

February 2023: VOLUME 4, ISSUE 1

VIRGINIA ANIMAL DIAGNOSTIC NEWSLETTER

A joint publication between Virginia Department of Agriculture and Consumer Services and the Virginia Tech Animal Laboratory Services

EDITORIAL

Canine nasal Eucoleosis

Testing of feces is the laboratory procedure most frequently used for the diagnosis of many parasitic infections in dogs. In veterinary practice a fecal test is usually recommended for diagnosis of gastrointestinal parasites, and it can be overlooked that fecal examination also allows the detection of parasites in several body systems besides the gastrointestinal tract. Correct diagnosis and consequent proper treatment are dependent upon the correct identification of the eggs/larvae in the fecal examination.

Dogs can be infected by several parasites belonging to the Family Trichuridae. The most common parasite species of this family in dogs in the USA is *Trichuris vulpis*, the “whipworm”. However, two less-known species from this family can also infect dogs: *Eucoleus boehmi* (syn. *Capillaria boehmi*) and *Eucoleus aerophila* (syn. *Capillaria aerophila*). The adults of *E. aerophila* live in the epithelium of bronchioles, bronchi, and trachea, while adults of *E. boehmi* are located in nasal and paranasal sinuses. The life cycle of these parasites is not completely understood. Eggs are released via feces into the environment where they develop to the infective stage. Dogs become infected when ingesting embryonated eggs from the environment, but earthworms may act as intermediate and/or paratenic hosts.

All Trichuridae eggs are similar, and are characterized by a barrel shape with polar plugs. The lack of species-specific distinctions poses important challenges in identification. Although both *Eucoleus* species are most widely found in wild carnivores (foxes, wolves, and coyotes) in several geographic areas, their presence in dogs is likely neglected due to coprological misidentification of their eggs which are incorrectly assigned to *T. vulpis*. As an example, reports of canine nasal eucoleosis, caused by *E. boehmi*, in the US are scarce, and in most cases have followed an initial misidentification as *T. vulpis* infection.

Dogs with nasal eucoleosis can suffer nasal discharge, sneezing, reverse sneezing, and epistaxis. More importantly, it has been suggested that *E. boehmi* can negatively affect the dog’s ability to

IN THIS ISSUE:

Editorial	1
Horses	2
Ruminants	2
Avian & Pigs	3
Companion Animals	4
Laboratory News	5

Contact ViTALS
Email: lcrvth@vt.edu
Phone 540-231-4320
Fax: 540-231-2657
vitals.vetmed.edu

Virginia-Maryland College of
Veterinary Medicine
245 Duck Pond
Blacksburg, VA 24061

Continued from page 1

detect odors. Our lab has been studying the epidemiology of nasal eucoleosis in hunting dogs, specifically in Foxhounds. The evidence shows that *E. boehmi* is widely present in these dogs, probably due to their lifestyle of sharing the habitat and interacting with foxes which are the natural definitive host of the parasite. However, there is a gap regarding the factual importance of nasal eucoleosis in canine clinical practice. The damage of the epithelium of the nasal turbinates and sinuses can induce rhinitis, which is believed to be the cause of the impairment of scenting ability.

At ViTALS, we offer the test for a proper diagnosis of canine nasal eucoleosis, which is critical to understand the gaps in the epidemiology and clinical importance of this parasite in dogs.

Roger Ramírez-Barrios DVM, PhD.
Head, Parasitology section
ViTALS

HORSES



Gastric impaction in a horse

A 24-year-old Belgian mare presented to VMCVM for gas distention and colic. Endoscopy revealed deviation of the esophagus and a food bolus at the cardia of the stomach. Attempts to pass a nasogastric tube were unsuccessful. Rectal palpation revealed severe gas distention of the intestine. The mare was hospitalized and treated with fluids. A barium study confirmed deviation of the esophagus and repeat endoscopy showed the same food bolus at the gastric cardia. The colic signs continued and the horse was euthanized and submitted for necropsy. Gross examination revealed a firm, fibrous adhesion between the greater curvature of the stomach and the diaphragmatic flexure of the large colon. The stomach was impacted with firm, somewhat dry ingesta and weighed 47 kg (104 pounds). The small intestine and cecum were distended with gas. Gastric impaction is rare in horses and has been associated with certain feed materials (persimmon seeds, sugar beet pulp), dental disease, dehydration, and abnormal stomach motility or secretion. In this case, the adhesion to the large colon, likely a result of previous peritonitis, caused rotation of the stomach, with esophageal

deviation and obstruction of gastric outflow. The adhesion also likely affected gastrointestinal motility at the level of the large colon.

Teresa Southard DVM, PhD, DACVP, Virginia Tech.

RUMINANTS



Pulmonary neoplasia in an ewe

A 16-year-old Dorset-cross ewe with no history of illness was found down, euthanized and submitted for necropsy. The only gross findings were slightly firm lungs with dozens of firm tan nodules, up to 1.5 cm in diameter distributed throughout the parenchyma. Histologic examination showed that the nodules were composed of atypical, proliferative epithelial cells forming glandular structures. The diagnosis was pulmonary adenocarcinoma. Although spontaneous pulmonary neoplasia can occur in sheep, most pulmonary adenocarcinomas are caused by jaagsiekte sheep retrovirus, a betaretrovirus first described in South Africa and now found in most major sheep rearing countries except for Australia

Continued from page 2

and New Zealand. The incidence in the United States is low. Sheep usually die within a few months of the onset of clinical signs. Horizontal transmission occurs via contact with nasal discharge from affected sheep.

Teresa Southard DVM, PhD, DACVP, Virginia Tech.

Lung worms in cattle

A five-year-old female Angus cow that was born and raised in Virginia was submitted with another cow of the same age after being found dead within the pasture. Externally there were external parasites observed on her abdomen and there was a significant amount of white foam observed within the nasal and oral cavity. This cow was in poor body condition (2/9 BCS). When removing the pluck, the lungs were noted to be extremely emphysematous and there were 1-2-inch white worms present in abundance within the trachea and continuing into every open spot from the cranial trachea to the distal bronchus in the tip of the caudal lung lobes. In addition, the urinary bladder mucosa was thickened with multiple round, raised nodules with gritty surfaces. On aerobic culture *Pasteurella multocida* was grown from the lung. Histopathology revealed a necro-hemorrhagic cystitis and mild bronchitis with intralesional nematodes. The parasite found within the lung tissue was likely *Dictyocaulus viviparus*.

Jamie Horstmann, DVM, Harrisonburg RAHL.

Avian and Pigs



“Ulcerative Enteritis” in three quails

Three juvenile quails were submitted for necropsy, with history of weight loss and lethargy of one-week duration. They have lost about 60 out of 250, and 40 died in the last 48 hours. These birds were healthy

when received by the producer. All of them had multifocal to coalescing irregular, white to gray, slightly firm, well demarcated plaque-like lesions in the duodenum and jejunum (ulcerative enteritis). In two birds, multifocal white pinpoint lesions were identified in the liver (necrotizing hepatitis). *Clostridium colinum* was isolated from the liver of two birds, which gives the diagnosis of “quail ulcerative enteritis”. This is an acute, highly contagious disease of chickens and quails, which is characterized by the presence of intestinal ulcers and multifocal embolic showers into the liver. It can start suddenly and may cause up to 100% mortality. Overcrowding and coccidiosis are important predisposing factors for this condition.

Francisco R Carvalho DVM, DSc, DACVP, Virginia Tech.

Uterine masses and cystic endometrial hyperplasia in a potbellied pig

An adult female Vietnamese potbellied pig with a history of constipation for 6 days duration was examined by a veterinarian. A large abdominal mass was detected on palpation and radiography and humane euthanasia was elected. Postmortem examination revealed multiple firm white/tan nodular masses throughout the uterus ranging in size from 5 cm to 40 cm diameter. In addition to the masses, the endometrium was diffusely expanded by coalescing fluid-filled cysts. Based on histologic examination, the uterine masses were leiomyosarcomas and the cystic change was diffuse cystic endometrial hyperplasia. Both uterine smooth muscle tumors and CEH are common in miniature pet pigs - in one study of 32 female miniature pigs 75% had CEH and 43% had uterine smooth muscle tumors (Vet Pathol 47(6) Nov 2010, 1071-1075).

Thomas Cecere DVM, PhD, DACVP, Virginia Tech.

COMPANION AND LABORATORY ANIMALS



Ethylene glycol intoxication in a dog

A one-year-old male Great Dane dog was euthanized following acute anuric renal failure. Based on the history provided by the owners, poisoning with ethylene glycol (antifreeze) was of concern. Postmortem examination revealed bilaterally pale and swollen kidneys. Histologically the kidneys were characterized by acute tubular necrosis with myriad intratubular oxalate crystals (Figure 1), compatible with a diagnosis of ethylene glycol toxicosis. This is among the most common toxic causes of acute tubular necrosis in dogs, cats, and occasionally livestock species.

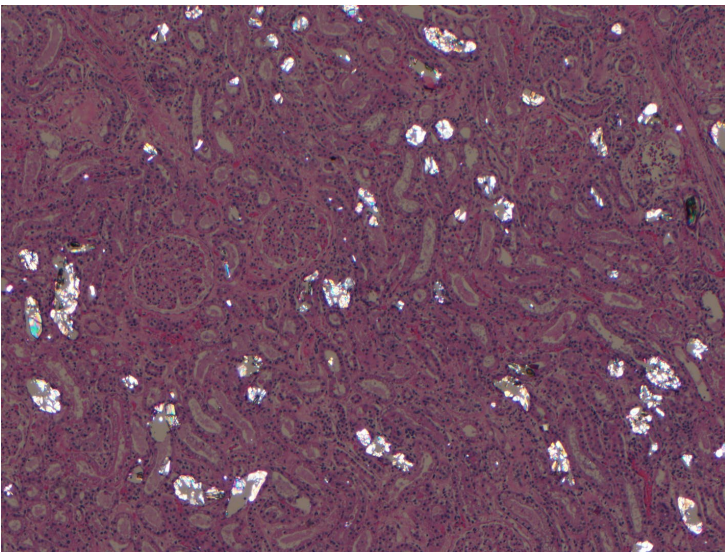


Figure 1. Kidney: Numerous birefringent oxalate crystals obliterate the lumen of renal tubules. Hematoxylin and eosin (100X), under polarized light.

Thomas Cecere DVM, PhD, DACVP, Virginia Tech.

Hemangiosarcoma in a cat

A six-year-old domestic shorthair cat with a 2-3-week history of being having gastrointestinal signs was euthanized and submitted for necropsy. On necropsy there was significant amount of gastrointestinal contents within the abdominal cavity. The stomach and small intestine were empty but intact with small 1-inch sections of gritty, hard surfaces. The ileocecal junction was significantly enlarged and had a blood clot attached to the external serosa. On histopathology there was the presence of an aggressive mesenchymal tumor with elongated cells that formed numerous variable sized vascular channels. While the primary location for a hemangiosarcoma is not the intestine it has been previously reported. The most common location for hemangiosarcoma in cats is the spleen and liver.

Jamie Horstmann, DVM, Harrisonburg RAHL.

Perianal mass in a dog

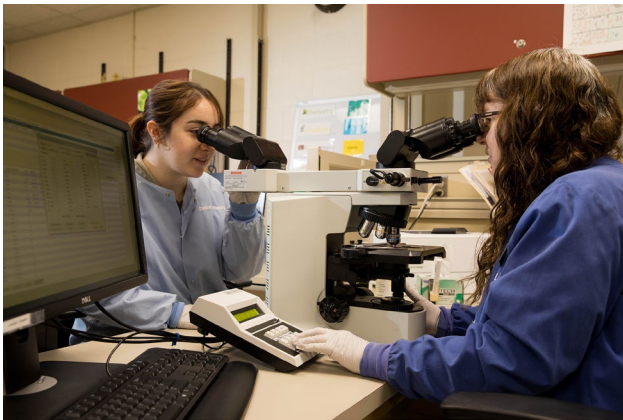
A 12-year-old, spayed female, miniature dachshund was presented to the Emergency department of Virginia Tech Veterinary Teaching Hospital due to acute vomiting and diarrhea, both containing fresh blood. On physical exam, she was moderately dehydrated, with a tense abdomen, and a dorsal perianal mass (12 o'clock position) was noted. On rectal examination, the patient was constantly straining with dripping blood. The rectum was markedly inflamed and erythematous, with thickening of the left sided rectal mucosa. The mass was firm, approximately 1 cm, ovoid, bilobed and with normal haired skin, uncomfortable but not painful. A fine-needle aspiration of the mass was performed and revealed marked mixed neutrophilic and macrophagic inflammation, with evidence of acute and chronic hemorrhage, abundant necrosis, and mineralization. No infectious agents were identified. In addition, a large population of hepatoid cells displaying mild cellular atypia was also present. Cytologically, it was not possible to determine whether the inflammatory process was causing a hepatoid gland reactive hyperplasia or if a hepatoid adenoma was causing secondary inflammation. Additional findings included an inflammatory leukogram, hypoalbuminemia, and mildly elevated liver enzymes. The patient returned two days later after initial stabilization and discharged with hypovolemic shock and evidence of a sepsis. The presumptive cause of the worsening was a gastroenterocolitis and/or the inflamed perianal

Continued from page 4

mass causing bacterial translocation. Hepatoid glands (aka perianal glands or circumanal glands) are ductless, modified sebaceous glands that occur only in dogs. Cytologic evaluation of any masses in this region are highly recommended and are often diagnostic. Inflammation, hepatoid adenomas, and apocrine gland anal sac adenocarcinomas (AGASACA) are possible etiologies of perianal masses.

Priscila B. S. Serpa, DVM, MSc, DSc, DACVP (Clinical), Virginia Tech

LABORATORY NEWS



ViTALS

I want to start by thanking all of the staff and faculty for their dedication in keeping the ViTALS laboratory running over the Christmas and New Year holidays. Veterinary diagnostics is critical at all times of the year, and the need does not end when the University shuts down for the break. Our necropsy service is available 7 days a week, including weekends and holidays on an emergency basis. I appreciate the faculty, residents, and students who keep the service running smoothly.

ViTALS faculty and residents were honored at the annual ACVP meeting in November. Valentina Stevenson won 3rd place in the Natural Disease category for her PhD research, and Francisco Carvallo received the prestigious Barbara Jean Thompson Award for outstanding service to the Davis Thompson Foundation. Congratulations on your great work!

Dr. Stevenson finished her anatomic pathology residency and PhD in December, and will be returning as an extended locum in January. We are excited to welcome her back to the group! Carrie Orey joined us in clinical pathology in November, and we now have a full complement of staff in that unit!

Happy New Year, and I look forward to another productive year!

Tanya LeRoith DVM, PhD, DACVP, ViTALS Director.

VDACS

The Virginia Regional Animal Health Labs are proud to be part of a newly recognized “satellite laboratory system” as part of the American Association of Laboratory Accreditation (A2LA). This means that the lab system, for the first time, is considered a system for external audit body purposes. While this primarily focuses on our quality system, it allows us to better develop the laboratory system as a whole.

January brought the detection of Highly Pathogenic Avian Influenza in two commercial poultry flocks in the Shenandoah Valley, requiring 7-day-a-week testing for movements out of the control zone! I am extremely proud of our team’s dedication and diligence in stomping out the disease, and our VDACS team as a whole in their response.

Our Ruminant Abortion and Bovine Respiratory PCR panels are up and running out of our Lynchburg Laboratory. Samples for these tests range from fluid to swabs to tissue. We are excited to offer this new diagnostic platform for antemortem testing! Please contact the Lynchburg Lab at 434-200-9988 for questions.

Congratulations to our newest Scientist 1, Sarah Shantz, who was promoted from Laboratory Assistant in January!

We are hoping to have new team members in all laboratories in the next few months by filling some vacant positions! Excited to help our Virginia Producers be the best that they can be!

We are always open to feedback and ideas for testing to further assist our agricultural community. It is our goal to make this lab system the best it can be to further serve our clients. Our partnership with the Virginia Tech Animal Laboratory Services Lab (ViTALS) continues to evaluate ways to collaborate and expand testing services. Whether by utilizing data for reports or enhancing testing capabilities, we look forward to continuing to work together and with all of you.

Jessica Walters DVM, PhD, DACPV, Program Manager, Office of Laboratory Services

