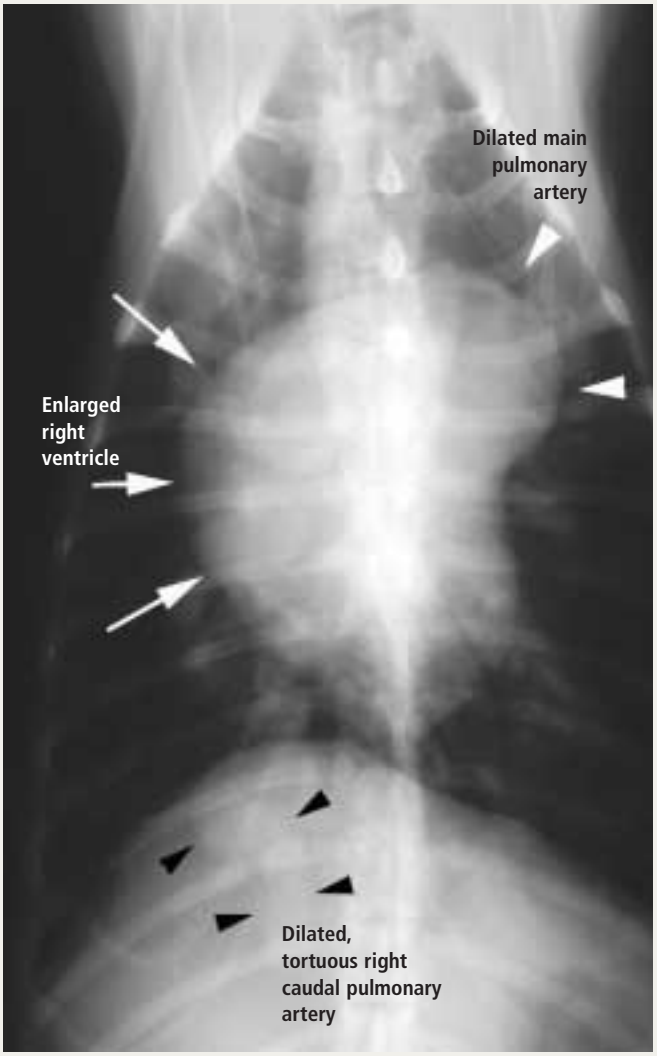
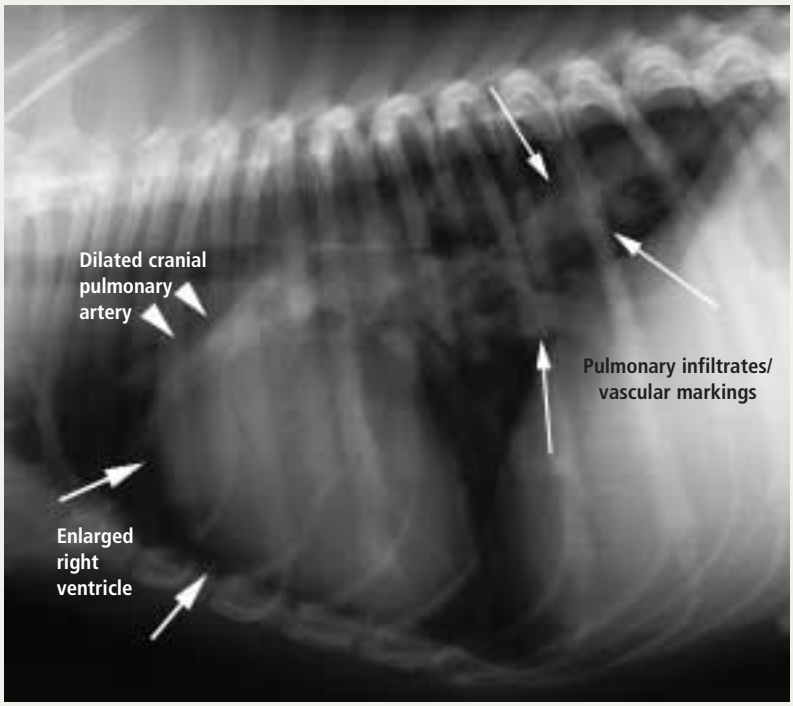
CANINE HEARTWORM DISEASE

Matthew Miller, DVM, MS, Texas A&M University

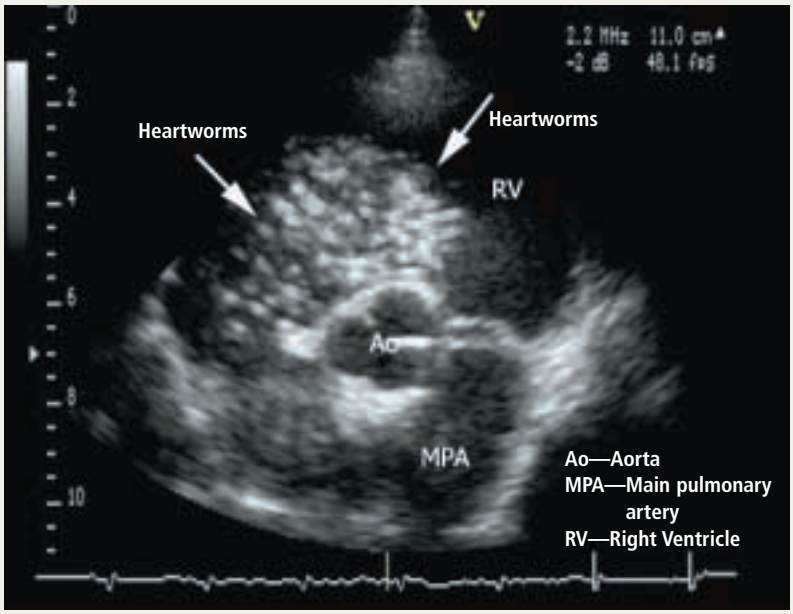
These images were obtained from an 8-year-old, intact male Boxer presented for progressive abdominal distention of 2-weeks duration. At initial physical examination, the dog was slight and thin with obvious abdominal distention secondary to fluid accumulation. A loud (IV/VI) systolic murmur was heard over the tricuspid valve area. The jugular veins were distended, and the femoral pulses were weak. Routine blood work was unremarkable with the exception of mild azotemia (BUN = 40), anemia (HCT = 28), and thrombocytopenia (platelets = 125,000). A heartworm antigen test was positive, and many circulating microfilaria were present.



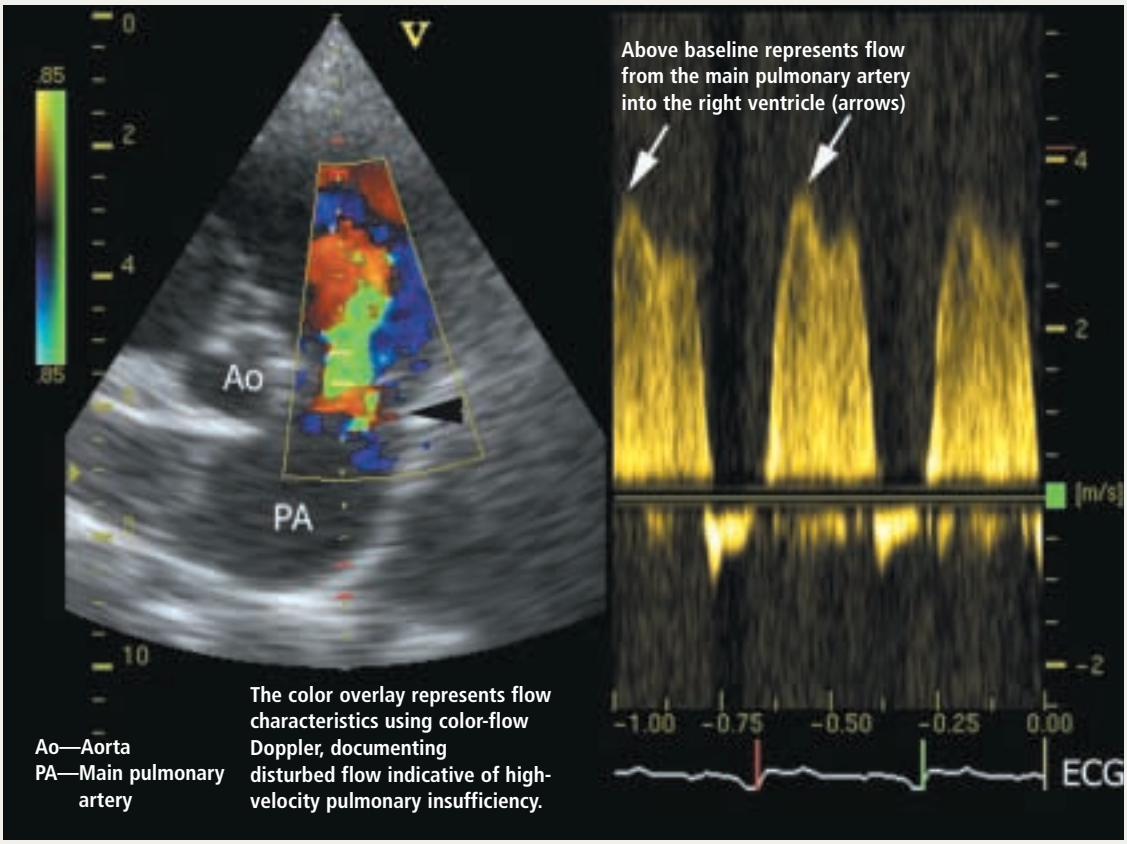
Dorsoventral radiograph. The right caudal pulmonary artery, which is evident as the silhouette on the diaphragm, is dramatically dilated and tortuous.



Lateral thoracic radiograph. Notice the increased vascular markings and interstitial pulmonary infiltrates in the caudal lung fields.



Two-dimensional echocardiographic image (2-D echo) showing a short-axis section of the heart. The right ventricle is in the near field and is markedly dilated. The numerous echogenic structures in the area of the tricuspid valve annulus are heartworms, which characteristically appear on echocardiography as bright (hyperechoic) equal signs (=).

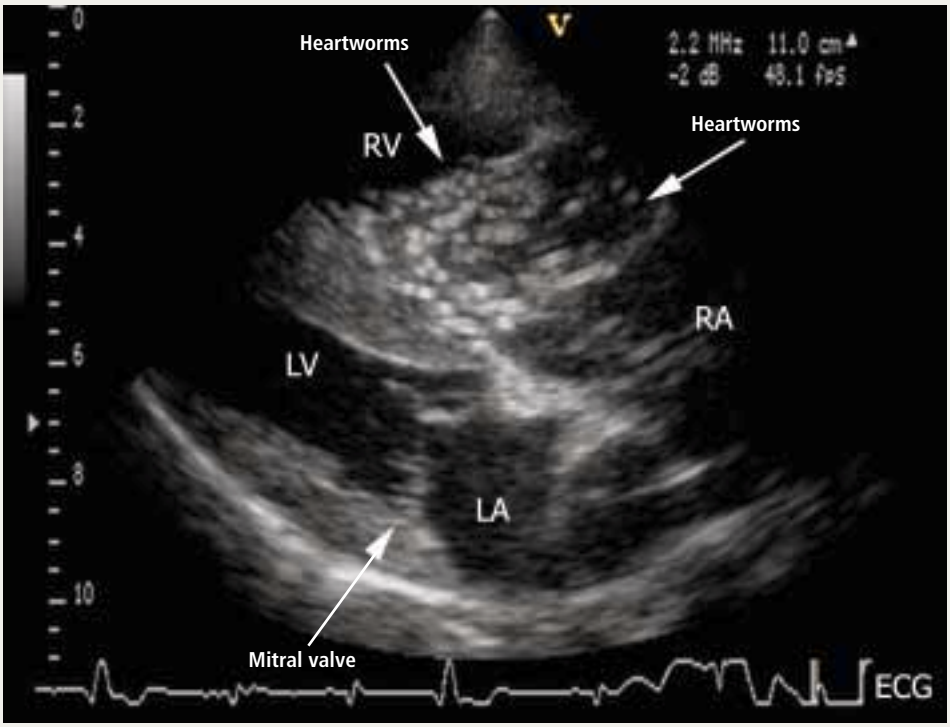


Ao—Aorta
PA—Main pulmonary artery

The color overlay represents flow characteristics using color-flow Doppler, documenting disturbed flow indicative of high-velocity pulmonary insufficiency.

LEFT PANEL
2-D echo showing a cross-section of the heart at the level of the aorta and the main pulmonary artery, just below the pulmonary valve (black arrowhead).

RIGHT PANEL
Spectral Doppler display that essentially converts the color spectra into velocity information. Echocardiography (ECG) allows us to time the event, showing that it occurs in diastole. This high-velocity pulmonary insufficiency confirms the presence of hypertension. Using the modified Bernoulli equation, we can accurately quantify the severity of the hypertension. In this patient, the calculated MPA pressure exceeded 64 mm Hg, which is considered severe pulmonary hypertension.



RV—Right ventricle
RA—Right atrium
LV—Left ventricle
LA—Left atrium

2-D echo showing a long-axis section of the heart. All four cardiac chambers are well visualized. Although the lumen of the right atrium and ventricle can be seen, a large mass of hyperechoic structures is visualized at the level of the tricuspid valve annulus—the mass is heartworms. The hyperechoic mass at the level of the tricuspid valve annulus coupled with the clinical findings is characteristic of caval syndrome.