

Capillaria plica in an asymptomatic feline: An ultrasonographic finding

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ABSTRACT

The aim of this report was to describe a case of urinary capillariosis in a feline and an ultrasonographic finding of *Capillaria plica* in the urinary bladder. A female feline, 14-years-old, was seen presenting a history of weight loss and anorexia for five days. A hemogram, renal and hepatic serum biochemistry, total protein dosages and albumin and urinalysis were performed. The urinalysis showed dark yellow urine, elevated density, turbid aspect, proteinuria, hematuria, cylindruria, presence of leucocytes and bacteria. The microscopic examination of the urinary sediment revealed the presence of oval and colourless eggs with a thick capsule and bioperculated, characterized as being of *C. plica*. Treatment with levamisole was carried out, however some of the parasites' eggs were still verified after the therapy. An abdominal ultrasonography was performed being visualized, in the urinary bladder, a filiform mobile hyperechoic structure of 0.59 cm of length and 0.28 of thickness, besides a thickening of the organ's wall. Ivermectine was administered at a dose of 0.2 mg/kg, IM. After this treatment, *C. plica* eggs were no longer found in the urinary sediment. The ultrasonographic examination of the urinary bladder may be a good tool for the confirmation of the diagnosis in these cases.

Keywords: *Capillaria plica* Ultrasonography. Urinalysis. Urinary Bladder.

Capillaria plica em felino assintomático: um achado ultrassonográfico

RESUMO

O objetivo desse relato foi descrever um caso de capilariose urinária em um felino e um achado ultrassonográfico de *Capillaria plica* na vesícula urinária. Um felino, fêmea, de 14 anos de idade, foi atendido apresentando um histórico de perda de peso e anorexia por cinco dias. Foram realizados hemograma, bioquímica sérica renal e hepática, dosagens de proteína total e albumina e urinálise. A urinálise mostrou uma urina amarelo-escura, elevada densidade, aspecto túrbido,

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proteinúria, hematuria, cilindrúria, presença de leucócitos e bactérias. O exame microscópico do sedimento urinário revelou a presença de ovos incolores, biopericulados e ovais com uma cápsula espessa, caracterizados como sendo de *C. plica*. Foi realizado tratamento com levamisol. No entanto, alguns ovos do parasita ainda foram verificados após o tratamento. Uma ultrassonografia abdominal foi realizada sendo visualizada, na vesícula urinária, uma estrutura hiperecótica, móvel, de 0,59 cm de comprimento e 0,28 cm de espessura, além de uma parede do órgão espessa. Ivermectina foi administrada na dose de 0,2 mg/kg, IM. Após este tratamento, ovos de *C. plica* não foram mais encontrados no sedimento urinário. O exame ultrassonográfico da vesícula urinária pode ser uma boa ferramenta para confirmação do diagnóstico nesses casos.

Palavras-chave: *Capillaria plica*. Ultrassonografia. Urinálise. Vesícula Urinária.

INTRODUCTION

The parasitism of the urinary bladder of cats by *Capillaria* sp. is not common, however has been reported worldwide (BÉDARD et al., 2002; BOWMAN et al., 2002; KRONE et al., 2008; KNAUS et al., 2014).

Capillaria plica and *Capillaria feliscati* are the species responsible for the feline urinary capilariosis (LEVINE, 1968). The life cycle of these parasites is indirect and involves, as an intermediary host, the worm, which ingests the eggs released in the urine. The definite host becomes infected after the ingestion of the intermediary host which contains a larva in the first stage which migrates to the urinary bladder and becomes an adult (BOWMAN et al., 2002; BOWMAN, 2010; CALLEGARI et al., 2010; ROSSI et al., 2011).

The infection by *C. plica* may cause cystitis, pollakiuria, dysuria and haematuria, however, cats with capilariosis are generally asymptomatic (BOWMAN, 2010; FERNÁNDEZ-AGUILAR et al., 2010). The infection is self-limiting and considered of low clinical significance (BÉDARD et al., 2002; TAYLOR et al., 2007).

The examination of the urinary sediment is the only tool which allows the identification of the *C. plica* eggs, however it has a low sensitivity once that the excretion of this parasite's eggs varies considerably. Hence the importance of the realization of other tests for the confirmation of the diagnosis and the efficiency of the treatment (CALLEGARI et al., 2010; KRAMER et al., 2010). The ultrasonography and radiography may assist in the identification of the parasitism (BASSO et al., 2014).

The differential diagnosis includes the *Diioctophyma renale* another nematode which may affect the urinary system of small animals (BASSO et al., 2014).

The treatment in cases of urinary capilariosis is based on the use of benzimidazole, ivermectine and levamisole (CALLEGARI et al., 2010; ROSSI et al., 2011).

The aim of this study was to describe a case of urinary capilariosis in an asymptomatic feline and an ultrasonographic finding of *C. plica* in the urinary bladder.

CASE REPORT

A 14-years-old crossbred feline female, weighing 2.6 kg, was admitted at the veterinary hospital of the Federal University of Campina Grande, Patos *Campus*, Paraíba, Brazil, presenting a history of weight loss and anorexia for five days.

In the physical examination the presence of oral ulcers, halitosis, dental calculus, moderate dehydration and emaciation were observed. A presumptive diagnosis of periodontal disease was established.

A blood sample was collected in order to perform a hemogram, renal (urea and creatinine) and hepatic (alanine aminotransferase and alkaline phosphatase) serum biochemistry and dosages of total protein and albumin. In addition, after sedation with 10 mg/kg of ketamine (Quetamina, Vetnil, Louveira, SP, Brazil) given intramuscularly, a sample of urine was collected by cystocentesis for the realization of urinalysis.

The cat was referred to hospitalization where it was submitted to the administration of 300 mL of intravenous fluid therapy with 0.9% NaCl solution (Fisiológico 0,9 %, Equiplex Pharmaceutical Industry, Aparecida de Goiânia, GO, Brazil) added with 9 mL of a complex of amino acids and carbohydrates (Hertavita, Hertape Calier, Juatuba, MG, Brazil) given intravenously. Furthermore, the animal received the following medications: enrofloxacin (Enrofloxacina 10 %, Tortuga, São Paulo, SP, Brazil), 10 mg/kg, subcutaneously; and metilprednisolone (Depo-Medrol, Pfizer, São Paulo, SP, Brazil), 30 mg/kg, given intramuscularly. The animal was maintained under observation for a day.

Hypochromic microcytic anemia was observed in the hemogram. The protein dosages revealed hypoalbuminemia (1.6 g/dL). Alterations in the renal and hepatic serum biochemistry we not observed.

The urinalysis revealed dark yellow urine, with elevated density (1.044), turbid aspect, proteinuria (+++), hematuria, cylindruria, presence of leukocytes (4-5 per microscopic field) and an elevated quantity of bacteria. Besides this, the microscopic examination of the urinary sediment revealed the presence of bioperculated, colorless and oval eggs with a dense capsule (Figures 1), characterized as being of *C. plica*.

After the animal was medicated the urinalysis was repeated and a reduction of the proteinuria (++) , leukocyturia and urinary density (1042) were observed. At this point, the presence of desquamated epithelial cells and rare bacteria, however parasites eggs were not observed.

It were prescribed: levamisole (Ripercol, Fort Dodge, Seropédica, RJ, Brazil), 25 mg/kg, administered orally (O), SID, for three days, enrofloxacin (Enrofloxacina 10 %, Tortuga, São Paulo, SP, Brazil), 5 mg/kg, orally, BID, for 10 days and a vitamin complex (Polivin B12, Bravet, Rio de Janeiro, RJ, Brazil) in the dosage of 0.5 mL/kg, orally, BID, until the appetite improved. Besides this, periodontal treatment was recommended.

FIGURE 1 – *C. plica* egg in asymptomatic cat (magnification: 100X).



Source: the author.

The animal returned after 10 days presenting an improvement of the body condition. A new urinalysis was carried out observing a slight turbid aspect of the urine, proteinuria (++) , leukocyturia (++) , great quantity of erythrocytes (15 to 20 per microscopic field), desquamated epithelial cells (3 to 4 per microscopic field) and *C. plica* eggs. A hemogram was performed, however this did not reveal any abnormalities. Moreover an abdominal ultrasonography was performed, and a filiform mobile hyperechoic structure of 0.59 cm of length and 0.28 cm of thickness (figures 2 e 3), and a thickening of the organ's wall, were visualized.

FIGURE 2 – Ultrasonography of the urinary bladder showing a filiform mobile hyperechoic structure of 0.59 cm long, resembling *C. plica*.



Source: the author.

FIGURE 3 – Ultrasonography of the urinary bladder showing a filiform mobile hyperechoic structure of 0.28 cm of thickness, resembling *C. plica*.



Source: the author.

At this point, ivermectine (Ivomec, Merial, Campinas, SP, Brazil) in the dosage of 0.2 mg/kg was given intramuscularly. Three days after there was a reduction in the number of erythrocytes (10 to 15 per microscopic field) and of the desquamated epithelial cells (0 to 1 per microscopic field) observed in the urinalysis and the parasite's eggs were not observed.

DISCUSSION

The presence of halitosis, oral ulcers and dental calculus observed during the physical examination is consistent with the diagnosed periodontal disease. The verified dehydration and the history of anorexia and weight loss occur due to the alterations in the ingestion of food and water in these cases (ALBUQUERQUE et al., 2012; PIERI et al., 2012).

The complementary tests were performed in order to establish a more accurate diagnosis. As for the administration of fluid therapy associated to a complex of vitamins, amino acids and carbohydrates, was carried out due to the history of anorexia and weight loss and the dehydration observed in the physical examination. The antibiotic was administered due to the suspicion of infection and the corticosteroid due to a possible autoimmune disease.

The verified hypochromic microcytic anemia and the hypoalbuminemia may be associated to the nutritional deficiency once that the animal was not eating adequately.

Besides this, inflammatory diseases, such as the cystitis diagnosed in this case, may also lead to this type of anemia (LOPES et al., 2007).

Despite the fact that the patient did not present clinical signs of urinary disease, the urinalysis findings may be indicative of cystitis and urinary infection (VAN VEEN, 2002; LOPES et al., 2007), requiring the administration of antibiotic therapy, as performed in this case. On the other hand, the reports of cats with infection by *C. plica* suggest association with cystitis (WHITEHEAD, 2009; FÉRNANDEZ-AGUILAR et al., 2010; PAGNOCELLI et al., 2011; ROSSI et al., 2011). The urinalysis in capilariosis cases, may reveal a moderate proteinuria, microscopic hematuria and presence of desquamated epithelial cells (BÉDARD et al., 2002), as observed in the present case. Elevated urinary density (1.040), presence of erythrocytes, leukocytes and desquamated epithelial cells accompanied by *C. plica* eggs in a dog also were found (BASSO et al., 2014).

Despite the parasitism by *D. renale* being considered as a differential diagnosis of the urinary capilariosis, the eggs of this parasite may be morphologically differentiated from those of the *C. plica* by microscopic examination. Furthermore, the adult forms of *D. renale* are much bigger than those of *C. plica* and occur mainly in the renal pelvis and only extraordinarily in the urinary bladder (BASSO et al., 2014).

Success in the treatment of the infection by *C. plica* has been reported using benzimidazole, levamisole and ivermectine (LOW, 1999; VAN VEEN, 2002). Despite this, it is believed that the treatment with levamisole was not effective, once that, after the administration of this drug, eggs of the mentioned parasite were still found. In contrast, the administration of ivermectine, in a single dose, was efficient in this case, seen as the eggs disappeared in the urinalysis.

The thickening of the urinary bladder's wall observed in the ultrasonographic examination may be indicative of cystitis (PIEROZAN, 2010). The presence of hyperechoic foci in the vesical lumen indicative of agglomerate of eggs or cellular residues were found in a dog with capilariosis (CALLEGARI et al., 2010). It is believed that the filiform mobile structure observed in the lumen of the urinary bladder during the ultrasonography is a young parasite, once that, the size observed does not correspond to the one reported in the literature for samples of adult *C. plica* which is of 20 to 60 mm for females and 13 to 30 mm for males (BOWMAN et al., 2002).

CONCLUSION

C. plica cases in cats have rarely been reported due to the absence of clinical signs and the low parasite load. Furthermore, it is not always possible to detect the presence of the eggs in the urinary sediment making the diagnosis difficult. Thus, the ultrasonographic examination of the urinary bladder may be a good tool for the confirmation of the diagnosis in these cases.

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