Case Report

EMERGENCY THORACOCENTESIS FOR HAEMOTHORAX DUE TO MESOTHELIOMA IN A DOG

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ABSTRACT

A nine year old non-descript male dog was presented to Madras Veterinary College Teaching Hospital with a history of anorexia, weakness, and clinical signs of respiratory distress and pyrexia. TFAST (thoracic-focused assessment with sonography for trauma) of the lung was performed to rule out pleural effusion. Upon confirmation of pleural effusion, thoracocentesis was performed and sample was collected to identify the cause. The pleural effusion was confirmed as haemothorax and cytology of the sample was confirmed as mesothelioma.

Keywords: Dog, Dyspnoea, Pleural effusion, Haemothorax, Mesothelioma.

Received : 19.11.2023 Revised : 19.01.2024 Accepted : 19.01.2024

INTRODUCTION

Haemothorax describes free blood within the pleural cavity with a packed cell volume (PCV) similar to or higher than that from a blood sample. Space between the parietal and visceral pleura is the pleural cavity, a possible compartment that might separate the media stinum, lungs, diaphragm, and chest wall. Normal conditions involve a mild amount of fluid that is invisible on thoracic radiography or ultrasonography (Allerton, 2019). Clinically, traumatic injuries and coagulopathies appear to be the most common causes of haemothorax in dogs (Nakamura *et al.,* 2008). While defects in secondary hemostasis are frequently associated with haemothorax, defects in primary hemostasis may also results in haemothorax. The most common cause of haemothorax in dogs is chest trauma, although tumours within the thorax can also result in a haemothorax. Clotting disorders may also cause bleeding within the chest cavity. While haemothorax is usually linked to problems in secondary hemostasis, it can also be caused by defects in primary hemostasis (Quinn and

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Dillary, 1999). The present report describes about the clinical signs, diagnostic methods, thoracocentesis and treatment followed for mesothelioma in a dog.

HISTORY AND DIAGNOSIS

A nine year old non-descript male dog was brought to the Madras Veterinary College Teaching Hospital with a history of anorexia, dullness, difficult breathing, increased panting, weakness and pale mucous membranes. Upon clinical examination, severe respiratory distress with short, shallow, rapid open-mouth breathing. Complete blood count revealed microcytic hypochromic anaemia, leucocytosis (21500 cells/cmm) with neutrophilia (81 %), and normal platelets (3 lakhs / cmm). Serum biochemistry was within the normal range. TFAST - thoracic focused assessment sonography for trauma revealed anechoic contents in the thorax suggestive of pleural effusion (Fig.1.) and the animal was stabilized with oxygen therapy (Fig.2). Lateral thoracic radiography revealed retraction of the lung lobes away from the thoracic wall and dorsal displacement of the cardiac silhouette as a result of the pleural fluid (Fig.3). Cytology of the fluid revealed it as mesothelioma.

THERAPEUTIC MANAGEMENT

Emergency thoracocentesis was carried out by 20 G scalp vein set needle attached to a 3-way stopcock via a closed circuit and was inserted perpendicular to the chest wall along the cranial aspect at the 8th inter-costal space (Sundararajan *et al.,* 2022). Around 250 ml of fluid (blood) was evacuated through aspiration and continued until the maximum fluid was evacuated. Ampicillin and Cloxacillin combination injection @ 22 mg/kg intravenously was given twice a day, Inj. Butorphanol @ 0.2 mg/kg intravenous for five days . Supportive intravenous fluid therapy Inj. Ringers Lactate @ 5 ml/kg and Vitamin B1, B6, B12 @ 1 ml intravenous were administered for five days.

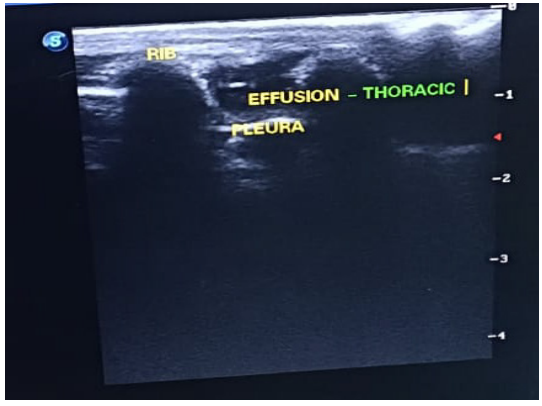

Fig. 1. TFAST indicated effusion in pleural Space in a dog

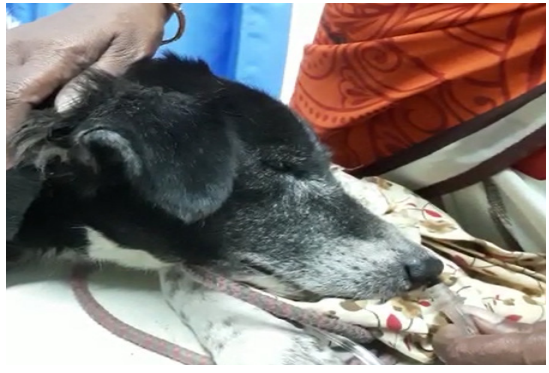

Fig. 2. Animal stabilized with oxygen therapy

The dog was stabilized with oxygen supplementation and emergency

thoracocentesis was performed to evacuate intra-thoracic fluid (Fig. 4, 5, 6). The owner was explained about the prognosis and the animal was managed with palliative therapy. Cytology of the Leishman-Giemsa-stained sample revealed the presence of large clusters of epithelioid cells with knobby borders (morulae) indicating mesothelioma (Fig.7). Based on these findings it was diagnosed as a case of mesothelioma.

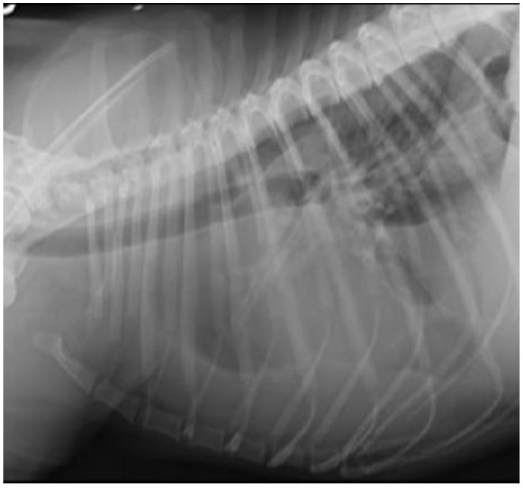

Fig.3. Left lateral thoracic radiography

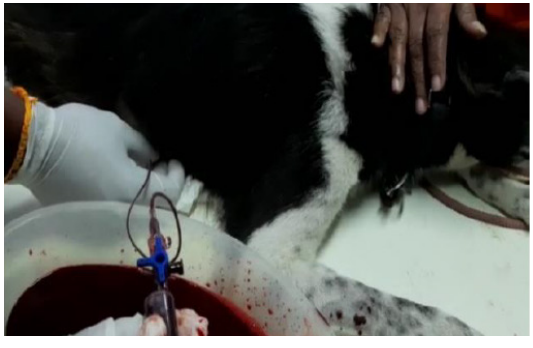

Fig.4. Emergency thoracocentesis showed pleural effusion in a dog haemothorax in a dog

Fig. 5&6. Post-emergency thoracocentesis relieved haemothorax and reduced respiratory distress in a dog

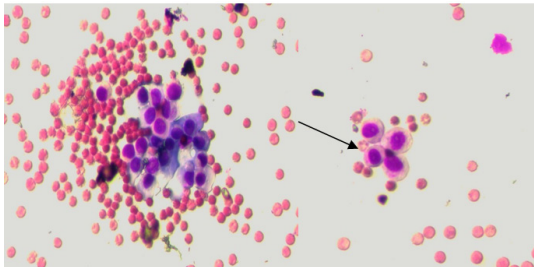

Fig.7. Presence of large clusters of epithelioid cells with knobby borders (morulae) indicating mesothelioma

DISCUSSION

Neoplasia was the most common cause associated with non-coagulopathic spontaneous haemothorax (Nakamura *et al.,* 2008) as seen in this present report. The cause of haemothorax due to neoplasia is multifactorial. Pulmonary parenchymal neoplasia has been postulated to cause haemothorax by direct invasion of pulmonary vessels, compression or ischemic necrosis of adjacent lung tissues by tumour, tumour-induced angiogenesis, or rupture of a well-vascularized tumour (Nakamura *et al.,* 2008). While the more muscular artery continues to permit some flow into the lung, the thin-walled pulmonary vein readily collapses. As a result, fluid accumulates and congeals as it passes through interstitial tissue, airways, and eventually the pleural space (Neath *et al.,* 2000). Radiographic evidence of pleural effusion includes widening of interlobar fissures (seen with >100 ml fluid) in a medium-sized dog (Thrall, 2018), which was evident in this case, scalloping of the lung margins at the costophrenic angles, a uniform retraction of the lungs from the thoracic wall and obstruction of the cardiac and diaphragmatic silhouettes (Prittie and Barton, 2004). Emergency thoracocentesis to remove pleural effusion which was performed in this case is an invaluable diagnostic and therapeutic tool for dogs with thoracic effusion/diseases (Silverstein and Hopper, 2023). The case of haemothorax in the present case was neoplasia which was confirmed by the cytology which revealed the presence of large clusters of epithelioid cells with knobby borders (morulae) indicating mesothelioma. Paintal *et al.* (2013) explained the cytology of mesothelioma which indicated the presence of cell groups with knobby borders ("morulae"), low nuclear: cytoplasmic ratios, lack of pleomorphism, and dense cytoplasm.

CONCLUSION

Traumatic injury and coagulopathies are common cause of haemothorax however thoracic tumours can also cause blood accumulation. Clinical signs are more indicative of hypovolemia than respiratory compromise resulting from the accumulation of pleural fluid. Cytology of effusion is diagnostic and also important for therapeutic approach. Initial patient stabilisation may require fluid support, oxygen therapy and judicious, emergency thoracocentesis. Thoracocentesis is invaluable diagnostic and therapeutic tool for dogs with pleural diseases.

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