Trichuris vulpis

Trichuris vulpis for Dog Last updated:
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Synopsis

CAPC Recommends

CAPC recommends testing all dogs and cats for whipworms by fecal flotation with centrifugation. Fecal tests for specific parasite antigens have been optimized for use in companion animals and are also available to aid in identification of infection.

Puppies should be tested for intestinal parasites more frequently than adult dogs. CAPC recommends testing for intestinal parasites, including whipworms, at least four times in the first year of life and at least two times per year in adults depending on patient health and lifestyle factors.

Species

Canine
Trichuris vulpis occurs in the dog, fox, and coyote.
Feline
Although feline whipworms occur in tropical areas, they appear to be rare in domestic cats in North America; putative whipworm eggs in feline fecal samples are more likely to be a capillarid other than Trichuris sp.

For this reason, feline whipworms will not be discussed further in this document, but additional information about feline whipworm infections can be obtained by consulting Bowman DD et al., 2002. Feline Clinical Parasitol, 348-350.

Overview of Life Cycle

Eggs are unembryonated when passed in feces and are highly resistant to desiccation, extremes in temperature, and ultraviolet radiation. Eggs embryonate in 9 to 21 days (or longer) depending on the temperature and moisture content of the soil. Infective whipworm eggs can remain viable for many years.

Hosts are infected by ingesting embryonated eggs from the soil or other substrates in which eggs are found.

Larvae hatch from eggs (generally in the small intestine) and penetrate the mucosa. They develop for 2 to 10 days in the mucosa, move to the cecum (occasionally the terminal small intestine or colon), and mature to adult worms.

The prepatent period of T. vulpis is 74 to 90 days.

Stages

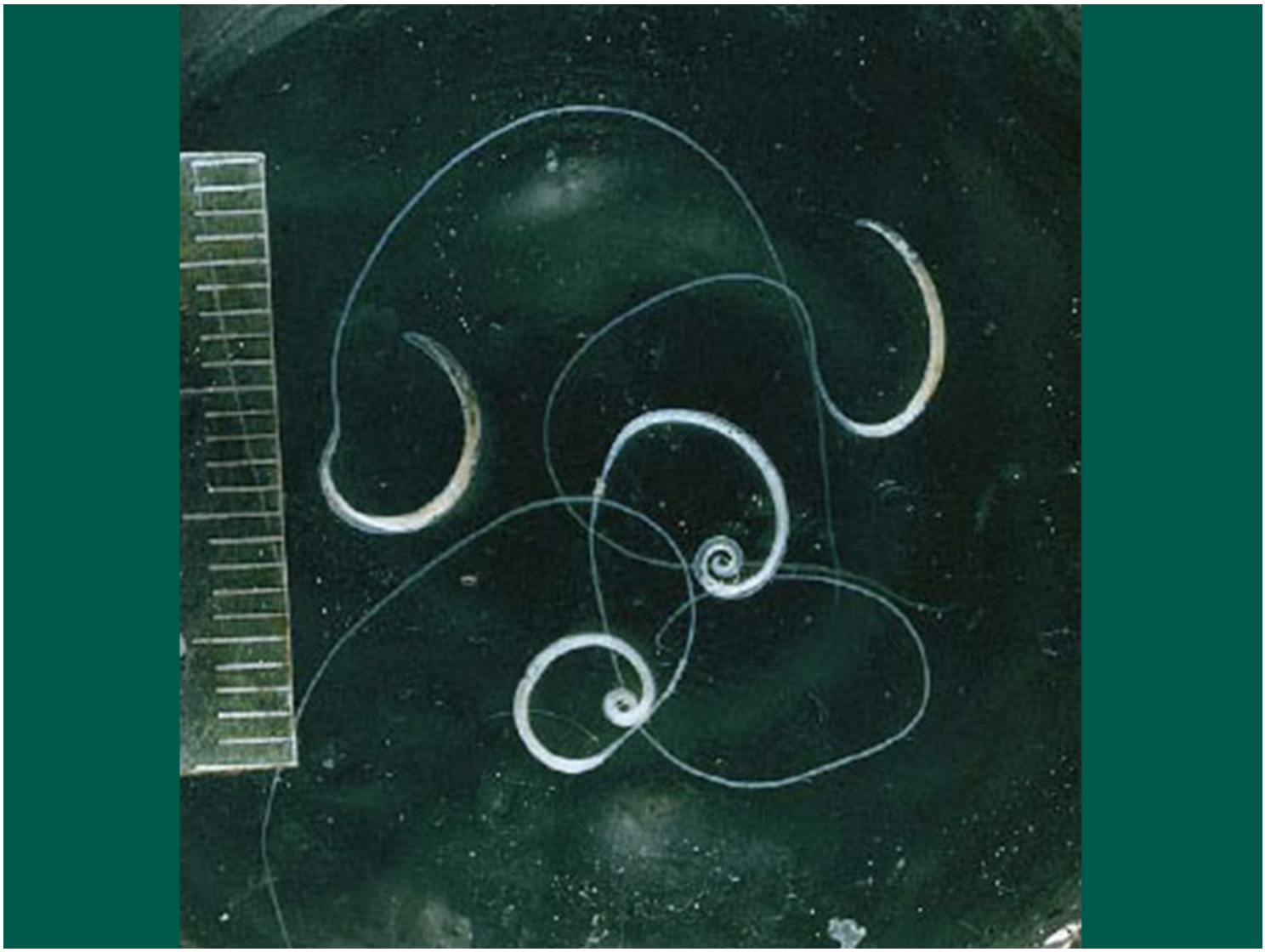
Whipworms are named for their characteristic whip-shaped body. The body is composed of a thin, filamentous, anterior end (the “lash” of the whip) and a thick posterior end (the “handle” of the whip). Adult worms are 4.5- to 7.5-cm long. Approximately 75% of their length is composed of the anterior (lash) portion of the whipworm (see image on right).

Eggs are football or barrel-shaped and yellow-brown, with prominent bipolar end plugs and a smooth shell.

Eggs are approximately 79 by 38 µm (link to image). They must be distinguished from eggs of Eucoleus spp. and Pearsonema spp., which are smaller and have a rough surface (see Lungworm Guidelines and Urinary Nematode Guideline).

Larvae hatch from ingested embryonated eggs and enter the mucosa of the small intestine (occasionally the large intestine). Larvae reenter the lumen and move to the cecum where they mature to adult worms (see image on right).

Adult worms begin producing eggs between 74 and 90 days after infection. Each female T. vulpis can produce more than 2,000 eggs per day.

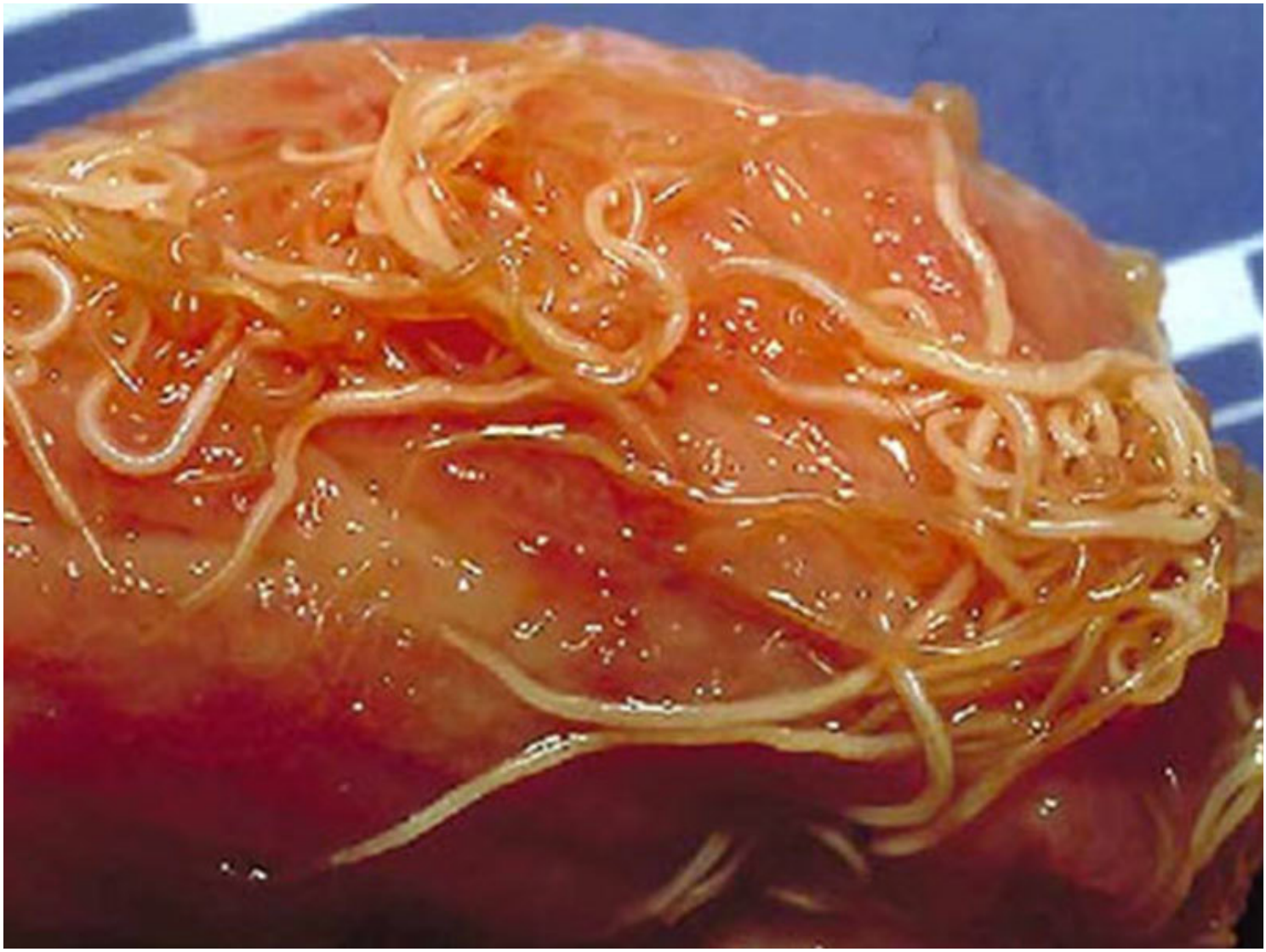


Disease

Many canine whipworm infections are either asymptomatic or subclinical.

Some infections result in hemorrhagic typhilitis or colitis characterized by diarrhea that is often streaked with mucus and fresh blood.

Severe infections result in bloody diarrhea, weight loss, dehydration, anemia, and in the most extreme cases, death.



Prevalence

Prevalence surveys confirm that T. vulpis occurs in dogs worldwide.

Whipworms are found in as many as 14.3% of shelter dogs sampled in the U.S. and 10% of dogs presented to veterinary teaching hospitals.

Click here to view our Prevalence Maps and to sign up for updates on reported cases in your area

Host Associations and Transmission Between Hosts

Dogs acquire T. vulpis infections only by ingesting eggs containing infective larvae from the environment.

Indirect transmission between animals via paratenic hosts and transplacental or transmammary transmission from the dam to her offspring does not occur.

Prepatent Period and Environmental Factors

The period from ingestion of embryonated eggs until eggs appear in feces is 74 to 90 days.

Infective whipworm eggs may persist in the environment for several years.

Site of Infection and Pathogenesis

Developing larvae of T. vulpis live in the mucosa of the small intestine (rarely the large intestine).

Development of larvae in the mucosa does not appear to result in demonstrable disease.

Trichuris vulpis adults live primarily in the cecum. Occasionally adult worms are recovered from the posterior small intestine or the anterior large intestine.

Adult worms thread their anterior ends through the superficial mucosa. The larger posterior end extends into the cecal lumen.

Adult whipworms consume blood, tissue fluids, and mucosal epithelium.

Feeding habits of the worms can result in bloody diarrhea, weight loss, dehydration.

Diagnosis

CAPC recommends testing all dogs and cats for whipworms by fecal flotation with centrifugation. Fecal tests for specific parasite antigens combined with centrifugal fecal flotation in companion animals has been shown to aid in identification of infection. The combination of tests may aid in identification of whipworms where few to no eggs are recovered from a fecal sample due to few adult worms being present, an infection with only young worms, or single sex infection.

Puppies should be tested for intestinal parasites more frequently than adult dogs. CAPC recommends testing for intestinal parasites, including whipworms, at least four times in the first year of life and at least two times per year in adults depending on patient health and lifestyle factors.

Whipworms have a long prepatent period and the eggs are not commonly found in very young pups but infections may become evident as early as 3-6 months of age.

Dogs of any age may have subclinical infections and show no signs of disease. However, when whipworm infections are allowed to persist, contamination of the environment with this potentially pathogenic parasite can occur.

Even when eggs are not present, disease caused by T. vulpis may be suspected on the basis of history, clinical signs, and response to therapy; fecal ELISA can confirm a diagnosis in these suspect, egg-negative cases.

Three issues may complicate diagnosis by detection of eggs:

Because of the long prepatent period, infected animals may show clinical signs before eggs are shed in the feces.

Eggs may be shed intermittently.

Eggs are quite dense (average specific gravity = 1.15); proper technique (centrifugation) must be used to recover them on fecal flotation.

Fecal flotation with centrifugation

Diagnosis of patent whipworm infections via fecal flotation can be challenging for the reasons listed above. The use of sugar solution and centrifugation can increase the sensitivity of whipworm egg detection.

Mix 1 to 5 g feces and 10 ml of flotation solution (sugar sp. gr. 1.25) and filter/strain into a 15-ml centrifuge tube.

Top off with flotation solution to form a slightly positive meniscus, add coverslip, and centrifuge for 5 minutes at 1500 to 2000 rpm.

Examine for characteristic eggs.

Eggs of Trichuris vulpis can be differentiated from those of other capillarids (e.g. Eucoleus spp.) by size and shape (see images under Life Cycle).

Trichuris vulpis: 72-90µ x 32-40µ

Eucoleus boehmi: 54-60µ x 30-35µ

Eucoleus aerophilus: 58-79µ x 29-40µ

Coprophagia is common in dogs and capillarid eggs from other hosts may be present.

Whipworm infection is rare in cats in most of the United States; eggs with bipolar plugs in feline fecal samples are more likely Eucoleus aerophilus or a capillarid rather than Trichuris spp.

Fecal tests for whipworm antigen

Commercial assays are available for detection of antigen produced by immature and adult whipworms in the lumen of the small intestine. Both male and female worms can be detected, and antigen production is not linked to egg production.

Diagnosis by detection of antigen allows identification of prepatent and single sex infections, supporting use of preventives and allowing earlier treatment.

Both centrifugal fecal flotation and fecal antigen tests have their strengths and weaknesses, however to ensure the widest breadth of detection of intestinal parasites in dogs and cats, fecal tests for antigen should be combined with microscopic examination of feces for eggs.

Trichuris ova

Treatment

The following anthelmintics are approved for treatment of T. vulpis infections in dogs:

Drontal Plus® (febantel [25 mg/kg], pyrantel pamoate [5 mg/kg], and praziquantel [5 mg/kg]), single administration)

Panacur® (fenbendazole [50 mg/kg]) for 3 consecutive days

To achieve control, treatment can be administered once a month for 3 months.

The following anthelmintics are approved for treatment and the continued monthly treatment of T. vulpis infections in dogs:

Interceptor® (milbemycin oxime [0.5 mg/kg])

Interceptor® Plus (milbemycin oxime [0.5 mg/kg] and praziquantel [5 mg/kg])

Sentinel (milbemycin oxime [0.5 mg/kg] and lufenuron [10 mg/kg])

Sentinel Spectrum (milbemycin oxime [0.5 mg/kg], lufenuron [10mg/kg], and praziquantel [5mg/kg])

Advantage Multi (moxidectin [2.5 mg/kg] and imidacloprid [10 mg/kg])

Coraxis™ Topical Solution for Dogs (moxidectin [2.5mg/kg]) (Bayer Animal Health)*

Trifexis® (milbemycin oxime [0.5 mg/kg] and spinosad [30 mg/kg])

Control and Prevention

Prevention of T. vulpis infections requires reducing exposure of dogs to embryonated eggs in the environment. This is best achieved by promptly removing feces from yards and other environments where dogs defecate.

Perform periodic fecal examinations as described in the section on Fecal Examination Procedures and treat infected dogs immediately with one of the products described previously in the Treatment section.

Control of T. vulpis can be achieved by use of monthly broad-spectrum heartworm prevention products that also control whipworms (see Treatment).

Public Health Considerations

Although there are reports in the medical literature of human infections with T. vulpis, these reports lack sufficient validation to consider T. vulpis a zoonotic parasite at this time.

Selected References

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