

Expecting the unexpected

By Geoff Orbell

Investigations into lameness in a young dog uncover a very rare parasitic disease.

Background

A five-year-old, neutered male Husky presented with chronic bilateral lameness isolated to the hocks, which appeared to be grossly thickened on palpation.

Investigations

An arthrotomy was performed, with joint fluid sampled for cytology and culture, and biopsies of the thickened synovium were taken for histology, suspecting villonodular synovitis. An analysis of the joint fluid revealed a white blood cell count of 22.8×10^9 cells per litre, with 49% neutrophils, 46% lymphocytes and 5% macrophages. A red blood cell count of the joint fluid was 10×10^9 cells per litre. A bacterial culture of the joint fluid was negative.

Histologically, the synovium and periarticular tissue were infiltrated by dense aggregates of plasma cells, with a lesser number of macrophages and few lymphocytes and neutrophils. Multifocally within areas of inflammation there were low to moderate numbers of two or three micron-long oval protozoa, most closely resembling *Leishmania* amastigotes, which were also identified within the cytoplasm of the macrophages. As there was no overseas travel history at the time of submission, other protozoa such as *Toxoplasma gondii* and *Neospora caninum* were also considered.

Diagnosis

Giemsa staining enabled a more accurate identification of kinetoplasts within the organisms, which supported *Leishmania* as a presumptive diagnosis (figure 1). On follow-up the animal's owner was able to advise that the dog had travelled to New Zealand from Israel in 2019.

As leishmaniasis is notifiable, the submitting veterinarian was notified, and the Ministry for Primary Industries (MPI) was contacted via its biosecurity hotline. Further testing by MPI confirmed circulating *Leishmania* antibodies, with results of the immunofluorescence antibody test greater than 1:160, and *Leishmania infantum* was confirmed by polymerase chain reaction (PCR) of formalin fixed tissue. As no vectors are present in New Zealand, the potential human health risk was considered low. The dog was considered a dead-end host and therefore was not euthanased, and appropriate treatment with allopurinol was approved.



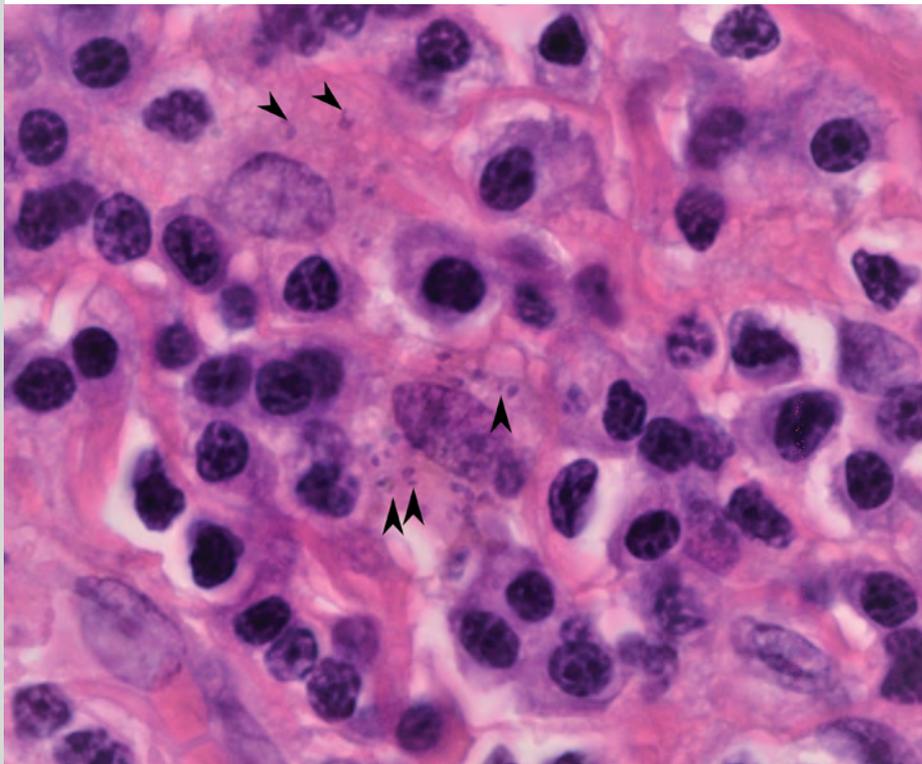


FIGURE 1:
Joint capsule
(1,000x):
Plasmacytic
and histiocytic
inflammation
with
intrahistiocytic,
two to three
micrometre
oval protozoa,
consisting of
a short linear
kinetoplast
(arrowheads)
arranged
adjacent to a
round nucleus.

Discussion

Most dogs infected with *Leishmania* do not develop clinical disease. Clinical leishmaniasis in dogs is either cutaneous or visceral and most commonly caused by *Leishmania infantum*. Cutaneous disease is more common and can be quite pleomorphic, mimicking other skin diseases with alopecia, exfoliation, erosions/ulcers, depigmentation, nodule formation or nailbed/mucocutaneous disease. Peripheral lymphadenopathy, which can mimic lymphoma, is also common.

The visceral form in dogs most commonly presents as renal disease, although hepatosplenomegaly, polyarthritis, enteritis and ophthalmic/neurological disease are also reported. Chronic renal failure is the most common cause of death in dogs with *Leishmania*.

Clinical pathology findings are relatively non-specific and most commonly include normocytic, normochromic or non-regenerative anaemia, or decreased albumin-globulin ratios with hyperglobulinemia, including increased beta and gamma globulin fractions and proteinuria. Less commonly identified abnormalities include azotemia, hyposthenuria, leucocytosis, alanine aminotransferase and alkaline phosphatase elevations and thrombocytopenia (Noli and Saridomichelakis, 2014).

Although cats can be infected with *Leishmania*, they rarely show clinical signs unless there is underlying immunosuppression, especially feline immunodeficiency virus or feline leukaemia virus infection. Clinical lesions are usually cutaneous with crusty, exfoliating or ulcerative lesions, most commonly around the head and neck (Brianti et al., 2019).

Cases of *Leishmania* in dogs in New Zealand are rare, and only three cases have been confirmed in the past 10 years, all of which have been in imported dogs

Leishmania spp. are very small (two to three micrometres) but can be identified using cytology or histology. They are characterised by oval, intrahistiocytic or extracellular protozoal amastigotes, with a round-to-oval nucleus adjacent to a short, linear kinetoplast, which represents a specialised region of mitochondrial

ABOUT LEISHMANIA

Leishmania spp. are zoonotic protozoal parasites most commonly transmitted by biting sandflies of the genera *Lutzomyia* and *Phlebotomus* (neither are currently present in New Zealand). Infection can also be transmitted vertically from dam to puppies by venereal routes and blood transfusions (Silva et al., 2009).

Leishmania is endemic in more than 80 countries, most commonly Central and South America, Africa, Asia and the Mediterranean countries of Europe and the Middle East, where up to 80% of dogs are considered infected. Cases are also seen in some southern states in the US (Pigott et al., 2014). Clinical cases in Europe are now also being identified further north due to increased pet travel and relocations (Maia and Cordoso, 2015).

Approximately 70 species of mammals are considered vertebrate hosts; they are most commonly rodents and dogs, but also marsupials, horses, primates and lagomorphs. In 2003 a novel *Leishmania* species was identified in red kangaroos in the Northern Territory of Australia, and it has since been identified in other macropods in this area (Rose et al., 2004; Dougall et al., 2009). This *Leishmania* species appears to be associated with *Lasiohelea* midges, which again are not found in New Zealand.

DNA (Cavalcanti and de Souza, 2018). Specific *Leishmania* diagnostic testing usually involves serology or PCR (The World Organisation for Animal Health 2014), which in New Zealand is only available through the MPI National Animal Health Laboratory in Wallaceville.

Treatment can be effective in reducing clinical disease in dogs, but can be lifelong, and recovered dogs usually remain asymptomatic carriers who can have relapses (Noli and Saridomichelakis, 2014). Overseas, *Leishmania* vaccines licensed for use in veterinary species are available, although their efficacy appears variable (Ribeiro et al., 2018).

Cases of *Leishmania* in dogs in New Zealand are rare, and only three cases have been confirmed in the past 10 years, all of which have been in imported dogs. They are usually diagnosed cytologically or histologically from samples of skin, lymph nodes or kidneys. This is the first case in New Zealand that has been identified through biopsies of synovium (Bingham, 2022).

Currently *Leishmania* screening is not part of MPI's requirements for the importation of cats and dogs to New Zealand (Anonymous, 2021). However, it is still a notifiable disease, and therefore should be considered as a differential diagnosis for imported cats, dogs and horses with unknown causes of malaise, lameness and cutaneous or renal disease. Suspected cases of leishmaniasis in animals should be reported using the MPI hotline: 0800 809 966. ¹⁹

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