AzVDL Newsletter

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From the Director:

Data management

We are now using a new "Microsoft Access" -based data management system designed by Barbara Hiers, our Administrative Assistant. This system will allow us to manage accessions with less paperwork and better efficiency. It will also help us to retrieve data at a later date. I appreciate the extra effort required of our personnel during the transition. To my knowledge, we're the first veterinary diagnostic laboratory to use this approach which has saved us many thousands of dollars (that we didn't have) and which permits great flexibility. We don't think the transition has affected our service but, as always; contact us if you have any concerns. Another advantage is that we will now be doing accounting and billing here rather than on campus, so call here with any billing questions.

Reporting

We can now send final written reports by e-mail, so let us know if you prefer e-mail to fax.

Evening and Weekends

Occasionally someone needs to find us when the laboratory is closed. We are starting to use a pager, 520-793-0344, which will be rotated between our veterinary diagnosticians. A common reason for calls is to access refrigeration at the AzVDL for animals over 45 pounds. Smaller animals can be placed in the refrigerator near our front door. If all else fails, feel free to try and find us at home. My home phone is 520-572-3802 and my cell phone is 520-241-2740. Some of our home numbers are also posted on the front door at AzVDL and most of us are listed in the telephone directory.

Robert D. Glock. Director

Short Comment Section

As you all may know, we also have a new telephone feature. When you telephone the diagnostic lab, you may reach your party by dialing their extension directly. This is very convenient for most of you. We do ask, however, that if your call is case-related you speak directly with the front office first. Most times, with the new database system, they can answer your questions much quicker than the diagnostician. In addition, the front office is able to route calls to the appropriate department and the appropriate diagnostician.

Submission Tip

Icing down carcasses is worth the effort! The carcass of a 350-pound calf was received in excellent condition after being transported from Southeastern Arizona in the middle of the summer. The carcass had been wrapped in a poly tarp and packed with ice per our r ecommendation.

T.H. Noon

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Diagnostic Update

The following are selected samples of cases submitted to the AzVDL during the summer months of June, July and August.

Bovine

Septicemia due to *Salmonella Dublin* was the cause of heavy mortality in one-to-three-month old Holstein calves in west central Arizona. The losses started a few months after the introduction of new heifers into what until then had been a closed herd.

We identified acute **clostridial abomasitis** in a group of eleven Holstein calves that were fed colostrum on Saturday morning and became acutely ill with abdominal bloating that afternoon and evening. The calves died over a period of two days. The primary necropsy finding was hemorrhage and edema in the wall of the abomasum. *Clostridium perfringens* type A was identified in abomasal tissues and in the colostrum that the calves received. One of the cows from which the colostrum was obtained had died after being milked and there was an unconfirmed suspicion of clostridial mastitis.

A four-year-old Hereford cow had been purchased within the past month and was on pasture with a calf at her side. She was observed gaunt and uncoordinated in the morning and died shortly thereafter. The diagnosis was **bronchopneumonia** caused by *Pasteurella multocida*. This case is somewhat unusual in that we do not frequently observe acute pasteurella pneumonia in older cows. The reason for this cow's exceptional susceptibility is undetermined.

Bloat (ruminal tympany) was diagnosed in a ten-month-old crossbred feedlot steer. The animal was simply "found dead". At necropsy, the abdomen of the carcass was distended and taut. The rumen was distended with gas. The liver was pale. Subcutaneous blood vessels in the anterior aspect of the animal were congested with blood. The tracheal mucosa was congested and hemorrhagic. Esophageal mucosa distal to the thoracic inlet was pale in appearance and the mucosa anterior to the thoracic inlet was discolored a pale purplish leaving a characteristic "bloat line" at the thoracic inlet.

Equine

There were numerous isolations of *Corynebacterium pseudotuberculosis* from deep intramuscular abscesses in horses from Pima County during the month of August. All were cases of "**chest abscess**" or "**pigeon breast**", a condition relatively rare in Southern Arizona. Although the mechanism of transmission of the disease is largely unknown, this strong seasonal clustering of cases in otherwise unrelated horses lends strong credence to the notion that insects play a significant role in the dissemination of the disease.

Small Ruminants

Pneumonia and septicemia by ***Mycoplasma mycoides*** subsp. mycoides (large colony type) was the cause of death of a three-year-old female Nigerian Dwarf goat. Necropsy findings included a chronic pneumonia, multifocal hepatic necrosis and polyserositis.

We received a four-month-old lamb with a history of being a poor doer. Necropsy findings indicated thickening of the lower smaller intestine with possible stricture of the ileocecal valve. **Proliferative enteritis** was identified histologically. This is occasionally observed in lambs but is much more common in swine and hamsters. PCR tests were positive for *Lawsonia intracellularis*, the cause of the disease in swine and hamsters. Its possible relationship to the disease in lambs has not been established.

We received the head of an alpaca cria that had respiratory distress with inability to nurse right after birth. **Choanal atresia** was diagnosed clinically and supported with radiographs. We were able to demonstrate a complete lack of communication between the posterior nasal cavity and the oral pharynx. This condition has been previously described in alpaca crias.

Avian

Salmonellosis caused by *S. typhimurium* was diagnosed in a central Arizona aviary with 200 cockatiels. Heavy mortality was observed in the baby cockatiels, with no losses recorded in the older birds. Affected birds were located in both indoor and outdoor cages.

Proventricular dilatation disease (PDD) was the necropsy finding in a seven-year-old male African gray parrot that was "doing well until found in the bottom of the cage this morning". The bird was emaciated and with a greatly dilated proventriculus full of feed. The condition is suspected of being caused by a virus. Non-specific dilatations, caused by inadequate diets, traumatic injuries, or nonspecific proventricular infections are a common necropsy finding in psittacines. Histologic examination of the gastrointestinal tissues is required to confirm the diagnosis of PDD.

We received an adult chicken with a history of birds losing weight and having swollen eyes. There was extensive white exudate in the conjunctival sacs, pharynx, esophagus, crop,

and proventriculus. Hyperkeratosis was confirmed in these tissues by histopathology. Serum vitamin A level was .11 µg/ml, which is far below the normal minimum of 0.30 µg/ml. The diagnosis was **vitamin A deficiency.**

Avian trichomoniasis was diagnosed in three birds of different origins. Two cases were in juvenile wild raptors (one American kestrel and one Cooper's hawk) that were in the care of wildlife rehabilitators and the third was a white-tipped dove from a zoological collection. All had typical lesions in the upper alimentary tract and cultures were positive for trichomonads in the Cooper's hawk and the dove. Cultures from the kestrel were negative and this was attributed to freezing of the specimen prior to submission. Freezing is lethal to trichomonads.

Salmonella septicemia was diagnosed in a pet pigeon that had been observed to be ill early in the day and was later found dead. Fecal pasting was evident on the feathers around the vent. Several birds in the flock had died previously. At necropsy, there was a chronic fibrinous epicarditis and bacterial colonies were evident within the lesions. Bacterial colonies were also evident in lung, spleen, interstitial blood vessels of kidney, and skeletal muscle. There was a portal hepatitis as well. The salmonella isolate was typed as a *Salmonella typhimurium* (Copenhagen).

Hemochromatosis was diagnosed in a male Rosenberg lorry that had no prior history of disease. At necropsy, the bird was in good flesh but the liver was discolored a light tan color and was tough when incised. Microscopic examination of the liver revealed prominent bridging fibrosis between portal areas with isolation of remnant hepatocytes. Increased numbers of lymphoid cells were present in the affected portal areas. There were prominent accumulations of brown, granular, iron-positive pigment in the cytoplasm of hepatocytes and Kupffer cells. Formalinized liver tissue contained an excessive amount of iron (3637 ppm; normal ~ 300 ppm).

Hemosiderosis was diagnosed in a Harris hawk that had been taken in by a wildlife rehabilitation agency. The bird had been observed to "down" for a week and was extremely emaciated. At necropsy, there were no significant lesions. Microscopically there was a prominent accumulation of brown, granular, iron-positive pigment in the cytoplasm of most hepatocytes. Kupffer cells were also laden with iron-positive pigment. Mild to moderate inflammation of the portal areas of liver was also evident. Testing of formalinized liver revealed an abnormal amount of iron (2608 ppm; normal probably ~ 300 ppm). The source of the iron was not determined.

Avian chlamydiosis was diagnosed in a seven-week-old Prince of Wales parakeet that had been under treatment with doxycycline for two weeks following episodes of weakness. At necropsy, the liver was swollen and there were multiple foci of faint, whitish discoloration of the parenchyma. Microscopically, there were severe portal and multifocal parenchymal infiltrates of mixed leukocytes in the liver. The serosa of the spleen, gizzard, and epicardium of heart were also inflamed. Pneumonia was evident in sections of lung. Gimenez-stained imprints of liver revealed numerous structures compatible with chlamydia. As most readers are aware, avian chlamydias are high-risk zoonotic organisms.

Feline

Aspergillus flavus was isolated from the spleen and uterus of a two-year-old DSH female with a severe pyogranulomatous splenitis, metritis, and focal encephalitis. The spleen was enlarged to more than five times the normal size; the uterine body and uterine horns were also thickened. The initial infection most likely took place in the uterus. There was also hydronephrosis of the right kidney, the result of ureter compression.

The exudative form of ***Feline Infectious Peritonitis*** was the diagnosis in four unrelated feline necropsies, ages six weeks to four years old. FIP is among the most common infectious causes of fatal disease in pet cats in Arizona.

A ten-year-old cat had sudden blindness and paresis. **Malignant histiocytosis** was identified histologically in kidney, brain, spinal cord, lung, and heart. The lesions were grossly visible as pale or tan areas in the brain, heart, and kidney.

An **astrocytoma** was diagnosed in a seven-year-old, neutered, male Bombay feline. The cat had been sick for about three or four weeks and clinical signs included lethargy and a flaccid tail, with progression to tetraparesis, which was more severe in the forelimbs. The necropsy examination revealed a linear, dark red to brown, gelatinous lesion (approximately 1/4 cm in diameter) that infiltrated the central areas of the spinal cord and extended distally from the medulla oblongata into the anterior cervical spinal cord for a distance of approximately four centimeters. Considerable effacement and disruption of spinal cord was noted in the affected area. Microscopic morphology was felt to be compatible with that of an astrocytoma.

Canine

An acute ***Bordetella bronchiseptica*** **pneumonia** was the only necropsy finding in a six-year-old Boston terrier with seizures of sudden onset. The dog was euthanized after sev-

eral hours of failed attempts to control the seizures. Hyperthermia and/or anoxia were the likely causes of the seizures.

Canine distemper was diagnosed in a three-month-old female Shepherd mix which died while being transported to the submitting veterinarian's clinic. At necropsy, the body was extremely emaciated with prominent ribs and bony prominences. There was purulent discharge matting the periocular hair and similar discharge was evident also on the nose. Microscopically, there were numerous, pale, eosinophilic, cytoplasmic inclusions compatible with those of canine distemper in bronchiolar epithelium, glandular epithelium of stomach, and transitional epithelium of urinary bladder.

An unusual case of chronic, severe, diffuse **pancreatitis** was diagnosed in an eight-week-old, spayed female "Yorkie" that had been euthanized. The submitting veterinarian noted that the puppy was a "poor doer" and had several seizures. There was no response to extensive treatment.

Coccidioidomycosis was diagnosed in a nine-year-old neutered male canine that had been euthanized following an illness of fifteen days duration. Clinical signs included coughing and vomiting followed by diarrhea. The submitted veterinarian noted "abdominal distention and effusion" and had performed an exploratory laparotomy during which the liver and spleen were biopsied. Examination of the biopsy specimens revealed congestion consistent with right heart failure. There was also swelling of the right fore limb and both hind limbs. At necropsy, the abdomen was full of sanguinous fluid and the liver was congested. The thorax was filled bilaterally with amber-colored fluid and the pericardium was greatly thickened (about 1/4 inch thick), appeared to be fibrotic, and was adherent in many areas to the epicardial surface of the heart. Microscopic examination of pericardium revealed a granulomatous focus that contained a single degenerate spherule consistent with that of Coccidioides immitis. Fungal cultures of the pericardial sac were positive for Coccidioides immitis.

A mixed viral infection, due to both **canine adenovirus** and **canine distemper** virus was diagnosed in a ten-week-old female poodle. The pup had reportedly been sick for about ten days and died spontaneously. The pup had received a single DHPPC vaccination when it was eight weeks old. Four days after vaccination, it was presented weak, lethargic, and with a nasal discharge. About a week after presentation, the dog began seizuring and died. In necropsy, the lungs were discolored dark red and sank in fixative. Multiple hemorrhages were present on the capsular surface of kidney and there was locally extensive submeningeal hemorrhage covering nearly the entire dorsal aspect of the cerebral cortex. Large, bluish, intranuclear inclusions compatible with those of adenovirus were scattered throughout sections of lung. Variably sized, eosinophilic, cytoplasmic inclusions compatible with those of canine distemper were present in transitional epithelium of renal pelvis and urinary bladder and in glandular mucosal cells of stomach. It was felt that the cerebral hemorrhage would explain the terminal seizures. Canine adenovirus type 2 is reported to be more strictly associated with respiratory disease in the dog. Naturally occurring pulmonary disease in the dog due to adenovirus infection is found mostly in conjunction with canine distemper or other conditions causing immunologic impairment.

Squamous cell carcinoma of the lung was diagnosed in an adult, spayed female Pekingese. The dog had been presented to the submitting veterinarian "struggling to breathe". Multiple, variably sized, nodular tumorous foci were scattered throughout the parenchyma of both lungs. Microscopic changes were typical.

A seven-year-old, spayed female mixed breed canine presented with a 24-hour history of lethargy, pale mucous membranes and painful abdomen. The dog became agonal and died. At necropsy, the thorax and pericardial sac were filled with unclotted blood. The liver contained both brodifacoum and diphacinone **anticoagulant rodenticides.** The source of the rodenticides was not determined.

A three and one-half-month-old, spayed female, Lhasa Apso went into cardiopulmonary arrest and died post-surgery for an elective procedure. Microscopic evaluation of the lung tissue revealed widespread mineralization of the walls of bronchioles and a mild eosinophilic bronchiolitis. The lesions suggested a chronic allergic **bronchiolitis** and it was postulated that this may have rendered the airways hyperreactive and caused bronchoconstriction under anesthesia.

Exotics

Severe multifocal **osteomyelitis** due to **salmonella infection** was diagnosed in a fourteen-year-old gopher snake. The animal had been ill for four months and the submitting veterinarian noted numerous bumps along the spine. The necropsy examination revealed numerous, variably sized exostoses along the ventral aspects of the vertebral bodies of the spinal column. Sections of the affected vertebral bodies had multiple foci of granulomatous inflammation, many of which surrounded a central core containing amorphous, eosinophilic debris. Cultures of four of the vertebral lesions yielded heavy growths of salmonella.

Canine distemper was diagnosed in an adult male pet ferret that began losing weight and developed a mucopurulent ocular discharge and a serous nasal discharge. The footpads were observed to be dry, hard, and crusty. Microscopically, numerous eosinophilic cytoplasmic inclusions compatible with those of canine distemper virus were observed in bronchiolar epithelium of lung and glandular epithelium.

Boid inclusion disease was diagnosed in a four and a half year old Red-tailed boa with a history of weight loss, anorexia, liquid feces, and CNS signs. Lesions included slight mottling of the liver, which histologically, had numerous eosinophilic inclusion bodies, particularly in the biliary epithelium. The intestine also had severe fibrino-necrotic enteritis with some necrosis. Heavy populations of *Salmonella arizonae* were isolated from the liver and there was a heavy population of trichomonads in the small intestine. The latter infections are assumed to be secondary to the viral disease.

A **yolk peritonitis** and a probable **salmonella septicemia** were diagnosed in a nine-plus-year-old female rattlesnake (*Crotalus willardi*), which was part of an Arizona zoo collection. The animal was found dead and had not been observed to be sick. The microscopic lesions were typical and a heavy growth of a *Salmonella sp.* was isolated in cultures of liver, oviduct, and gall bladder.

Wildlife

An acute **chlamydial pneumonia** was the cause of death of a Bald eagle nestling, which fell from the nest and was found on the ground. It appeared to be overheated and dehydrated. The bird died after two days of treatment.

A thirteen-week-old coyote pup was presented for lethargy, depression, labored respiration and bloody feces. The pup was 10% dehydrated and had a body temperature of 104.4F. Miliary nodules were present throughout both lung fields and there were enlarged hilar lymph nodes on thoracic radiographs. At necropsy, the lungs had numerous 1.0 cm diameter tan foci. The sternal and tracheobronchial lymph nodes were replaced by firm tan tissue. Scattered, 1.0 cm tan foci were present in the spleen. Microscopically, the lung, lymph nodes and spleen contain foci of granulomatous inflammation with fungal hyphae. *Penicillium sp.* and *Mucor sp.* were isolated from the lung. Also present were characteristic microscopic lesions of canine distemper virus infection. **Canine distemper** resulting in immune-suppression and a secondary systemic mycotic infection with *Penicillium sp.* and *Mucor sp.* was the final diagnosis.

A coyote pup of undetermined age was found lying by the side of a residential garage. The owners of the property were able to pick the pup up and put it in a box without the coyote making any attempt to bite or move. The pup was euthanized. The pup had marked, diffuse alopecia and hyperkeratosis of the skin over the entire body. Large numbers of tapeworms were present in the small intestine. A severe infection of the skin with **Sarcoptes mites** was confirmed on histologic examination of the skin.

Multiple neoplasms were diagnosed in a 15-year-old male gray fox from an Arizona zoological collection. The fox had a history of poor vision and rear limb lameness attributed to spinal degenerative disease and was retired from the exhibit in July of 1999. **Pheochromocytoma, multifocal bile duct carcinoma**, and **parathyroid adenoma** were found on necropsy. Pheochromocytoma is a functional tumor of the adrenal medulla that secretes catecholamines. They do not usually metastasize but can be locally invasive into the vena cava, liver and kidneys. In this case there was evidence of extension into the perirenal fat. They are often incidental findings at necropsy.

Both **avian pox** and **avian malaria** were diagnosed in a grackle that was found in the Scottsdale area. External examination revealed multiple, variably sized, large, (1.3 cm in diameter) featherless, tumor-like masses on the dorsal aspect of the right wing. Multiple smaller masses were present on the featherless areas of the feet and legs. Sections of the wing, feet, and leg lesions were typical of avian pox. Also found were microscopic changes typical of avian malaria. Intracytoplasmic structures compatible with avian plasmodia were found in erythrocytes and lung capillary fields and schizonts compatible with those of avian plasmodia were found in the cytoplasm of some hepatocytes. Malaria pigment was present within liver sinusoids and Kupffer cells. Both avian pox and avian malaria are mosquito-borne diseases of birds.

Comments on Diagnostic Update can be directed to Dr. Greg Bradley via e-mail at: azvdl@ag. arizona.edu

compiled by Greg Bradley, Bob Glock, Carlos Reggiardo, T. H. Noon, Sharon Dial, and Barbara Hiers

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Access to the AzVDL: Take Tucson Interstate 10 to the Miracle Mile exit #255. Travel approximately 1/4 mile on the south bound frontage road between Miracle Mile and Grant Rd. Turn west onto the farm at the signed entrance.
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