History

An 8-year-old spayed female German Shepherd Dog was brought to its veterinarian because of signs of lethargy and inappetence with weight loss. Hepatomegaly was evident on radiographic views of the abdomen; lymphoblasts and mitotic cells were identified on cytologic evaluation of a fine-needle aspirate of the enlarged liver. Treatment with lactulose and metoclopramide was initiated. Three weeks later, the patient was referred for chronic liver disease and recent collapse.

Pale mucous membranes with a slightly icteric tinge and an extremely prolonged capillary refill time were noted on referral physical examination. The dog was nonambulatory with signs of depression but was responsive and had a body condition score of 1.5 of 5 with severe wasting of the muscles of the pelvic limbs. Abnormalities detected on CBC included mild anemia, microcytosis, thrombocytopenia, and leukocytosis with mature neutrophilia. A high serum alkaline phosphatase activity, high serum creatinine concentration, hypoproteinemia, hypoalbuminemia, mild hypocalemia, and hyperbilirubinemia were evident on serum biochemical analysis. Radiographs of the thorax were obtained (Figure 1).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →

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Figure 1—Left lateral (A) and ventrodorsal (B) radiographic views of the thorax of an 8-year-old spayed female German Shepherd Dog evaluated for chronic liver disease, lethargy, and weight loss.
The thymus is relatively large at birth, grows quickly during the first few months of age, and begins to involute at approximately 2 to 5 months of age. It decreases in size rapidly and is often replaced by fat but does not usually atrophy completely. The thymic remnant is rarely seen radiographically; therefore, a mass in this area is suggestive of thymic disease. Thymomas can be difficult to differentiate from thymic lymphoma; however, distinction is important as treatment recommendations differ. Clinical signs may aid differentiation; thymic lymphoma in dogs is often associated with generalized lymphadenopathy or hypercalcemia, whereas myasthenia gravis is concurrently reported with thymoma in both dogs and cats.

Thymic lymphoma usually responds rapidly to aggressive chemotherapy, unlike thymoma. Therefore, thymoma should be suspected in patients that do not have full remission of thymic disease 10 to 14 days following initiation of chemotherapy. Ultrasonography is useful to confirm a thymic mass and may help differentiate thymoma from thymic lymphoma; thymoma is documented as a large echogenic mass with numerous cavitations, whereas homogeneously hypoechoic masses with hyperechoic rims have been reported with lymphoma. Ultrasound-guided fine-needle aspiration of the mass for cytologic evaluation is a relatively simple procedure but may incompletely distinguish thymoma from thymic lymphoma; lymphocytes and mast cells are commonly identified, rather than epithelial tumor cells.

A well-defined, large (6-cm-diameter), moderately vascular, hypoechoic cranial mediastinal mass was evident ultrasonographically in the patient of this report. Small lymphocytes were the only intact cells on cytologic evaluation of the ultrasound-guided fine-needle aspirate. Mast cells, eosinophils, or plasma cells, often found with thymoma, were not identified. In view of these findings, along with the sonographic appearance, thymoma was considered less likely. A tentative diagnosis of small cell thymic lymphoma was made. An aspirate sample was sent to a diagnostic laboratory for antigen receptor rearrangement testing to confirm and characterize the lymphoma.

The patient was treated with 1 dose of l-asparaginase and discharged on long-term treatment with prednisone, streptavidin, metronidazole, and famotidine; unfortunately, rapid decline in patient condition prompted the owner to elect euthanasia. PCR assay results confirmed T-cell lymphoma.

Comments

Thymic disease in dogs and cats occurs infrequently but should be considered in mature animals with cranial mediastinal masses in the thymic fold. The normal thymus may be identified radiographically in young animals adjacent to the cranial border of the cardiac silhouette on the lateral view and in the thymic fold on the ventrodorsal projection. The soft tissue opacity created by the thymus is usually curved (lateral view) and triangular (ventrodorsal view) and extends from midline into the left hemithorax, following the medial border of the left cranial lung lobe. The thymus is relatively large at birth, grows quickly during the first few months of age, and begins to involute at approximately 2 to 5 months of age. It decreases in size rapidly and is often replaced by fat but does not usually atrophy completely. The thymic remnant is rarely seen radiographically; therefore, a mass in this area is suggestive of thymic disease. Thymomas can be difficult to differentiate from thymic lymphoma; however, distinction is important as treatment recommendations differ. Clinical signs may aid differentiation; thymic lymphoma in dogs is often associated with generalized lymphadenopathy or hypercalcemia, whereas myasthenia gravis is concurrently reported with thymoma in both dogs and cats.

Radiographic Findings and Interpretation

There is a large soft tissue mass in the cranial mediastinal reflection (formerly known as thymic fold), immediately cranial to the cardiac silhouette on the lateral view and extending just to the left of the cardiac silhouette on the ventrodorsal projection (Figure 2). The cardiovascular structures, pulmonary parenchyma, and tracheal diameter are unremarkable. There is no evidence of tracheobronchial lymphadenopathy; there is no conclusive evidence of sternal or cranial mediastinal lymphadenopathy; however, subtle enlargement may be obscured by the overall size of the apparent thymic mass. A small amount of fluid is present in the caudal thoracic portion of the esophagus. Radiographic findings are consistent with a thymic mass; differential diagnoses include thymoma, thymic lymphoma, or possibly hemorrhage in the cranial mediastinal reflection.

Figure 2—Same radiographic images as in Figure 1. The large, bulbous soft tissue mass (white arrowheads) cranial to the cardiac silhouette on the lateral view is localized to the cranial mediastinal reflection (cranial and to the left of the heart) on the ventrodorsal projection, indicative of a thymic mass.