



International Journal of Veterinary Sciences and Animal Husbandry



ISSN: 2456-2912

VET 2025; 10(1): 153-155

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www.veterinarypaper.com

Received: 06-11-2024

Accepted: 08-12-2024

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Navigating the challenges of Pyothorax: The inspiring story of a cat's recovery

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DOI: <https://doi.org/10.22271/veterinary.2025.v10.i1c.2012>

Abstract

A six-month-old female domestic shorthaired cat was presented with a three-day history of respiratory distress. On clinical examination, the cat was severely tachypnoeic and lung auscultation revealed muffled sounds. Clinical examination revealed severe tachypnoea, and lung auscultation detected muffled sounds, indicating potential pleural effusion. Diagnostic imaging, including radiography and ultrasonography, revealed fluid accumulation in the thoracic cavity. To alleviate the cat's distress, emergency thoracocentesis was performed, removing approximately 150 ml of brown opaque fluid from the thoracic cavity. A 28-day course of Amoxicillin-Clavulonic acid was administered to address potential underlying infections. Follow-up thoracocentesis, performed two weeks later, removed an additional 70 ml of light brown fluid, and the cat's condition continued to improve. Ultimately, the cat made a full recovery, with no evidence of pleural effusion noted during a four-week follow-up examination.

Keywords: Pyothorax, Pleural effusion, cats, culture, thoracocentesis

Introduction

Case History and Treatment

A six-month-old male domestic shorthaired cat was presented with a three-day history of respiratory distress and inappetence, exhibiting severe clinical signs, including sternal recumbency, open-mouth breathing, and a slightly arched back, indicative of significant thoracic cavity compromise. Upon clinical examination, the cat's temperature was notably elevated at 103.8°F, with concurrent severe tachypnoea, pale mucous membranes, and evidence of severe dehydration and tachycardia, collectively suggesting a critical underlying condition. Radiographic examination revealed substantial fluid accumulation within the thoracic cavity, accompanied by border effacement of the cardiac silhouette. On Ultrasonographic examination, contents with less echogenicity in the thoracic cavity were visualized, thereby confirming the presence of severe pleural effusion. Haemato-biochemical analysis revealed leucocytosis, characterized by an elevated WBC count of 59,000/cmm, with a predominance of neutrophils (88%), alongside hypoproteinaemia (4.6 g/dL) and hypoalbuminemia (2.45 g/dL), as well as an elevated lactate dehydrogenase level (326.5 IU/L), collectively indicating a severe underlying inflammatory process. Following sedation with Butorphanol (0.2 mg/kg intramuscular route) and local anaesthesia with Lignocaine, emergency thoracocentesis was performed, and approximately 150 ml of foul-smelling, brown fluid was removed, which was subsequently subjected to cytological examination, revealing numerous degenerated neutrophils (Total nucleated cell count - 3,07,000/cmm) with bacteria. The fluid was subjected to bacterial culture on MacConkey Agar, which showed pink mucoid growth, identifying gram-negative *Klebsiella sp.* as the causative agent. Antimicrobial sensitivity tests were also performed, demonstrating sensitivity of the organism to Amoxicillin-Clavulonate. The cat was treated with intravenous Amoxicillin-Clavulonic acid and Ringer's Lactate, followed by oral antibiotics for 28 days (Sim *et al.*, 2021) [6], resulting in normalization of hydration status and appetite within four days.

Serial follow-up examinations, including thoracic ultrasonography and thoracocentesis on second week, revealed 70 ml of light brown fluid, signalling gradual resolution of pleural effusion. With complete normalization of blood test results and no evidence of fluid accumulation within the thoracic cavity after four weeks, the cat had an uneventful recovery.



Fig 1: Cat with open mouth breathing and slightly arched back



Fig 2: Thoracic radiography - Fluid accumulation in the thoracic cavity with border effacement of cardiac silhouette



Fig 3: Thoracic ultrasonography-Anechoic contents in the thoracic cavity



Fig 4: Pleural fluid-pyothorax

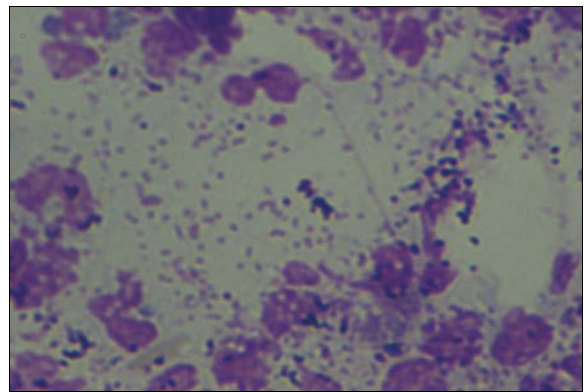


Fig 5: Pleural fluid cytology-Numerous neutrophils with bacteria

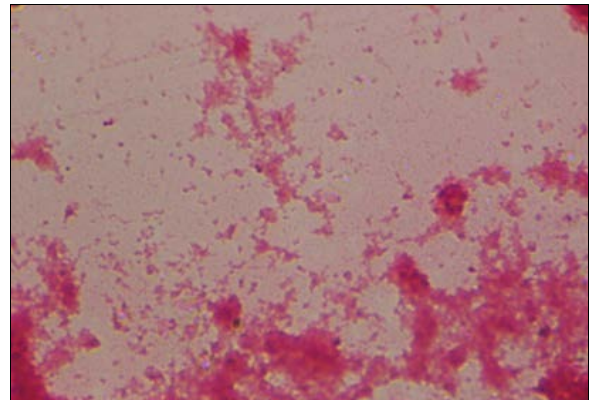


Fig 6: Gram staining-Gram negative bacilli



Fig 7: MacConkey Agar-Pink mucoid colonies-Klebsiella sp

Discussion

Pyothorax, a severe and potentially life-threatening condition also known as thoracic empyema, is characterized by the accumulation of septic purulent fluid within the pleural space, precipitating a cascade of inflammation and infection that compromises the surrounding tissues (Beatty and Barrs, 2010) [1]. The primary etiological factor underlying feline pyothorax is thought to be parapneumonic spread of infection (Murphy, and Papasoulitis, 2011) [4], wherein oropharyngeal flora colonizes lung tissue, frequently as a complication of pneumonia, thereby facilitating the penetration of bacteria into the lung parenchyma and subsequent dissemination to the pleural space (Demetriou *et al.*, 2002) [2]. This complex sequence of events culminates in the accumulation of infected fluid within the pleural cavity, necessitating prompt and accurate diagnosis to guide effective treatment and ensure successful outcomes (Epstein, 2014) [3]. A comprehensive diagnostic approach, incorporating clinical evaluation, laboratory analysis, and imaging studies, is crucial for identifying the underlying cause of pyothorax and informing

the development of a tailored treatment plan (Stillion and Letendre, 2015)^[5].

Conclusion

The presentation of pyothorax in cats is often insidious and nonspecific, manifesting as vague and seemingly unrelated signs such as lethargy, anorexia, and respiratory distress, which can lead to a delayed diagnosis and initiation of treatment. As a result, prompt recognition and rapid intervention are critical to preventing severe and potentially life-threatening complications, including sepsis, organ failure, and death, which can arise from the proliferation of bacteria within the pleural space. The key to timely intervention lies in maintaining a high index of suspicion, combined with the strategic use of diagnostic imaging modalities, such as radiography and ultrasonography, and cytologic examination of pleural fluid to detect the presence of bacteria and guide targeted antimicrobial therapy. By adopting a proactive and multidisciplinary approach, a successful outcome can be ensured, thereby reducing the risk of complications, and improve the quality of life for affected animals

Conflict of interest

Authors have no conflict of interest in this study.

Financial Support: Not available

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How to Cite This Article

Karunyakaran DH, Gowri B, Selvaraj P, Tirumurugan KG, Sabareeswaran S. Navigating the challenges of Pyothorax: The inspiring story of a cat's recovery. *International Journal of Veterinary Sciences and Animal Husbandry.* 2025;10(1):153-155.

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