Veterinary Journal of Republic of Srpska (Бања Лука-Banja Luka), Вол/Vol.XVIII, Бр/No.2, 408 – 425, 2018
Stevanović et all:
Ante mortem diagnosis of aelurostrongylus abstrusus (railliet, 1898) in domestic cat in Republic of Srpska (BiH)

DOI 10.7251/VETJEN1802408D **UDK 636.8.09:616.995.132(497.6)**

Case report

ANTE MORTEM DIAGNOSIS OF *AELUROSTRONGYLUS ABSTRUSUS* (RAILLIET, 1898) IN DOMESTIC CAT IN REPUBLIC OF SRPSKA (BIH)

Miljan DOBRIJEVIĆ[1], Oliver STEVANOVIĆ[1], Dejan VUJANIĆ[1]

[1] Veterinary clinic "BL VET" Banja Luka,
Bulevar Vojvode Stepe Stepanovića 173, 78 000 Banja Luka Republic of Srpska, B&H
* Corresponding Author, e-mail: oliver.13.stevanovic.bih@gmail.com

Abstract: This paper describes the occurrence of verminous bronchopneumonia in a domestic cat caused by the lung nematode Aelurostrongylus abstrusus (Railliet, 1898).The male cat showed some of the signs of respiratory distress in earlier clinical examinations, but the definitive diagnosis was not made. Since the cat has been in poor condition, a coprological examination was recommended. After coprological diagnostics and findings of larval stage of parasite A. abstrusus, clinical examination and radiology of thorax was repeated, and therapy were applied. Based on additional analysis, a chronic aelurostrongylosis was recorded. This is the first description of aelurostrongylosis in cats in Republika Srpska and Bosnia and Herzegovina, which points to the need that routine coprological examinations must be carried out in daily veterinary practice.

Keywords: *cat, verminous bronchopneumonia, Aelurostrongylus abstrusus*

INTRODUCTION

Infection of cats with pulmonary metastrongyloid nematode have gained significance in clinical parasitology in recent years. Several species of pulmonary nematodes from the superfamily Metastrongyloidea, which parasitize in the lungs of domestic and wild felids, have been described. The most important are the species Aelurostrongylus abstrusus, Oslerus rostratus, Troglostrongylus brevior, Troglostrongylus subcrenatus and Angiostrongylus chabaudi - L1 larvae. On the basis of available literature data, it is noted that the species A. abstrusus (Strongylida: Angiostrongylidae) is

the most common in cats inEurope. Gavrilovic et al. (2017) describe fatal granulomatous pneumonia in kittenin Serbia caused by this nematode, which confirms the possible spread of this parasite in cats in the Balkans. In Bosnia and Herzegovina, the presence of T.brevior was detected in lynx (Alić and sar. 2016). The conducted studies were mainly based on post-mortem examinations (Gavrilović et al. 2017), but in clinical practice verminous pneumonia is rarely diagnosed.

Aelurostrongylosis of cats is mainly subclinical, and in the case of infection with higher intensity, respiratory signs are possible (Ilić et al., 2017). The following clinical signs (respiratory changes) are noted: sneezing, coughi, nasal discharge, dyspnoea and tachypnea, but there were also chronic cases with pronounced cachexia and general weakness recorded (Traversa and Di Cesare, 2016) Aelurostrongylosis of cats can be suspected on the basis of clinical examination and radiographic examination of the thorax, while the definitive diagnosis is set on the detection of the first stage larva (L1) of Aelurostrongylus abstrusus in the feces and the bronchoalveolar lavage content (Ilić et al. 2017).

This paper describes the ante-mortem diagnosis of verminous bronchopneumonia in a domestic cat from the territory of Banja Luka, Republika Srpska (BiH).

CASE DESCRIPTION

Larvaae of A. abstrusus (Railliet, 1898) in domestic cat were diagnosed after routine coprological examination. According to the data in the software and on the basis of earlier clinical examinations, it was found that the cat showed some of the respiratory symptoms of the disease, but a definite diagnosis was notestablished. After a coprological findings, the owner was contacted when is recommended that cat should be brought for repeated clinical examination, radiography of thorax and therapy.

CASE HISTORY

The patient is a domestic cat, male, around 1.5 years old, uncastrated. This is outdoor cat which freely moves around the household in Vrbanja (rural region in Banja Luka). All data on patient diagnostics and therapy were archived in the software of Veterinary ambulance «BL Vet» Banja Luka. By reviewing the data, it can be noticed that one of the interventions was associated with the occurrence of some respiratory abnormalities. In March, the cat was brought in bad health in ambulance, and it was diagnosed with external otitis. A few days later, at the end of March 2018, the cat was brought back suspected of being poisoned with alloy wheel cleaner. He refused food and water. Clinical

examination revealed: conjunctivitis with severe eye discharge, facial oedema, nasal discharge, tachypnea, fever and tachycardia. The cat was sneezing and coughing. It was depressed and cachectic. Hematological tests showed: erythrocytosis and leukocytosis. Enrofloxacin, cefalexin, Hartmann's solution and non-steroidal anti-inflammatory drugs were administered. The animal was serologically negative to feline immunodeficiency and feline leukemia virus (immunocromatographic test). After repeated therapy, the health was improved, but the poor condition was the reason to recommend a coprological examination.

COPROLOGICAL EXAMINATION

Cat feces were subjected to routine parasitological examination by flotation method with saturated aqueous solution of zinc sulfate (specific gravity of 1.30-1.40 at 20 ° C). Microscopic examination revealed parasitic metastrongyloid larvae, which could not be determined because they were shriveled under high osmotic pressureof zinc sulfate. To confirm the infection, the rest of the sample was tested by Baermann technique – Conboy modification for small samples (Penagos-Tabares et al., 2016). Approximately 5 grams of the sample was packed in a double gauze and placed in a 50 ml falcon tube which was previously filled with water and closed with a plug. Sediment was examined after 24 hours in triplicate (2-3 drops of sediment were transferred by Pasteur pipette to three slides) After the larvae were found in the sediment, several drops of hydrogen peroxide and / or Lugol's solution were added, for the immobilisation and fixation of the larvae and for easier morphological examination (Figure 1). First stage larvae are morphologically determined according to reference descriptions (Traversa and Di Cesare, 2016; Diakou et al., 2016). The diagnosis of the nematode *Aelurostrongylus abstrusus* was made on the basis of morphological characteristics.

Figure 1. «A» - there is an apical «plateau» on the anterior part of diagnosed larvae so that it looks as it was cut straight. «B» The tail or posterior part of the leg has a typical «S» shape. Dorsally the tail sharply bends with noticeable ventral and dorsal incisions (cuts), ending with a button-like shape. Tip of the tail narrows from the middle to a thin filament.

After A. abstrusus was diagnosed, the owner was contacted and thoracalx-ray (in order to determine the degree of lesions), clinical examination and the implementation of therapy were recommended.

CLINICAL EXAMINATION

When the cat, after the diagnosis, was brought back, no clinical signs specific to cardiopulmonary diseases were observed. Bad nutrition and physical condition were noticed.

RADIOGRAPHIC INSPECTION

Radiography of thorax («LL» projection) revealed a broncho-interstitial pattern with thickened bronchial walls due to peribronchial infiltration. Significantly localized, interstitial changes were present in dorso- caudal part of the lungs (diaphragmatic lobes), where the shadow of the lungs was changed. These changes do not have a clear boundary limit, they increase non-homogeneous shading of transparent lung shadow and correspond to verminous bronchopneumonia (chronic, exudative, localized inflammation process) (Figure

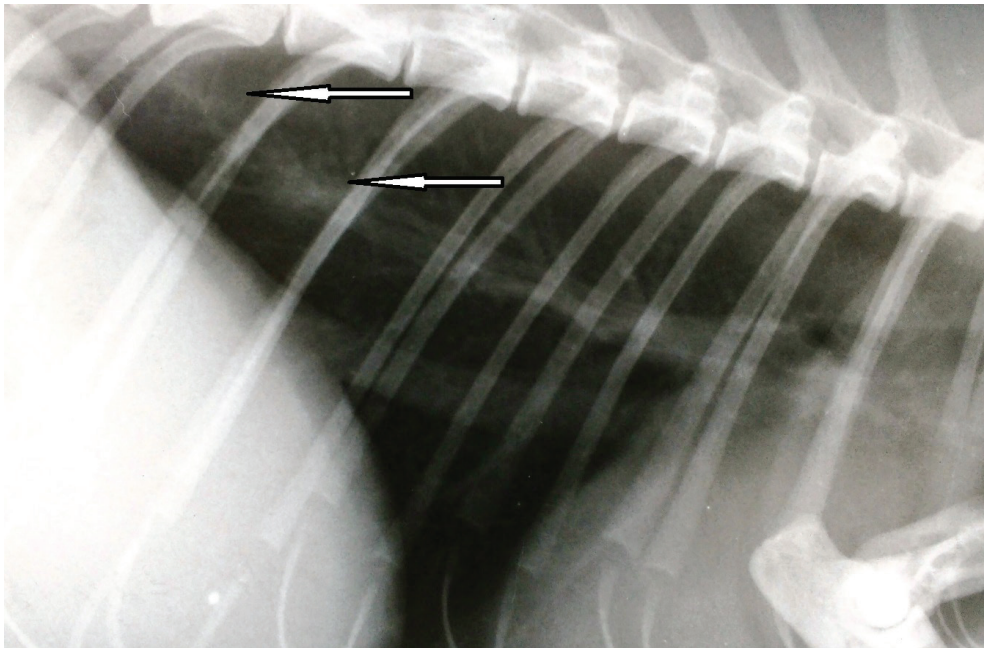

Figure 2. Chest x-ray of the infected cat (LL projection)

Therapy. Since the patient was an adult cat, ivermectin was administered subcutaneously at a dose of 0.4 mg / kg, informing the owner that control is necessary 2-3 weeks after treatment (Kirkpatrick and Megella, 1987). After the therapy, we contacted the owner from whom we found out that the condition of the cat was stable and that his condition improved. The faeces sample was not submitted to the control coprological examination.

DISCUSSION

In everyday practice, only a small number of veterinarians conduct regular coprological tests of dogs and cats. The consequence of this approach to parasitic diagnosis is the lack of timely and valid diagnostic of a large number of parasitic infections, which shows that routine laboratory procedure is underestimated. The diagnosis of aelurostrongylosis of cats is rare in practice. So far it has been described in several European countries, but italian researchers gave the greatest contribution to the knowledge of metastrongyloidosis (Traversa and Di Cesare, 2016). Epidemiologically, there are areas where this disease appears endemically and isone of the first differential diagnosis that veterinarians suspect after a clinical examination and the diagnosis of respiratory disorders.

On the other hand, in the area of the Balkan Peninsula, diagnosis od aelurostrongylosis in cats is based on the results of the parasitological section. The prevalence of this metastrongyloids is higher in Mediterranean countries. In Croatia, the prevalence was 22% (Grabarevic et al. 1999), and in some parts of Italy it was found to be 18.5% (Traversa et al.., 2008). In Albania, prevalence is estimated to be around 50%, 15.3% in Germany, 10.6% in the UK, 2.6% in the Netherlands, 14% in Hungary (Traversa and Di Cesare, 2014). The results obtained in this study confirm the finding of this parasite in Republika Srpska and Bosnia and Herzegovina.

The clinical picture varies in cats depending on the degree of infection, but the disease is mainly subclinical (Scott, 1973). Kittens or immunocompromised cats are affected when they have one of the following signs: coughing, mucopurulent nasal discharge, sneezing and difficulty breathing. In the described case, it is a subclinical infection, although it is possible that parasitosis contributed to the respiratory disturbances observed in early March. During the clinical examination, poor nutrition of the animal was noticed, which is often seen because the cat had the possibility of free movement outside the house and contact with other cats, especially during the mating period. The radiographic finding indicates a chronic process with mild changes on the diaphragmatic lobes. Similar data are found in the literature, since the radiographic findings depends on the degree of lung damage (Lacava et al., 2017). Since in the presented case there were no respiratory symptoms or

disseminated lung lesions determined by a radiographic examination, it was concluded that in this case chronic and subclinical aelurostrongylosis was diagnosed.

Lung lesions are localized in diaphragm lobes, and the bronchial wall is thickened, indicating the existence of a mixed pattern of lung lesion. For more intensive infections with A. abstrusus radiography shows generalized interstitial lesions in the lungs of affected cats (Lacava et al., 2017). Additionally, the detected changes in the lung lobe in our case are specific to verminous bronchopneumonia.

Several antiparasitics have been described in the literature as well as various formulations that are effective on the nematode A. abstrusus: fenbendazole, selamectin, moxidectin, praziquantel, levamisole and ivermectin (Elsheikha et al., 2016) However, in Republika Srpska, many of these drugs are not registered, which significantly restricts therapeutic and prophylactic opportunities in the fight against this nematodiosis. Oral and / or spot-on preparations are safer for use, but therapeutic protocols are longer. Because of the described toxicity, recommendation is to avoid the parenteral application of ivermectin in kittens (Lewis et al., 1994).

The obtained finding suggests that clinicians should conduct the coprological examination more frequently, which would certainly increase the number of registered cases of aelurostrongylosis and other parasitosis in cats. Evidence of the presence of this disease in the territory of Republika Srpska and Bosnia and Herzegovina indicates the necessity of conducting an epidemiological study in order to determine the prevalence of aelurotrongylosis.

LITERATURE

1. Alić A., Traversa, D., Duscher, G.G., Kadrić, M., Di Cesare, A. and Hodžić, A., (2015): Troglostrongylus brevior in an Eurasian lynx (Lynx lynx) from Bosnia and Herzegovina. Parasites & vectors, 8(1), p.653.
2. Diakou A., Psalla, D., Migli, D., Di Cesare, A., Youlatos, D., Marcer, F., & Traversa, D. (2016): First evidence of the European wildcat (Felis silvestris silvestris) as definitive host of Angiostrongylus chabaudi. Parasitology research, 115(3), 1235-1244.
3. Ilić T., Mandić, M., Stepanović, P., Obrenović, S. and Sanda, D., (2017): Cardiopulmonary metastrongyloidosis of dogs and cats contribution to diagnose. Veterinarski glasnik, 71(2), pp.69-86
4. Gavrilović P., Jovanović, M., Gavrilović, A. and Nešić, S., (2017): Fatal aelurostrongylosis in a kitten in Serbia. Acta parasitologica, 62(2), pp.488-491.
5. Grabarevic Z., Curic, S., Tustonja, A., Artukovic, B., Simec, Z., Ramadan, K. and Zivicnjak, T., (1999): Incidence and regional distribution of the lungworm Aelurostronglus abstrusus in cats in Croatia. Veterinarski arhiv, 69(5), pp.279-288.
6. Elsheikha H.M., Schnyder, M., Traversa, D., Di Cesare, A., Wright, I. and Lacher, D.W., (2016): Updates on feline aelurostrongylosis and research priorities for the next decade. Parasites & vectors, 9(1), p.389
7. Penagos-Tabares F., Lange, M. K., Chaparro-Gutiérrez, J. J., Taubert, A., & Hermosilla, C. (2018): Angiostrongylus vasorum and Aelurostrongylus abstrusus: Neglected and underestimated parasites in South America. Parasites & Vectors, 11, 208. http://doi.org/10.1186/s13071-018-2765-0
8. Scott DW. (1973): Current knowledge of aelurostrongylosis in the cat. Literature review and case reports. Cornell Vet. 1973; 63:483–500.
9. Traversa D., Lia, R.P., Iorio, R., Boari, A., Paradies, P., Capelli, G., Avolio, S. and Otranto, D., (2008): Diagnosis and risk factors of Aelurostrongylus abstrusus (Nematoda, Strongylida) infection in cats from Italy. Veterinary parasitology, 153: 182-186.
10. Traversa D., & Di Cesare, A. (2016): Diagnosis and management of lungworm infections in cats: cornerstones, dilemmas and new avenues. Journal of feline medicine and surgery, 18(1), 7-20.

11. Traversa D, Di Cesare A. (2014): Cardio-pulmonary parasitic nematodes affecting cats in Europe: unraveling the past, depicting the present, and predicting the future. Front Vet Sci. 2014;1:11.

12. Lewis D.T., Merchant, S.R. and Neer, T.M., (1994): Ivermectin toxicosis in a kitten. Journal of the American Veterinary Medical Association, 205(4), pp.584-586

13. Lacava G., Zini, E., Marchesotti, F., Domenech, O., Romano, F., Manzocchi, S., Venco, L. and Auriemma, E., (2017): Computed tomography, radiology and echocardiography in cats naturally infected with Aelurostrongylus abstrusus. Journal of feline medicine and surgery, 19(4), pp.446-453.

14. Kirkpatrick C.E; Megella, C. (1987): Use of Ivermectin in treatment of Aelurostrongylus abstrusus and Toxocara cati infections in a cat. J Am Vet Med Assoc, , 190 (10), 1305-1310

Paper received: 05.09.2018.

Paper accepted: 12.10.2018.