

# Acute Nephritis in the Canine Due to Leptospirosis (A Case Report)

by  
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 and  
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## Summary

The case report presented demonstrates the protean nature of leptospirosis and the absolute dependence on either cultural or serological evidence of the disease for definitive diagnosis.

## Discussion

On Aug. 22, 1973, a one-and-a-half-year-old male Sheltie Collie was brought to the Iowa State University veterinary clinic showing depression, anorexia, vomiting, and a temperature of 101.2° F. The dog had been vaccinated with a distemper-hepatitis vaccine on Aug. 20. On Aug. 21, a fecal examination showed an *Ancylostoma* infection. This was a chronic infection which had first been diagnosed on Dec. 28, 1972, and had been treated twice prior to this with *disophenol*. A physical examination showed the dog to have a mild tonsillitis, enlarged anal glands which were expressed at that time, pain upon abdominal palpation, mild dehydration, along with the general depression noted in the initial examination. From these signs a differential diagnosis was established as shown in table I.

## Vomiting

gastrointestinal foreign  
 body  
 intestinal parasites  
 gastritis  
 nephritis  
 hepatitis  
 pancreatitis

Blood was drawn for a routine blood workup on Aug. 22. This showed an elevated BUN which was supportive of a nephritis. Initial therapy was directed towards this condition. Five hundred ml. of lactated Ringers solution were given intravenously to attain normal hydration and to begin to flush the kidneys. This was accompanied by two ml. of B Sol<sup>1</sup> subcutaneously. On Aug. 23, the temperature was 100.0° F.; the dog was of normal hydration, had urinated in the cage, and had a full bladder. Another 500 ml. of lactated Ringers were given intravenously along with one ml. of B Sol<sup>1</sup> subcutaneously, one ml. of *gentamicin* intramuscularly, and three ml. of *Visorbin*<sup>3</sup> orally. The dog was also put on a ration of K/D.<sup>3</sup> On Aug. 24, the dog's condition had deteriorated considerably. He had a dull coat, pale mucus membranes, blood on the thermometer, but still a temperature of 100.4° F. Two hundred and fifty ml. of lactated Ringers, one ml. of *gentamicin* and one ml. of B Sol<sup>1</sup> were administered in the morning and the lactated Ringers and *gentamicin* repeated in the afternoon. On Aug. 25, the dog was much improved, was not dehydrated, and the BUN was now down to 29. The fluid therapy was discontinued but the *genta-*

TABLE I.

Symptom	Differential
General depression	intestinal parasites nephritis gastritis enteritis
Depressed appetite	gastrointestinal foreign body intestinal parasites gastritis

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<sup>1</sup>Bsol is a B vitamin complex preparation of Fort Dodge Labs. Inc., Fort Dodge, Iowa, 50501.

<sup>2</sup>Visorbin is a vitamin-iron preparation with sorbitol, produced by Norden Laboratories, Lincoln, Nebr. 68901.

<sup>3</sup>K/D is prescription diet produced by Hill's Division of Riviana Foods, Inc. Topeka, Kansas, 66601.

*micin b.i.d.* and B. Sol<sup>1</sup> *s.i.d.* were both continued for three more days at which time the dog was dismissed from the hospital.

The dog was readmitted on Sept. 13 for an examination and a disopenol treatment. At this time the dog appeared normal, had a temperature of 103.5° F., and the owner reported no vomiting or other signs of illness, so the disopenol was given. Urine samples and blood samples were also drawn at this time and again on Nov. 19 for determination of blood parameters and for leptospirosis serology.

Results of all the blood work and urin-  
alyses on this dog were rather unrevealing except for the BUN as mentioned previously and as shown in table II.

TABLE II.

Dates	8/22	8/23	8/24	8/27	9/13	11/9
BUN (mg./ 100ml.)	145	87	29	22	23	24

Perhaps even more significant was the four-fold increase in *L. pomona* titer between the acute and convalescent stages of the disease. The results of serology are listed in table III. The serological pattern

TABLE III.

	L. <i>pomona</i>	L. ictero- <i>hemorrhagica</i>	L. <i>canicola</i>
Acute	1:40	1:40	1:160
Convalescent	1:160	1:40	1:160
3 months post	1:40	1:40	1:160

deserves some further explanation. One can only hypothesize as to the reasons for the titer to *L. canicola* but the most likely reason is that the dog did have a previous infection with that organism, although not a clinical one. This is not an unusual finding in view of the fact that it is estimated that 11 to 38 per cent of the canine population in the United States has been infected with the organism but do not develop clinical signs.<sup>1</sup> The titer to *L. icterohemorrhagica* is probably best explained by considering the limitations of the test used to detect these antibodies—the macroscopic agglutination test. Some of the reported limitations of this test are that it results in lower titers in general and yields a broader pattern of cross-reactions.<sup>3</sup>

As exemplified by this case, not every dog with leptospirosis shows all the classical signs of the disease. Some of the

salient features pointed out by this case include the elevated BUN, vomiting, depression, anorexia, abdominal pain, and mild tonsillitis. But even with this many concurrent signs, a diagnosis could not be made until the serological results on paired serum samples were obtained. This patient also shows an ideal recovery in the way the BUN dropped steadily from 143 to normal. A good prognosis in this instance is further substantiated by the drop in antibody titer by three months post infection giving an indication that the organisms have been cleared from the animal. The fact that the organisms were apparently cleared from the dog suggests another point about this case. It is most commonly recommended that known cases of leptospirosis be treated with high levels of *penicillin* and *streptomycin* to assure elimination of the shedder state, but in this case we seem to have achieved shedder elimination with *gentamicin*.

#### Public Health Significance

Accurate diagnosis of leptospirosis, although not critical to the treatment of the nephritic animal, is of public health significance to you and to the owner. In 1970, 52 cases of human leptospirosis from 17 states were reported to the Center for Disease Control. A probable source of infection was noted in 29 of these cases. Nine (or 31 per cent) were attributed to dogs. This figure compares favorably with those found in 1969 when 19 per cent of 43 confirmed cases were found to be associated with dogs. Leptospirosis in man appears to be associated with occupational exposure. Sewer workers, butchers, miners, ditchdiggers, longshoremen, and others working in rat infected areas are often exposed to the organism; but leptospiral infections also tend to be more common in veterinarians, animal handlers, dog breeders, and dog owners. Therefore veterinarians should take the necessary sanitary precautions when dealing with a nephritic animal just in case it has Leptospirosis. Also, it is our duty to find to the best of our ability the specific etiology of an acute nephritis so that if it is due to

leptospire, the clients can be properly warned of the danger to which they may have been exposed. Occasionally farm dogs may become infected by contact with other livestock, tipping the veterinarian off as to the cause of reproductive problems, such as in a herd of swine. And, as pointed out in this particular case, specific diagnosis of leptospirosis is next to impossible without the application of serology and/or culturing of the organism.

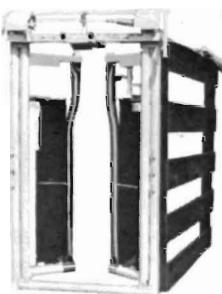
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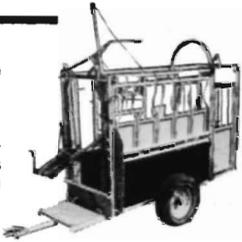
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