodies in dogs. Rapid Slide Agglutination Test (RSAT) is initially used to screen for *B. canis* antibodies. The RSAT is specific for *B. canis* and is based on direct agglutination of killed whole-cell antigen. In addition, the 2-mercaptoethanol (2ME)-RSAT also is performed. This second test improves specificity by reducing antibodies in the sample that may cross-react with other bacteria. The 2ME-RSAT is less sensitive but more specific than the RSAT. Thus, the more sensitive test is performed first, and the more specific test follows. If the serum is negative on the RSAT, the animal is considered either not infected with *B. canis* or early in infection prior to the development of an antibody response. An additional sample should be submitted in 4 to 6 weeks to detect recent infection. If a serum sample is positive on both the RSAT and 2ME-RSAT, the animal is presumptively diagnosed as being infected with *B. canis*, and bacterial culture samples should be forwarded to the National Veterinary Laboratory Service (NVSL) for definitive diagnosis. In some cases, the RSAT is positive, but the 2ME-RSAT is negative. This can be due to early infection or non-specific/cross reactive antibodies. Repeat 2ME-RSAT is recommended in 30 days.

Disease Updates

Bovine

Bovine Pneumonia was diagnosed in both calves and adult cattle throughout the late winter and spring. Bovine respiratory coronavirus (BoCV) and bovine respiratory syncytial virus (BRSV) were the most common viruses identified with 30 positive BoCV and 7 positive BRSV PCR samples. Bacterial pneumonia was even more common with *Pasteurella multocida* (46 cases), *Mannheimia hemolytica* (36 cases), *Trueperella pyogenes* (22 cases) and *Mycoplasma* spp. (20 cases) routinely isolated on culture of lung tissues. Many tissues tested positive for more than one bacterium and/or virus.

There were 301 cases of calf **scours** submitted to the laboratory with confirmation of at least one diarrhea-associated pathologic agent. The most common bacterium was *Escherichia coli.* Virulence factors were identified for both enterotoxigenic and enteropathogenic *E. coli.* Other commonly identified causes of scours included coccidiosis, *Cryptosporidium* spp., rotavirus and coronavirus. *Clostridium perfringens* enterotoxin A was identified in several cases with characteristic clinical signs and histologic lesions.

Infecious bovine rhinotracheitis (IBR or bovine herpesvirus-1) accounted for 9 **abortions**. Other common organisms identified in aborted bovine fetuses included *Trueperella pyogenes*, *Mannheimia hemolytica* and *Pasteurella multocida*. There was one listeriosis-associated abortion diagnosed.

Small Ruminants

Like the more prevalent ruminant **pneumonia** cases submitted, *Mannheimia hemolytica* (11 cases), *Pasteurella multocida* (4 cases), *Trueperella pyogenes* (4 cases) and *Mycoplasma* spp. (7 cases) were identified in respiratory cultures from 13 sheep and 8 goats.

PCR was positive for *Chlamydia* in 3 goat **abortions**. No protozoal or bacterial pathogens were identified in another 3 goats and 9 sheep.

Equine

This spring, there was also a case of **equine herpesvirus-1 (EHV-1) associated abortion**. One of the more consistent gross findings with EHV-1 is very edematous lungs with prominent lobules. Microscopically, there is an interstitial pneumonia (Figure 1), along with necrosis and intranuclear inclusion bodies within the bronchial and bronchiolar respiratory cells (Figure 2).

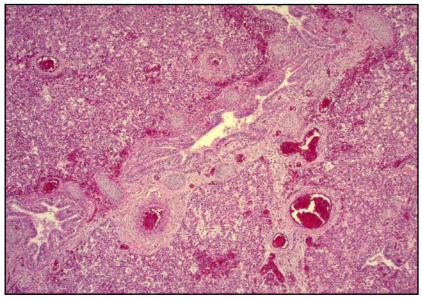

Figure 1: Necrotizing interstitial pneumonia in an equine fetus. (Heidi Pecoraro, NDSU)

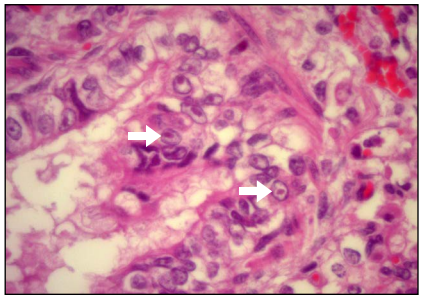

Figure 2: Inclusion bodies within the nuclei of respiratory cells lining large airways. (Heidi Pecoraro, NDSU)

MINI CASE REPORTS

Large Animal

Equine carcinomatosis was noted in a 23-year-old Quarter Horse gelding that presented for autopsy. A ruptured urinary bladder was suspected based on clinical signs. On gross examination, there was a copious volume of clear, red, serosanguinous abdominal fluid. Variably sized irregular nodules were located along the body wall, diaphragm and visceral surfaces throughout the abdomen (Figure 3). The pancreas was completely obscured by similar nodules. Microscopically, the nodules corresponded to neoplastic foci of epithelial cells with nuclear polarity and abundant eosinophilic granules consistent with zymogen granules (Figure 4). Pancreatic acinar cell carcinoma was diagnosed based on these features. Carcinoma metastases along the surfaces of and invading multiple abdominal organs (also known as carcinomatosis) is seen in other veterinary species, such as chickens with ovarian carcinoma and nonhuman primates with intestinal adenocarcinoma. Pancreatic cancer has been sporadically diagnosed in horses. Interestingly, no cases of pancreatic carcinomatosis have yet to be reported in the literature.

Figure 3: The abdominal body wall with neoplastic foci and cavity filled with serosanguinous fluid.
(Heidi Pecoraro, NDSU)

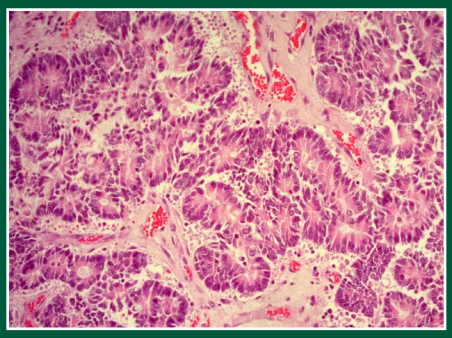

Figure 4: Neoplastic cells arranged in acinar structures with polarized nuclei and eosinophilic cytoplasmic zymogen-like granules.
(Heidi Pecoraro, NDSU)

Small Animal

As summer approaches and our small animal companions venture farther into the great outdoors with us, exposure to environmental hazards, including microorganisms, increases. Several cases of canine and feline **fungal and protistan infections** were identified by histopathology over the last several months. Exposure to these microorganisms likely occurred in the summer or fall.

One **adult domestic longhaired cat** presented to the clinic with a facial mass and enlarged regional lymph nodes. Microscopically, sections of the mass and lymph node revealed widespread necrosis admixed with severe suppurative inflammation. Interspersed throughout were numerous 20-40 um thin-walled yeast with a clear halo around a central basophilic or vacuolated structure. The yeast exhibited both broad-based and narrow-based budding (Figures 5-6). A special histochemical stain for *Cryptococcus* spp. was negative, and the presumptive diagnosis was systemic **blastomycosis**.

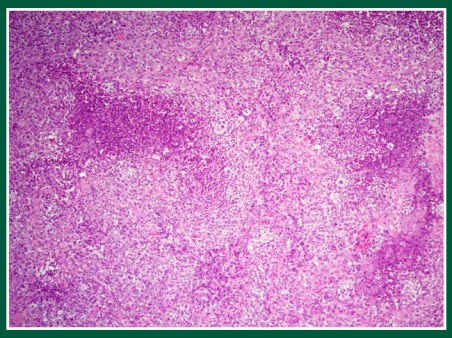

Figure 5: Sections of skin from a feline facial mass is expanded by suppurative inflammation with thin-walled, broad-based budding yeast consistent with *Blastomyces dermatitidis*.
(Heidi Pecoraro, NDSU)

In another case, an **adult mixed-breed dog** had a history of chronic sneezing and nasal discharge. A solitary deep-purple mass was noted on examination, and a section was sent to the VDL for histology. Microscopic evaluation of the mass showed irregularly hyperplastic and polypoid mucosa. The submucosa was markedly expanded by chronic-active inflammation that often surrounded ruptured and intact variably sized sporangia occasionally containing numerous endospores (Figures 7-8). These features are consistent with ***Rhinosporidium seeberi*** infection. *Rhinosporidium seeberi* is a member of the Mesomycetozoa (DRIP clade of aquatic protistan parasites) and is an uncommon cause of rhinitis in dogs, horses and humans. The organism is difficult to culture and is considered potentially zoonotic. Rhinosporidiosis generally presents as a unilateral strawberry-colored nasal mass. It has been reported in at least two other dogs in the upper Mississippi River valley that had no extensive travel history (Hill et al. J Am Anim Hosp Assoc. 2010 Mar-Apr;46(2):127-31). Complete surgical excision is typically curative.

Figures 6, 7 and 8 on back page.

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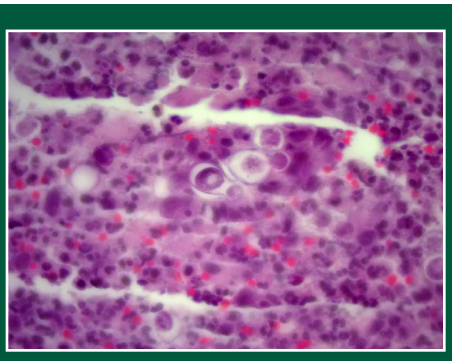

Figure 6: Close-up image of budding yeast consistent with blastomycosis. (Heidi Pecoraro, NDSU)

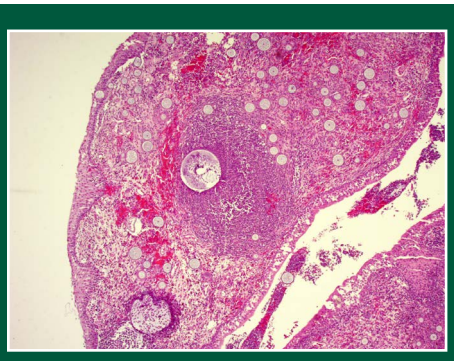

Figure 7: Severely hyperplastic and inflammed polypoid mass with variably sized sporangia from the nose of an adult dog. (Heidi Pecoraro, NDSU)

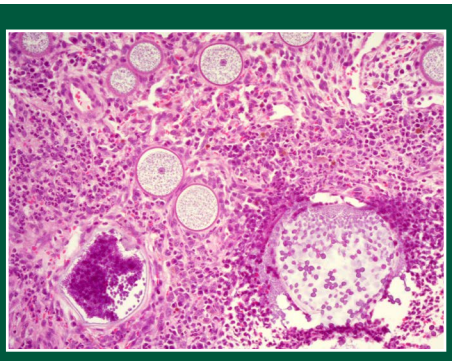

Figure 8: Sporangia are in multiple stages, including mature large sporangia with endospores and smaller juvenile sporangia without endospores. (Heidi Pecoraro, NDSU)

Feedback is always welcome. Please feel free to send your comments or suggestions to ndsu.vetlab@ndsu.edu and specify “newsletter” in the subject line.

Contact Information

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For more information on this and other topics, see **www.vdl.ndsu.edu**