NDSU Veterinary Diagnostic Laboratory

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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 ndsu.vetlab@ndsu.edu or call the laboratory at (701) 231-8307.

I want to thank everyone who has signed up to receive the newsletter; the response thus far has exceeded our expectations.

The new NDSU-VDL website is scheduled to be up and running in mid-April. Please be sure to visit the new website and check out the searchable test catalog that contains information on available tests, fillable submission forms and other useful resources.

The annual NDSU Veterinary Diagnostic Laboratory Seminar, a daylong continuing education event, will be held Thursday, May 22. This year's program will include lectures on parasitology by Dr. Michael Hildreth from South Dakota State University and clinical pathology by Dr. Jed Overmann from the University of Minnesota. VDL faculty also will be presenting interesting cases, new assays and an update on rabies.

The cost for the seminar, which includes lunch, is $50 per person. Please visit our website for additional information. We look forward to seeing many of you in May.

Sincerely,

Brett T. Webb, DVM, PhD, DACVP
Veterinary Pathologist
NDSU Veterinary Diagnostic Laboratory

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

New Tests

New PCR Tests	Price
Ovine progressive pneumonia (OPPV)	$35
Malignant catarrhal fever (OHV-2)	$35
Porcine epidemic diarrhea virus (PEDv)	$40

Porcine Epidemic Diarrhea Virus

The first North Dakota case of PEDv was diagnosed at the NDSU-VDL this spring in a group of 3- to 10-day-old diarrheic piglets from an eastern North Dakota farm. PEDv should be considered in all diarrheic piglets, even in cases of low morbidity and mortality. Since the first case, an additional case from a western Minnesota farm has been confirmed by the VDL.

Laboratory diagnosis of PEDv is achieved by a PCR assay that can be performed on feces or intestine. If you suspect PEDv, please submit at least 1 gram of feces for PCR testing. More information on PEDv can be found at www.ag.ndsu.edu/ansc/extension-1/swine-extension/ndsu-swine-extension-information.

The North Dakota Board of Animal Health now requires a certificate of veterinary inspection with the following statement on all intrastate movements of swine; “The premises the swine are originating from has not had any signs or a diagnosis of Transmissible Gastroenteritis (TGE)
or Porcine Epidemic Diarrhea virus in the last 60 days.”

More information can be found at www.nd.gov/ndda/disease/porcine-epidemic-diarrhea-virus-pedv.

Jeng Hung Liu, NDSU

Diagnostic Laboratory Calendar

- May 22, Annual NDSU-VDL Seminar (CE)

The diagnostic laboratory will be closed on the following holidays:

- April 18, Good Friday
- May 26, Memorial Day
- July 4, Independence Day
- Sept. 1 Labor Day

Canine Parvovirus PCR Available

The laboratory received a report of a dog with clinical signs of canine parvovirus infection that twice tested negative for parvovirus by an ELISA (snap test) performed in the clinic. However, when tested at the VDL using PCR, the sample was positive.

Although the commonly used enzyme immunoassay “snap” tests reportedly detect all variants of CPV-2 a, b, c and feline panleukopenia, and thus have excellent specificity, the sensitivity of the tests have been shown to be significantly lower than PCR. Therefore, animals shedding low levels of parvovirus in feces may be negative by ELISA but positive by PCR.

Due to the low sensitivity of ELISA tests, PCR is a better testing method for parvovirus in animals that have clinical signs of enteritis but are negative by ELISA tests. The cost of the assay is $45. Please submit at least 1 gram of feces.

Histophilus somni

Neil W. Dyer, D.V.M., M.S., Diplomate ACVP
Director, NDSU Veterinary Diagnostic Laboratory

Recent laboratory records indicate that Histophilus somni infections have been diagnosed in North Dakota cattle with increased frequency in 2012 and 2013.Cases occur every month of the year, but they are reported more frequently in the late fall and winter.

Typically, histophilosis presents as encephalitis/vasculitis, myocarditis and/or pneumonia. While all three lesions can be found in the same animal at the same time, they more commonly occur as a single syndrome in each case. Recovery of H. somni from joint infections, uterine infections, eye infections and cases of abortion and mastitis have been reported as well.

Of 54 confirmed cases (culture and lesions) in 2012-13, 37 were bronchopneumonia, seven were encephalitis (and a subset of four of these were encephalitis with myocarditis), one myocarditis only, one myocarditis with pneumonia, two septicemias and two pneumonia/myocarditis/encephalitis cases.

In respiratory cases, H. somni is often recovered from affected lungs along with Mannheimia hemolytica, Bibersteinia trehalosi, Trueperella pyogenes and Pasteurella multocida or BVDV, BRSV and IBRV. However, in only two of the 54 cases was a virus identified along with H. somni. Polymerase chain reaction (PCR) testing was positive for BVDV on heart tissue from an H. somni myocarditis case and PCR was BRSV positive on lung tissue from an H. somni pneumonia case.

Under normal conditions, the bacteria can be found in the reproductive and urinary tracts of normal bulls and cows. The animals shed the organism in urine or reproductive discharges and contaminate the environment.

Clinical histories associated with histophilosis most often reveal that affected animals are feedlot cattle in the 500- to 1,000-pound range. Affected animals have often already been immunized with a product designed to protect against H. somni infection as well as multivalent viral products. It was common for the cattle to have been treated with multiple antibiotics.

Most cases were sensitive to nearly all antibiotics in the laboratory's large animal sensitivity panel. If resistance did appear in these cases, it was most often to neomycin or neomycin/sulphadimethoxine. Several isolates were resistant to clindamycin and gentamicin as well. Finally, a few (seven cases) were resistant to multiple antibiotics, including tetracycline, tilmicosin, tylosin and tulathromycin. No correlation was found between multidrug resistance and lesion type.

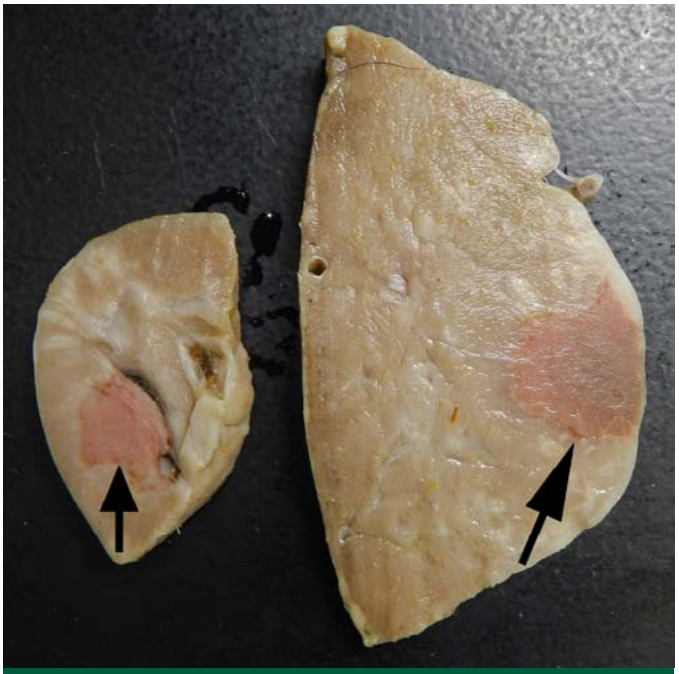

Figure 1: Myocardial lesions of histophilosis. Cross sections of left ventricle through the papillary muscle and apex are affected by multifocal to coalescing areas of necrotizing myocarditis (arrows). Two regionally extensive infarcts are also present. (Brett Webb, NDSU)

Diagnosis of histophilosis is achieved through culture of the organism and observation of the lesion. In cases of encephalitis and myocarditis, the lesion is distinctive enough to suspect the presence of H. somni even if the organism is not recovered. Occasionally, sections of bovine heart show multifocal areas of scarring, which suggest an animal has survived an acute H. somni infection. Pneumonia cases are more equivocal due to the fact that they often involve mixed pathogens. Isolation of H. somni in the laboratory typically requires incubation at 5 percent CO2. Recovery of the organism can be hindered if the animal was treated with antibiotics. The routine bovine respiratory panel conducted at the VDL includes tests that look for H. somni.

Antimicrobial Sensitivities Available Online

Antimicrobial sensitivities now are viewable online. To view the antimicrobial sensitivity, log into your account and select the case/culture of interest.

If you do not view test results online and are interested in doing so, please visit the website, click "sign in" and sign up for an account.

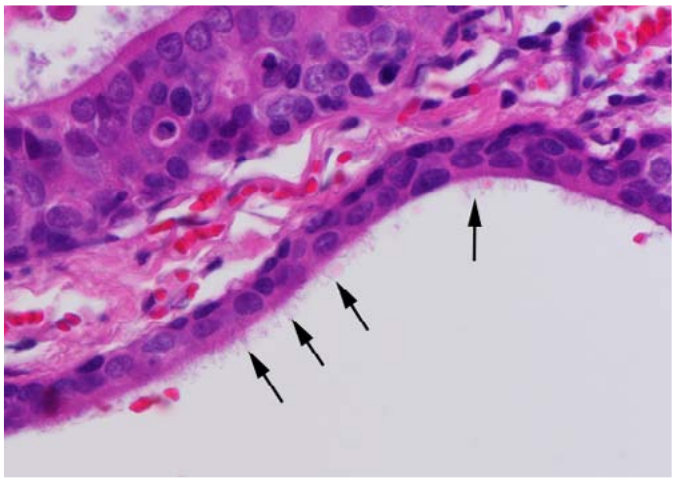

Figure 2. Histologic section of digital tumor showing cilia on the apical surface of neoplastic cells. (Teresa Newell, NDSU)

Figure 3. Multiple digital masses present on the forepaws. (Brett Webb, NDSU)

Figure 4. Thoracic radiograph showing multiple pulmonary masses in the caudal lung lobes. (Radiograph courtesy of Dr. Kevin Dill, Animal Health Clinic, Fargo)

Noteworthy cases

Feline Lung-digit Syndrome

Teresa. K. Newell, D.V.M., Ph.D., Diplomate ACVP
Pathologist, NDSU Veterinary Diagnostic Laboratory

Biopsy specimens were submitted from a swollen, painful digit and a subcutaneous mass from a 4-year, 4-month-old DSH cat. An aspirate from a second subcutaneous cystic mass also was submitted for cytology.

Digital and thoracic biopsies were histologically similar, containing foci of invasive anaplastic adenocarcinoma with frequent and abnormal mitoses, and occasional cilialike projections on the apical surface of epithelial cells (Figure 2). Cytology suggested the cyst to be a similar neoplastic process. Metastatic pulmonary adenocarcinoma, or feline "lung-digit" syndrome, was suspected based on these findings.

Feline lung-digit syndrome describes an unusual pattern of metastasis seen with some highly aggressive primary lung tumors, particularly bronchial and bronchoalveolar adenocarcinomas. Tumor metastases are thought to derive from direct arterial embolization from the primary tumor and are found at atypical sites, most notably the digits. Other common sites include the skin, skeletal muscle, eye, bone and visceral organs. The primary lung tumor often is not clinically evident at the time of presentation for metastatic disease; hence, diagnosis is challenging.

Radiographic evidence of bony lysis of the distal phalanx elevates suspicion for lung-digit disease, and thoracic radiographs are warranted prior to any surgery due to the rapid progression and the poor prognosis for this disease. Mean survival time averages only 58 days after presentation.

Multiple new subcutaneous and digital tumor foci were reported in this case within days after presentation (Figure 3). Thoracic radiographs then were taken and showed multiple pulmonary masses (Figure 4). The animal was euthanized due to widespread metastatic disease 43 days post-biopsy.

In addition to digital lesions, metastatic foci were widespread within skeletal muscle; the subcutis, including one eyelid and the lip; both kidneys; the spleen; intestine (sclerosing mural/serosal lesions); lymph nodes; and meninges.

This represents the third case of feline metastatic pulmonary adenocarcinoma diagnosed by VDL pathologists in the past year. This case was unusual in that affected animals are typically geriatric (mean age 12 years).

Submission Tips

Lead Toxicosis

In cases of bovine neurologic disease and sudden death, lead toxicosis should be considered. It is one of the most common toxicoses we see at the laboratory.

If lead toxicosis is on your differential list, please include at least 0.5 milliliter of whole blood (EDTA or heparin). Ideally, the samples should be received within 24 hours after collection. The laboratory has a rapid assay for whole blood that allows us to make a diagnosis the same day the case is received.

If whole blood isn't available, diagnosis can be achieved by quantitating lead in kidney or liver tissue. Please submit at least 10 grams of tissue.

Submitting Electronic EIAs?

The laboratory has been receiving electronic EIA submission samples without the accompanying form. Please remember that the form must be printed and enclosed with the corresponding serum sample when submitted to the laboratory. Failure to enclose the form will result in a delay in testing.

Trichomoniasis Testing

On rare occasions, the laboratory receives preputial washings that have little to no appreciable sediment. An appropriately collected washing should be light pink and cloudy, with visible material and little blood.

Clear samples and samples with significant blood contamination are not appropriate for testing.

Recommendations for collecting samples for Trichomoniasis testing are available on our website at www.vdl.ndsu.edu or by calling the laboratory at (701) 231-8307.

Cover photo by Brett Webb, NDSU

Contact Information

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

Diagnostic Trends (2014)

Bovine

Abortion	# of cases
IBR	16
BVDV	2
Fungal	3
Camplyobacter fetus venerialis	1
Ureaplasma sp.	1
Respiratory	
Mannheimia hemolytica	17
Pasteurella multocida	12
Mycoplasma sp.	21
Histophilus somni	7
Bibersteinia trehalosi	4
BVDV	4
Neurologic	
Rabies	1
Lead toxicity	1
Gastrointestinal	
E. coli	66
Salmonella	10
Clostridium	9
Cryptosporidia	13
Rotavirus	12
Coronavirus	14

Sheep/Goat

Camplyobacter jejuni	7
Listeria sp.	1
Mannheimia hemolytica	1
Mycoplasma sp.	1

Equine

Respiratory	
Streptococcus equi	1
Strep. zooepidemicus	1
Other	
Corynebacterium pseudotb.	1

Canine/Feline

Respiratory	
Feline calicivirus	3
Neurologic	
Rabies	1
Gastrointestinal	
Hemolytic E. coli	3
Camplyobacter sp	1
Canine Parvovirus	1

Miscellaneous species

Pig	PEDv