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Rare occurrence of *Spirocerca lupi* in peritoneal cavity of a dog

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Abstract

The parasitic nematode Spirocerca lupi primarily affects dogs and other wild canid carnivores which is associated with oesophageal tumours. A 6 year old female dog presented to a private clinic in Hyderabad with dystocia, which finally ended up in the emergency caesarian section. While performing surgery nematodes were found in the peritoneal cavity, those worms were collected, preserved and processed in the laboratory for morphological confirmation of species. Grossly worms were reddish pink in colour and they were spirally coiled. On microscopic examination, it was identified as S.lupi worm showing characteristic trilobed lips, male worm with spicules, female worm with uterus filled with eggs and a blunt end tail region. On faecal examination capsule-shaped thick shelled eggs which have larvae within were found. Reports of S. lupi in the peritoneal cavity provides insight into the parasite's biological behaviour but also has implications for diagnosis, differential considerations, awareness among clinicians and and expanding the spectrum of documented anatomical sites of infection.

Keywords: *Spirocerca lupi, peritoneal cavity, trilobed lips, eggs*

Spirocercosis is a disease caused by *S. lupi* that primarily infects canines, particularly dogs and is a significant cause of oesophageal and gastrointestinal disorders in these animals (Hoseini *et al.,* 2019, Le Thi Khanh Hoa *et al.,* 2021). It is found throughout the world in areas with warm temperatures; most reports come from India, South Africa, Brazil, Kenya, Israel, Greece, Turkey, Pakistan (Van der Merwe *et al*., 2008). Worms are typically pink in colour and spirally wound, females can grow up to 80 mm and are rather robust, while the males can reach a maximum length of 54 mm (Naem 2004). The parasite's indirect life cycle involves scarabaeoid intermediate hosts and most frequently, domestic dogs as definitive hosts. Dogs infected with *S. lupi* by eating coprophagous beetles that contain third-stage larvae (L3) (Rojas *et al.,* 2018), which are released in the dog's stomach and migrate along arteries, maturing in the thoracic aorta before eventually moving to the caudal oesophagus, where female worms develop and release eggs shed in the dog's faeces (Alfaro-Segura *et al*., 2024). *Spirocerca lupi* causes nodules to grow in the oesophageal submucosa and muscle walls. These nodules can spread into the aorta and result in aneurysms and ossifying spondylitis of the thoracic vertebrae. Neurological changes could result from this nematode's aberrant larval migration into the central nervous system (Di Cataldo *et al.,* 2023). Most infections are not discovered until the disease is advanced because spirocercosis can have a prolonged subclinical infection phase (Mazaki-Tovi *et al.,* 2002). A wide range of clinical symptoms, such as coughing,

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tiredness or lethargy, vomiting and regurgitation and weight loss, can be associated with spirocercosis (Dvir *et al.,* 2001; Ranen *et al.,* 2004). Furthermore, aorta aneurisms brought on by larval migration may burst, causing haemorrhage and sudden death (Gal *et al.,* 2005). Oesophageal nodules frequently undergo malignant transformation into osteosarcoma and fibrosarcoma, which can spread to the lungs (Traversa *et al.,* 2008).The characteristic pathology includes the formation of oesophagal nodules classified as inflammatory, preneoplastic, or neoplastic with metastasis to distant organs (Rojas *et al.* 2020). Reports of *S. lupi* in the peritoneal cavity are exceptionally rare, making each observation significant for broadening the current understanding of its epidemiology and pathogenesis. Documenting such atypical occurrences not only provides insight into the parasite's biological behavior but also has implications for diagnosis, differential considerations, awareness among clinicians and and expanding the spectrum of documented anatomical sites of infection.

During a routine caesarean section at a private clinic in Hyderabad, an unusual finding of approximately 11 pinkish spirally coiled worms freely moving within the peritoneal cavity of a female dog was recorded, these were collected in normal saline and subsequently transported to the laboratory for further examination. Faecal sample from the same dog was also collected and stored in formalin for further processing in the laboratory. The worms were dehydrated in ascending grades of alcohol and cleared using lactophenol as per Soulsby (1965) and observed under a microscope for morphological identification of the worm. The faecal sample was processed by using a direct faecal smear and observed under 10X and 40X magnification.

On gross examination the adult worms appeared pinkish red in colour, slender, cylindrical, coiled into a spiral shape (Fig.1a) which is a characteristic of this parasite. The adult females were approximately 7 mm and males 4 mm in size which revealed that females were larger than males. On microscopic examination of adult worm cuticle was possessing longitudinal ridges (Fig.1b), the worms anterior end had trilobed lips (Fig.1c), short pharynx and oesophagus was having two portions anterior muscular and posterior glandular region (Fig.1e). In males, the posterior end had spicules (Fig.1i) whereas in females, the uterus was loaded with eggs (Fig.1f) and had a blunt tip (Fig.1g). On faecal sample examination eggs were observed which had a thick shell and capsule shape (Hosseini *et al.,* 2019).

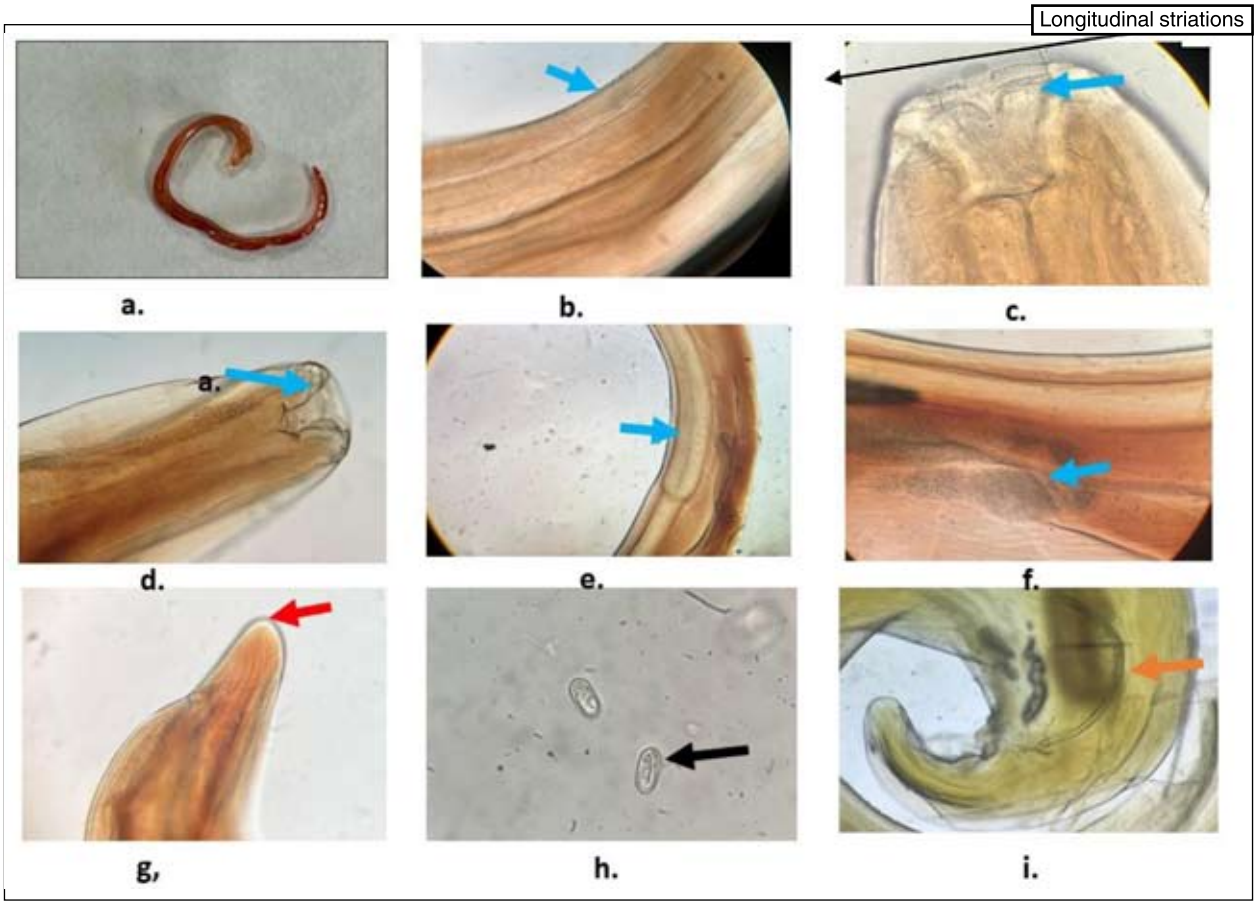

Fig.1 (a) Pinkish red colour worm (b) Cuticle longitudinal striations (c) Anterior end under 40X (d) Anterior end of worm under 10X (e) oesophagus (f) Female uterus filled with spirocerca eggs (g) Posterior end of female worm (h) *S.lupi* eggs (i) posterior end of male showing spicules

Spirocerca lupi is a nematode parasite of dogs and wild canids that characteristically localizes in the esophagus, where it produces nodular lesions with potential for malignant transformation (Bailey, 1972; Fox *et al.,* 1988). The thoracic aorta and stomach are also recognized as common sites of infection (van der Merwe *et al.,* 2008). However, aberrant migration leading to ectopic localization has been reported in a variety of tissues, highlighting the unpredictable behaviour of this parasite.

In the present case study the results were like, grossly the worms were redish pink in colour and coiled at one end. Microscopically worm has trilobed lips, oesophagus having anterior muscular portion and a posterior glandular portion. The posterior end of the worms have spicules in males and a blunt end in the case of females. The results were in accordance with (Hosseini *et al.,* 2019, Gomez-Puerta *et al*., 2018, Cataldo *et al.,* 2023, Rinas *et al*., 2009, Naem 2004).

Several unusual sites of *S. lupi* infection have been documented. Spinal cord involvement leading to hindlimb paralysis has been reported in dogs (Mazaki-Tovi *et al.,* 2002). Pulmonary and tracheal nodules have also been described (Lobetti, 2000). Renal and splenic localizations have been reported sporadically, often discovered at necropsy (Chandrasekharan *et al*., 1995; Gal *et al.,* 2010). Subcutaneous nodules and even ocular involvement have been rarely noted (Olivier and Le Roux, 1988; Dvir *et al.,* 2010). These findings, although uncommon, indicate that *S. lupi* can migrate extensively and establish in extra-esophageal locations.

Reports of *S. lupi* in the peritoneal cavity are exceedingly scarce. Most documented cases involve nodules attached to abdominal organs rather than free worms within the peritoneal fluid. In the present case, approximately 11 adult worms were unexpectedly observed freely moving in the peritoneal cavity during a cesarean section in a female dog. To the best of our knowledge, such a presentation has not been frequently documented in the veterinary literature, making this an unusual and noteworthy occurrence.

The presence of adult worms in the peritoneum raises important questions about parasite migration pathways and host-parasite interactions. Possible explanations include aberrant migration of larvae through the gastrointestinal wall, failed establishment in the esophagus, or rupture of immature nodules with subsequent release into the abdominal cavity. These mechanisms, however, remain speculative and warrant further investigation.

Clinically, such atypical presentations are significant because they may not manifest with the classical signs of spirocercosis (dysphagia, regurgitation, or esophageal mass effects). Instead, they may be discovered incidentally during surgery or necropsy. Awareness of such unusual presentations is important for veterinarians in endemic areas, as failure to recognize them could lead to underreporting and misdiagnosis.

Summary

In conclusion, this case expands the spectrum of aberrant localizations of *Spirocerca lupi*, documenting its occurrence in the peritoneal cavity of a dog. Given the rarity of such findings, further surveillance and reporting of atypical cases are necessary to improve our understanding of the epidemiology, migratory behaviour, and clinical impact of this parasite.

Conflict of interests

The author(s) declare that there are no conflicts of interest related to this article. No financial relationships, personal affiliations, or professional connections have influenced the research, interpretation, or conclusions presented in this work

References

Alfaro-Segura, P., Baneth, G. and Rojas, A. 2024. *Spirocerca lupi. Trends Parasitol*. **40**(8): 763-764.

Bailey, W. S. 1972. *Spirocerca lupi:* A continuing inquiry. *J. Am. Vet. Med.Assoc.* **160**(10): 1281–1288.

Chandrasekharan, K., Krishnamurthy, D. and Sastry, G. A. 1995. Aberrant migration of *Spirocerca lupi* in a dog. *Indian Vet. J.*. **72:** 381–382.

Di Cataldo, S., Cevidanes, A., Sepúlveda-García, P., Alvarado-Rybak, M., Lia, R. P., Otranto, D. and Millán, J. 2023. *Spirocerca lupi* in the stomach of two Andean foxes (*Lycalopex culpaeus*) from Chile. *Parasitol. Res.* **122**(6):1261-1269.

Dvir, E., Clift, S. and Williams, M. 2010. Proposed histological progression of spirocercosis-induced esophageal sarcomas in dogs. *Vet. Pathol.* **47**(3): 387–395.

Dvir, E., Kirberger, R. M. and Malleczek, D. 2001. Radiographic and computed tomographic changes and clinical presentation of spirocercosis in the dog. *Vet. Radiol. Ultrasound.* **42**(2): 119- 129.

Fox, S. M., Burns, J. and Hawkins, E. C. 1988. Spirocercosis in dogs. *Compendium on Continuing Education for the Practicing Veterinarian,* **10**(7): 807–819.

Gal, A., Kleinbart, S., Aizenberg, Z. and Baneth, G. 2005. Aortic thromboembolism associated with *Spirocerca lupi* infection. *Vet. Parasitol.* **130**(3-4): 331-335.

Gal, A., Klement, E., Harrus, S and Aizenberg, I. 2010. Unusual clinicopathological manifestations of canine spirocercosis. *Vet. Parasitol.* **169**(3–4): 347–356.

Gomez-Puerta, L. A., Carrasco, J., Lopez-Urbina, M. T. and Gonzalez, A. E. 2018. Morphological and molecular identification of *Spirocerca lupi* (Nematoda: Spiruridae) found in the Andean fox (*Lycalopex culpaeus*). *J.Parasitic Dis.* **42**(3): 449-454.

Hoseini, S. M., Ronaghi, H., Zaheri, B. A., Moshrefi, A. H. and Adibi, M. A. 2019. Esophageal Infection of *Spirocerca lupi* with *Vulpes rueppellii* in Yazd Province, Iran: Case Report. *Iranian J.Parasitol.* **14**(3): 482.

Hosseini, S. M., Ronaghi, H., Moshrefi, A. H., Zaheri, B. A., Adibi, M. A. and Tavassoli, K. 2019. Histopathological study of gastric infection with *Spirocerca lupi* in Pallas's cat (*Otocolobus manul*). *Comparative Clin. Pathol.* **28**(4): 943-947.

Lobetti, R. G. 2000. Clinical evaluation of dyspnoea in the dog and cat. *J. South African Vet.Assoc.* **71**(2): 92–98.

Mazaki-Tovi, M., Baneth, G., Aroch, I., Harrus, S., Kass, P. H. and Aizenberg, I. 2002. Canine spirocercosis: Clinical, diagnostic, and epidemiological characteristics. *Vet. Parasitol.* **107**(3): 235–250.

Naem, S. 2004. Scanning electron microscopic observations on adult *Spirocerca lupi* (Nematoda: Spirurida, Thelaziidae). *Parasitol. Res.* **92**(4): 265-269.

Olivier, J. and Le Roux, P. 1988. Ocular spirocercosis in a dog. *J. South African Vet.Assoc* **59**(2): 93–94.

Ranen, E., Lavy, E., Aizenberg, I., Perl, S. and Harrus, S., 2004. Spirocercosis-associated esophageal sarcomas in dogs: a retrospective study of 17 cases (1997–2003). *Vet. Parasitol.* **119**(2-3): 209-221.

Rinas, M. A., Nesnek, R., Kinsella, J. M. and DeMatteo, K. E., 2009. Fatal aortic aneurysm and rupture in a neotropical bush dog (Speothos venaticus) caused by *Spirocerca lupi. Vet. Parasitol.***164**(2-4): 347-349.

Rojas, A., Dvir, E. and Baneth, G., 2020. Insights on *Spirocerca lupi*, the carcinogenic dog nematode. *Trends Parasitol.* **36**(1): 52-63.

Rojas, A., Dvir, E., Farkas, R., Sarma, K., Borthakur, S., Jabbar, A. and Baneth, G. 2018. Phylogenetic analysis of *Spirocerca lupi* and *Spirocerca vulpis* reveal high genetic diversity and intra-individual variation. *Parasites Vectors*. **11**(1): 639.

Soulsby, E.J.L. 1965 Textbook of veterinary clinical parasitology, Vol 1. Helminths. Blackwell,Oxford, UK.

Traversa, D., Avolio, S., Modrý, D., Otranto, D., Iorio, R., Aroch. and Lavy, E. 2008. Copromicroscopic and molecular assays for the detection of cancer-causing parasitic nematode *Spirocerca lupi. Vet. Parasitol.* **157(**1-2) :108-116.

Van der Merwe, L. L., Kirberger, R. M., Clift, S. J., Williams, M. C., Keller, N and Naidoo, V. 2008. Spirocercosis in dogs: A global perspective. *Vet. Parasitol.* **157**(3–4): 175–180. ■