The Small Animal Parasites That You Want to Forget, But Should Not

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Many people remember the common small animal parasites: heartworm, roundworm, flea tapeworm, and *Giardia* spp., just to name a few. However, there are other important parasites that are not as common. We learned about them in order to pass a test and then thought, "I can forget these, because I will not see them in practice." You may not diagnose the following parasites frequently, but you will encounter them often enough that you should keep them in the back of your mind. Treatment regimens for these parasites are based on what has been attempted and what worked. The list below is not all inclusive, and has been compiled from multiple years of lecture notes, and interaction with clinicians.

***Physaloptera* spp. aka "Stomach worm"**

This parasite has a sporadic distribution and prevalence, and as its name implies, lives in the stomach of the definitive host. Transmission is via ingestion of arthropod intermediate host or a mammalian paratenic host. The worms have a "spiky" cuticular collar that when attached to gastric mucosa can cause local gastric irritation and bleeding. Secondary to the gastric irritation, acute or chronic vomiting can occur. Also, the worms may cause anorexia, melena, and anemia, secondary to the bleeding.

Diagnosis is normally made when a worm (normally an adult) is found in the vomit. *Physaloptera* spp. are the diameter of *Toxocara* spp., but shorter in length. As stated above, there is a collar on the anterior end of the worm, and caudal alae on posterior end of male. While not ideal, diagnosis of infection is sometimes made on endoscopy. Diagnosis by fecal flotation is possible, however, eggs can be difficult to detect, since they are 'heavier.' Alternatively, one can use a sedimentation technique.

The following regimens have been used for treatment:

-Fenbendazole (Panacur) - 50 mg/kg PO x 3d
-Pyrantel (Strongid) - 5-10 mg/kg PO
-Ivermectin - 0.2 mg/kg PO or SC

Capillarids

This is the class of parasites that people remember as "the other eggs that look like whipworm eggs." They live in the urinary or respiratory tract of the definitive host.

<u>*Pearsonema* spp.- the Urinary Capillarids</u>

Pearsonema plica can infect dogs and cats, whereas *P. feliscati* seems to be specific to cats. Adults embed in the urinary bladder mucosa, and shed unembryonated eggs. The life cycle most likely involves an earthworm intermediate host (IH). Infection is usually asymptomatic, although cystitis can occur due to a large number of worms embedded in the bladder mucosa. These animals will present with hematuria, and will attempt to urinate frequently. Observing eggs upon examination of urine sediment is definitively diagnostic.

<u>*Eucoleus* spp.- the Respiratory Capillarids</u>

Adult worms are embedded in the nasal or respiratory mucosa, and depending on the species can be found in both dogs and cats.

Eucoleus aerophilus is found in foxes, dogs, and cats. Adult nematodes live in the mucosa of the trachea, bronchi, and bronchioles. Eggs are produced, coughed up in sputum, swallowed and excreted in the feces. Infection results upon ingestion of infective eggs or potentially an earthworm paratenic/intermediate host. Larvae hatch in the small intestine and then migrate via blood to the lungs, where they penetrate the alveoli and migrate into the air passages. The prepatent time is 3 to 5 wks. As with the urinary capillarids, infection is normally asymptomatic. An occasional to chronic cough and wheezing may be noted. In severe cases, the animal may

present with tracheobronchitis, dyspnea, and pneumonia. Definitive diagnosis is made by detecting eggs in fecal flotation, sputum, or a trans-tracheal wash. Eggs are greenish brown, rather asymmetrical, with a granular shell, bipolar plugs and single-cell embryo.

The following regimens have been used for treatment:

-Fenbendazole 50-100 mg/kg PO x 10d
-IVM 200ug/kg, may have to repeat

Eucoleus boehmi is the nasal capillarid of dogs. Adults live in the mucosa of the nasal turbinates and sinuses. The life cycle is unknown, but is hypothesized to be direct. Although, as with *E. aerophilus*, an earthworm may be involved with the life cycle. Eggs are passed in feces or in excess nasal mucous. Infection is usually asymptomatic. The presence of worms and eggs can result in inflammation, which can then cause sneezing and mucopurulent nasal discharge. Definitive diagnosis is made by observing eggs on a smear of nasal discharge or on fecal flotation. The eggs can be difficult to recover by nasal swabs. The eggs are symmetrical and golden with bipolar plugs. The surface of the egg is pitted, and has a "thimble" pattern. The eggs are passed in partial stage of embryonation. Fenbendazole and ivermectin are used for treatment.

Aelurostrongylus abstrusus

Never forget about *A. abstrusus* as a differential diagnosis in a coughing cat, at least in the southeast US. Adult worms live in the terminal bronchioles, and alveolar ducts. The lifespan of the worms is about 9 months. Eggs are deposited in clusters in the lung. The larvae inside the eggs will hatch and travel up the trachea, after which they will be swallowed and enter the GI tract. First-stage larvae (L1) are shed in feces. A snail or slug will become infected with the L1, which will then develop to an infectious L3. The slug can then be consumed by a paratenic host. When a slug or paratenic host is ingested by a cat, the definitive host, the larvae will migrate from the GI tract to the lungs. In 5 to 6 weeks, the worms will develop to adults, thus completing the life cycle. Radiographic changes may be evident. In order to obtain a definitive diagnosis you may perform the Baermann technique, which is the most reliable diagnostic method, a sedimentation, or a centrifugal flotation. If the animal is infected with *A. abstrusus*, you will observe larvae with an S-shape kinked tail and sub-terminal dorsal spine. Larvae may also be detected in the sputum. Treatment includes fenbendazole at 50 mg/kg PO for 3d or 15d, or IVM at 0.2 mg/kg PO for 5d. Prednisone may also be used for symptomatic treatment.