OOMYCOSIS: LAGENIDIOSIS IN A DOG

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Bosco, a 9 year old, male, neutered Doberman pinscher, presented through the Emergency Critical Care (ECC) service with a 2-day history of anorexia, lethargy, and vomiting. Initial blood work revealed mild neutrophilia (12.5 Ku/L) with a total WBC of 14.9 Ku/L. Alkaline phos-phatase was elevated at 454 U/L, and amylase at 1632 U/L. Abdominal radio-graphs were taken, where a loss of detail in the cranial abdomen was noted, and treatment was symptomatic with fluids and anti-emetics. The following day the owner elected to discharge the pet, with the rec-ommendation of an abdominal ultrasound as the next diagnostic step.

One month later Bosco returned through the ECC, due to a distended abdomen. Abdominal radiographs revealed gastric dilatation with no evidence of torsion. The stomach was decompressed with the passage of an orogastric tube, and the dog was treated for hypovole-mic shock. An abdominal ultrasound was performed, which revealed a mass in the right cranial abdomen (Figure 1).

Figure 1: Ultrasound image showing abdominal mass associated with pyloric region.

Aspirates were taken of the mass, which were interpreted as septic pyogranulomatous inflam-mation with scattered fungal hyphae. An exploratory laparotomy was performed, which identified an 8 cm mass circumferentially involving the gastroduodenal junction (Figure 2). The mass completely surrounded the common bile duct and approximately ½ of the right limb of the pancreas, and surgical resection was not possible. Tru-cut biopsies and tissue cultures were obtained of the mass, and a prophylactic gastro-pexy was done.

Figure 2: Intra-operative photo of dilated pyloric mass; intestine returns to normal size as it enters proximal duodenum.

Tissue biopsy samples were interpreted as severe diffuse chronic active fibrosing granulat-ing eosinophilic lymphoplasmacytic and suppura-tive transmural enteritis, with light growth of E.Coli, Enterococcus, and Corynebacterium on culture. Fun-gal serology was submitted, which tested positive for Histoplasmosis, an antibody test. Anti-fungal therapy with Itraconazole was initiated, and further consul-tation resulted in a urine antigen test for Histoplas-mosis, which was negative. Serology for pythiosis tested negative, and serology testing for Lagenidium returned strong positive.

Animals exposed to warm, standing fresh water are more likely to be in contact with the infectious zoospore, and dogs with gastrointestinal disease are thought to ingest the organism which then encysts and invades the damaged mucosa of the alimentary tract.

Lagenidium is a water mold that has been used as a pesticide ingredient to control mosquito larvae.

Lagenidium is a genus of Oomycota, and although they look and behave like fungi, they are related to diatoms and brown algae. Pythiosis is also a water mold causing Oomycosis as either a cutaneous/sub-cutaneous, gastrointestinal, or multisystemic disease. Animals exposed to warm, standing fresh water are more likely to be in contact with the infectious zoo-spore, and dogs with gastrointestinal disease are thought to ingest the organism which then encysts and invades the damaged mucosa of the alimen-tary tract. The stomach and duodenum are the most common sites of infection, and Lagenidiosis usually results in more disseminated disease than pythiosis.

Treatment of choice for Oomycosis is aggressive sur-gical resection, when possible. Although antifungal drugs are recommended, they may not be effective since ergosterol, which is the target molecule of the drugs, is lacking in the plasma membrane of oomy-cetes. A vaccine has been tried targeted at immuno-therapy to treat the cutaneous form of pythiosis. The prognosis is

guarded to poor in most of these infec-tions, due to the often disseminated and advanced disease at the time of diagnosis.

Gastrointestinal pythiosis in 10 dogs from California. *Berryessa NA, et al. J Vet Intern Med 2008; 22: 1065-1069.*

Distribution of Pythiosis previously reported in tropi-cal and subtropical regions. In the US most common distribution in Gulf coast states, no previous reports in California. Report describes clinicopathologic and epidemiologic features of GI pythiosis in 10 dogs from CA. Environmental questionnaire available in 8/10 dogs. In 8/8 no recent travel history and 7/8 had frequent water access. Eosinophilia (7/9), hypo-albuminemia (9/9), and hyperglobulinemia (8/9) common on labwork. Lesions in esophagus (2/10), stomach (3/10), small intestine (6/10), colon (3/10), and multiple sites (5/10) reported. Recent environ-mental manipulations including flooding of rice fields and irrigated landscaping may influence new distribution of pythiosis into CA. Pythiosis should be included as a differential for young, large-breed dogs with chronic GI signs or with histologic evidence of pyogranulomatous or eosinolophilic gastroenteri-tis. Confirmation by immunoblot or ELISA serology, immunohistochemistry, culture, and specific PCR amplicfication of DNA are possible.

Pythiosis, lagenidiosis, zygomycosis in small animals. *Grooter AM. Vet Clin Small Anim 33 (2003) 695-720.*

The history, taxonomy, life cycle, epidemiology, eti-ology, and clinicopathologic findings are described for pythiosis, lagenidiosis, and zygomycosis with similarities and differences noted. Lagenidium is an oomycete closely related to Pythium with similar epidemiologic and clinicopathologic features. Dogs with lagenidiosis present with cutaneous lesions and lymphadenopathy. Lagenidosis lesions in distant loca-tions (great vessels, sublumbar and inguinal lymph nodes, lung, pulmonary hilus, and cranial mediasti-num) are reported unlike pythiosis. Dog only species Lagenidium reported in. Differentiation important between three for prognosis and treatment. Zygo-mycosis more responsive to medical therapy and cutaneous form less aggressive than pythiosis and lagenidiosis. Tissue submission for fungal or oomy-cete culture require special handling to maintain specimen viability and should be submitted early to appropriate labs. Aggressive surgical resection treat-ment of choice in small animals; non-resectable lymphadenopathy is not always indicative of hyphae spread and surgical margins should still be attempted if lymphadenopathy is present. Radiographs and ultrasonography prior to surgery for identification of occult systemic lagenidiosis lesions recommended. Post op medical management recommended due to high post op recurrence rates.

Clinicopathologic findings associated with Lagenidium sp. Infection in 6 dogs: Initial description of an emerging oomycosis. >Grooters AM, et al. J Vet Intern Med 2003; 17: 637-646.

Initial description of Lagenidium sp. including charac-teristic microbiology, serology, histopathology, immu-nohistochemistry, and clinical findings in 6 dogs. Microscopically hyphae and zoosporulation identi-fied. Serology evaluation with immunoblot analysis identified antigens of Lagenidium; however, antigens of

pythium were also identified. Cutaneous histo-logic lesions reported as eosinophilic granulomatous inflammation. Six dogs affected were young to middle aged dogs in the southeastern US with 3/6 having fre-quent access to water. 5/6 presented for progressive cutaneous or subcutaneous lesion on extremities or trunk. Regional lymphadenopathy in 4/5, initial com-plaint in 1 dog. Skin lesions are progressive, locally invasive, and have poor response to surgical excision and systemic antifungal therapy. Main difference from Pythium is frequency of distant lesions including lung (2/6), aorta (2/6), caudal vena cava (1/6), esophagus, trachea, hilar lymph node (1/6), and mediastinal lymph node (1/6). Distant lesions may be suggestive of hema-togenous or lymphatic dissemination.

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