UNIVERSITY of GUELPH
LABORATORY SERVICES

Animal Health Laboratory

AHL Newsletter

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In this issue:

OMAFRA - UofG Agreement, 2008-2018

- April, 1997 - In the Enhanced Partnership negotiated between the Ontario Ministry of Agriculture Food and Rural Affairs, the Animal Health Laboratory was created as part of the Laboratory Services Division, University of Guelph.
- April, 2007 - The Enhanced Partnership is extended for 1 year in order to renegotiate a new agreement.
- April, 2008 - A new 10-year agreement is formalized between OMAFRA and the UofG, to be reviewed after 5 years.
    - Under the terms of the new agreement, Lab Services is recognized as consisting of 2 major units - the Animal Health Laboratory (AHL) and the Agriculture and Food Laboratory (AFL), with their respective strategic outcomes and performance measures.
    - The Director of the AHL, **Grant Maxie,** and the Director of the AFL, **John Melichercik**, also serve as co-Executive Directors of Lab Services, and report to **Rich Moccia**, Associate Vice-President (Agri-Food and Partnerships); these 3 individuals constitute the Executive Committee of Lab Services.
    - Within the terms of the new agreement, the AHL has received additional funding to pursue new initiatives, as noted in the OMAFRA press release http://www.omafra.gov.on.ca/english/infores/releases/2008/042808.htm
    "This includes activities aimed at providing Ontario with improved methods to address an animal health crisis:
        - new tests for emerging diseases
        - baseline surveillance for the early detection of emerging hazards
        - development and testing of emergency and business continuity plans for the Animal Health Laboratory."

We are delighted with the outcome of the latest round of negotiations, and look forward to working closely with OMAFRA to fulfill our objectives. *AHL*

Purolator reminder *Linda McCaig*

All waybills must be ordered through the AHL in order to have the charges billed to our account number. Please do not attempt to order them directly from Purolator. They do not have our permission to assign our account number when ordered in large numbers by a third party.

You may continue to fill out individual waybills (see page 8 of our current Fee Schedule for instructions). However, **Purolator will no longer transfer invoices from a clinic account to the AHL account when the waybill did not indicate that AHL was to be billed.**

If you have any questions regarding waybills, please call us at 519-824-4120 x 54530.

Can you ID this toxic plant?

From a pile of plant clippings in a cattle pasture.

See page 20 for answer and article.

McNabb Teaching Garden of toxic plants established at the OVC

Margaret Stalker, Melanie Philbin, Brent Hoff

Practicing veterinarians are expected to be familiar with the diagnosis of common plant toxicities in various animal species, however under the current veterinary curriculum, this knowledge is gained primarily through self-directed learning. In response to this, several veterinary schools across North America have recognized the utility of providing teaching resource gardens to increase awareness of potentially toxic plants in our environment, and assist in basic plant identification skills. In the fall of 2005, the newly formed OVC Student Chapter of the American College of Veterinary Pathologists, mentored by Drs. Margaret Stalker and Dorothee Bienzle, identified the goal of designing and installing a teaching garden of toxic plants at the OVC. The proposal was accepted by the University, and with the generous support of the Department of Pathobiology, the Grey-Bruce Veterinary Association, Dr. Terry Fisk, and the Grey County Gardeners; the guidance of Dr. Brent Hoff, U of G botanists Carole Ann Lacroix and Jack Alex; Dr. Bob Wright of OMAFRA, and Brian Steed of the U of G grounds department, and the enthusiastic gardening skills of members of the OVC Pathology Club, the garden was born.

Located in the enclosed McNabb courtyard between the Veterinary Teaching Hospital and Pathobiology (Fig. 1), this garden is now the home of over 60 species, including common household garden plants (such as Japanese yew, castor bean, lily-of-the-valley, delphinium, Asiatic lily, monkshood), Ontario native plants (such as white snakeroot, chokecherry, Jack-in-the-pulpit, buttercup), and exotic/introduced weedy species (such as Saint-John's wort, Russian knapweed). Student presentations showcasing the garden have won prizes each year at College Royal, and the garden has been featured on CBC radio, Rogers community television, as well as in local press releases including Grand River Life, the Guelph Mercury, and UofG's At Guelph.

While the garden is not open to the general public, tours can be arranged by contacting Dr. Margaret Stalker, and visiting veterinarians are always welcome. The garden is a work in progress, and a website and permanent interpretive signage are currently under development. Several excellent factsheets on selected plant toxicities are also available on the OMAFRA website at: http://www.omafra.gov.on.ca/english/livestock/horses/forages.html

AHL

Figure 1. The McNabb Teaching Garden of Toxic Plants, June 2007. (Photo courtesy of Dr. Peter Lusis).

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Editorial Assistant: **Ms. Helen Oliver**
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Its mission is to inform AHL clients and partners about AHL current activities, and laboratory-based animal disease events and disease trends. *Ideas and opinions expressed herein do not necessarily reflect the opinions of the University or the editor.*

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Our continued thanks to all of the non-author AHL clerical, technical, and professional staff who contribute to the generation of results reported in the AHL Newsletter.

Mycotoxins and mycotoxicoses

Brent Hoff, Nick Schrier, Patsy Graham

Toxigenic fungi

Mycotoxins are fungal metabolites that cause intoxication when consumed by animals, including humans. There may be >20,000 unique mycotoxins, but fewer that 50 have been well characterized. These toxins can be found in processed foods and in feeds produced from contaminated feedstocks. The most common mycotoxins are produced by fungi in the genera *Aspergillus, Penicillium* and *Fusarium.* However, fungi in the genera *Alternaria, Stachybotrys, Claviceps* and *Epichloe* also produce common and important mycotoxins.

Mycotoxins identified in Ontario

Aflatoxins (carcinogenic, hepatotoxic)
Zearalenone, zearalenol (estrogenic syndrome)
Deoxynivalenol (DON, vomitoxin) (feed refusal)
Trichothecene mycotoxins (T-2, HT-2, DAS) (reduced feed consumption, gastroenteritis)
Fumonisins ("moldy corn poisoning" in horses)
Ochratoxins, citrinin (nephrotoxic)
Claviceps (ergot) (ergotism)
Fescue ("summer syndrome" cattle)
Penitrem A, roquefortine ("garbage mycotoxins" in dogs)

Laboratory testing for mycotoxins

Evidence that mycotoxins are responsible for illness in humans or animals is generally based on:

- Occurrence(s) of the disease linked with feeding a particular feed or consuming a particular food.
- Examination of the suspect feed shows evidence of fungal activity.
- The disease is not transmissible from animal to animal.
- Laboratory testing of the affected animal or person does not clearly identify an infectious agent.
- Young, old and pregnant animals are generally the most susceptible and are the first to show signs.

When one or more of these criteria are met, the suspect food or feeds should be tested for mycotoxins in the laboratory.

The AHL offers several options for mycotoxin testing. For grain samples (corn, wheat, etc.) ELISA testing is suitable, and ELISAs are currently available for;

- Fumonisin
- Ochratoxin
- Aflatoxin
- Deoxynivalenol (DON)
- Zearalenone

ELISA testing is not recommended for complex feeds such as pelleted feeds, TMR, silage and distiller grains. For these complex feeds, a chromatography-based method is required for accurate determination of mycotoxin levels. Chromatography-based methods available are:

- GC/MS trichothecene screen (includes DON, T-2, HT-2, DAS, and other metabolites)
- HPLC mycotoxin screen with affinity column cleanup (includes aflatoxins, ochratoxins, and zearalenone)
- HPLC aflatoxins
- HPLC zearalenone

Sampling for mycotoxins and sample preparation

An adequate and representative sample of suspect feed grain or other feed should be obtained. This can be difficult in livestock feeding operations because the majority of the suspect feed may have been consumed. It may be necessary to remove the feed from the corners of the feeders or retrieve feed from the corners of the storage unit. Proper sampling is essential as one kernel in 1,000 kernels of grain may be a source of significant mycotoxin contamination, and contamination may occur only in pockets (hot spots) in the feed mass.

A representative sample may require random sampling of feed from all areas of feed mass. Samples stored for analysis should be placed in a paper bag or cardboard box and kept under cool, dry conditions that will not permit fungal growth or continued production of mycotoxins.

Diagnosis

In animals, few mycotoxins produce clinical signs so characteristic that they permit unequivocal diagnosis. For example, the estrogenic syndrome in cattle can be caused by phytoestrogens in forage as well as zearalenone and zearalenol in grain. Refusal of feed containing corn or cereal grains usually indicates mycotoxins produced by *Fusarium spp.*

Typically, aflatoxin, ochratoxin and fumonisin tests should be sensitive in the part per billion (ppb) range, whereas tests for DON, T-2 and zearalenone are sensitive in the part per million (ppm) range.

Summary

- **Mycotoxins are prevalent in feedstuffs.**
- **Many different mycotoxins exist.**
- **Mycotoxins affect animals in many ways, and the most important is perhaps immunosuppression.**
- **While mycotoxins can produce acute toxicity, they are more likely to cause chronic problems of increased disease.**
- **Diagnosis of mycotoxicosis is difficult and indirect, but mycotoxins should be considered as a potential cause of increased disease and loss of production.**

Reference

Jacobson BJ, et al. Mycotoxins and Mycotoxicosis. Publication EB0174 Montana State University Extension. 2007.

AHL Lab Reports

RUMINANTS

Coxiella burnetii real-time PCR service available at the AHL

Hugh Cai, Rebeccah Travis, Durda Slavic, Beverly McEwen

Coxiella burnetii, the causative agent of Q fever in humans, can also cause abortion in pregnant cattle, sheep, goats, cats and other animals. It is an obligate intracellular pathogen that is not routinely culturable. The modified acid fast stain (MAF) used to be the only diagnostic method available at the AHL and many other diagnostic labs. In 2008, 6 ruminant abortion cases were found to be positive for *Coxiella*-like organism by MAF examination at the AHL.

We recently validated a real-time PCR assay with 61 field samples in parallel with MAF testing. The diagnostic specificity for the PCR was 100% (95% CI 66.4, 100) and the diagnostic sensitivity was 78.8% (95% CI 65.3, 100). The low sensitivity may be due to the low sensitivity of MAF testing - the detection limit for MAF is ~100,000 cells/g vs. 2,000 to 7,000 copies of DNA/mL for real-time PCR. By using Bayesian model statistics, **the sensitivity of the PCR was found to be 97.03% (95% CI 91.9, 99.7) and specificity was 96.17%** (95% CI 90.4, 99.4). This PCR assay can detect *C. burnetii* DNA from MAF-positive tissue after dilution by as much as 100 million times (10^{-8}).

Aborted placenta or fetal stomach content can be submitted to the AHL Molecular Biology Lab for *C. burnetii* real-time PCR testing. The price is $28 per sample. *AHL*

References

Kim SG, et al. *Coxiella burnetii* in bulk tank milk samples, United States. Emerg Infect Dis 2005;11:619-621.

Panning M, et al. High throughput detection of *Coxiella burnetii* by real-time PCR with internal control system and automated DNA preparation. BMC Microbiol 2008;8:77.

Woldehiwet Z. Q fever (coxiellosis): epidemiology and pathogenesis. Res Vet Sci 2004;77:93-100

Taxus (yew) toxicosis – always a concern!

Murray Hazlett

We have had 2 more incidents reported this spring of cattle killed as a result of exposure to *Taxus* spp. (most likely *Taxus cuspidata*, Japanese yew) (Fig. 1, page 17). **This common ornamental shrub is found on many rural and residential properties**, and both of these incidents resulted from trimmings being collected into a pile that cattle had access to.

As noted in the AHL Newsletter, Dec, 2005, ***Taxus* kills quickly and there are no specific lesions**. The toxic compound, taxine, is thought to have a cardiotoxic effect. Necropsy diagnosis is made by finding the plant in stomach or oral cavity. The seeds, needles, and stems of *Taxus cuspidata* are toxic; the red arils (the fleshy outer-part of the fruit) are considered nontoxic. Horses are most sensitive to toxicity, and birds least sensitive. *AHL*

Reference

Wilson CR, et al. Taxines: a review of the mechanism and toxicity of yew (*Taxus* spp.) alkaloids. Toxicon 2001;39:175-185.

Storage and shipping conditions affect culture results for *Mycobacterium paratuberculosis*

Ann Godkin

Researchers in Texas have reported that fecal culture results from Johne's positive cows varied depending on how the samples were stored prior to testing. Less than half of the confirmed positive cows were identified when the samples were refrigerated at 4°C for 4 h and then frozen at -20°C for 1 wk. This likely mimics how many veterinary submissions are handled in Ontario. It was better to keep samples at a steady refrigeration temperature than to freeze them in household-type freezers.

The rate of "positivity" after refrigeration for 2 and 9 d was 92% and 89% respectively. This dropped to only 51% when samples underwent freezing for 7 d at -20°C. The highest rates of positivity, 87%, 92%, 98% and 92 % were achieved when samples were held at 4°C for 48 h and frozen to -70°C for 1 wk, 3 wk or 3 mo, respectively.

Veterinarians wishing to improve confidence in MAP culture rates should consider sample storage and handling when arranging Johne's testing for dairy herds. **Refrigeration at 4°C for as short a time as possible would appear to be better than freezing fecal samples if only -20°C temperatures can be achieved.**

Reference

Khare S, et al. Effects of shipping and storage conditions of fecal samples on viability of *Mycobacterium paratuberculosis*. J Clin Microbiol 2008;46:1561-1562.

AVIAN/FUR/EXOTIC SPECIES

Summary of pet bird pathology diagnoses, 2007-2008

Emily Martin, Marina Brash, Brian Binnington, Jan Shapiro

The AHL receives numerous submissions of pet birds for necropsy and/or histopathology evaluation. Over the past year, cases of species belonging to the families Psittacidae (e.g., African grays, Amazons, budgerigars, cockatiels, cockatoos, conures, macaws, parakeets, parrotlets, *Poicephalus*, rosella) and Fringellidae (e.g., canaries, finches) were submitted for evaluation. The intensity of evaluation depended on the tissues available, and many cases had multiple diagnoses.

The most common diagnosis was **proventricular dilation disease** (PDD). This diagnosis is based on histopathology as there are currently no other diagnostic tests to detect the presence of this disease. Crop biopsies can be submitted for evaluation; however, this particular sample is ~60% diagnostic, and a negative result does not confirm the absence of disease. If tissues from a necropsy are to be submitted for evaluation, we recommend submitting the following: crop, proventriculus-ventriculus (whole, combined), small intestine (3-4 pieces), adrenal gland, and nervous tissue (brain and spinal cord in situ, peripheral nerves).

Neoplasia was the second most common diagnosis, and neoplasms included adenocarcinoma (ventricular, renal), fibroma, hemangiosarcoma, lipoma, lymphosarcoma, renal tubular carcinoma, spindle cell tumor (cervical muscle), and thyroid adenoma. The ability to categorize a mass depends on the location of the mass and its histologic appearance. It is not always possible to determine the exact origin of a mass even using immunohistochemistry as a diagnostic tool.

The third most common diagnosis was **atherosclerosis**. This is an important rule-out in cases of sudden death and is commonly associated with birds being fed high-fat diets, e.g., seeds. It is important to examine the large vessels of the heart to identify possible thickening, and to submit the whole heart including the large vessels for histopathology. A good histologic section through the large vessels of the heart provides valuable information for the diagnosis of this condition. Thyroid glands, liver, and spleen could also be submitted - thyroids may be dysplastic, and liver/spleen may have aggregates of lipid-filled macrophages.

Various other diagnoses made on pet birds included cases with **hepatic lesions,** including hepatitis, hepatic cirrhosis, hepatic lipidosis, hepatic necrosis, and toxic hepatitis. There were also cases with **renal lesions,** including nephropathy, idiopathic nephritis, interstitial nephritis and urate nephrosis (with or without visceral urate deposits). Depending on the tissue samples available, these lesions may be related to a specific diagnosis or may be considered nonspecific or of unknown cause.

There are also a few diagnoses that can be confirmed by histopathology. These include **megabacteriosis** (*Macrorhabdus ornithogaster*), **mycobacteriosis**, polyoma virus infections, circovirus infections (psittacine beak-and-feather disease), and poxvirus infections. The best tissue to submit to diagnose megabacteriosis is proventricular-ventricular junction (isthmus).

Starting in 2004 and occurring again in 2007, we received cases with large clusters of sudden deaths and lesions of acute severe hepatic and splenic necrosis. The affected species were all psittacines (e.g., African grey, Amazon, conure, Jardine, macaw, parakeet, parrotlet, *Pionus*, budgerigars) and showed no age-related predisposition. Only some of the birds had specific diagnoses (e.g., PDD, *Chlamydophila*, circovirus, bacterial infection). We suspect that these deaths were caused by a reovirus infection, but could not confirm this on virus isolation or electron microscopy. Samples from these cases have been sent to a laboratory in the Netherlands that has a PCR available for this disease; preliminary results show that the affected tissues from these cases do indeed have reovirus organisms present.

The AHL provides full necropsy and histopathology services for avian and exotic species. Please also see '*Pet bird pathology submissions – tips for veterinarians*' on p. 13 of our June/05 AHL Newsletter. *AHL*

References

Berhane Y, et al. Peripheral neuritis in psittacine birds with proventricular dilatation disease. Avian Pathol 2001;30:563-570.

Shivaprasad HL. Pathology of birds – an overview. CL Davis Fndtn Conf, Gross Morbid Anatomy of Animals, AFIP, Washington DC, April, 2004.

van den Brand JMA, et al. Reovirus infections associated with high mortality in psittaciformes in the Netherlands. Avian Pathol 2007;36:293-299.

SWINE

Porcine circovirus 2 - associated disease diagnoses decline in 2007 and 2008

Susy Carman, Beverly McEwen, Josepha DeLay, Hugh Cai, Jim Fairles, Tony van Dreumel

***Porcine circovirus 2* (PCV-2)-associated disease declined in 2007, and declined further in the first half of 2008,** with 222 new cases presented in 2007, and only 58 new cases presented in the first half of 2008, compared to 350 cases in 2005 and 408 presented in 2006 (Fig.1). The percent of total swine submissions decreased from 8.9% in 2005 and 10.1% for 2006 (Fig. 1) to 6.3% in 2007 and 3.6% in the first half of 2008. Because these data are impacted by submission biases to the diagnostic laboratory, they cannot be regarded as population prevalence estimates. However these data reflect impressions of field infection and follow the increased usage of PCV-2 vaccines in Ontario swine.

The PCV-2 PCR-RFLP typing for all PCR testing requests continued to show a **significant change from RFLP type 422 (2a) seen in previous years to RFLP type 321 (2b)** (Fig. 2), with RFLP type 321 (2b) accounting for 135/171 cases in 2005, 130/159 cases in 2006 cases, 53/58 cases in 2007 and 3/3 cases in the first half of 2008. However, RFLP type 422 (2a) is occasionally still found in Ontario swine and was seen in 4 of 58 cases in 2007. Very few PCV-2 PCR-positive cases were requested to be typed in 2008. *AHL*

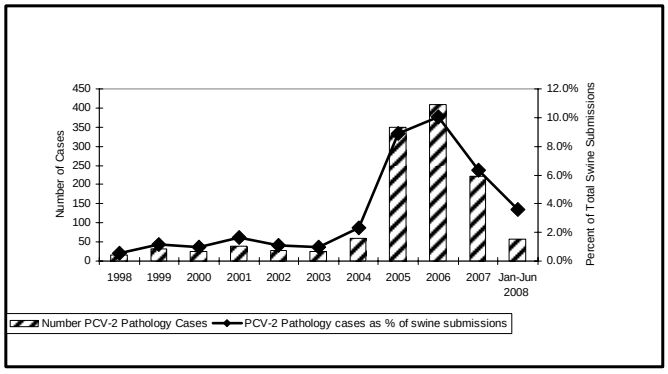

Figure 1. Number of PCV-2 pathology cases, and PCV-2 pathology cases as percent of total swine submissions, submitted to the

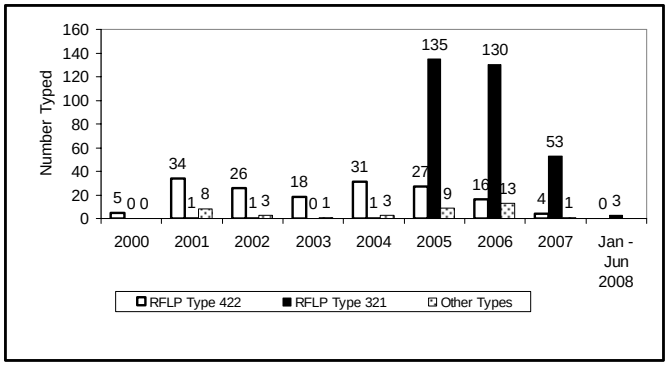

Figure 2. PCR-RFLP typing patterns of PCV-2 strains for cases

HORSES

Primary lymphoma of the central nervous system in a horse

Murray Hazlett, Josepha DeLay

A 4-year-old female Standardbred horse was presented for necropsy following a short (<24 h) period of hindlimb paresis that resulted in euthanasia. The mare had stumbled during training 3 wk prior to presentation, and had been laid off since that time. The owner described a period of head-tossing several days before the onset of paresis, raising concerns about rabies.

At necropsy, significant gross lesions were confined to the brain. Two large masses filled the lateral ventricles of the cerebral cortex. Both masses were cream-colored to grey, and firmer than surrounding normal brain tissue on sectioning. Centered in the left ventricle and extending into the diencephalon (thalamus), there was a 2.5 x 5 cm firm gray-white tumor occupying the length of the entire lateral ventricle (Fig. 1). A smaller, irregularly shaped tumor measuring 1 x 2 x 5 cm was present in the right lateral ventricle. These masses were initially thought to be cholesterol granulomas, which are relatively common but benign cerebral masses in adult horses.

Histologically, the ventricular tumors were composed predominantly of large numbers of small to medium-sized round cells resembling lymphocytes that had moderate variation in nuclear size and shape, and an average of 2 mitotic figures per 40X field. In many areas, tumor cells were

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accompanied by moderate numbers of eosinophils. Neoplastic lymphocytes were intermingled with more normal brain tissue at the periphery of the tumors and often had perivascular orientation, particularly in periventricular white matter. Histiocytic cells, occasional multinucleated cells, and plasma cells were interspersed amongst the tumor cells. There was no evidence of neoplastic involvement in numerous other tissues examined microscopically (kidney, skeletal muscle, colon, small intestine, pituitary, heart, adrenal gland, and thyroid gland).

Approximately 80% of neoplastic lymphocytes stained with antibody to CD3 (T-lymphocyte marker), and approximately 40% of cells stained with antibody to CD79a (B-lymphocyte marker) (Fig. 2). **This staining pattern is most consistent with a T-cell rich B-cell lymphoma.**

Except for pituitary tumors, primary tumors of the central nervous system (CNS) of horses are rare events. From a total of 757 equine neoplasia cases identified at the AHL over the past 10 years, only 5 intracranial neoplasms have been identified (0.66%). The CNS tumors included 2 meningiomas, 1 tumor of likely neuroendocrine origin, 1 astrocytoma, and the lymphosarcoma described here. Of the 757 equine neoplasms, 59 were diagnosed as lymphoma (8%) involving various primary sites but not brain. As mentioned previously, cholesterol granulomas are commonly recognized tumor-like masses seen in the cerebral lateral ventricles of horses. Two such lesions have been reported at the AHL in the last 10 years, however it may be that most were seen as incidental lesions and not encoded. *AHL*

Figure 1. Mass in-situ in left lateral ventricle (arrow). Bar = 1cm.

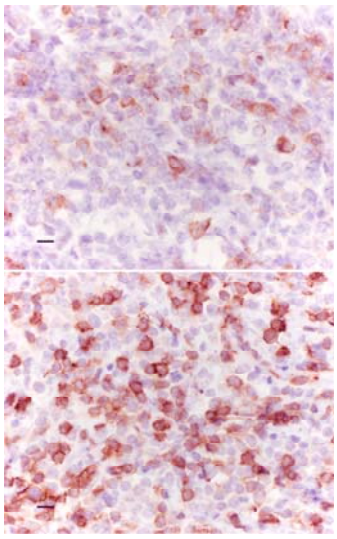

Figure 2. CD79a (top) and CD3 (bottom) immunohistochemistry. Bars = 10 µm.

COMPANION ANIMALS

Canine brucellosis

Durda Slavic, Sarah Flint

A 2-year-old female spayed Shiba-Inu mix dog was presented to the Ontario Veterinary College Emergency Service for evaluation of suspected diskospondylitis. The dog had 2-3 episodes of back pain over the course of a year; these responded to Robaxin. **Spinal radiographs done at the referring clinic revealed narrowing of the L2–L3 disk space and lysis of the vertebral endplates**. At the time of admission, complete blood count, serum biochemistry profile and urinalysis were all unremarkable. There was a grade I-II/VI protosystolic heart murmur at the left heart base. Ultrasound-guided aspiration of the L2-L3 disk space was performed and cytology of the aspirates did not reveal any bacteria or fungal elements. The blood was submitted to the AHL for culture and susceptibility testing to rule out bacterial valvular endocarditis as an underlying etiology. The subsequent echocardiogram, however, did not show any evidence of endocarditis, and the heart murmur was considered to be physiologic.

Blood culture yielded pure growth of a gram-negative coccobacillus. Limited biochemical testing in our laboratory identified the isolate as *Brucella canis*. Final confirmation of *B. canis* identification was carried out by the Public Health Agency of Canada.

***B. canis* infects susceptible hosts by penetrating mucous membranes, primarily in the oral cavity, vagina or conjunctiva.** At the mucosal surfaces, *B. canis* is phagocytosed and transported to lymphatic and genital tract tissue where it multiplies. Non-reproductive tissues can also be affected. *B. canis* is known to localize in the endarterial circulation of the intervertebral disk, causing diskospondylitis. Furthermore, *B. canis* can also infect the eye, kidney and meninges. Adult dogs are rarely clinically ill. Most of the signs of disease are associated with reproductive problems. In females, the most frequent sign is the abortion of dead puppies between 45 and 60 da of gestation. A brown or green-grey vaginal discharge that lasts 1-6 wk is frequently present. In addition, there are reports of conception failure or early embryonic death. The clinical disease is more obvious in males because of testicular abnormalities. Males are usually in good physical condition but have an enlarged scrotum, and spermatogenesis is severely reduced.

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Canine brucellosis - continued from p. 23

Clinical laboratory findings are usually nonspecific. The only consistent finding is hyperglobulinemia concurrent with hypoalbuminemia in chronically infected animals. If only diskospondylitis is present, cerebrospinal fluid analysis is unremarkable. As a result, radiographic detection of diskospondylitis should always include serological testing and bacteriological culture. Canine brucellosis is most frequently diagnosed based on serological testing using a variety of methods. Sera should be free of hemolysis since hemoglobin may cause false-positive reactions especially in the antigen tube test. The serological tests are usually negative during the first 3-4 wk post-infection. Regardless of the method used, the titers should be positive by 8-12 wk post-infection.

Canine brucellosis is rare in Ontario. In a survey of 2000 dogs in southwestern Ontario, 0.3 % of dogs showed serological evidence of infection. In contrast, the prevalence in the southern United States is ~8%. At the time of blood culture submission, the travel history of the dog was unknown. **After *B. canis* was identified, it was revealed that the dog came to Canada from a rescue shelter in Louisiana.** As can be seen from this case, it is very important to provide the laboratory with the complete clinical and travel history of the patient to facilitate a fast and accurate diagnosis, especially for diseases not frequently encountered in Ontario. *AHL*

Reference

Bosu WTK, Prescott JF. A serological survey of dogs for *Brucella canis* in southwestern Ontario. Can Vet J 1980;21:198-200.

Anesthetic and perisurgical death in dogs and cats

Murray Hazlett, Beverly McEwen

Most of our veterinary staff at the AHL have spent time in clinical practice, and are familiar with the emotional turmoil experienced by clients and clinic staff associated with the unexpected death of a pet. Veterinarians should be aware of their obligation to advise owners that independent necropsy is available, and often this in itself helps to diffuse tensions.

Unexpected deaths associated with surgical procedures are relatively common pathology submissions to the AHL. From January 1997 to July 2008, there were 64 canine and 80 feline cases coded as anesthetic or perisurgical associated death by AHL pathologists (Table 1). Anatomic lesions or significant intercurrent disease were not present in 75% of dogs and 68% of cats (Table 2).

Absence of lesions that could explain the death in these cases is often difficult to explain to a distraught client, however, biochemical and physiological dysfunction often occurs without anatomic lesions, for example with cardiac arrhythmias or idiosyncratic reaction to drugs. **Ruling out significant intercurrent diseases in these cases may help alleviate some of the owner's concerns.**

The average age of dogs submitted for necropsy following anesthetic death was 2 yr (range 8 wk - 13 yr). The median age of 10 mo reflects that most dogs (60%) had died during or following ovariohysterectomy or castration. Yorkshire Terriers were over-represented in this group, comprising 9.5% of anesthetic deaths compared to the overall necropsy rate for this breed of 2.6%. Due to the submission biases to the laboratory, this may not reflect the true prevalence of breed-related anesthetic deaths.

The average age of cats submitted was 2.9 yr (range 10 wk to 14 yr). The median age of 10 mo similarly showing that most of the cats had died following routine neutering or declawing procedures (84%). Interestingly, pulmonary atelectasis and pneumothorax seemed to be a feature mentioned only in the diagnosis records of the cats – they may be more prone to develop pneumothorax due to resuscitation attempts. Pneumothorax in cats has been associated with (long term) positive pressure ventilation, trauma and feline asthma. *AHL*

Table 1. Occurrence of unexpected death in relation to surgery.

Species	Total cases	Pre-surgical	During surgery	Post-surgical	Not indicated
Canine	64	9	15	21	19
Feline	80	8	15	36	21

Table 2. Categories of lesions associated with anesthetic death.

Diagnosis	Canine (# cases)	Feline (# cases)
Cardiac lesion/failure*	7	16
Hemoperitoneum	3	0
Pneumonia	4	6
Other	2	4
No significant lesions*	48	54
Total	64	80

*Included 12 cats with pulmonary atelectasis/pneumothorax (11 cause undetermined, 1 cardiac).

Reference

Lee J, et al. Indications for and outcome of positive-pressure ventilation in cats: 53 cases (1993–2002). J Am Vet Med Assoc 2005;226:924-931.

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