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CASE REPORT

Aelurostrongylus abstrusus Infection and Radiographic Findings in a Kitten

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ABSTRACT

A two-month-old female kitten suffering from respiratory signs, lethargy, and anorexia for fifteen days was brought to Balikesir University Small Animal Internal Medicine Clinics of Veterinary Faculty. During pulmonary auscultation, stridors in the cranial pulmonary lobes were detected. Laterolateral and ventrodorsal radiographs were obtained. A live larva of *Aelurostrongylus abstrusus* was also detected in the patient's direct fecal smear. The patient had recovered after treated with suitable antibiotics and anthelmintics. The parasite is determined in young adults or older cats, and it can cause serious infection. It can cause serious radiological findings in the lungs in kittens besides clinical symptoms. In conclusion, a differential diagnosis list in kittens that have dyspnea and serious pulmonary radiological findings must involve *A. abstrusus* infection.

Keywords: *Aelurostrongylus abstrusus*, kitten, nematoda, thorax radiography

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Bir Yavru Kedide *Aelurostrongylus abstrusus* Enfeksiyonu ve Radyografik Bulgular

ÖZ

Balıkesir Üniversitesi Veteriner Fakültesi Küçük Hayvan İç Hastalıkları Kliniği'ne Kliniği'ne 15 gündür solunum bulguları, uyuşukluk ve iştahsızlık şikayeti olan iki aylık dişi yavru kedi getirildi. Pulmoner oskültasyon sırasında, kraniyal pulmoner loblarda stridorlar tespit edildi. Hastanın laterolateral ve ventrodorsal radyografileri çekildi. Hastanın direkt dışkı yaymasında da canlı bir *Aelurostrongylus abstrusus* larvası tespit edildi. Hasta, uygun antibiyotik ve antelmintiklerle tedavi edildikten sonra iyileşti. Genç yetişkinlerde veya yaşlı kedilerde belirlenen parazit ciddi enfeksiyonlara neden olabilir. Ayrıca kedilerde klinik semptomların yanı sıra akciğerlerde ciddi radyolojik bulgulara neden olabilir. Sonuç olarak, nefes darlığı ve akciğerlerinde ciddi radyolojik bulguları olan yavru kedilerde ayırıcı tanı listesi *A. abstrusus* enfeksiyonunu içermelidir.

Anahtar Kelimeler: *Aelurostrongylus abstrusus*, nematod, toraks radyografisi, yavru kedi

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INTRODUCTION

Aelurostrongylus abstrusus (Nematoda, Strongylida) lungworm is a common parasite that infects cats worldwide (Anderson 2000). The life cycle of the parasite is indirect. Many species of snails have been considered globally as intermediate hosts (Lopez et al. 2015). Cats get infected via ingesting intermediate or paratenic hosts like lizards, birds, snakes, rodents frogs, etc. (Anderson 2000, Hobmaier and Hobmaier 1935).

After the ingestion of the eggs, the parasite reaches its sexual maturity in about four weeks. Adult stages of the parasite live in the terminal respiratory bronchioles and alveolar ducts of the definitive host. Following mating, female parasites produce eggs, and the embryos complete their maturation within the pulmonary ducts and alveoli. When the larvae are hatched, they are swallowed by the cat and released into the environment by feces (Anderson 2000).

Adult parasites, production of eggs, migration of larvae can cause mild to heavy granulomatous or mixed inflammatory response in *A. abstrusus* infection (Dennler et al. 2013). Clinical manifestations depend on several factors such as age, health status, immune response, and worm burden (Elsheikha et al. 2016). The infection can limit itself, and respiratory signs may resolve within several weeks (Traversa et al. 2010). The most frequent respiratory symptoms are mild to severe coughing, sneezing, wheezing, dyspnoea, nasal discharge, and tachypnoea (Traversa et al. 2008a, 2008b). In addition, generalized signs such as weight loss and lethargy are also described (Grandi 2005). Severe respiratory and cardiovascular manifestations, such as labored breath, tachycardia, and even sudden death, may occur in young cats with immunosuppression (Pechman 1984). Furthermore, it is suggested that nearly 10% of cats dying during or post anesthesia were suffered form by *A. abstrusus* infections (Gerdin et al. 2011). There are no pathognomonic features in radiological examination related to aelurostrongylosis. Alveolar, bronchial, and interstitial patterns are observed. However, the severity of the bronchial wall thickening and interstitial opacity increase in the lungs can be change depending on the chronicity of the infection and worm burden (Losonsky et al. 1983, Mahaffey 2005).

A. abstrusus L1 can be diagnosed via direct fecal smear, coprological examination, and Baermann method (Grandi 2005). Immunofluorescence antibody technique and PCR technique have been used in the diagnosis of the parasite (Amnoscia et al. 2014, Briggs et al. 2013). However, ELISA is using more commonly in recent years diagnosing the parasite (Zottler et al. 2017).

In the literature, several duration and dosage procedures that contain fenbendazole have been described for treatment; such as 20 mg/kg per b.w., orally for 5 days and up to 50 mg/kg per b.w., orally for 15 days. On the other hand, some researchers have reported that ivermectin was not clear the infection in the cats efficiently (Kirkpatrick and Megella 1987).

CASE HISTORY

A two-month-old female kitten suffering from dyspnea, lethargy, and anorexia for fifteen days was brought to Balikesir University Small Animal Internal Medicine Clinics of Veterinary Faculty. The animal was treated once against external parasites but not vaccinated. It came with an anamnesis of intermittently coughing that is without being associated with tiredness. In the last days, an increased frequency and duration of the neurological seizures were explained by the owner. Dyspnea, tachycardia (250 bpm), tachypnea (45 bpm), slightly cyanotic mucous membranes, emaciation, lethargy, and poor haircoat were observed during clinical examination of the patient. The patient's fever was not high (39 oC). During pulmonary auscultation, stridors were detected in the cranial pulmonary lobes. Laterolateral and ventrodorsal radiographs were obtained (images 2, 3). A live larva of *A. abstrusus* was also detected in the patient's direct fecal smear (image 1). For the treatment of the infection 50 mg/kg/ b.w. SID, fenbendazole (Aniprazol KK) was administered orally for 15 days. Moxidectin (Heuer et al. 2020) and eprinomectin (Knaus et al. 2014) are effective and useful to treat Aelurostrongylosis. However, according to our search, there is no suitable form in Turkey these drugs for cats, so fenbendazole was selected for the treatment. To improve the overall condition, additional non-specific therapy dexamethasone (Vetakort© 4 mg) at a dose of 0.1 mg/kg b.w., intramuscularly 3 times per 48 hours, ampiciline (Ampisina©, 250 mg / 1 flacon) at a dose of 10 mg/kg b.w., intramuscularly per 24 hours for 5 days were administered. At the end of the treatment, the cat owner reported that the cat had recovered.

Image 1: *Aelurostrongylus abstrusus* larva. (40x)

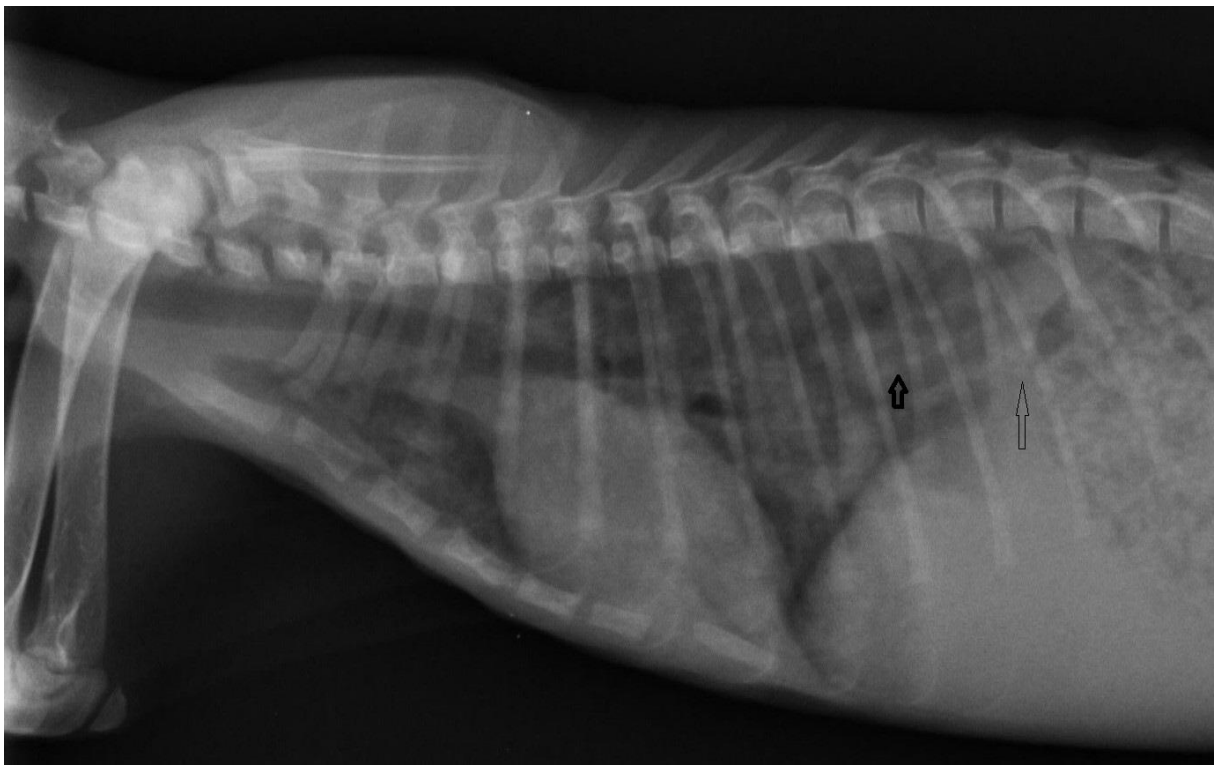

Image 2: Unstructural interstitial pattern (bold arrow); alveolar pattern (thin arrow).

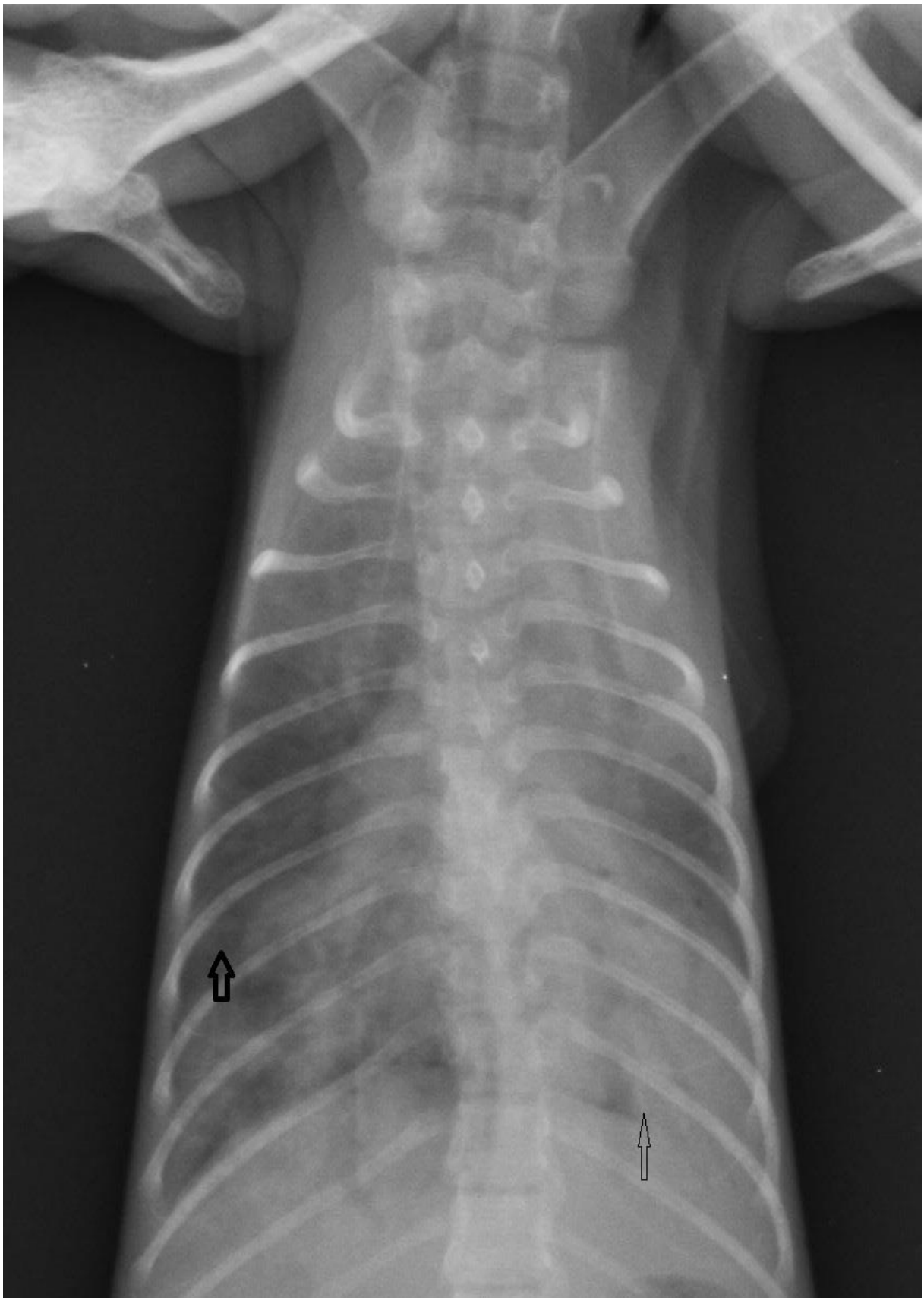

Image 3: Unstructural interstitial pattern (bold arrow); alveolar pattern (thin arrow).

DISCUSSION AND CONCLUSION

A. abstrusus is a lungworm parasite that infects cats globally (Anderson 2000). The infection caused by the parasite was reported from several countries of Europe and Turkey (Atasever and Yazar 2009, Burgu and Sarımehmetoğlu 2004, Grandi 2005, Tüzer et al. 2002, Traversa et al. 2008b, Yildiz et al. 2011). Our physical examination findings such as dyspnea, tachycardia, poor hair coat, emaciation and lethargy and radiographic findings such as alveolar pattern, unstructured interstitial pattern, increased bronchial wall thickness and increased opacity of all lung lobes are consistent with previous reports (Elsheikha et al. 2016, Grandi et al. 2005, Losonsky 1983, Mahaffey 2005, Traversa et al. 2008a 2008b, Tüzer et al. 2002). Feline aelurostrongylosis can be easily confused with other diseases of the respiratory system and due to the infection similar clinical, radiographic, and hematological findings can be observed. (Foster et al. 2004a 2004b, Holmes et al. 1993). However, most of the research articles and case reports about the parasite include young or young adult cats that ages generally change between 1 to 3 years old. Although many developed techniques are used to diagnose the parasite (Amnoscia et al. 2014, Briggs et al. 2013, Zottler et al. 2017) in this case report, there was no need to use specific diagnostic methods after confirming the species of the parasite.

According to our literature search, only just one publication reported that the parasite has been determined in a 3.5 months old kitten (Burgu and Sarımehmetoğlu, 2004). As stated before, in most cats, non-specific pulmonary findings such as diffuse interstitial pulmonary pattern, bronchial, or alveolar pulmonary pattern were observed. It is important to note that, in this case report, the kitten was only 2 months old, and besides increased bronchial wall thickness and alveolar pattern that is considered non-specific for lung parasites; it had severe pulmonary radiological findings include caudodorsally located unstructured interstitial pulmonary pattern which is considered specific for lung parasites.

In conclusion, *A. abstrusus* rarely been reported from Turkey, especially in kittens. So this case report is important in terms of epidemiology and diagnosis of the parasite, and the infection caused by the parasite should be involved in the differential diagnosis list in kittens that have respiratory distress syndrome.

Conflict of Interest

The authors declared that there is no conflict of interest.

Ethics Committee Approval

In accordance with Article 8 (k) of the "Regulation on Working Procedures and Principles of Animal Experiments Ethics Committees," this study does not require HADYEK's permission.

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