

Northwest ZooPath

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Case #: G24-933

Presenter: Marley E. Iredale, MS, DVM, DACVP

Collaborators: Michael M. Garner, DVM, DACVP, Wm. Kirk Suedmeyer, DVM, ACZM

Signalment: An approximately 12-year-old female California sea lion (*Zalophus californianus*)

History: An approximately 12-year-old female California sea lion (*Zalophus californianus*) in captivity at a zoological institution presented with hematuria and anorexia. She was administered antibiotics and fluid therapy. She initially responded to therapy but was found deceased.

Gross: The significant findings on post-mortem examination were a cobblestone appearance of the mediastinum and pleura and an abnormal appearance of the gastric mucosa.



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History: An approximately 12-year-old female California sea lion (*Zalophus californianus*) in captivity at a zoological institution presented with hematuria and anorexia. She was positive on urine PCR for leptospirosis, and treatment for leptospirosis was initiated, including gastroprotectants, fluid therapy, anti-inflammatories, maropitant, and antibiotics. She was administered the antibiotics orally when eating and by injection when anorexic. Serology documented rising titers to *Leptospira interrogans ballum*. She initially responded to therapy but was found deceased after a one-week recrudescence.

Histopathology: Examined is a section of the kidney. The tubular epithelium is often necrotic, attenuated, or regenerative, and the tubules frequently contain eosinophilic fluid or granular and cellular casts. The tubules rarely contain degenerative neutrophils. Loose aggregates of lymphocytes and plasma cells multifocally infiltrate the interstitium. The basement membrane of Bowman's capsule is variably thickened by homogenous, eosinophilic material, and the parietal epithelial cells are often prominent. The glomerular mesangium is frequently segmentally thickened.

Morphologic Diagnoses: Tubular necrosis and tubulitis with interstitial nephritis

Etiologic diagnoses: Leptospirosis

Confirmatory testing:

Warthin-Starry stain: No bacteria are detected.

Serology and PCR on blood and urine: Positive for *Leptospira interrogans ballum*

Comment: Leptospirosis is reported in free-ranging California sea lions along the Pacific Coast of North America and is likely enzootic in this population. However, individual infections and outbreaks occur periodically and result in strandings with animals showing signs of clinical leptospirosis. Sporadic infections have also been reported in captive animals. *Leptospira interrogans pomona* is often implicated in disease in CSLs. The clinical signs and laboratory values of pinnipeds with leptospirosis are consistent with renal failure and include polydipsia, elevated BUN, elevated creatinine, and hyperphosphatemia. Infection may also cause abortions. Liver lesions have not been described. Grossly, the kidneys are swollen, pale tan, and lack corticomedullary distinction. Histologically, tubular necrosis is a significant feature and may be more conspicuous than inflammation. The organism is often not easily detected at the time of diagnosis but, when present, can be highlighted with a silver stain. Immunohistochemistry against the *Leptospira* antigen and PCR are often necessary to confirm the diagnosis in animals with chronic infections or those treated with antibiotics. *Leptospira interrogans ballum* is commonly carried by mice. It has limited significance as a naturally occurring infection, and most mice are subclinical. However, there are zoonotic concerns for humans and other animals exposed to infected mice. No vaccine is available for this serovar. Other significant lesions in this case include evidence of metastatic mineralization, likely related to renal failure, and meningitis, which is a significant feature of human leptospirosis but has not been reported in the veterinary literature.

References:

1. Colegrove KM, Burek-Huntington KA, Roe W, et al. Chapter 23 - Pinnipediae. In. Pathology of Wildlife and Zoo Animals: Academic Press; 2018:569-592.
2. National Research Council (US) Committee on Infectious Diseases of Mice and Rats. Infectious Diseases of Mice and Rats. Washington (DC): National Academies Press (US); 1991. 11, Genitourinary System. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK235138/>