What Is Your Diagnosis?

History

An 8-year-old spayed female domestic shorthair cat was examined by the referring veterinarian because of dyspnea. Pleural effusion was diagnosed on the basis of abnormalities detected on a thoracic radiograph (Fig 1). Thoracocentesis yielded 300 ml of chyloous fluid, but the cat's respiratory effort worsened. Within minutes, the cat was referred to our hospital in respiratory distress.

During initial examination at our hospital, the cat appeared alert and anxious with severe inspiratory and expiratory dyspnea. Heart and lung sounds were decreased in all fields. Transfer to an oxygen cage resulted in improvement of respiration after 20 minutes. At that time, thoracic radiographs were obtained (Fig 2).

Determine whether additional imaging studies are required, or make your diagnosis from Figures 1 and 2—then turn the page.

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consistent with chronic accumulation of pleural fluid. Rounded by excess fluid or soft-tissue opacification were masses further suggested that they were collapsed lung lobes. A large left caudal lobar artery was apparent in the right hemithorax and moderate interstitial to alveolar opacification of the left cranial and caudal lung lobes were evident (Fig 3).

**Comments**

The smooth, rounded pulmonary borders surrounded by excess fluid or soft-tissue opacification were consistent with chronic accumulation of pleural fluid. Chronic chylos pleural effusions can cause fibrosing pleural disease, and affected lung lobes may be unable to expand adequately after removal of pleural fluid. Lack of peripheral bronchial or vascular markings in the right hemithorax on radiographs obtained after thoracocentesis is consistent with a diagnosis of pneumothorax. Distinct masses at the carina (arrowheads), adjacent to the left atrium (small arrows), and in the caudal thoracic region (open arrows) correspond to the location of collapsed right cranial, middle, and caudal lung lobes, respectively. An oval mass immediately to the right of the eleventh thoracic vertebra is evident on the dorsoventral view only; this mass corresponds to the accessory lobe. A heavy, patchy interstitial to alveolar opacification, consistent with pulmonary edema, is evident in the left cranial and caudal lung lobes.

**Diagnosis**

Radiographic diagnosis—Soft-tissue/ fluid opacity in the thorax and rounding and retraction of the caudal lung lobe margins (Fig 1). After thoracocentesis, loss of peripheral bronchial and vascular markings in the right hemithorax and moderate interstitial to alveolar opacification of the left cranial and caudal lung lobes were evident (Fig 3).

Lack of peripheral bronchial or vascular markings in the right hemithorax on radiographs obtained after thoracocentesis is consistent with a diagnosis of pneumothorax. In cats, the mediastinum is typically incomplete, but may become sealed when inflammation develops resulting in hemipneumothorax. Well-circumscribed, soft-tissue–density intrathoracic masses were also evident on both views. Differential diagnoses for intrathoracic masses include atelectatic lung tissue; pneumothorax is an uncommon complication of the other conditions. The perihilar location of these masses further suggested that they were collapsed lung lobes. A large left caudal lobar artery was apparent in the dorsoventral view. Collapse of the right lung would increase vascular resistance on the right, thus increasing the volume of blood flow to the left lung, which would result in pulmonary vascular engorgement.

Overzealous thoracocentesis may result in 3 distinct complications. First, pneumothorax can develop as a result of formation of a bronchopleural fistula, or if lung tissue is lacerated during thoracocentesis. Second, hemodynamic collapse may develop as a result of vagally mediated bradycardia. Third, reexpansion pulmonary edema may develop because of excessive shearing forces on pulmonary microvessels. This could explain the infiltration in the left cranial and caudal lung lobes on the radiographs obtained after thoracocentesis.

Repeated thoracocentesis failed to help this cat, and the owner elected to euthanatize it. Necropsy confirmed pneumothorax, a chylos pleural effusion, and severe collapse and firmness of the right cranial and middle lung lobes. A pinpoint rupture at the base of the right caudal mainstem bronchus was found, confirming a diagnosis of bronchopleural fistula. Gross evidence of pulmonary laceration, hemorrhage, or lung lobe torsion was not detected.