



Diagnostic Exercise

From The Davis-Thompson Foundation*

Case #: 107 Month: October Year: 2018

Answer Sheet

Title: Cat, subcutaneous tissue, lagochilascariasis.

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Diagnosis: Lagochilascariasis

- 1) What is your morphologic diagnosis? Cat, subcutaneous tissue and muscles of the head, presence of adult nematodes (morphology compatible with *Lagochilascaris* sp.) with cutaneous fistula.
- 2) What would be the main cause(s) to consider in this case? *Lagochilascaris* sp. and *Dracunculus* sp.
- 3) If a clinical suspicion of this parasite was established prior to death, how would you have confirmed it? The clinical diagnosis can be performed by identifying eggs of the parasite in the exudate of abscesses and fistulas. The identification is made by cytology (imprint or aspiration). In advanced infections, the collection of larvae and adult nematodes through the wounds is also possible. The parasites should be fixed in 70% alcohol, cleared in magnesium sulfate solution, and subsequently placed on a glass slide to be examined with a light microscope.
- 4) What is the clinical significance of this parasite in this particular case? The parasite had no association with the neurologic signs described by the owner. On histological examination of the brain, there were several tissue cysts morphologically consistent with *Toxoplasma gondii* accompanied by moderate to severe lymphoplasmacytic encephalitis. The nematodes were therefore considered an incidental finding in this cat, while the encephalitis was interpreted as the cause of death.

Typical Gross Findings: The adult nematodes of the genus *Lagochilascaris* are generally located in the small intestines of carnivores (generally wild felids), but occasionally also infect the subcutaneous tissue of the cervical region of humans, cats and dogs inducing subcutaneous

granulomatous inflammation and frequently forming abscesses that have an external communication (fistula).

Typical Microscopic Findings: The head of the adult parasite has a prominent cleft that forms a groove, which gives the impression that the parasite has “lips” (Fig. 4) (from the Greek: *Lagos* means ‘hare’ and *cheilos* means ‘lips’). The cuticle is irregular. The female may be filled with eggs; these are more oval than round, have one uninucleate central zygote each and are covered by a thick, irregular shell (Fig. 5). Histologically, the presence of the parasite within the subcutaneous tissue and muscles may be accompanied by moderate to severe lymphoplasmacytic and histiocytic to granulomatous inflammation. In this case, evidence of subcutaneous and muscular inflammation was seen only on microscopy and was characterized by mild to moderate infiltration of histiocytes, lymphocytes and plasma cells surrounding the sites where the nematodes were located.



Figure 4

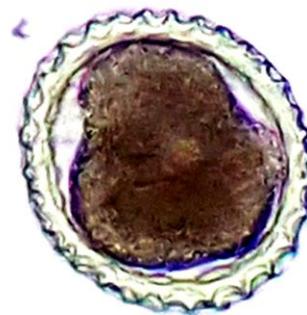


Figure 5

Discussion: One of the differential diagnoses for this case was *Dracunculus* sp. Infection by this nematode has been recently reported in North American cats. It presents several similarities with *Lagochilascaris* but there are also some important differences: (1) *Dracunculus* is more frequent in the limbs while *Lagochilascaris* is classically located in the head and neck; (2) *Dracunculus* induces skin nodules that frequently ulcerate while *Lagochilascaris* induces abscesses with communicating fistula; and (3) The adult specimens of *Dracunculus* are longer (females: 14 to 70 cm; males; 2 to 3 cm) than those of *Lagochilascaris* (females: 1.2 to 1.4 cm; males: 0,9 cm). *Anatrichosoma* is another rare nematode that may infect the subcutis of cats, however, the typical gross lesion is characterized by swelling and ulceration of the paws. *Dirofilaria immitis* may cause erratic migration to the subcutis, but this presentation is generally associated with

microfilaria and not adult worms. *D. repens*, on the other hand, infects skin and subcutis of dogs and cats, generally associated with microfilaria and, rarely, with adult worms. The adult parasites are larger (8 cm in length) when compared to *Lagochilascaris*. *Dipetalonema* (*Acanthocheilonema*, *Cercopithifilaria*) *grassii* is another nematode mentioned as a possible cause of parasitic skin infection of dogs and cats; however, the dermatitis is generally induced by microfilaria. In this case, the typical location in the head, the gross aspect of the lesion, and the size of the adult nematodes led to the suspicion of lagochilascariasis before the parasite could be examined on the microscope.

Lagochilascaris is considered a rare ascarid, with its occurrence basically restricted to South America. Wild felids are the definitive hosts but, occasionally, it also infects domestic cats, dogs and humans. The infection of humans by this parasite has been reported in several countries from Latin America, including Costa Rica and Brazil. The genus *Lagochilascaris* includes five species: *L. minor*, *L. major*, *L. buckleyi*, *L. turgida* and *L. sprengi*. In Brazil, domestic cats have been naturally infected by *L. minor* and *L. major*. The nematode from this cat was not submitted to further species identification, but the number of pits on the surface of the eggshell at the circumference of the eggs (29-33) is suggestive of *L. major*. Many aspects of the natural life cycle of *Lagochilascaris* remain unknown. It is possible that an unknown intermediate host may carry the larval form of the parasite in its muscles, and that the definitive host gets infected by ingesting the tissues of the intermediate host. Another possibility is that humans, cats and dogs get infected by ingesting the larvae originated from the eggs eliminated into the environment by wild felids. This parasite is mentioned by Mauldin & Peters-Kennedy (2015) as a cause of subcutaneous abscesses in dogs and cats. Apart from that, some parasitology books (for instance by Fortes, 1997) have mentioned the parasite, and a small number of articles have reported natural infections in domestic cats from Argentina, Brazil and Uruguay.

The association between *Lagochilascaris* infection and immunosuppression has not yet been established; however, the disease has been mainly reported in post-parturient and young animals, which suggests that the immune status may play a role in the occurrence of clinical infection, as is the case with many other kinds of parasites in domestic animals. Similarly, no association between infection with FIV and FeLV and lagochilascariasis has been reported. This cat was not tested for FIV and FeLV; however, the presence of encephalic toxoplasmosis suggests that the animal was immunosuppressed. The first clinical description of the infection in a domestic cat from southern Brazil was published only a few years ago. This is the first case of *Lagochilascaris* infection in a domestic cat submitted to necropsy at our laboratory.

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