

## The Difficulty of Definitive Diagnosis

An 8-year old spayed golden retriever was presented for ataxia, dull mentation, cervical pain, inappetence, and an episode of collapse. On examination, the dog was febrile with cervical pain. A CBC revealed a mature neutrophilia, and cerebrospinal fluid (CSF) analysis revealed nondegenerative neutrophilic pleocytosis with no infectious agents. A working diagnosis of steroid-responsive meningitis-arteritis was made; immunosuppressive doses of steroids were administered. After a temporary response, the dog deteriorated and experienced an apparent vestibular episode.

Magnetic resonance imaging revealed an epidural abscess in the cervical

vertebral canal. Drainage of the abscess revealed filamentous, branching organisms. Treatment with clindamycin, ampicillin, cefotaxime, and trimethoprim-sulfa was initiated. Oral prednisone was discontinued and IV dexamethasone sodium phosphate was administered at anti-inflammatory doses once a day for 3 days. Enrichment broth cultures of CSF revealed a gram-positive bacterial organism. PCR identified the organism as *Actinomyces* spp, and cefotaxime and trimethoprim-sulfa were discontinued. After 9 days in the hospital, the patient was discharged with oral amoxicillin, clindamycin, omeprazole, and gabapentin. Oral antibiotics were continued for 8 to 10 weeks. Eight months after drainage of the epidural abscess, the dog was reportedly normal.

### Commentary

A large majority of patients with meningoencephalitis do not have an underlying infectious cause and are treated with immunosuppressive agents.

Excluding an infectious process is vital but challenging, as this case report highlights. A fastidious bacterial organism was ultimately cultured from the spinal fluid but not before the patient deteriorated while receiving prednisone. Infectious causes of meningoencephalitis may include fungal, protozoal, parasitic, and bacterial infections, all of which can be difficult to definitively diagnose. Many organisms have geographical tendencies that can allow a focused list of differentials, but it can be a perilous habit if clinicians limit their list of differentials excessively. Thankfully, further evaluation was performed when the patient deteriorated. This led to an accurate diagnosis, and the dog responded well to appropriate therapy. —Jonathan Bach, DVM, DACVIM, DACVECC

### Source

Song RB, Vitullo CA, da Costa RC, Daniels JB. Long-term survival in a dog with meningoencephalitis and epidural abscessation due to *Actinomyces* species. *J Vet Diagn Invest*. 2015;27(4):552-557.

## Coagulation & Cytauxzoonosis

Cytauxzoonosis, a protozoal disease of bobcats, is transmitted to domestic cats by feeding ticks. Parasitic thrombi occlude small-to-medium-sized blood vessels, which can potentially cause ischemia, organ dysfunction, and organ failure. In this prospective study, 5 cats with cytologic and PCR-confirmed disease underwent coagulation studies to characterize abnormalities and determine the presence of disseminated intravascular coagulation (DIC). Parameters measured included: platelet count; activated partial thromboplastin time; prothrombin time (PT); fibrinogen; antithrombin (AT); D-dimer; protein C;

antiplasmin; plasminogen; factors VII, VIII, IX, X, and XI; and von Willebrand factor. Thromboelastography analysis was also performed.

All 5 cats had thrombocytopenia, low protein C activity, and prolonged PT. These results fit the proposed criteria for overt DIC; however, none of the cats had AT deficiency, commonly seen in human and canine DIC cases. None of the cats had clinical signs of hemorrhage despite these abnormalities; however, only 3 survived to discharge. The 2 that succumbed had disseminated cytauxzoonosis throughout vessels of various organs and died of respiratory failure. Further research into treatment aimed at the inciting inflammatory stimuli and thrombotic complications of DIC in cats with cytauxzoonosis is needed.

### Commentary

Based on these study results, it appears that hemostatic abnormalities are common in cats with cytauxzoonosis. Hemostatic test results in these 5 cats indicated the presence of a hypocoagulable state and DIC. Remarkably, none of the cats displayed overt signs of hemorrhage despite evidence of hypocoagulability on numerous tests. These findings remind us that there is more to hemostasis than what can be tested in plasma or whole blood samples. Further questions remain. How can bleeding or thrombosis be best detected, predicted, and prevented in these cats?—Julie M. Walker, DVM, DACVECC

### Source

Conner BJ, Hanel RM, Brooks MB, Cohn LA, Birkenheuer AJ. Coagulation abnormalities in 5 cats with naturally occurring cytauxzoonosis. *JVECC*. 2015;25(4):538-545.