
*Case Report***Successful treatment of pyothorax in cat: A case report**

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ABSTRACT

A five-month-old male cat was brought to the Teaching and Training Pet Hospital and Research Center, CVASU with the history of coughing, open mouth breathing and extended neck. This case was considered for the study with aimed to describe the diagnostic and treatment procedure of pyothorax in cat and to observe the recovery of it. Clinical examinations revealed respiratory distress, dyspnea, muffled lung sound and fever. Radiography and thoracocentesis were confirmed the pyothorax. Neutrophilia was found on haematology and rod shaped bacilli with degenerated neutrophil were found on cytology of pleural fluid. The cat was treated with amoxicillin (Moxin[®], Oponin Pharmaceuticals Ltd.) at the rate of 20 mg/kg bid s/c and furosemide (Fusid[®], Square Pharmaceuticals Ltd.) at the rate of 1 mg/kg bid i/m for 7 days followed by oral amoxicillin (Moxin[®], Oponin Pharmaceuticals Ltd.) for next 21 days. The recovery of the cat was observed at different day interval by taking radiography. The complete recovery was observed after 28 days of diagnosis.

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1. INTRODUCTION

Thoracic empyema (pyothorax) is an accumulation of septic exudate in the thoracic cavity, which is characterized by tachypnea, dyspnea, cough, lethargy,

weight loss and anorexia (Stillion et al., 2015). It is considered as life-threatening critical condition for cats. Pyothorax is more frequent in cats than in dogs (Barrs et al., 2005). Predominant causes of feline

pyothorax are penetrating thoracic wounds, parapneumonic spread and foreign body migration. Pleural infection secondary to parapneumonic spread may be more common than penetrating bite wounds. Pyothorax can also occur secondary to extension of infection from the lungs, parasitic migration (*Toxocaracati*), haematogenous spread of bacterial infection, pulmonary abscess, neoplasia and iatrogenic causes (Stillion et al., 2015). It is clinically characterized by respiratory distress, open mouth breathing, abducted elbow, extended head/neck and inspiratory dyspnea (Venkatesakumar et al., 2019). Clinical history, clinical signs, physical examination findings, thoracic radiography, thoracocentesis and cytology of pleural fluid may be helpful for definitive diagnosis (Epstein, 2014). Hematology and serum biochemistry also help in diagnosis (Stillion et al., 2015). Underlying causes and treatment recommendations vary greatly between cases (Gorris et al., 2017a). Pyothorax has classically been treated either by medical or surgical intervention. Though evidence-based treatment protocols are deficits in both veterinary and human medicine, antimicrobial in combination with thoracic drainage is generally accepted. Patients with signs of systemic inflammatory response syndrome or sepsis need cardiovascular stabilization with IV fluids to correct shock, dehydration, electrolyte, and acid-base abnormalities is an important step. Supplemental oxygen should also be administered to patients with hypoxemia or cardiovascular instability (Epstein, 2014). Prognosis of feline thoracic empyema is fair to good if early treatment is started with proper antibiotic and evacuation of purulent materials from pleural cavity by

thoracocentesis, otherwise leading to guarded prognosis (Venkatesakumar et al., 2019). The study was aimed to describe the diagnostic and treatment procedure of pyothorax in cat and to observe the recovery period of it.

2. MATERIALS AND METHODS

Case history and physical examination

A five-month-old male cat was presented to Teaching and Training Pet Hospital and Research Center, CVASU with the history of coughing, open mouth breathing and extended neck. All clinical examinations were done to diagnose the pyothorax.

Thoracic radiography

Thoracic x-ray (lateral view) was taken at different time interval to diagnose and to evaluate the recovery of the patient.

Blood collection

1 ml of blood with EDTA vacutainer and 1.5 ml of blood with clot activator vacutainer were collected for haematological and serum biochemical evaluation.

Thoracocentesis and cytology

Thoracocentesis was done on sternal recumbency at 7th intercostals space to drainage the pleural fluid by connecting 5 ml syringe with 23 G butterfly needle. A little amount of fluid was placed on a slide to prepare a smear and air dried. After that it was fixed with 100% methanol and again air dried. Then it was stained with 10% Giemsa stain and allowed for 20 minutes. After rinsing on tap water to remove the extra stain, it was air dried and

examined under microscope at 100X objectives with oil emersion.

Treatment

The cat was treated with systemic antibiotic amoxicillin (Moxin[®], Opsonin Pharmaceuticals Ltd.) at the rate of 20 mg/kg bid s/c and furosemide (Fusid[®], Square Pharmaceuticals Ltd.) at the rate of 1 mg/kg bid i/m for 7 days followed by oral amoxicillin (Moxin[®], Opsonin Pharmaceuticals Ltd.) for next 21 days.

3. RESULTS AND DISCUSSION

In our study, age of the cat with pyothorax was 5 months; however, Venkatesakumar et al. (2019) reported it is mostly found in 6 months to 4 years old cats. The sex of our study cat was male that is agreement with the study of Demetriou et al. (2002), who reported that incidence of pyothorax is more in male cats than female. It is due to young male have a greater likelihood to roam and fight resulting in penetrating injuries (Waddell et al., 2002). Some studies reported that aspiration of oropharyngeal flora with parapneumonic spread might be a more frequent cause of pyothorax than bite wounds (Barrs and Beatty, 2009).

Clinical examinations of the cat revealed respiratory distress, open mouth breathing, abducted elbows, extended head/neck and inspiratory dyspnea (Figure 1). Rectal temperature, respiratory rates were elevated in the cat. Gorris et al. (2017b) recorded fever, dyspnea and open mouth breathing in cats with pyothorax. On auscultation of chest area found muffled sounds in lung and heart that was consistent with other reports (Epstein, 2014; Gorris et al. 2017b). Neutrophilia

was found in haematology (Table 1). Biochemical parameters were within the normal range (Table 2). Demetriou *et al.* (2002) reported leukocytosis, hypoalbuminaemia and hyperglobulinaemia in pyothorax in cats. In our study case neutrophilia in haematology is due to bacterial infection and no abnormality in serum biochemistry is due to early detection of the case.

Radiography revealed effusion in the pleural cavity obscuring the left apical lobe of lung and cardiac silhouette (Figure 2). Dorsoventral radiography of thorax confirms the presence of pleural effusion (Beatty and Barrs, 2010) and the lateral radiography helps to detect locations (Christie, 2010).

In current study, thoracocentesis was performed to drainage the pleural fluids which diminish the open mouth breathing and helps to evaluate the fluid by cytology (Figure 3 and 4). Similar technique was recommended in a study conducted by Venkatesakumar et al. (2019). In cytology we found that rod shaped bacteria with degenerated neutrophils (Figure 5). This finding is supported with the study of Stillion et al. (2015), who reported bacterial isolates from feline pyothorax consisted of gram-negative, facultative anaerobic rods and/or obligate anaerobic bacteria, representing oropharyngeal flora. The cat was treated with amoxicillin (Moxin[®], Opsonin Pharmaceuticals Ltd.) at the rate of 20 mg/kg bid s/c and furosemide (Fusid[®], Square Pharmaceuticals Ltd.) at the rate of 1 mg/kg bid i/m for seven days followed by oral amoxicillin (Moxin[®], Opsonin Pharmaceuticals Ltd.) for next 21 days. Greene (2006) reported that amoxicillin-clavulanic acid (10-40 mg/kg bid or tid) in

cats is best antibiotic of choice for the management of pyothorax. In the present study, the cats showed remarkable recovery following thoracocentesis and antibiotic treatment. The recovery was observed by taking radiography at day 5, 12 and 28 respectively. The obscure in left

apical lobe of lung subsiding gradually and complete radiolucent was found at day 28 (Figure 6, 7 and 8). This observation is agreement with the findings of Barrs et al. (2005), who observed clinical signs of pyothorax were diminished in 78% cases between 2 to 6 weeks after diagnosis.

Table 1: Analysis report of haematological parameters

Parameters	Results	Reference value
Hemoglobin (Hb)	15.20 g/dl	9.8-15.4 g/dl
Red blood cells (RBC)	4.97×10^6 /cumm	$5.0-10.0 \times 10^6$ /cumm
White blood cells (WBC)	9.5×10^3 /cumm	$5.5-19.5 \times 10^3$ /cumm
Pecked cell volume (PCV)	37.31%	30-45%
Differential Leukocyte Count		
Neutrophils	69%	45-64%
Lymphocytes	28%	27-36%
Monocytes	2%	0-5%
Eosinophils	1%	0-4%
Basophils	0%	0-1%

Table 2: Analysis report of biochemical parameters

Parameters	Results	Reference value
Total protein (TP)	8.0 g/dl	5.2-8.8 g/dl
Albumin	2.8 g/dl	2.5-3.9 g/dl
Globulin	5.2 g/dl	2.3-5.3 g/dl
Alanine aminotransferase (ALT)	72.0 u/l	10-100 u/l
Aspartat aminotransferase (AST)	39.7 u/l	10-100 u/l
Alkaline phosphatase (ALP)	37.2 u/l	10-50 u/l
Serum creatinine	0.8 mg/dl	0.6-1.5 mg/dl
Blood urea nitrogen (BUN)	28.29 mg/dl	14-36 mg/dl

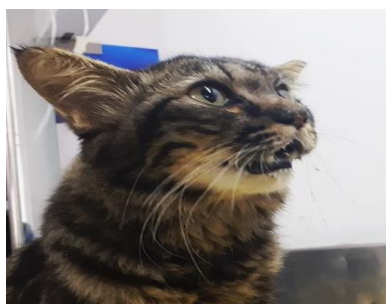


Figure 1: Open mouth breathing with extended head/neck



Figure 2: Obscure of left apical lobe of lung in lateral thoracic radiography at day 1



Figure 3: Pleural fluid (pus) after thoracocentesis in kidney tray



Figure 4: Open mouth breathing was diminished after thoracocentesis

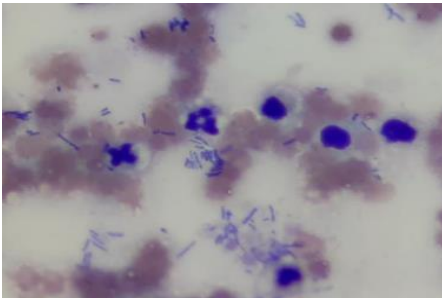


Figure 5: Rod shaped bacteria with degenerated neutrophil in Giemsa stain



Figure 6: Gradually subsiding the obscure of left apical lobe of lung at day 5

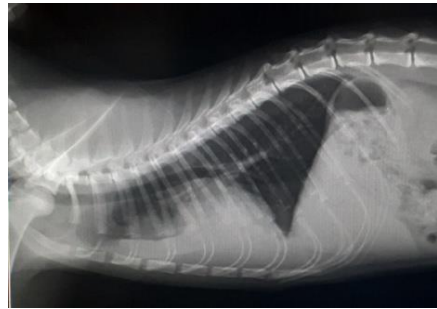


Figure 7: Gradually subsiding the obscure of left apical lobe of lung at day 12



Figure 8: Radiolucent left apical lobe of lung at day 28

4. CONCLUSIONS

Cat with pyothorax showed dyspnea, open mouth breathing, extended head/neck, abducted elbow and fever. It was diagnosed based on clinical signs, haematology, radiography and thoracocentesis. Long term antibiotic therapy followed by thoracocentesis was effective for pyothorax in cat.

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