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What Is Your Diagnosis?

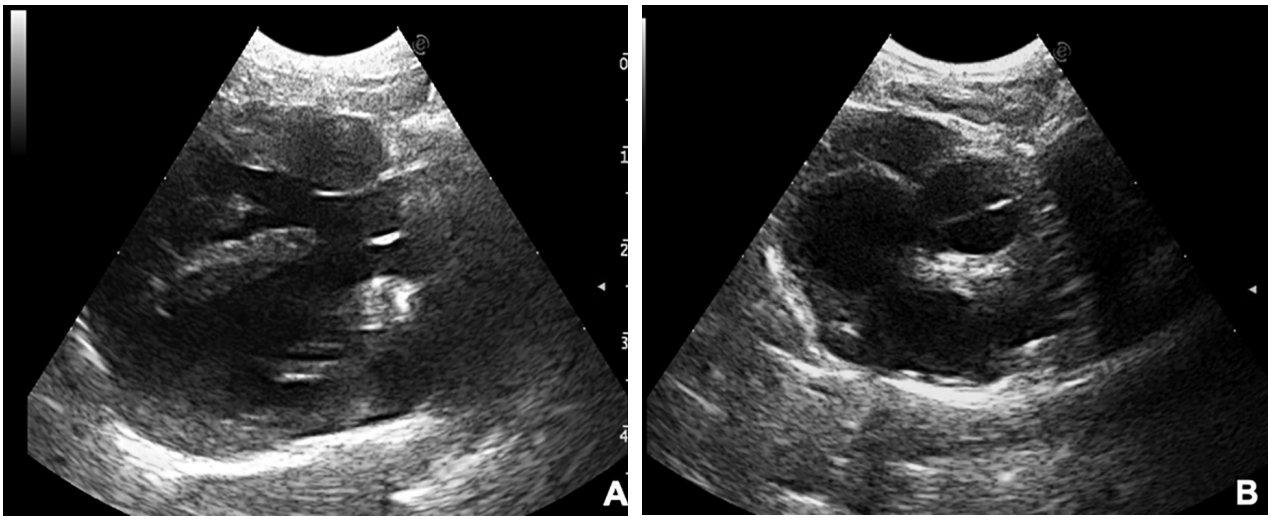

Figure 1—Right parasternal long-axis (A) and short-axis (B) echocardiographic views of a 2-year-old male domestic shorthair cat with a history of a heart murmur, but no related clinical signs, that underwent echocardiography as part of preanesthetic screening before undergoing surgical treatment for an infected wound.

History

A 2-year-old castrated male domestic shorthair cat with a history of a heart murmur since adoption at 5 months of age was referred for echocardiography before anesthesia for surgical treatment of an infected wound. The wound had occurred 5 days earlier, and treatment with amoxicillin–clavulanate potassium (12.5 mg/kg [5.7 mg/lb], PO, q 12 h, for 6 days) had been initiated by the referring veterinarian 2 days before referral. The cat had no signs of cardiovascular compromise, and the owners reported no history of the cat having had syncope or signs of exercise intolerance.

Findings on physical examination included pink mucous membranes with capillary refill time < 2 seconds (reference range, 1 to 2 seconds), unremarkable femoral pulses, and a continuous grade 3/6 heart murmur, best heard over the sternal area, superimposed over otherwise clinically normal cardiac sounds. The cat's respiratory rate and results of auscultation were unremarkable. Clinicopathologic findings included Hct of 45% (reference range, 24% to 45%), high serum creatinine concentration (17.6 mg/L; reference range, 0 to 12 mg/L), and serum total protein and BUN concentrations within reference limits. Thoracic radiography revealed profound enlargement of the cardiac silhouette, a wide and indistinct left cranial mediastinal area, and unremarkable lung fields. Echocardiography was performed **(Figure 1)**.

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

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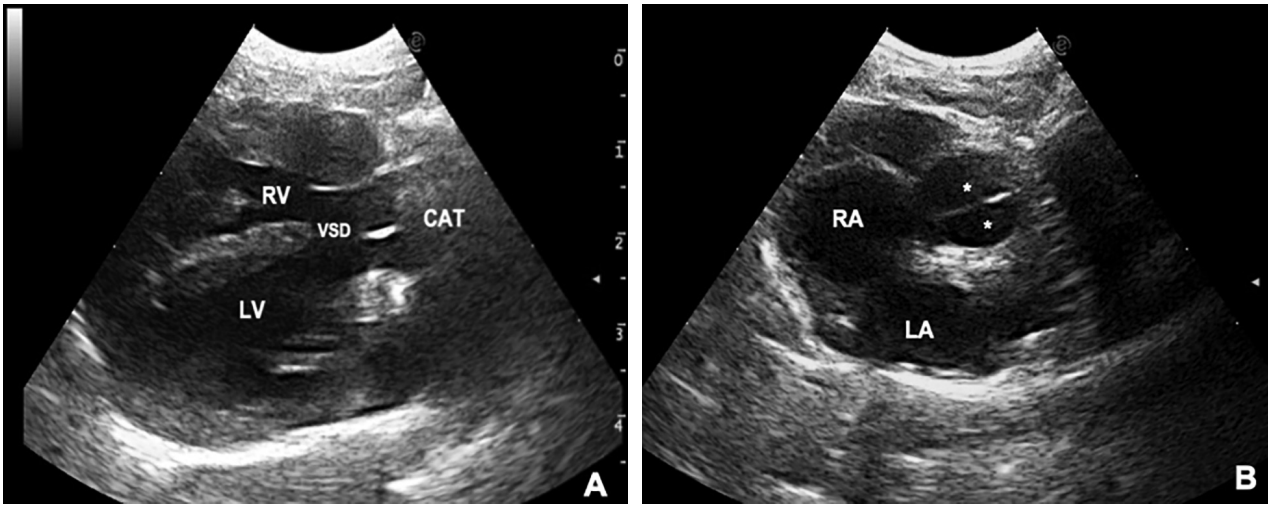

Figure 2—Same echocardiographic images as in Figure 1. A—Severe hypertrophy of the right ventricle and a large, high ventricular septal defect are evident. B—The closed bicuspid valve (asterisk on each cusp [ie, right and left cusps]) is visible at the base of the large, common arterial trunk. CAT = Common arterial trunk. LA = Left atrium. LV = Left ventricle. RA = Right atrium. RV = Right ventricle. VSD = Ventricular septal defect.

Diagnostic Imaging Findings and Interpretation

Echocardiography revealed hypertrophy of the right ventricular wall (right ventricular wall thickness in diastole, 7.4 mm [upper reference limit, 3.6 mm]; interventricular septum thickness in diastole, 6.3 mm [upper reference limit, 6 mm]) with unremarkable chamber sizes but a large (6-mm-diameter) high ventricular septal defect **(Figure 2)**. In addition, paradoxical systolic septal motion was observed, and a single large (12-mm-diameter) vessel was observed overriding the ventricular septal defect. This large vessel was identified as the common arterial trunk, and in the transverse echocardiographic view, a large bicuspid valve was evident at the base of it. The pulmonary trunk could not be identified originating from the right ventricle but instead was observed arising from the ventral aspect of the common arterial trunk **(Figure 3)**, then splitting into left and right branches. Color-flow Doppler ultrasonography revealed a low velocity (1.3 m/s) bidirectional shunt through the septal defect and no valvular insufficiency.

These findings were characteristic of type I truncus arteriosus, and other differential diagnoses included other types of truncus arteriosus and tetralogy of Fallot with pronounced pulmonary atresia. Noncyanotic tetralogy of Fallot with pulmonary atresia may occur when blood is supplied to the lungs from aortopulmonary collateral arteries, the bronchial arteries, or through a patent ductus arteriosus. This was less likely in the cat of the present report because the pulmonary arterial trunk arose from the ventral aspect of the common artery.

Treatment and Outcome

Given the lack of abnormal clinical signs and no radiographic evidence of pulmonary overperfusion, no treatment for the cardiovascular abnormalities detected was attempted at that point. However, the cat did undergo general anesthesia with IV administration of methadone hydrochloride (0.2 mg/kg [0.1 mg/lb]), midazolam hydrochloride (0.25 mg/kg [0.11 mg/lb]), and etomidate (0.4 mg/kg [0.2 mg/kg]) for surgical treatment of the infected wound. No complications occurred.

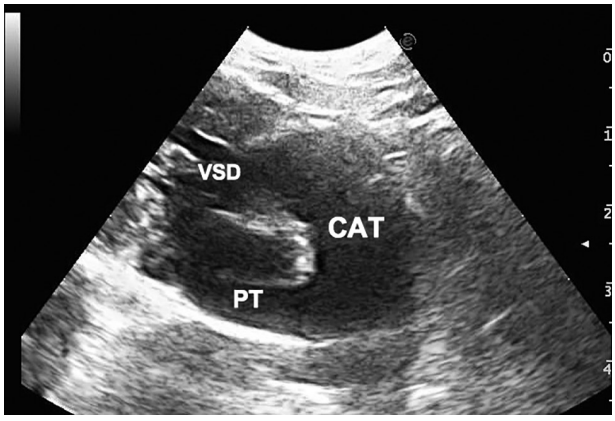

Figure 3—Right parasternal long-axis echocardiographic view cranial to that obtained in in Figure 1 showing the pulmonary arterial trunk emerging from the ventral aspect of the common arterial trunk. PT = Pulmonary arterial trunk. ***See*** Figure 2 for remainder of key.

Comments

Persistent truncus arteriosus is rarely reported in cats, and, to our knowledge, the present report was the first of a cat with a bicuspid common arterial trunk valve. Such valves have been reported to have 3 or 4 cusps in cats, 2 or 3 cusps in dogs, and 2 to 5 cusps in humans.[1–3]

Echocardiography was essential in establishing the diagnosis of persistent truncus arteriosus with a

bicuspid common arterial trunk valve in the cat of the present report. In addition, CT angiography could facilitate assessment of cardiac great vessel and pulmonary anatomy in patients with complex conotruncal defects,[1,4,5] and color-flow Doppler ultrasonography could allow evaluation of truncal valve stenosis or regurgitation, the latter having a poor prognosis in humans.[2,3] Furthermore, radiography is also important in assessing the pulmonary vasculature in patients with signs of pulmonary overperfusion, underperfusion, or asymmetric perfusion.[4,6]

We believe that the prognosis for this cat was not necessarily poor in that similar conditions have been described in adult animals (eg, a 6-year-old cat[2] and an 8-year-old Poodle[1]); however, many affected animals probably die early in life, before clinical examination. In the cat of the present report, the balance between systemic and pulmonary blood flow seemed to be adequate for the cat to live a normal life.

References

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