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Feline Trichomoniasis

P Profile

Definition

- Feline trichomoniasis is an infection of the large bowel caused by the protozoal parasite *Tritrichomonas foetus*.
- *T foetus* contains a single nucleus and averages approximately 16.5 µm × 6.5 µm in size. Three anterior flagella and 1 posterior recurrent flagellum originate from the anterior region of the cell. The recurrent flagellum forms an undulating membrane that extends three fourths the length of the cell body. A prominent rod-like axostyle also extends from the posterior region of the cell; it is thought to support the cell body (Figure 1).
- *T foetus* has a fast, erratic movement when observed microscopically. An example (in culture) can be viewed at www.vetmed.auburn.edu/~blagbbl/blagburn.mpg.
- *T foetus* often affects the colon but has also been found in the ileum and cecum. Less often it invades the colonic crypts. The organism adheres to the surface epithelial layer of the colon.
- Feline trichomoniasis has been documented throughout the U.S., including Hawaii. One survey reported that 16 of 169 cats sampled over 18 months were positive for *T foetus*. Positive cats were both pure and mixed breeds. In Europe, samples taken from pure-breed cats at an international cat show indicated that 36 of 117 were positive for *T foetus*.



Differential interference contrast photomicrograph of *Tritrichomonas foetus*. The axostyle supporting the pyriform cell body and the anterior and posterior flagella are clearly visible. The spherical organelles lining the axostyle are hydrogenosomes, used by the organism to synthesize adenosine triphosphate and molecular hydrogen in the absence of mitochondria.

Signalment

Breed Predislection. Feline trichomoniasis has been documented in both pure-breed and mixed-breed cats, male and female. Commonly reported pure breeds include toyger, Siamese, Bengal, pixie-bobtail, and Maine coon.

Age and Range. Feline trichomoniasis is usually diagnosed in cats younger than 2 years of age (mean age, 9 months).

Pathophysiology

The route of transmission of *T foetus* between individual cats is unknown; however, it is most likely fecal–oral, possibly involving shared litter boxes, grooming, or mother-to-kitten transmission.

Most histopathologic changes resulting from *T foetus* infection can be seen in the colon.

- Mild to moderate colonic lesions:
 - Crypts: Hypertrophy of epithelial cells, hyperplasia of epithelial cells, increased mitotic activity, microabscesses
 - Surface epithelium: Attenuation
 - Lamina propria: Increased lymphocytes, increased plasma cells, increased neutrophils
- Severe colonic lesions:
 - Macrophages infiltrating the lamina propria
 - Multifocal ulcerations
 - Suppurative inflammation
 - Multifocal nodules: Granulating, necrotic, pyogranulomatous
 - Hyperplastic lymph nodes

Causes/Risk Factors

- History of diarrhea (chronic, relapsing)
- High numbers of cats in small area
- Coexisting infections:
 - Disease: Feline inflammatory bowel disease, feline infectious peritonitis, feline enteric coronavirus, FeLV or FIV infection
 - Bacteria
 - Parasites: *Giardia*, *Isospora*, and *Cryptosporidium* species

FeLV = feline leukemia virus; FIV = feline immunodeficiency virus

continues

Signs

Clinical signs may vary among infected cats and are often acute if there are concurrent intestinal infections. Reported signs include:

- Large bowel diarrhea
 - Chronic
 - Loose to semiformal
 - Bloody
 - Muroid
 - Malodorous
- Flatulence
- Tenesmus
- Fecal incontinence (may result in soiling outside litter box)
- Anal irritation
- Weight loss
- Fever

Diarrhea may be seen periodically, alternating between severe diarrhea and normal stools over a period of months to years. Diarrhea may resolve within 2 years of onset.

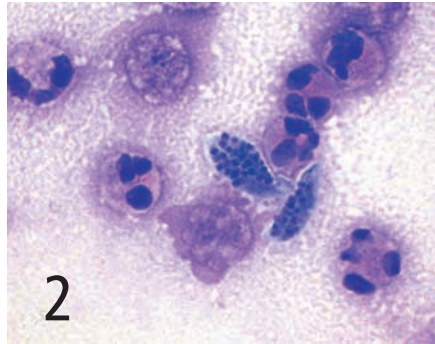
Dx Diagnosis

Feline trichomoniasis may be misdiagnosed and is probably underdiagnosed.

- Trichomonad numbers in feces fluctuate. Consequently, trichomonads may not be observed if low numbers are being shed.
- *T foetus* is commonly mistaken for *Giardia* species because of their structural similarities. Movement by *Giardia* species resembles that of a "falling leaf," while movement of *T foetus* is fast and erratic.

Diagnostic Tests

- Direct smear (Figure 2)
 - Fresh feces suspended in saline or culture media
 - Viewed under 100x or 400x magnification
 - Observation of motile trichomonads



Two *Trichomonas foetus* organisms from a direct smear stained using Diff Quik. The pyriform cell body is visible and contains numerous spherical organelles (hydrogenosomes). Surrounding the trichomonads are several degranulating neutrophils.

- Culture
 - InPouch TF culture system (www.biomeddiagnostics.com); stored at room temperature up to 12 days
 - Diamond's TYM medium (stored at 37°C for 2 to 5 days)
- Polymerase chain reaction
 - Trichomonad DNA isolated from feces
 - Species verification using specific primers for highly conserved genes

Tx Treatment

There is no approved treatment for feline trichomoniasis. Success of treatments has varied and is not 100% effective in all cases. Additional factors, such as overall health and housing environment, may contribute to difficulty in treatment.

- Clinical signs or resolution of diarrhea may initially improve after treatment. This may be due to antibacterial effects of drugs that reduce bacteria numbers in the colon.
- At-home treatments, such as special diets or supplements, are not effective.
- Frequent litter box changes are not effective.

- It is difficult to completely eradicate the parasite.
 - Drugs may inhibit parasite survival.
 - Numbers may increase once treatment is discontinued.

Medications

Numerous drugs have been used to treat feline trichomoniasis. A few drugs have demonstrated efficacy in resolving diarrhea and reducing or eradicating parasites.

- Given concurrently:
 - Enrofloxacin: 5 mg PO Q 24 H for 21 days (Retinal degeneration is a risk if drug is given at high doses.)
 - Metronidazole: 75 mg PO Q 24 H for 10 days
 - Fenbendazole: 50 mg/kg PO Q 24 H for 5 days
- Ronidazole: 30 to 50 mg/kg PO Q 12 H for 14 days (possible dose-related neurotoxicity)
- Tinidazole: 30 mg/kg PO Q 24 H for 14 days

Follow-up

Patient Monitoring

- Repeat fecal examination 2 to 3 weeks after last treatment.
- Diarrhea may reoccur after a few months if treatment is unsuccessful.
 - Diarrhea may wax and wane for a period of months to years.
 - Treatment failure may result from intercurrent infections or underlying conditions.

Prevention

- Prevention is difficult because not all methods of transmission are yet known.
- Provide clean litter boxes (clean daily; change litter 2 to 3 times weekly)
- Have ample litter boxes for the number

TYM = trypticase-yeast extract-maltose

of cats living together.

- Remember that litter box hygiene and provision of clean food, proper water, and control of fomites are essential.

In General

Relative Cost

Diagnostic and treatment costs (5.9-kg cat):

- InPouch TF culture used for diagnosis: \$/pouch
- Polymerase chain reaction on feces: \$\$/assay
- Enrofloxacin, metronidazole, fenbendazole combination given concurrently: \$/21 days
- Ronidazole: \$/14 days (additional costs may be required for compounding)
- Tinidazole: \$/14 days

Cost Key

\$ = < \$100 \$\$\$\$ = \$500–\$1000

\$\$ = \$100–\$250 \$\$\$\$\$ = > \$1000

\$\$\$ = \$250–\$500

Prognosis

- Treatment of feline trichomoniasis is problematic and not always successful.
- Additional infectious agents or other underlying conditions may complicate treatment.
- In many cases, feline trichomoniasis resolves within 2 years of onset of diarrhea. ■

at a Glance

- Rule out all other possible causes of diarrhea.
- Separate infected cats from noninfected cats; provide separate litter boxes.
- Examine feces directly for motile trichomonads:
 - Attempt to culture organisms with InPouch TF system.
 - Verify species by using polymerase chain reaction specific for *T foetus* if possible.
- Begin regimen for drug of choice (not 100% effective in all cases)
 - Combination of:
 - Enrofloxacin (5 mg PO Q 24 H for 21 days)
 - Metronidazole (75 mg PO Q 24 H for 10 days)
 - Fenbendazole (50 mg/kg PO Q 24 H for 5 days)
 - Ronidazole (30 to 50 mg/kg PO Q 12 H for 14 days)
 - Tinidazole (30 mg/kg PO Q 24 H for 14 days)
- Reexamine feces 2 to 3 weeks after treatment is completed.

See Aids and Resources, back page, for references, contacts, and appendices.

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