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A Report on Pathomorphological Study of Pyothorax in a Cat

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Abstract

The life-threatening emergency of feline pyothorax is one that small animal veterinarians frequently deal with. An eight-month-old female Persian cat was presented with the history of dyspnoea, nasal discharge, vomiting, diarrhoea, severe emaciation and weight loss. Animal was under treatment for respiratory distress for six days and collapsed. At necropsy, fibrin deposits over the pleura and unilateral accumulation of creamy fluid in the thoracic cavity were observed. Histopathological examination of lung showed fibrinous pleuritis with marked inflammatory cell infiltration, prominent vascular changes and diffuse alveolar damage.

Key words : Pyothorax, fibrinous pleuritis, alveolar damage

Pyothorax refers to an infection of the pleural space marked by the buildup of a purulent discharge in pleuralspace (Swinbourne*etal*.,2011).Young to middle-aged cats are typically affected by pyothorax, which has no known breed or sex predisposition (Barrs*etal*.,2005). Following trauma, such as surgical wounds, perforating bite wounds, direct inoculation, hematogenous and lymphatic spread or translocation from nearby structures like mediastinum or oesophagus, perioperative aspiration are the main causes of pyothorax (Ottenjann *et al*., 2008).

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Materials and Methods

Carcass of a female Persian cat of eight months old, with the history of dyspnoea, nasal discharge, vomiting, diarrhoea, severe emaciation and weight loss, was presented for the post mortem examination at the department of Veterinary Pathology, College of Veterinary and Animal sciences, Pookode. The animal was under treatment for respiratory distress for six days. Detailed post mortem examination was conducted and the represented tissue samples were fixed in 10% neutral buffered saline, processed routinely and stained using haematoxylin and eosin (H&E) (Suvarna *et al.,* 2018). The pus sample was collected and sent to department of Veterinary Microbiology for bacterial culture and identification.

Results

On necropsy, gross changes observed were pale conjunctival mucous membrane and gums. Thoracic cavity contained approximately 100 ml of light cream coloured semi-viscous pus and lungs were collapsed (Fig. 1).On left side, visceral pleura was adhered firmly to parietal pleural at multiple areas. Fibrin deposits with rubbery consistency were distributed diffusely over the left cranial and diaphragmatic lobes indicating severe fibrinous pleuritis. Right cranial and diaphragmatic lobe showed diffusely dark red discolouration. Histopathological findings were corroborating with the gross pathological observations. There was congestion, haemorrhage, oedema and marked infiltration of inflammatory cells in the lung parenchyma. Sections from right accessory lobe showed perivascular inflammatory cell infiltration, bronchitis and bronchi-

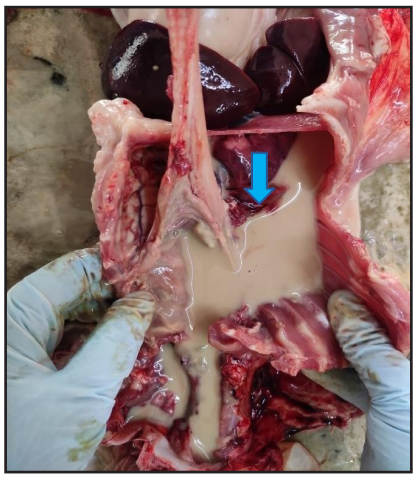

Fig 1: Pyothorax- Cream coloured pus in the thoracic cavity (arrow)

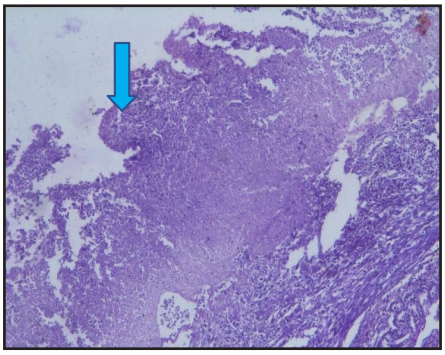

Fig 3: Lung- Fibrinous pleuritis – Fibrin strands and inflammatory cell infiltration over the pleura (arrow). Note the adjacent underlying atelectatic alveoli (H&E, 100X)

olitis with the presence inflammatory exudate and desquamated epithelium in the lumen (Fig. 2). Microscopic examination of left cranial and diaphragmatic lobes showed attached fibrin strands and marked inflammatory cell infiltration over the visceral pleura. The alveoli adjacent to the affected pleura were found to be atelectatic (Fig. 3). Microscopic examination of bacterial culture revealed gram negative bacilli.

Discussion

Pyothorax, which affects the pleural area and may cause systemic disease and organ malfunction as a result of sepsis, is a potentially fatal and frustrating ailment in small animals. This report gives a pathomorphological description of a case of pyothorax in an eight-month-old Persian cat. Barrs and Beatty (2009) stated that young cats were primarily affected by the disease pyothorax and despite of the likelihood

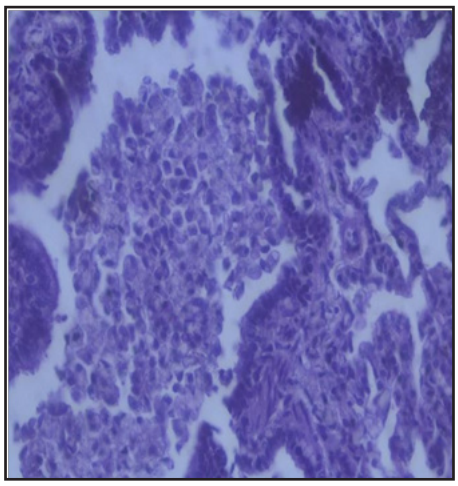

Fig 2: Lung- Bronchiolitis – Bronchiolar lumen with exudate containing inflammatory cells and desquamated epithelium (arrow) (H&E, 100X)

of an insidious disease progression, the majority of patients exhibited acute symptoms. The most frequent cause of pyothorax in cats is oropharyngeal-derived facultative and obligate anaerobes. Even though in the present case of pyothorax, bacterial culture revealed gram negative bacilli in the pus sample, the exact cause of pyothorax could not be determined. In a study consisting of 28 cases of pyothorax in cats, Sim *et al.* (2021) identified gram negative bacteria such as *Escherichia coli* and *Pseudomonas aeruginosa* in 17.8 per cent and 3.57 per cent of cases, respectively. The most prevalent cause of feline pyothorax appears to be para-pneumonic dissemination of infection following colonisation and invasion of lung tissue by oropharyngeal flora, which contradicts the widely held idea that direct seeding of pleural cavity by bite wounds is more frequent (Barrs *et al.*, 2005). But, Epstein and Balsa (2020) in a review on canine and feline exudative pleural diseases, stated that underlying etiopathogenesis in many cases of pyothorax was either difficult to determine or unknown. In the current case study, gross examination revealed the presence of light cream coloured semi-viscous pus in the thoracic cavity. Doyle *et al.* (2005) observed brown, turbid, flocculent exudate with yellow material specks in the thorax indicating the change in the appearance of the content depending on the agents causing infection. Histopathologically, they observed fibrin deposits and inflammatory cells over the

pleural surface, atelectasis, inflammatory cell infiltration in lung parenchyma, bronchitis and bronchiolitis. These findings are in accordance with the microscopic finding of the present study.

Acknowledgement

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Conflict of interest

Authors declare that they have no conflict of interest.

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