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CASE REPORT

Aortic dissection associated with an obstructive aortic chondrosarcoma in a dog☆

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Abstract A 6-year-old, 35-kg, female spayed German wirehaired pointer was referred for evaluation of collapse/seizure-like activity and a suspected mediastinal mass. Echocardiographic examination revealed an obstructive, intraluminal aortic mass with aortic dissection. Gross and histopathological findings confirmed the aortic dissection with right pulmonary artery compression and an aortopulmonary fistula. The mass was histologically consistent with an intraluminal chondrosarcoma. To the authors knowledge this case represents only the second case of aortic chondrosarcoma in a dog, and interestingly the first case in either a dog or human to have aortic dissection associated with aortic obstruction by an intraluminal aortic tumor.

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A 6-year-old female spayed German wirehaired pointer weighing 35 kg was presented to the Oregon State University, Veterinary Teaching Hospital (OSU – VTH) in August 2008 for evaluation of collapse/seizure-like activity. Six days prior to evaluation at OSU the dog had an episode of collapse while walking, from which she quickly recovered. Two days later the dog collapsed and was unresponsive for 15 min. She was taken to an emergency referral center and was stabilized overnight with oxygen and fluids. The following day, an electrocardiogram (ECG) revealed sinus arrhythmia and thoracic radiographs revealed pleural effusion, a widened mediastinum and a mineralized opacity cranial to the heart. Mild to moderate pleural effusion and a potential mass cranial to the heart were seen with thoracic ultrasound. A CT scan performed the next day showed a mineralized structure distal to the aortic bulb with dilation of the ascending aorta and a non-contrast enhancing mediastinal mass. The mediastinal mass appeared to compress the right pulmonary artery. An ovoid hypoattenuating, non-contrast enhancing area extending proximally from the mineralized structure was also identified. The dog was referred to OSU for further diagnostics and potential surgical exploration the following morning.

On presentation to OSU – VTH the dog was ambulatory but depressed with a temperature of 103.1 F, heart rate of 132 bpm, and she was panting. There were no audible murmurs although auscultation was impaired by the panting. A complete blood count revealed a mild neutrophilia (12,289/μL, reference range 3000–11,400/μL) and thrombocytopenia (144 K/μL, reference range 200–900 K/μL) with normal red blood cell count (6.07×10^6/μl, reference range $5.5–8.5 \times 10^6$/μL) and hematocrit (41.2%, reference range 37–55%). Blood chemistry showed mildly decreased BUN (8 mg/dL, reference range 10–30 mg/dL) and creatinine (0.7 mg/dL, reference range 1–2 mg/dL) and hypokalemia (3.8 mEq/L, reference range 4–5.7 mg/dL). Shortly after presentation to the VTH the dog became agitated and dyspneic with a heart rate of 225 bpm. An ECG revealed sinus tachycardia with a heart rate of 230 bpm and criteria for right atrial (P wave amplitude of 0.8 mV) and right ventricular (S wave amplitudes of 1.2 mV in lead II, 1.0 mV in lead CV_6LL, 0.8 mV in lead CV_6LU) enlargement. An echocardiogram showed moderate to severe right ventricular and right atrial enlargement with severe left ventricular concentric hypertrophy (Video 1, Table 1). Moderate tricuspid valve insufficiency was present with a maximal velocity of 4.4 m/s. A 1.4 cm × 3.4 cm mineralized hyperechoic mass obstructed the lumen of the ascending aorta with subsequent aortic dissection originating from the sinus of the non-coronary cusp of the aortic valve (Video 2, Table 1). Systolic flow occurred through the aortic dissection (Video 3, Table 1) with a maximal velocity of 4.6 m/s. Continuous flow from the main pulmonary artery (MPA) to the right pulmonary artery (RPA) was present (Video 4, Table 1) with a systolic maximal velocity of 3.4 m/s. A second jet of continuous flow was identified entering the MPA (Video 4) with a systolic maximal velocity of 2.2 m/s. Cardiac catheterization and selective angiocardiography were offered to further evaluate the complex echocardiographic Doppler findings and to try and determine if surgical treatment was an option. However, due to the dog's deteriorating condition and overall poor prognosis without access to cardiac bypass, the owner elected to euthanize the animal.

Table 1 Videos.

Videos	Video Legends
Video 1	A right parasternal short axis view displaying severe concentric left ventricular (LV) hypertrophy with concurrent right ventricular (RV) enlargement
Video 2	A right parasternal long axis view displaying obstruction of the aorta (Ao) by a hyperechoic mass with concurrent aortic dissection
Video 3	A right parasternal long axis view with superimposed color-flow Doppler reveals high velocity systolic flow across an apparent tear within the non-coronary aortic valve sinus into the aortic dissection. Tricuspid valve insufficiency and high velocity flow within the right pulmonary artery can also be identified
Video 4	Color-flow Doppler identifies continuous flow coursing into the right pulmonary artery secondary to compression by the aortic dissection and mediastinal hematoma. Continuous flow can also be identified entering the main pulmonary artery (MPA) just below the pulmonary valve. Ao:aorta

Supplementary videos related to this article can be found at doi:10.1016/j.jvc.2010.05.001

The owner agreed to an in-house post-mortem examination and 200 ml of serosanguinous fluid was collected from the thoracic cavity. An extensive, approximately 20 cm in length well-organized hematoma spanned along the aorta from the cranial mediastinum, surrounding the aortic arch and ascending aorta, to nearly the level of the diaphragm (Fig. 1). At the heart base the hematoma enveloped and compressed the RPA. Careful dissection and reflection of the hematoma revealed two sites of perforation in the aortic adventitia of the false lumen. An approximately 1 cm transversal tear was identified adjacent to the origin of the left