

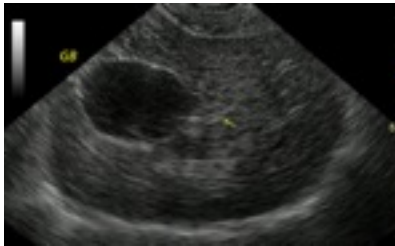
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## **LEPTOSPIROSIS – 2 PAGES**



### **Introduction:**

**Leptospirosis** is a spirochete bacterial disease that is caused by pathogenic strains of the *Leptospira* genus. It is both a significant cause of disease in companion animals and a zoonotic risk. Infection is maintained in wild mammalian reservoir species, and spread via infected urine, which comes into contact with intact mucosal surfaces or damaged epithelial surfaces. Environmental factors such as warm, slow or stagnant water, or wet soil encourage survival of this organism.

### **Clinical Signs and Labwork abnormalities:**

Signs of active **leptospirosis** can be vague, and are *most commonly* related to renal and hepatic dysfunction. Signs may include lethargy, fever, anorexia, vomiting, abdominal pain, polyuria/polydipsia, as well as generalized signs attributable to vasculitis.

Renal failure can be secondary not only to bacterial penetration into renal tubules, but also through vasculitis secondary to immune response to the organism and cytotoxic compounds produced by the bacteria itself. *Note that polyuria/polydipsia can be seen without azotemia in some cases.*

Hepatic abnormalities typically include elevations in bilirubin, alkaline phosphatase and ALT to a lesser extent. Histopathology may be insignificant in the face of severe icterus in some patients. It is thought that cholestasis in these animals may be related to a septic state and not cellular damage within the liver. Chronic infection may also lead to signs of hepatic failure.

Other signs can be attributed to this organism's ability to create widespread vasculitis. These may manifest as muscle or joint pain, weakness (including polyarthropathy), disorders of hemostasis, dyspnea associated with pulmonary hemorrhage or thromboembolic disease, and uveitis.

Blood count and chemistry abnormalities can vary as well depending on the severity of disease present. Typically, a leukocytosis and thrombocytopenia are present, along with varying degrees of azotemia, hyperbilirubinemia and hepatic enzyme elevations. Low urine specific gravity with concurrent proteinuria and glycosuria may also be seen. Anemia, elevations in amylase or lipase, and electrolyte abnormalities may also be noted.

#### **Diagnostics and associated problems:**

*MAT (Microscopic agglutination test) titers* are readily available and have become the mainstay of diagnostic testing. Guidelines for determining a positive result would be based on titers  $\geq 1:800$  for an unvaccinated dog, and  $\geq 1:3200$  for a previously vaccinated animal.

Several problems exist in evaluation of *lepto* titers. Possibly of biggest concern is the fact that initial titers can be negative despite clear signs of clinical disease. These false negative results can lead to improper therapeutics for the patient and an increased risk of zoonotic spread. In cases where *lepto* is suspected, the titer should be reevaluated in 10-14 days (longer convalescent titers may be negative or low positive if the patient has been treated in the interim.) False negatives can also occur if the correct serovar is not tested for. Some of these may be low positive on standard titers due to some cross reactivity between the antibodies to different *lepto* species, and therefore patients displaying this low positive result could still be actively infected. Serologic testing does not differentiate a natural infection from a vaccinated patient, and therefore if clinical suspicion of disease exists, evaluation of the initial magnitude of the titer and rising convalescent titers may be helpful.

*Thoracic radiographs* may reveal patchy pulmonary opacities consistent with pulmonary hemorrhage or thromboembolic disease. *Ultrasonographic findings* may include hepatomegaly, renomegaly, hyperechoic renal cortical tissue and presence of corticomedullary rims, pyelectasia or presence of perirenal fluid. These changes are not pathognomonic for *leptospirosis*, and are seen in other disorders causing vasculitis. **Absence of radiologic or ultrasonographic change does NOT indicate absence of infection.**

*Leptospirosis* continues to be a diagnostic challenge, and recent reports suggest that it has been formerly underdiagnosed. This disease is found worldwide, and should be considered in animals displaying any of the above-mentioned signs, regardless of vaccination and travel history.

#### **Treatment:**

Ampicillin IV in hospital is the most effective treatment acutely while doxycycline is effective against the carrier state. Therefore, combination therapy is recommended over a 4-6 week period.

The above information was compiled from multiple lectures and papers presented at the ACVIM forum, 2009-2011

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