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Anaplasmosis in Domestic Feline (*Felis cattus*) on South of Brazil: a Case Report

Anaplasmose em Felino Doméstico (*Felis cattus*) no Sul do Brasil: um Relato de Caso

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Abstract

Anaplasmosis is a parasitic blood infection caused by *Anaplasma platys,* an obligatory intracellular gram-negative bacterium which parasites the host's blood platelets. The infection occurs mainly by the bite of the *Rhipicephalus sanguineus* tick and the clinical signs, when present, are nonspecific, such as anorexia, apathy, pale mucous membranes, hyperthermia and increased lymph nodes. On the blood analysis, the main finding is thrombocytopenia. Therefore, the aim of this work was to describe a case of anaplasmosis in a domestic feline in the city of Pelotas in the state of Rio Grande do Sul, Brazil. The analyzed blood sample came from a feline, adult, female and without defined race. On the clinical evaluation, it was observed the presence of fleas and ticks. On the hemogram, the only alterations observed were thrombocytopenia and eosinophilia, and in the biochemical exam there were no alterations. On the blood smear there were visualized structures compatible with morulae in blood platelets, a characteristic of *Anaplasma platys.* Following the diagnosis, the treatment with doxycycline was instituted every 12 hours with oral administration, during 14 days, and for the ectoparasites control an ectoparasiticide based on Selamectine was used. At the end of the treatment, a new blood smear was performed, no longer being observed morulae of *A. platys,* indicating the efficacy of the treatment.

Keywords: Cats. Blood Parasite. Diagnosis. Blood Platelets.

Resumo

Anaplasmose é uma hemoparasitose causada pelo Anaplasma platys, uma bactéria gram-negativa, intracelular obrigatória que parasita as plaquetas do hospedeiro. A infecção ocorre principalmente pela picada do carrapato Rhipicephalus sanguineus e os sinais clínicos, quando presentes, costumam ser inespecíficos, como anorexia, apatia, mucosas pálidas, hipertermia e linfonodos aumentados. Na análise do sangue, o principal achado é a trombocitopenia. Portanto, o objetivo deste trabalho foi descrever um caso de anaplasmose em felino doméstico no município de Pelotas no estado do Rio Grande do Sul, Brasil. A amostra de sangue analisada foi procedente de um felino, adulto, fêmea, e sem raça definida. Na avaliação clínica, foi observado a presença de pulgas e carrapatos. No hemograma, as únicas alterações observadas foram trombocitopenia e eosinofília, e no exame bioquímico não foram detectadas alterações. No esfregaço sanguíneo foram visualizadas estruturas compatíveis com mórulas em plaquetas, característico de Anaplasma platys. A partir do diagnóstico, instituiu-se o tratamento com doxiciclina a cada 12 horas por via oral, durante 14 dias, e para controle dos ectoparasitos foi utilizado ectoparasiticida tópico a base de Selamectina. Ao término do tratamento, foi realizado novo esfregaço sanguíneo, não sendo mais observadas mórulas de A. platys, indicando eficácia do tratamento.

Palavras chave: *Gatos. Hemoparasito. Diagnóstico. Plaquetas.*

1 Introduction

Due to the fact that cat is a domestic animal that adapts the most to the human being routine, the number of felines by residence has been increasing each year (PINTO *et al*., 2018). The Brazilian Institute of Geography and Statistics (2020) estimated that 19.3% of Brazilian domiciles possess at least one cat. It is known that felines are less predispose to present ticks when compared to dogs and it is believed that they can present resistance to the development of diseases which the arthropods can transmit (CORREA *et al*., 2011). The knowledge surrounding diseases transmitted by these parasites in cats is considerably lower than in other species (PINTO *et al*., 2018).

The blood parasite diseases in cats are still relatively low described in Brazil (CORREA *et al*., 2011). Among those, it is possible to highlight anaplasmosis, caused by *Anaplasma platys*, a mandatory intracellular of blood platelets gram negative bacteria (SNELLGROVE *et al*., 2020). The infection occurs by the bite of the *Rhipicephalus sanguineus* tick, and the period of incubation can variate from 8 to 15 days, the disease courses with nonspecific clinical signs and during the acute phase it is noted a big amount of infected blood platelets. It can cause imperceptible cases to severe cases that can lead to the patient's death (CORREA *et al*., 2011). In coinfections cases with other blood parasites transmitted by the same agent and some intrinsically factors to the hosts, such as age, race, physical condition, immune state and stress, can contribute to a more severe form of the disease (ANTOGNONI *et al*.,

2014).

The diagnosis is performed through the analysis of colored blood smear, searching the identification of morulae inside the blood platelets, or even by serological and molecular exams (SKOTARCZAK, 2018).

Therefore, this report aims to describe a case of anaplasmosis in a domestic feline in Pelotas in the state of Rio Grande do Sul, Brazil.

2 Case Report

The blood samples analyzed came from a feline, adult, female and without defined race. The tutors reported that they found the animal in the street, infested with fleas and some ticks. On the clinical evaluation, it was observed the presence of ectoparasites. On the clinical exam no alteration was detected, all of the parameters were inside the physiological values for the feline species. A blood collection was performed for hemogram and biochemical analysis (creatinine, urea, aspartate amino transferase, alanine aminotransferase and alkaline phosphatase). An aliquot of the blood was used for the research of blood parasites through blood smear colored with rapid panoptic.

3 Results and Discussion

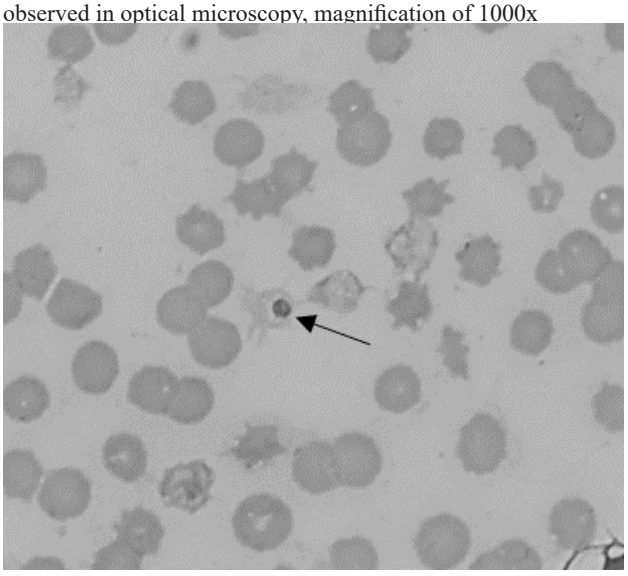
On the hemogram, the only alterations observed were thrombocytopenia and eosinophilia (Table 1), and in the biochemical exam alterations were not detected. On the blood smear compatible structures were visualized with morulae in blood cells, characteristic of *Anaplasma platys* (Figure 1).

Table 1 - Results of the hemogram, feline patient diagnosed with *A. platys*

Eritrogram	Result	Reference value	Leucogram	Result	Reference value
Red Blood cells	8.7 millions/ul	5-10 millions/ul	Total Leukocytes	11.519 /uL	5.500-19.500 /uL
Hemoglobine	11.9 g/dL	8-15 g/dL	Neutrophils	4.341 /uL	2.500-12.500 /uL
MCV	41.2 fL	39-55 fL	Lymphocytes	2.527 /uL	1.500 - 7.000 /uL
MCHC	32.8 %	31-35 %	Monocytes	305 /uL	0-850 /uL
Blood platelets	81 (mil/uL)	300 - 800 (mil/uL)	Eosinophils	4.346 /uL	0-1.500 /uL

Source: Resource data.

Figure 1 - Photomicrography of blood smear, evidencing the presence of a morula of *A. platys* in blood smear (arrow), observed in optical microscopy, magnification of 1000x



Source: Authors.

The preconized treatment was Doxycycline (10mg/kg, VO, SID, during 14 days). On the treatment for anaplasmosis, the chosen pharmaceutics are the class of tetracyclines, being doxycycline, a large spectrum antibiotics, employed with higher frequency, once it does not cause nephrotoxicity, and presents reduced collateral effects and low hepatotoxicity in cats (NEER *et al*., 2002; TASKER, 2010). Besides that, such a drug is a liposoluble bacteriostatic, rapidly absorbed, accomplishing satisfactory serum and intracellular concentrations (SPINOSA, 2002; DAVOUST *et al*., 2005). As a consequence, it is effective in the intracellular parasite elimination, justifying its therapeutic recommendation in the present case report.

It is relevant to highlight that the oral administration of potentially ulcer genic medications, as doxycycline, can lead to a severe inflammatory process, resulting in esophagitis and stenosis in felines. So, to avoid such a problem, after the administration of doxycycline water or humid ration must be supplied, with the goal of reducing the time of contact of the medicine with the esophageal mucosa (GRAHAM *et al*., 2000; WESTFALL *et al*., 2001; GERMAN *et al*., 2005).

As for the control of fleas, the ectoparasiticide based on Selamectina (Revolution®) was used in a topic form. In the end of the treatment, after carrying out of a new blood smear, morulae of *A. platys* on blood platelets was no longer observed, indicating the efficacy of the treatment.

Regarding the diagnosis, the blood smear is the most used method on the veterinary clinical routine to direct identification of morulae in blood platelets. It is a practical, fast and with reduced costs method, with a proper specificity during the acute phase, mainly when peripheral blood and buffy coat are used (DANTAS-TORRES *et al*., 2006; PINTO *et al*., 2018). However, it presents reduced sensibility due to low parasitemia, with the possibility to occur false negatives (NAKAGHI *et al*., 2008; RAMOS *et al*., 2009). Other ways of laboratory diagnosis include serological exams to detect antibodies, as the indirect immunofluorescence (RIFI), or the molecular such as the polymerase chain reaction (PCR), used to amplify the agent's DNA (FERREIRA *et al*., 2008).

The animals affected by *A. platys* can develop asymptomatic cases or present nonspecific clinical signs, such as anorexia, apathy, pale mucous, hyperthermia and increased lymph nodes (DYACHENKO *et al*., 2012; ZOBBA *et al*., 2014; ANDRÉ *et al*., 2015; NAIR *et al*., 2016; PINTO *et al*., 2018). As for the laboratory findings, it is possible to visualize thrombocytopenia, macro blood platelets and anemia (SANTARÉM *et al*., 2005; FERREIRA *et al*., 2007). Thrombocytopenia and parasitemia occur in a one- or two-week break, because of that, the infection by *A. platys* in dogs is also known as cyclic canine thrombocytopenia (ESPINDOLA *et al*., 2015). In the present case report, during the clinical exam, the patient presented only apathy and in the hemogram thrombocytopenia and eosinophilia were detected.

A. platys has been reported occasionally in domestic felines in Brazil (CORREA *et al*., 2011; PINTO *et al*., 2018; RODRIGUES *et al*., 2021). The sporadic diagnosis might be related to the following factors: reduced agent's pathogenicity; limitation of knowledge regarding infirmities transmitted by ticks in cats and problems identifying the parasite due to variable parasitemia (STUBBS *et al*., 2000; ZOBBA *et al*., 2014; ANDRÉ *et al*., 2015).

As a form of prevention, it is important to guide the tutors about the hygiene and the use of parasiticides on the environment and the animals (NICHOLSON *et al*., 2010). Beyond that, it is essential to carry out routine exams, because through the early identification and treatment, best results and greater chances of success are obtained (IRWIN, 2002).

4 Conclusion

It is evident that more studies are needed related to the occurrence of *A. platys* in domestic cats, identifying the risk factors of this hemoparasite in this species, becoming an instrument of guidance for veterinarians and tutors on this disease. Through early diagnosis, it is possible that prophylactic measures and appropriate treatment are recommended, aiming at the patient's health and well-being.

References

ANDRÉ, M.R. *et al*. Tick-borne agentes in domesticated and stray cats from the city of Campo Grande, state of Mato Grosso do Sul, midwestern Brazil. *Ticks Tick Borne Dis.,* v.6, n.6, p.779-786, 2015. doi: 10.1016/j.ttbdis.2015.07.004

ANTOGNONI, M.T. *et al*. Natural infection of *Anaplasma platys* in dogs from Umbria region (Central Italy). *Vet Ital.*, v.50, n.1, p.49-56, 2014. doi: 10.12834/VetIt.82.258.2

CORREA, E.S. *et al*. Investigação molecular de *Ehrlichia* spp. e *Anaplasma platys* em felinos domésticos: alterações clínicas, hematológicas e bioquímicas. *Pesq. Vet. Bras.,* v.31, n.10, p.899-909, 2011. doi: 10.1590/S0100-736X2011001000011

DANTAS-TORRES, F.; FIGUEREDO, L. A. Canine babesiosis: a Brazilian perspective. *Vet Parasitol.,* v.141, n.3-4, p.197-203, 2006. doi:10.1016/j.vetpar.2006.07.030

DAVOUST, B. *et al*. Validation of chemoprevention of canine monocytic ehrlichiosis with doxycycline. *Vet. Microbiol.,* v.107, n.3-4, p.279-283, 2005. doi: 10.1016/j.vetmic.2005.02.002

DYACHENKO, V. *et al*. First case of *Anaplasma platys* infection in a dog from Croatia. *Parasites & Vectors*, v.5, n.49, p.1-7, 2012. doi: 10.1186/1756-3305-5-49

ESPINDOLA, P.P.; BELLINI, M.L.; VICENTE, P.U.C. Correlação da trombocitopenia canina com *Ehrlichia canis* durante a rotina laboratorial da Clínica Veterinária Fullpet. *Ensaios Ciênc.,* v.19, n.4, p.163-169, 2015. doi: 10.17921/1415-6938.2015v19n4p%25p

FERREIRA, R. F. *et al*. *Anaplasma platys* diagnosis in dogs: comparison between morphological and molecular tests. *Intern. J. Appl. Res. Ve.t Med.*, v.5, n.3, p.113-119, 2007.

FERREIRA, R.F. *et al*. Avaliação da ocorrência de reação cruzada em cães PCR-positivos para *Anaplasma platys* testados em Elisa comercial para detecção de anticorpos de *Anaplasma phagocytophilum*. *Rev. Bras. Parasitol. Vet.,* n.17, Supl.1, p.5-8, 2008.

GERMAN, A.J. *et al*. Oesophageal strictures in cats associated with doxycycline theraphy. *J Feline Med Surg.,* v.7, n.1, p.33-41, 2005. doi: 10.1016/j.jfms.2004.04.001

GRAHAM, J.P. *et al*. Esophageal transit of capsules in clinically normal cats. *Am. J. Vet. Res.,* v.61, n.6, p.655-657, 2000. doi: 10.2460/ajvr.2000.61.655

IRWIN, P.J. Companion animal parasitology: a clinical perspective. *Int. J. Parasitol.,* v.32, n.5, p.581-593, 2002. doi: 10.1016/s0020-7519(01)00361-7

NAIR, A.D.S. *et al*. Comparative Experimental Infection Study in Dogs with *Ehrlichia canis*, *E. chaffeensis*, *Anaplasma platys* and *A. phagocytophilum*. *Plos One*, v.11, n.2, p.1-21, 2016. doi: 10.1371/journal.pone.0148239

NAKAGHI, A.C.H. *et al*. Clinical, hematological, serological and molecular survey of canine ehrlichiosis. *Cienc. Rural* v.38, n.3, p.766-770, 2008. doi: 10.1590/S0103-84782008000300027

NEER, T.M. *et al*. Consensus statement on ehrlichial disease of small animals from the infectious disease study group of the ACVIM. *J. Ve.t Int. Med.,* v.16, p.309-315, 2002. doi: 10.1892/0891-6640(2002)016<0309:csoedo>2.3.co;2

NICHOLSON, W.L. *et al*. The increasing recognition of rickettsial pathogens in dogs and peaple. *Trends Parasitol.*, v.26 n.4, p.205-212, 2010. doi: 10.1016/j.pt.2010.01.007

PINTO, A.B.T. *et al*. Anaplasmataceae em gatos (*Felis catus*) no município de Campos dos Goytacazes, Rio de Janeiro. *Pesq. Vet. Bras.,* v.38, n.6, p.1137-1150, 2018. doi: 10.1590/1678-5150-PVB-4753

RAMOS, C.A.N. *et al*. Comparação de nested-PCR com o diagnóstico direto na detecção de *Ehrlichia canis* e *Anaplasma platys* em cães. *Rev. Bras. Parasitol. Vet.,* v.18, n.1, p.58-62, 2009. doi:10.4322/rbpv.018e1011

RODRIGUES, K.B.A. *et al*. Frequência de Hemoparasitos em Cães e Gatos Domésticos Naturalmente Infectados, Provenientes de Zonas Urbanas no Município de Araguaína, Região da Amazônia Legal- TO, Brasil. *Braz. J. Develop.,* v.7, n.5, p.53147-53159, 2021. doi: 10.34117/bjdv.v7i5.30469

SANTARÉM, V.A.; LAPOSY, C.B.; DE FARIAS, M.R. Inclusões plaquetárias semelhantes a *Anaplasma platys* (*Ehrlichia platys*) em gato. *Colloquium Agrar.*, v.1, n.2, p.60-66, 2005.

SKOTARCZAK, B. The role of companion animals in the environmental circulation of tick-borne bacterial pathogens. *Ann. Agric. Environ. Med*., v.25, n.3, p.473-480, 2018. doi: 10.26444/aaem/93381

SNELLGROVE, A.N. *et al*. Vector competence of *Rhipicephalus sanguineus* sensu stricto for *Anaplasma platys*. *Ticks Tick Borne Dis*, v.11, n.6, p.101517, 2020. doi: 10.1016/j.ttbdis.2020.101517

SPINOSA, E.S. Antibióticos: Tetraciclinas, Cloranfenicol e Análogos. In: SPINOSA, E.S.; GORNIÁK, S.L.; BERNARDI, M.M. *Farmacologia aplicada à Medicina Veterinária*. Rio de Janeiro: Guanabara Koogan, 2002. p.420-424.

STUBBS, C.J. *et al*. Feline ehrlichiosis. *Comp. Continuing Educ. Practising Vet.*, v.22, n.4, p.307-318, 2000.

TASKER, S. Haemotropic mycoplasmas: what's their real significance in cats? *J. Feline Med. Surg.*, v.12, n.5, p-369-81, 2010. doi: 10.1016/j.jfms.2010.03.011

WESTFALL, D.S. *et al*. Evaluation of Esophageal Transit of Tablets and Capsules in 30 Cats. *J. Vet. Intern. Med.,* v.15, n.5, p.467-470, 2001. doi: 10.1892/0891-6640(2001)015<0467:eoe-tot>2.3.co;2

ZOBBA, R. *et al*. Cell tropism and molecular epidemiology of *Anaplasma platys*-like strains in cats. *Ticks Tick Borne Dis*, v.6, n.3, p.272-280, 2015. doi: 10.1016/j.ttbdis.2015.01.008