

Optimizing preoperative care with oxygenation for traumatic diaphragmatic hernia repair in a domestic short hair cat

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ABSTRACT: Diaphragmatic hernia is a life-threatening condition in cats that requires prompt diagnosis and a systematic approach for management. This case report highlights the critical role of presurgical oxygenation in enhancing the safety and success of surgical management of diaphragmatic hernias in cats. A female domestic short-haired cat, Mini, was referred to the PDHB Drh Anton SAP clinic for lethargy and inability to defaecate. Radiographic examination revealed a disrupted diaphragmatic outline with increased cranial opacity, indicating displacement of gastrointestinal organs into the thoracic cavity, including the stomach, small intestine, and colon. The cat was diagnosed with diaphragmatic hernia. Prior to the surgical intervention, presurgical oxygenation was administered to stabilise the patient and reduce the risk of hypoxia. Surgery involved the repositioning of the abdominal organs and repair of the ruptured diaphragm. Postoperative care included intensive monitoring and administration of antibiotics and analgesics. After one week of recovery, the cat showed significant improvement, with healed surgical wounds and stable clinical conditions, and was discharged in good health.

Keywords:

diaphragmatic hernia, domestic short hair cat, presurgical oxygenation, surgical management

■ INTRODUCTION

A diaphragmatic hernia occurs when a ruptured diaphragm allows abdominal organs such as the liver, stomach, intestines, and spleen to migrate into the thoracic cavity (Qi 2023). Clinical signs vary and may include respiratory distress, tachypnoea, tachycardia, abdominal posture, anorexia, and gastrointestinal issues such as vomiting and constipation (Besalti *et al.* 2011; Worth & Machon 2005).

The prevalence of diaphragmatic hernias is notably higher in cats than that in dogs. In felines, the primary causes are trauma such as vehicular accidents, bites from fights, falls from heights, and congenital abnormalities (Fossum 2012). Diagnosis is predominantly based on clinical signs, imaging studies such as radiography and ultrasonography, and, in some instances, exploratory surgery (Legallet *et al.* 2016). In particular, imaging studies are critical for identifying the presence of abdominal organs within the thoracic cavity, a hallmark feature of diaphragmatic hernias (Panprom *et al.* 2021).

Surgical repair of the diaphragm or herniorrhaphy remains the sole definitive treatment (McMichael 2022). However, mortality of cats during and after herniorrhaphy is frequently associated with hypoxia. Preoperative oxygenation has been reported to improve patient survival (Yayingül *et al.* 2019). Reports on the application of this method in veterinary practice in Indonesia remain scarce, making this case study significant for demonstrating the successful implementation of this approach in managing diaphragmatic hernia in a domestic short-hair cat.



Figure 1. Mini, the Domestic Short Hair cat diagnosed with diaphragmatic hernia

■ CASE

Signalment: A female domestic short-hair (DSH) cat, Mini, with an orange and white coat (Figure 1). **History:** The cat was referred to the PDHB Drh Anton clinic for lethargy and inability to defaecate. **Clinical Signs:** Body temperature of 38.7°C, SpO₂ at 60%, dyspnoea, lethargy, and dehydration (skin turgor > 2 s). **Diagnostic Findings:** Radiographic examination revealed a disrupted diaphragmatic outline with abdominal organs visible in the thoracic cavity (Figure 2). **Diagnosis:** Diaphragmatic hernia. **Prognosis:** Dubius. **Treatment:** Surgical repair of the diaphragmatic tear and repositioning of the displaced organs were preceded by preoperative oxygenation to stabilise the patient.

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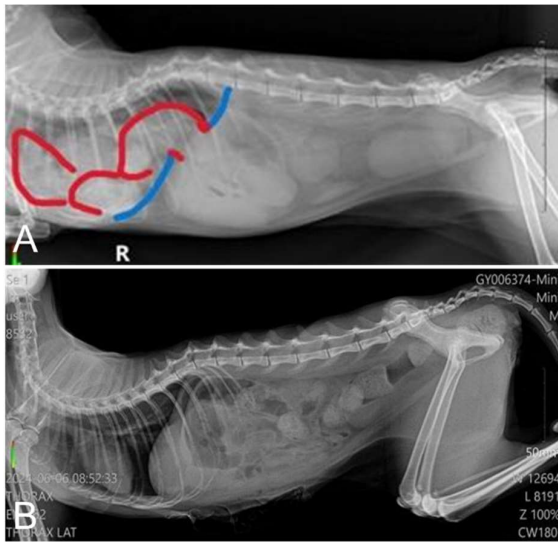


Figure 2. Radiographic images before and after surgery. (A) Diaphragmatic tear (discontinuous blue line, unhighlighted part) with displaced gastrointestinal organs, including the stomach, small intestine, and colon (highlighted in red) in the thoracic cavity. (B) Postoperative condition showing successful repositioning of abdominal organs in the cat.

RESULTS AND DISCUSSION

In this case, the diaphragmatic hernia was likely caused by trauma. Radiographic imaging (Figure 2A) revealed a disrupted diaphragm with abdominal organs, including the stomach, small intestine, and colon, displaced into the thoracic cavity. Survival rates are approximately 52% (Fossum 2012) depending on the time between trauma and treatment. Preoperative oxygenation for 3-5 hours to achieve an oxygen saturation of at least 90% is crucial for reducing hypoxia and ensuring surgical success, highlighting the importance of stabilisation protocols in managing diaphragmatic hernia in cats.

The cat was anaesthetised with propofol and maintained with isoflurane (Constantinides *et al.* 2011). Figure 3 depicts the surgery involving a midline incision, repositioning of the displaced abdominal organs into the abdominal cavity, and identification of diaphragmatic tear. The defect was sutured and negative thoracic pressure was restored by evacuating air from the thoracic cavity.

Postoperatively, the cat was monitored in the ICU with oxygen supplementation and showed signs of recovery, such as grooming within an hour. Radiographs confirmed restored organ positioning (Figure 2B), and the postoperative care included antibiotics, anti-inflammatory drugs, and supportive therapy. After a week, the cat fully recovered and was discharged in stable condition.

CONCLUSION

Diaphragmatic hernia, identified through radiography, requires surgical repair as the only definitive treatment. Preoperative oxygenation proved essential in stabilizing the patient and ensuring surgical success.

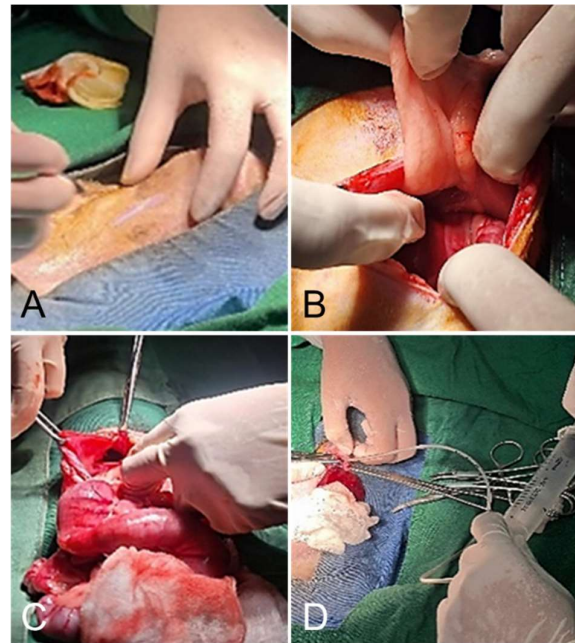


Figure 3. Surgical Procedure. (A) Linea alba incision, (B) Visualization of the omentum, (C) Identification of the diaphragmatic tear, and (D) Restoration of negative thoracic pressure during tissue suturing.

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