doi: 10.5216/rpt.v44i4.39235

CASE REPORT

Platynosomum fastosum IN AN ASYMPTOMATIC CAT IN THE STATE OF ESPÍRITO SANTO: FIRST REPORT

Maylla Garschagen Gava[1], Emy Hiura[1], Aline del Carmen Garcia Lopes[1], Fernanda de Toledo Vieira[1], Mayra Cunha Flecher[1], Leandro Abreu da Fonseca[1], Filippe Elias de Freitas Soares[2], Thais Zanotti Giuberti[1], Flaviana Lima Guião Leite[1], Dominik Lenz[1], Alice Correa Rassele[1], Jeanne Saraiva da Paz[1], Andréa Alves[1] and Fábio Ribeiro Braga[1,2]

ABSTRACT

Platynosomum fastosum is a parasite that affects cats, and among these, domestic cats, especially those originating from areas with tropical and subtropical climates. It is the most common liver parasite of domestic cats and is usually located in the bile ducts and gall bladder, but may also be found in the small intestine and pancreas. Infection occurs through ingestion of geckos containing metacercariae, causing cholangitis in the bile ducts of domestic cats. The aim of this study was to report the occurrence of *P. fastosum* after necropsy of an asymptomatic domestic cat, with a history of sudden death, received at the Animal Pathology sector of the Ricardo Alexandre Hippler Veterinary Hospital, Espírito Santo, Brazil. In macroscopic examination adult specimens of *P. fastosum* were observed inside the visibly dilated bile ducts. The dilatation, the presence of parasites and papillary proliferations into the lumen of the ducts were confirmed by histopathological examination. Then, a cholangiohepatitis associated to *P. fastosum* infection was classified. This is the first report of the occurrence of *P. fastosum* in a domestic cat in the state of Espírito Santo.

KEY WORDS: Cholangitis; biliary tract; helminths.

RESUMO

Platynosomum fastosum em um gato assintomático no estado do Espírito Santo: primeiro relato.

Platynosomum fastosum é um parasito de felinos, entre os quais os gatos domésticos, sobretudo os originados de locais onde o clima é tropical e subtropical. Este é o parasito hepático mais comum de gatos domésticos e se localiza geralmente nas vias biliares e vesícula biliar, mas também pode ser encontrado no intestino delgado e pâncreas. A infecção se dá por meio da

1. Setor de Patologia do Hospital Veterinário "Professor Ricardo Alexandre Hippler", Universidade Vila Velha, Vila Velha, Espirito Santo, Brasil.
2. Departamento de Veterinária, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brasil.

Corresponding author: Dr. Fabio Ribeiro Braga, Universidade Vila Velha, Vila Velha, Espirito Santo, Brasil. Email: fabio.braga@uvv.br

Received for publication: 2/10/2014. Reviewed: 15/4/2015. Accepted: 23/10/2015.

ingestão de lagartixa contendo as metacercárias que, nas vias biliares de gatos domésticos, causam uma colangite. O objetivo do presente trabalho foi relatar a ocorrência de *P. fastosum*, verificada por meio de necropsia de um gato doméstico, assintomático, com histórico de morte súbita, recebido no setor de Patologia Animal do Hospital Veterinário Ricardo Alexandre Hippler, Espírito Santo, Brasil. No exame macroscópico, foram observados exemplares adultos de *P. fastosum* no interior dos ductos biliares que se encontravam visivelmente dilatados. No exame histopatológico, foram confirmadas dilatação, presença de parasitos e proliferações papilares para a luz dos ductos, seguindo-se a classificação como colangiohepatite associada à infecção por *P. fastosum*. Este é o primeiro relato da ocorrência de *P. fastosum* em um gato doméstico no Espírito Santo.

DESCRITORES: Colangite; vias biliares; helmintos.

INTRODUCTION

Platynosomum fastosum is a trematode that mainly parasitizes domestic cats (*Felis catus domesticus*) in tropical and subtropical countries (24), such as Hawaii (2), the Caribbean (15, 14) and Brazil (28). In Brazil the states that have reported the occurrence of the parasite are: São Paulo (19, 26), Paraíba (1), Cuiabá (20), Rio de Janeiro (24), Minas Gerais (17, 28), Paraná (12) and Bahia (25). It is the most common hepatic parasite of domestic cats and is generally located in the bile ducts and the gallbladder, but can also be found in the small intestine and pancreas (3, 18). Its life cycle involves to elimination in feces of operculate eggs that are embryonated. Next, these eggs are ingested by the first intermediate host, a snail from the genus *Sublimes* (10).

The domestic cat is the definitive host of *P. fastosum* and infection occurs through ingestion of some species of animals of the order *Squamata*, commonly known as geckos, containing metacercariae, which are released into the upper digestive tract until they reach the bile ducts, where they complete the cycle (10). In the bile ducts, these parasites cause cholangitis associated with infection by trematode parasites (8), in addition to which the colangiohepatites are considered the second most common liver disease of cats (11). The diagnosis may be coproparasitological (3, 4, 24, 27), by histopathological examination (27) by aspiration of bile (30) or by ultrasonography (24, 32).

In a significant way, especially here, infected animals may be asymptomatic in cases of slight infections, or even evolve to death in the most serious cases. In addition, they may show nonspecific clinical signs such as anorexia, lethargy, weight loss, jaundice (30, 31) and hepatomegaly (30), in addition to diarrhea, vomiting, drooling, petechiae, ecchymoses and abdominal distension (28). The treatment of cholangitis due to *P. fastosum* infection is performed with anthelmintics, but since symptoms may not be apparent, early diagnosis can be especially difficult (27). This is the first report of *P. fastosum* in an asymptomatic domestic cat in the State of Espírito Santo.

CASE REPORT

A female, young adult domestic cat, of no defined breed, with a history of sudden death, was referred to the Animal Pathology sector of the Ricardo Alexandre Hippler Veterinary Hospital, Espírito Santo, Brazil. At necropsy, the presence of adult parasites in the gallbladder and bile ducts was observed. These were collected in jars containing distilled water (5). Then, samples of liver, brain, kidney, lung, pancreas and intestines were collected and fixed in 10% formalin before being processed by routine histological techniques.

The necropsy revealed the presence of pearly ocular secretion, hemorrhage and laceration of the abdominal muscles with mild mesenteric evisceration and thoracic and pelvic limb bleeding associated with extensive laceration of their muscles. The authors suggest that the laceration was possibly responsible for excessive blood loss leading to hypovolemic shock, leading to the death of the animal. Apart from those changes that culminated with the death, a partially obstructed common bile duct and markedly dilated bile duct were observed (Figure 1A). At the opening of the gallbladder, trematode parasites were observed in large quantity. The liver featured an evident, moderately lobular pattern and the histological section showed marked increase in thickness of the bile ducts and also lots of trematode parasites in the lumen of the ducts .

On microscopic examination of the liver, diffuse moderate congestion, mild dilation of the sinusoid capillaries, moderate bile duct proliferation, with papillary projections to the lumen, associated with peripheral fibrosis and moderate inflammatory infiltrate rich in polymorphonuclear eosinophils predominantly in the periportal region, and other foci of lymphocytic infiltrate were observed. Presence of moderate to severe amounts of parasites within a few bile ducts and mild to moderate diffuse presence of intracytoplasmic yellowish granules in hepatocytes (bilestasis) were also noted (Figure 1B and C)).

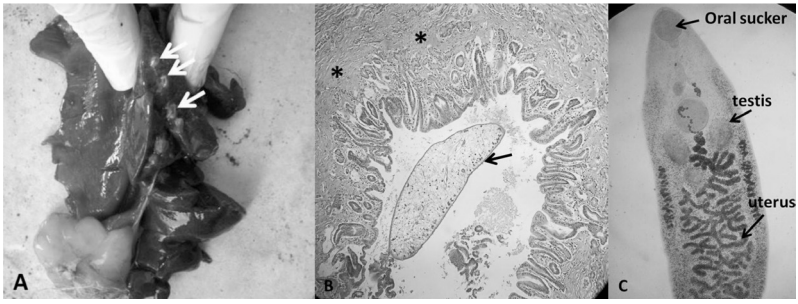

Figure 1 - (A) Liver, noting the increased thickness of the bile ducts (white arrow) on the cut surface; (B) microscopic examination of the liver, moderate bile duct proliferation associated with peripheral fibrosis (*) and parasite within a bile duct; (C) *P. fastosum*, sheet format.

DISCUSSION

Parasites analyzed by microscopy (Figure 2) were seen to be morphologically flattened, with elongated body, genital pore near to the junction of the cecum, testicles located side by side with the acetabulum (28), ovary at midline after the testicles (5, 28), and the size of the parasite varying from 4 to 6 millimeters (mm) in length (28), which characterized the trematode as *P. fastosum*.

The necropsy suggested death, possibly due to hypovolemic shock. Mosier (16) claims that this occurs when there is great loss of blood or fluids, with the necropsy findings characterized by generalized congestion, unless blood loss is severe, as in the animal in the present report. In the present work, the animal showed no generalized congestion, which can be explained by a probable accentuated loss of blood through the trauma that the animal suffered and the large area of hemorrhage that presented in the pelvic muscle. In relation to necropsy findings observed in this work and, among these the dilation of bile ducts and gallbladder distention, they may be associated with the presence of *P. fastosum*. These observations are in agreement with Vieira et al. (28) who reported similar findings in a domestic cat infested by *P. fastosum*.

The literature mentions that the isolated finding of polymorphonuclear inflammatory infiltrate around the bile ducts can be a feature of cholangitis associated with infection by parasites, since these cannot often be observed on histopathological examination (9). Moreover, in the present report, a moderate to severe amount of parasites was found in the bile ducts, during histopathological examination, in accordance with other authors (6, 28) even in animals which had no macroscopic signs of infection (28). However, in other reports, the parasite was only found in the cytological analysis of the bile from the animal (15, 29).

Microscopic findings from the liver are in agreement with the findings suggested by Rothuizen et al. (23) and Cullen (8) for the classification of cholangitis in domestic cats, suggesting a picture of cholangiohepatitis associated with chronic infection by trematodes. These animals are classified as having neutrophilic and lymphocytic cholangitis, and chronic cholangitis associated with infection by trematodes parasites (23) and also in destructive cholangitis (8).

In some animals the cholangitis may develop into cholangiohepatitis, which is characterized by invasion of periductal inflammatory infiltrate to the adjacent hepatic parenchyma, and in cats the finding of cholangitis is more common than cholangiohepatitis (30). To classify the type of cholangitis definitively it is necessary to carry out histopathological examination (21). In a study conducted by Clark et al. (7) where necropsies were performed on 44 cats with cholangitis, the chronic neutrophilic form was found with a high mortality

rate. In the same study, of the 44 necropsied cats, only one was diagnosed with cholangitis associated with infection by parasites, in this sense, *P. fastosum* can still lead to cystic liver disease as reported by Xavier et al. (29) and has also been associated with cholangiocarcinoma in cats by Andrade et al. (1).

In this report the cat was female, as well as in the reports of Sampaio et al. (25), Xavier et al. (29), Vieira et al. (28), Carreira et al. (6), Headley et al. (12), possibly due to the fact that they possess the habit of hunting to feed their brood (22). However, there are reports of *P. fastosum* in males (12, 13, 15). The semi-domestic habit is also a predisposing factor, since free-living adult cats have a higher incidence of infection due to increased contact with intermediate hosts compared to those animals that live confined (24, 27). Furthermore, it was, according to the owner, asymptomatic, which then reinforces that depending on the parasite load, the animal may not have clinical signs (30). The finding of these parasites in asymptomatic animals is observed (28).

This is the first report of the occurrence of *P. fastosum* in a domestic cat in the State of Espírito Santo, Brazil, to the best of our knowledge, which shows that more work is needed to reveal the real extent of this parasitism in the State.

ACKNOWLEDGMENTS

The authors thank CNPq and FAPES for financial support.

REFERENCES

1. Andrade RLFS, Dantas AFM, Pimentel LA, Galiza GJN, Carvalho FKL, Costa V MM, Riet-Correa F. *Platynosomum fastosum*-induced cholangiocarcinomas in cats. *Vet Parasitol 190*: 277-280, 2012.
2. Ash LR. Helminth Parasites of dogs and cats in Hawaii. *J Parasit 48*: 63-65, 1962.
3. Barriga OO, Caputo CA, Weisbrode SE. Liver flukes (*Platynosomum concinnum*) in an Ohio cat. *J Am Vet Med Assoc 179*: 901-903, 1981.
4. Bielsa LM, Grenier EC. Liver flukes (*Platynosomum concinnum*) in cats. *J Am Anim Hosp. Assoc 21*: 269-274, 1985.
5. Bowman DD, Lynn RC, Eberhard ML, Alcaraz A. *Parasitologia veterinária de Georgis*. São Paulo: Manole; 2006.
6. Carreira VS, Vieira RFC, Machado GF, Luvizotto MCR. Feline cholagitis/cholagiohepatitis complex secodary to *Platyosomum fastosum* infection in a cat. *Rev Bras Parasitol Vet 17*: 184-187, 2008.
7. Clark JEC, Haddad JL, Brown DC, Morgan MJ, Winkle TJV, Rondeau MP. Feline cholangitis: a necropsy study of 44 cats (1986-2008). *J Feline Med Surg 13*: 570-576, 2011.
8. Cullen JM. Summary of the world small animal veterinary association standardization committee guide to classification of liver disease in dogs and cats. *Vet Clin Small Anim 39*: 395-418, 2009.
9. Cullen JM, Brown DL. Hepatobialiary system and exocrine pancreas. In: Zachary JF, Mcgavin MD. *Pathologic basis of veterinary disease*. 5 ed. Missouri, Saunders Elsevier 2012. p. 405-457.

10. Day DG. Feline cholangiohepatitis complex. *Vet Clin North Am Small Anim Pract 13*: 375-385, 1995.

11. Eldredeg DM, Carlson DG, Carlson LD, Giffin JM. *Cat Owner's Home veterinary Handbook*. New Jersey, Wiley Publishing, 2007.

12. Headley SA, Ferioli RB, Reis ACF, Bracarense APFRL. *Platynosomum fastosum*-induced infections in domestic shorthair cats: a retrospective study of seven cases. *Bras J Vet Pathol 4*: 227-234, 2011.

13. Headley SA, Gillen MA, Sanches AWD, Satti MZ. *Platynosomum fastosum*-induced chronic intrahepatic cholangitis and Spirometra spp. infections in feral cats from Grand Cayman. *Jr Helminthol 86*: 209-214, 2012.

14. Krecek RC, Moura L, Lucas H, Kelly P. Parasites of stray cats (*Felis domesticus L*., 1758) on St. Kitts, West Indies. *Vet Parasitol 172*: 147-149, 2010.

15. Montserin SAS, Muñoz K, Seebaransingh R, A. Basu K. Clinical case: *Platynosomum fastosum* Kossack, (1910) infection in a cat: First reported case in Trinidad and Tobago. *Rev Med Vet 164*: 9-12, 2013.

16. Mosier DA. Vascular disorders and thrombosis. In: Zachary JF, Mcgavin MD. *Pathologic basis of veterinary disease*. 5 ed. Missouri: Saunders Elsevier 2012. p. 60-88.

17. Mundim TCD, Oliveira Júnior SD, Rodrigues DC, Cury MC. Freqüência de helmintos em gatos de Uberlândia, Minas Gerais. *Arq Bras Med Vet Zootec 56*: 562-563, 2004.

18. Norsworthy GD. Flukes: liver, biliary, and pancreatic. In: Norsworthy GD, Grace SF, Crystal MA, Tilley LP. *The Feline Patient*. 4th ed. Iowa: Blackwell Publishing Ltd; 2011. p. 193-194.

19. Ragozo AMA, Muradian V, Ramos e Silva JC, Caravieri R, Amajoner VR, Magnabosco C, Gennari SM. Ocorrência de parasitos gastrintestinais em fezes de gatos das cidades de São Paulo e Guarulhos. *Braz J Vet Res Anim Sci 39*: 244-246, 2002.

20. Ramos DGS, Scheremeta RGAC, Oliveira ACS, Sinkoc AL, Pacheco RC. Survey of helminth parasites of cats from the metropolitan area of Cuiabá, Mato Grosso, Brazil. *Rev Bras Parasitol Vet 22*: 201-206, 2013.

21. Richter KP. Diseases of the liver and hepatobiliary system. In: Tams TR. *Handbook of small animal gastroenterology*. 2nd ed. Missouri: Saunders Elsevier; 2003. p. 286-352.

22. Rodriguez-Vivas RI, Williams JJ, Quijano-Novelo AG, Bolio GME, Torres-Acosta JFJ. Prevalence, abundance and risk factors of liver fluke (*Platynosomum concinnum*) infection in cats in Mexico. *Vet Rec 154:* 693-694, 2004.

23. Rothuizen J, Desmet VJ, Ingh TSGAM van den, Twedt DC, Bunch SE, Washabau RJ. *Sampling and handling of liver tissue*. WSAVA Standards for Clinical and Histological Diagnosis of Canine and Feline Liver Diseases. Saunders Elsevier; 2006. p. 5-14.

24. Salomão M, Souza-Dantas LM, Mendes-de-Almeida F, Branco AS, Bastos OPM, Sterman F, Labarthe N. Ultrasonography in hepatobiliary evaluation of domestic cats (*Felis catus, L*., 1758) infected by Platynosomum Looss, 1907. Int J Applied Res Vet Med 3: 271-279, 2005.

25. Sampaio MAS, Berlim CM, Angelim AJGL, Gondim LFP, Almeida MAO. Infecção natural pelo *Platynosomum* fastosum Looss 1907, em gato no município de Salvador, Bahia. *Vet Bras Saúde Prod An 7*: 1-6, 2006.

26. Silva HC, Castagnolli KC, Oliveira DM, Costa GHN, Gomes RA, Nascimento AA. Fauna helmíntica de cães e gatos provenientes de alguns municípios do Estado de São Paulo. *Semana Ci Agrárias 22*: 67-71, 2001.

27. Twedt DC, Armstrong PJ. Feline inflammatory liver disease. In: Bonagura JD, Twedt DC. *Kirk's current veterinary therapy XIV*. Missouri, Saunders Elsevier; 2009. p. 576-581.

28. Vieira ALS, Ecco R, Lima WS, Guedes RMC. *Platynosomum fastosum* infection in two cats in Belo Horizonte, Minas Gerais State-Brazil. *Rev Bras Parasitol Vet 2*: 45-48, 2009.

29. Xavier GF, Morato GS, Righi DA, Maiorka PC, Spinosa HS. Cystic liver disease related to high *Platyosomum fastosum* infection in a domestic cat. *J Feline Med Surg 9*: 51-55, 2007.

30. Watson PJ, Bunch SE. Doenças hepatobiliares no gato. In: Nelson RW, Couto CG. *Medicina interna de pequenos animais*. 4th ed. Rio de Janeiro, Elsevier, 2010. p. 520-541.

31. Webster CRL, Cooper JC. Diagnostic approach to hepatobiliary disease. In: Bonagura JD, Twedt DC. *Kirk's current veterinary therapy XIV*. Missouri, Saunders Elsevier; 2009. p. 543-549.

32. Willard MD, Fossum TW. Diseases of the gallbladder and extrahepatic biliary system. In: Ettinger SJ, Freldman EC. *Textbook of veterinary interal medicine*. 5th ed. Philadelphia: Saunders; 2000. p. 1343-2000.