

Protothecosis in Dogs

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BASIC INFORMATION

Description

Canine protothecosis is an uncommon disease caused by a type of algae. It can cause severe gastrointestinal (GI) disease. It can also affect the skin, the eyes, or the whole body. The organism may infect human beings as well as dogs, cats, and cattle, but it does not spread between animals and people.

Causes

The infectious agents, *Prototheca zopfii* and *Prototheca wickerhamii*, are commonly found in sewage, animal waste, and tree slime. Water and soil may be contaminated by these materials. The disease occurs in North America, Europe, Asia, the Pacific islands, Africa, and Australia. Most cases of protothecosis in the United States occur in the southeastern states. Animals with defective immune systems and those that are very ill with another disease may be more susceptible to protothecosis than healthy animals with normal immune systems. Infection occurs when the organism comes into contact with injured skin or the lining of the GI tract or nose.

There are two forms of the disease, systemic and cutaneous. In the systemic form, the organism is swallowed, infects the GI tract, and then may spread to other areas in the body through the bloodstream or the lymph system. In the cutaneous (skin) form, the disease enters through puncture wounds, cuts, or abrasions to the skin.

Clinical Signs

In the systemic form of protothecosis, the most common clinical sign is intermittent, bloody diarrhea or black, tarry feces. Weight loss, vomiting, and straining to defecate may also be seen. If the infection spreads to the eyes, one or more eye may be inflamed, painful, and blind. If the central nervous system (brain and spinal cord) is infected, neck pain, head tilt, lethargy, circling, ataxia (wobbly gait, lack of coordination), seizures, and weakness or partial paralysis may be seen.

The cutaneous form is less common than the systemic form in dogs. Cats develop only the skin form. Skin lesions consist of nodules and draining ulcers on the legs and trunk. Thickening of the outer layer of the skin may be seen. Occasionally, the infection may spread to nearby lymph nodes (glands), causing them to enlarge. In some dogs, the skin form of the disease transforms into a widespread infection.

Diagnostic Tests

Routine laboratory tests, abdominal x-rays, and fecal tests are often recommended when diarrhea and other GI signs are present.

Microscopic evaluation of a rectal scraping may reveal algal organisms in rectal cells. An eye examination may reveal inflammation and retinal detachment.

The organism can sometimes be cultured from the urine, cerebrospinal fluid (obtained by spinal tap), or vitreous humor (the clear gel that fills the back of the eye, obtained by aspirating the eye). If the kidneys are involved, the organism may be seen on microscopic evaluation of the urine.

Biopsies of the colon are needed in some cases to demonstrate the organism. Immunologic testing may be recommended in some animals. Other tests may be needed to rule out more common causes of GI and ocular inflammation.

TREATMENT AND FOLLOW-UP

Treatment Options

Protothecosis is difficult to treat. Antifungal drugs, such as itraconazole and amphotericin, sometimes slow the progression of the systemic form of the disease, but they do not cure it. Amphotericin is given intravenously and is potentially toxic to the kidneys, so hospitalization is usually required when it is administered. Antibiotics and antifungal drugs have been used in combination in some cases. Prolonged therapy is needed.

Cutaneous protothecosis is sometimes treated by surgical removal of skin lesions combined with drug therapy.

Follow-up Care

Drug therapy is usually continued for at least 2-4 months, and for 3-4 weeks beyond the time that clinical signs seem to resolve. Some dogs require lifelong therapy. If infected eyes are painful, they may be removed to improve the quality of the dog's life. Removal of infected eyes does not alleviate the disease elsewhere in the body. Recheck visits and repeated laboratory testing are needed to monitor response to treatment, make modifications in therapy, and check for side effects of the medications.

Prognosis

Prognosis is very poor in most cases. Clinical signs may reappear after treatment is stopped, and most animals are not cured. Successful treatment of systemic protothecosis is rare. Animals suffering from the cutaneous form of the disease may have a slightly better prognosis than those with the systemic form. Animals with compromised immune systems have a grave prognosis, because they often succumb very quickly to the disease.