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Air gun pellet retrieval from the thoracic cavity of a dog

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A One-year-old nondescript male dog was presented with respiratory distress of unknown cause. Examination revealed a 0.3 cm penetrating wound at the right 5th intercostal space and marked inspiratory stridor. Thoracic radiographs showed haemothorax, an air gun pellet within the thoracic cavity, and obscured diaphragmatic and cardiac outlines. The dog exhibited open-mouth breathing, laboured respiration, progressive tachycardia, and normal body temperature. Haematology indicated elevated PCV (57%), and serum biochemistry revealed hyperglycaemia (218 mg/dL) and low total protein (4.9 g/dL). Capillary refill time (2 s) suggested recent trauma.

Preoperative management included tranexamic acid (10 mg/kg body weight IM), frusemide (2 mg/kg IV), slow Ringer's lactate infusion (90 mL/kg IV), and enrofloxacin (10 mg/kg IM). Emergency thoracotomy was performed under atropine–xylazine premedication, ketamine induction, and isoflurane maintenance with positive-pressure ventilation. Surgery aimed at controlling intrathoracic bleeding and retrieving the pellet, but extraction was initially unsuccessful due to the pellet's small size, low weight, non-magnetic nature, and increased haemorrhage during manipulation. Bleeding from the base of the right cardiac lung lobe was controlled with absorbable gelatin packing; the lobe appeared congested and partially collapsed. A thoracostomy tube was placed for air and fluid drainage, and PEEP was applied before closure to maximize lung inflation. After stabilization with crystalloids (Ringer's lactate 10 mL/kg IV), a second thoracotomy was performed, and the pellet was retrieved from behind the heart.

During the second procedure, an active bleeding point on the cardiac lung lobe was controlled using a gelatin sponge, allowing improved lobe manipulation and successful foreign-body removal. Thoracotomy closure was achieved with polyamide 2-0 interrupted sutures placed through the intercostal muscles and around the ribs, followed by a simple continuous layer to ensure an airtight seal. Thoracostomy tube placement and PEEP application were repeated as per the first surgery.

Postoperative care included inj. ceftriaxone (20 mg/kg IV) and inj. pantoprazole (1 mg/kg IV) for five days, with analgesia provided using inj. tramadol (2 mg/kg IM) for three days. inj. dexamethasone (0.5 mg/

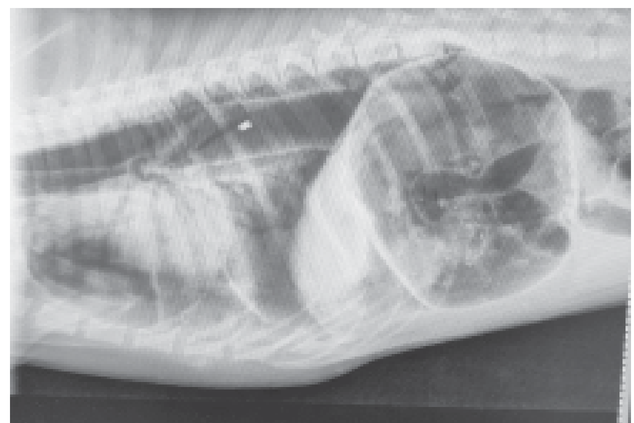

Fig. 1: Lateral thoracic radiographic view after thoracotomy shows the caudal migration of the pellet during intra-thoracic manipulation. Also the fluid opacity has reduced and the radiolucent appearance of the thoracic cavity was regained partially. Air bronchogram corresponding to lung lobe collapse is also visible in the cardiac area.

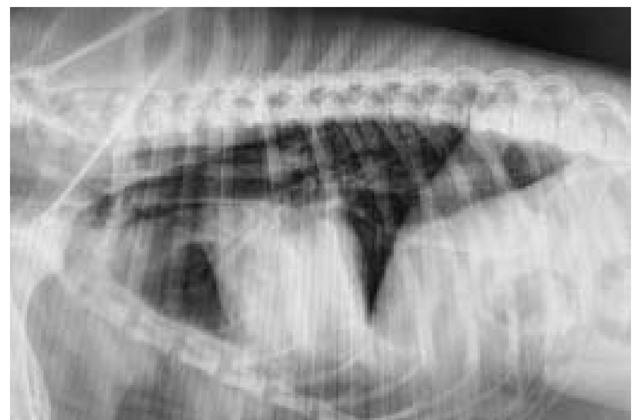

Fig. 2: Postoperative radiograph of the right lateral thorax on day 5, post 2nd thoracotomy.

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kg IM) was administered for three days. The thoracostomy tube was maintained to evacuate residual air and fluid. The dog recovered uneventfully within four days, and the tube was removed once pleural effusion resolved and respiration normalized.

Reports of air gun pellet retrieval in animals are uncommon (Kumar *et al.*, 2015; Fox *et al.*, 2020). Although pellets fired from a distance usually penetrate only the skin and superficial tissues (Mahesh *et al*., 2014), projectile migration can be unpredictable (Madhu *et al*., 2014; Kumar *et al*., 2015). In this case, the pellet had entered the thoracic cavity, an atypical trajectory. Thoracic gunshot injuries in dogs and cats generally carry a better prognosis than abdominal or spinal injuries (Fullington and Otto, 1997), which was consistent with the present outcome.

Diagnostic imaging options are limited for metallic foreign bodies; MRI is contraindicated due to uncertain ferromagnetic properties, and CT quality is reduced by metal artefacts (Fox *et al*., 2020). Trauma-related hyperglycaemia reflects a stress response and may correlate with injury severity (Ji *et al*., 2018). The hyperglycaemia observed here likely resulted from severe thoracic injury and haemothorax.

Common complications of penetrating projectile injuries include tissue erosion, migration, and bullet embolization (Fox *et al*., 2020). Early surgical retrieval in this case likely prevented such sequelae. This report highlights the successful surgical management of haemothorax and intrathoracic foreign-body retrieval in a non-descript dog, with early presentation and timely diagnosis contributing to favourable recovery.

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