

## **Diagnostic and Therapeutic Approach of Primary Spontaneous Pneumothorax in a Greyhound Dog**

**S. Saravanan<sup>1</sup>, S. Kathirvel and G. Selvaraju**

Department of Veterinary Public Health and Epidemiology, Veterinary College and Research Institute, TANUVAS, Namakkal - 637 002, Tamil Nadu

*Received: May 2024*

*97/24*

*Accepted: September 2024*

<sup>1</sup>*Corresponding author's Email: sarvet.25@gmail.com*

### **ABSTRACT**

A two-year-old male Greyhound dog was presented with respiratory distress and hyporexia. Radiographic examination revealed an accumulation of air in the thorax and an elevated silhouette of the heart. Thoracocentesis was performed to stabilize the case by relieving the accumulated air in the thorax. The respiration rate and appetite returned to normal without any recurrence of the condition.

**Keywords:** Greyhound dog, Spontaneous pneumothorax, Thoracocentesis

### **INTRODUCTION**

Spontaneous pneumothorax in dogs may be an acute or insidious condition and results in respiratory difficulty, which is life-threatening. It is the presence of air within the pleural space associated with the loss of visceral or parietal pleural membrane integrity. Pneumothorax may be spontaneous (primary or secondary) or acquired (traumatic or iatrogenic) and pathophysiological (open or closed, tension or simple) (Mooney, 2018). This paper reports a case of spontaneous pneumothorax in a sporting dog with no evidence of traumatic wound or pulmonary parenchymal lesions.

### **CASE HISTORY AND OBSERVATION**

A two-year-old male Greyhound dog was presented to the Teaching Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal, with signs like tachypnea, hyporexia and exercise intolerance for two days. The case upon physical and clinical examination revealed normal appearance, good bodily condition, dull behaviour, anxious expression with rocking nostrils, orthopnoeic posture, compulsive walking, pink conjunctival mucous membrane, palpable lymph node, normal body temperature (38.8°C), normal heart rate (90 beats per minute), regular pulse, tachypnea (40 breaths per minute) with paradoxical breathing pattern and absence of lung sounds by auscultation of thorax. The case was subjected to radiographic examination of the thorax on a lateral view. Blood and serum samples were collected for haemato-biochemical analysis.

### **TREATMENT AND DISCUSSION**

Radiographic examination of the thorax by lateral view revealed elevated cardiac silhouette from the sternum and free air in the thoracic cavity with the absence of pneumonic changes. The dog had no history or evidence of thoracic trauma. Hence, it was diagnosed as a case of spontaneous

pneumothorax of primary etiology (bullae or blebs). Thoracic radiographs are considered the primary imaging tool in the diagnosis of pneumothorax with a reported sensitivity of up to 100% (Au et al., 2006). However, detection of bullae by radiography in dogs is challenging, with an accuracy ranging from 0% to 50% (Cassandra et al., 2021), and the number of lesions may be underestimated or inappropriately localised (Au et al., 2006).

The clinical signs observed in this case are in accordance with those of Mooney et al. (2018) and Sundararajan et al. (2022). The haematology and serum biochemical analysis revealed no alterations in the parameters. Thoracocentesis was performed aseptically by inserting a 20-gauge winged needle perpendicular to the chest wall along the cranial aspect at the 8th intercostal space, and nearly one litre of air on either side of the thorax could be relieved until an intrathorax negative pressure was obtained. Recurrence of pneumothorax could not be observed. Stabilization is reported to be the primary consideration by performing a thoracocentesis for animals with spontaneous pneumothorax.

Primary spontaneous pneumothorax (PSP) occurs in the absence of clinically apparent underlying lung disease or rupture of subpleural blebs or bullae, while secondary spontaneous pneumothorax (SSP) is associated with pulmonary parenchymal disease or lung pathology and associated rupture of alveoli (Fossum et al., 2013). The PSP is reported to be a common form of pneumothorax in dogs, occurring in 36%-68% of cases (Puerto et al., 2002). The source of air is most commonly from the pulmonary parenchyma may include trachea, bronchi, oesophagus, and rarely

*Diagnostic and Therapeutic... by Saravanan et al.*

gas-producing bacteria within the pleural space (Matthys, 2011). Pneumothorax also decreases static and dynamic lung compliance by impairing thoracic wall recoil, decreasing transpulmonary pressure, and reducing lung elastic recoil (Desai and Moustarah, 2021). Hence, animals with respiratory distress need urgent therapeutic intervention (Cassandra et al., 2021).

## **CONCLUSION**

Radiography could be more useful in the diagnosis of life-threatening pneumothorax, and performing thoracocentesis could help in the stabilization of the patient by reducing the respiratory distress. However, additional tests like fine needle aspiration, bronchoalveolar lavage, endotracheal wash, and *Dirofilaria* serology would help in the identification of underlying lung pathology and guide further treatment after control of pneumothorax.

## **REFERENCES**

- Au, J.J., D.L. Weisman, J.D. Stefanacci and M.P. Palmisano (2006), Use of computed tomography for evaluation of lung-lesions associated with spontaneous pneumothorax in dogs: 12 cases (1999-2002), *J. Am. Vet. Med. Assoc.*, **228**:733–737.
- Cassandra, G., A. Odunayo and A.M. Hespel (2021), Spontaneous Pneumothorax: Pathophysiology, Clinical Presentation and Diagnosis, *Trop. Companion Anim Med.*, **45**:100563.
- Desai, J.P. and F. Moustarah (2021), Pulmonary Compliance, Stat Pearls. Treasure Island (FL): Stat Pearls Publishing.
- Fossum, T.W. (2013), Surgery of the lower respiratory system, Ed. In: Fossum T.W, Editor. *Small Animal Surgery*, Elsevier Mosby, St. Louis, pp: 992–1014.

*Diagnostic and Therapeutic... by Saravanan et al.*

Matthys, H. (2011), Spontaneous pneumothorax, *Multidisci. Respir. Med.*, **6**:6–7.

Mooney, E. (2018), Pneumothorax. In: Drobatz K.J., K. Hopper, E. Rozanski and D.C. Silverstein, Editors. *Textbook of Small Animal Emergency Medicine*, Hoboken, NJ, USA: John Wiley & Sons, Inc. pp: 278–284.

Puerto, D.A, D.J. Brockman, C. Lindquist and K. Drobatz (2002), *Surgical and nonsurgical*

management of and selected risk factors for spontaneous pneumothorax in dogs: 64 cases (1986-1999). *J. Am. Vet. Med. Assoc.*, **220**:1670–1674.

Sundararajan, R.C., S. Saravanan and A.R. Ninu (2022), Traumatic pneumothorax in a hunting *Chippiparai* dog and its management, *J. Pharm. Innov.*, **11**(3): 607-608.



**Figure 1: Thoracocentesis relieving air from the thorax in a Greyhound dog**



**Figure 2: Radiographic examination of the thorax showing an elevated cardiac silhouette (arrow) off the sternum with accumulation of air**