



CASE REPORT

Lung lobe torsion associated with chylothorax in a cat

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A 10.5-year-old domestic shorthair presented with a history of progressive inappetence, lethargy and elevated respiratory rate. Clinical and diagnostic findings confirmed the presence of a chylothorax with evidence of a mass or collapsed lung within the right cranial thorax. Computed tomography, sternotomy and histopathology confirmed the presence of a right middle lung lobe torsion associated with a chylothorax. The torsion was successfully managed with surgical removal of the affected lung lobe, and the patient continues to be asymptomatic 6 months postoperatively.

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Lung lobe torsion (LLT) in cats is a rare occurrence in our veterinary population. Though the exact mechanism of LLT is not well understood, most often it is thought to be either spontaneous or secondary to pleural effusion (commonly chylothorax in canine), trauma, neoplasia or chronic respiratory disease.^{1–3} An LLT is defined as an axial rotation of the lung lobe and the vascular pedicle. The rotation results in compression of the venous vasculature and lymphatics, but leaves the thick walled arteries partially patent. The continued influx of blood with lack of outflow leads to lobar congestion, edema, hemorrhage and necrosis.^{1,2,4,5} Chylothorax has been associated with LLT in dogs, especially in the Afghan hound, but to the authors' knowledge, there has been no published report of a case of spontaneous LLT associated with chylothorax in a clinical feline case.^{6,7}

A 10.5-year-old, male castrated domestic shorthair (DSH) was referred to our facility for diagnostic work-up of pleural effusion. The patient had previously presented to its regular veterinarian for suspected upper respiratory tract infection (URI), due to a short history of sneezing, hyporexia and elevated respiratory rate. Orthogonal thoracic radiographs performed at that clinic revealed moderate pleural effusion. There was no previous medical history of cardiac/respiratory disease or any known trauma to the thoracic cavity.

On presentation to our facility, the cat was quiet, alert and responsive. The patient had a body condition score of 9/9, a heart rate of 200 beats per

minute (bpm) and was mildly tachypneic (40–50 breaths/min). Diminished lung sounds in the ventral lung fields and a grade 2/6 left parasternal heart murmur with a regular rhythm were auscultated. A therapeutic thoracocentesis was performed that yielded 90 ml of white, opaque fluid.

Serum biochemistry performed on the day of presentation to our facility revealed no significant abnormalities except for elevated blood glucose and creatine kinase, most likely stress induced. Complete blood count revealed changes consistent with a stress leukogram. Thyroid level, urinalysis, and feline pancreatic lipase immunoreactivity were also within normal limits. Analysis of the pleural effusion revealed a majority of small mature lymphocytes along with triglycerides and cholesterol concentrations of the fluid being 1502 mg/dl (reference interval 20–90 mg/dl) and 98 mg/dl (82–218 mg/dl), respectively, all consistent with a diagnosis of chylous effusion (Table 1).

The radiographs performed by the referring hospital were reviewed and showed moderate pleural effusion and evidence of a soft tissue opacity in the cranial mediastinum. An echocardiogram was performed which revealed a structurally normal heart with normal wall thickness, left atrial size (LA:Ao = 1.36, reference interval 1.25 ± 0.18)⁸ and valvular function. A hyperechoic mass/atelectatic lung lobe was identified by thoracic ultrasound in the right mid-cranial thorax. An abdominal ultrasound was performed which had no significant findings other than a mildly enlarged pancreas, consistent with acute/chronic pancreatitis. Top differentials at this time for the cause of the chylothorax included neoplasia of the right middle lung lobe (RMLL) or cranial mediastinum, granuloma, LLT or

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Table 1. Fluid analysis.

	Results	
	Conventional units	SI units
Source	Pleural	
Volume	2.0 ml	
Appearance	White, milky	
Protein	6.8 g/dl	68 g/l
Red blood cell count	<10 ⁶ cells/ μ l	<10 ¹² cells/l
Nucleated cell count	3.4 \times 10 ⁴ cells/ μ l	3.4 \times 10 ¹⁰ cells/l
Neutrophil	14%	
Small mononuclear	81%	
Large mononuclear	5%	
Cholesterol	98 mg/dl	2.6 mmol/l
Triglyceride	1502 mg/dl	16.9 mmol/l

Cytologic interpretation: the fluid contains many small mature lymphocytes and low numbers of neutrophils and foamy macrophages. It is a chylous effusion, compatible with a ruptured or leaking thoracic duct.

idiopathic chylous effusion. Thoracic computed tomography (CT) with ioversol contrast (Optiray 300; Mallinckrodt at a dose of 2 ml/kg) study was performed. The imaging revealed the presence of right middle lung mass/consolidation, a widened cranial mediastinum and enlarged sternal lymph nodes (Figs 1 and 2). Due to the CT findings, exploratory sternotomy was pursued.

The patient was premedicated with ketamine (Ketaset; Fort Dodge) 1 mg/kg IM and midazolam (Hospira) 0.2 mg/kg IM. Induction was performed with IV propofol (Propflo; Abbott) 4 mg/kg IV and fentanyl (Hospira) 3 μ g/kg IV, and anesthesia was maintained with 1–2% isoflurane inhalant gas (VetOne) and a fentanyl (Hospira) constant rate infusion at 0.1–0.5 μ g/kg/min. Peri-operative cefazolin (West-Ward) was administered at 22 mg/kg IV every 90 min. A routine median sternotomy was performed and upon entering the thoracic cavity a moderate amount of chylous effusion was noted along with thickened pleurae. A complete thoracic exploratory revealed a moderate amount of adipose tissue, explaining the wide appearance observed on CT, with enlarged sternal lymph nodes and a severely atelectatic RMLL, which failed to expand with positive pressure ventilation to 20 cm H₂O. A sternal lymph node was removed and a right middle lung lobectomy without de-rotation was performed at the level of the hilus using a Thoracoabdominal V3 stapler, with the site testing negative for free air leakage. Both specimens were submitted for histopathologic examination. A 14 French thoracostomy tube was placed before closure. Following this a subcutaneous diffusion catheter was placed to facilitate postoperative analgesia of the sternotomy site and a mixture of 1 ml bupivacaine (Hospira) and 0.5 ml lidocaine (Hospira) was instilled every 6 h. Subcutaneous and skin layers were closed routinely. Recovery from anesthesia was uneventful. Postoperatively the patient

was maintained on a fentanyl constant rate infusion at 5 μ g/kg/min, maintenance intravenous fluids, and routine thoracostomy tube management. The patient did well throughout its hospital stay, aside from development of mild purulent nasal discharge and sneezing which was suspected to be secondary to a URI. After removal of both the diffusion catheter and thoracostomy tube, the patient was discharged from the hospital 3 days postoperatively with buprenorphine (Buprenorphine HCl; Bedford) 0.015 mg/kg sublingually q 12 h, Fluocinolone acetonide 0.01% and dimethyl sulfoxide 60% (Synotic Otic Solution;

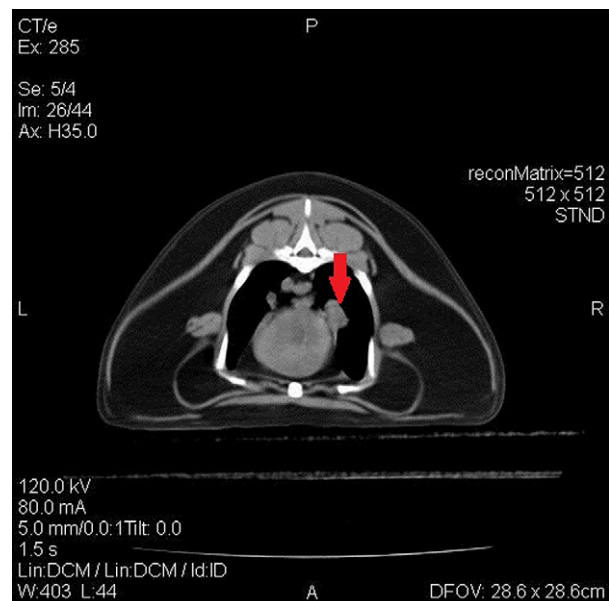


Fig 1. Transverse slice of thoracic cavity reveals a suspected parabronchial mass (see arrow); which has well-defined peripheral, rounded margination, located within right lung field adjacent to the heart.

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