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Utility of thoracic radiology as clinical indicator of pulmonary hypertension in dogs with heartworm disease (*Dirofilaria immitis)*

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Heartworm disease is a cardiopulmonary condition caused by *Dirofilaria immitis*, which lodges in the pulmonary arteries of the hosts. The presence of the parasites produces pulmonary endarteritis, which chronically leads to pulmonary hypertension (PH) and right-sided cardiac failure. The diagnosis of these alterations is essential for a correct management of the disease. The objective was to determine the utility of radiological findings to stage the severity of PH in heartworm disease. For this, 62 heartworm-infected dogs were evaluated. The presence/absence of microfilariae was determined. Ultrasound examination was used to determine the parasite load, and the presence/absence of PH by means of the Right Pulmonary Artery Distensibility Index. Latero-lateral (LL) view, right recumbence and dorso-ventral (DV) thoracic radiographs were performed. Vertebral Heart Score (VHS) and ratio of the right cranial pulmonary artery to the fourth rib (P:R ratio) were measured according to previous authors. A statistically significant relationship ($p<0.05$) was observed between the presence or absence of PH (n=32 and n=30, respectively) and the P:R ratio LL (1.4±0.4 vs 1±0.2), P:R ratio DV (1.6±0.6 vs 1.2±0.3) and VHS (10.4±0.8 vs 9.7±0.8). On the other hand, the parasite load did not influence the radiological findings. Regarding the presence/absence of microfilariae, only a statistically significant difference was observed in the P:R ratio DV (1.5±0.3 vs 1.37±0.58).

The results show a relationship between presence of PH and radiological changes. Currently, thoracic radiology is used to determine the severity of heartworm disease, but the evaluation is based on subjective parameters. The results validate the possibility of using thoracic radiology as a tool to help determine the presence and severity of PH in dogs infected by *D immitis*.

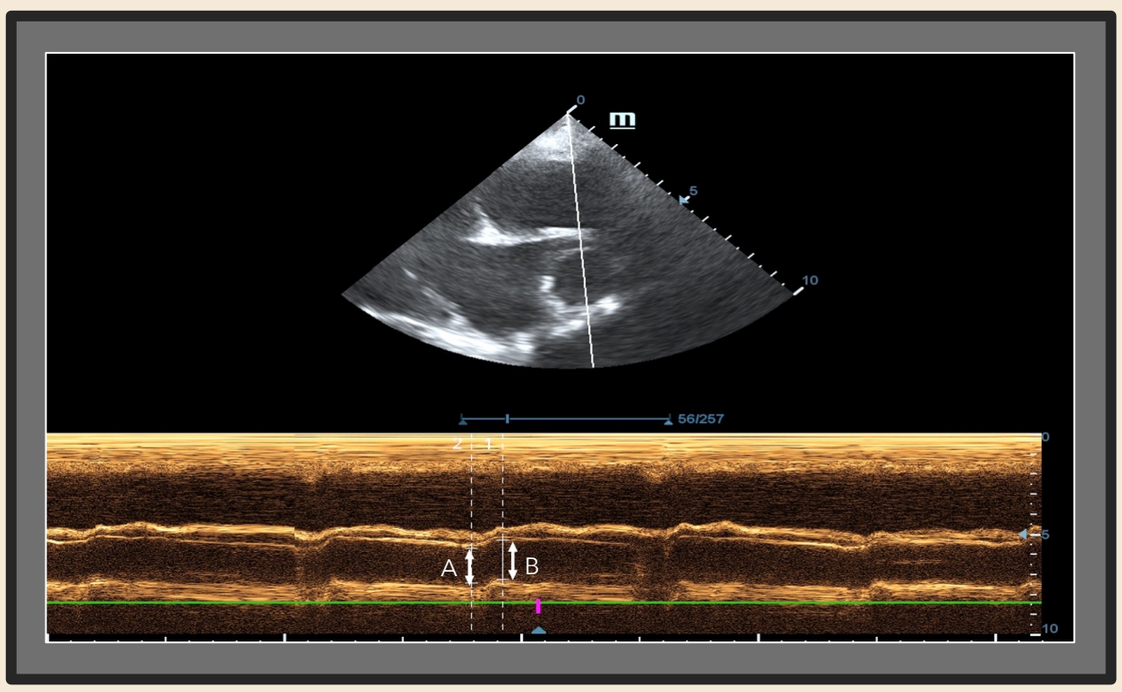

Figure 1. Measurement of the Right Pulmonary Artery Distensibility index (RPAD index) in a patient that presented severe pulmonary hypertension (20%). RPA measurement in sistole (A). RPA measurement in diastole (B). Right parasternal position, four-chamber longitudinal section in M mode.

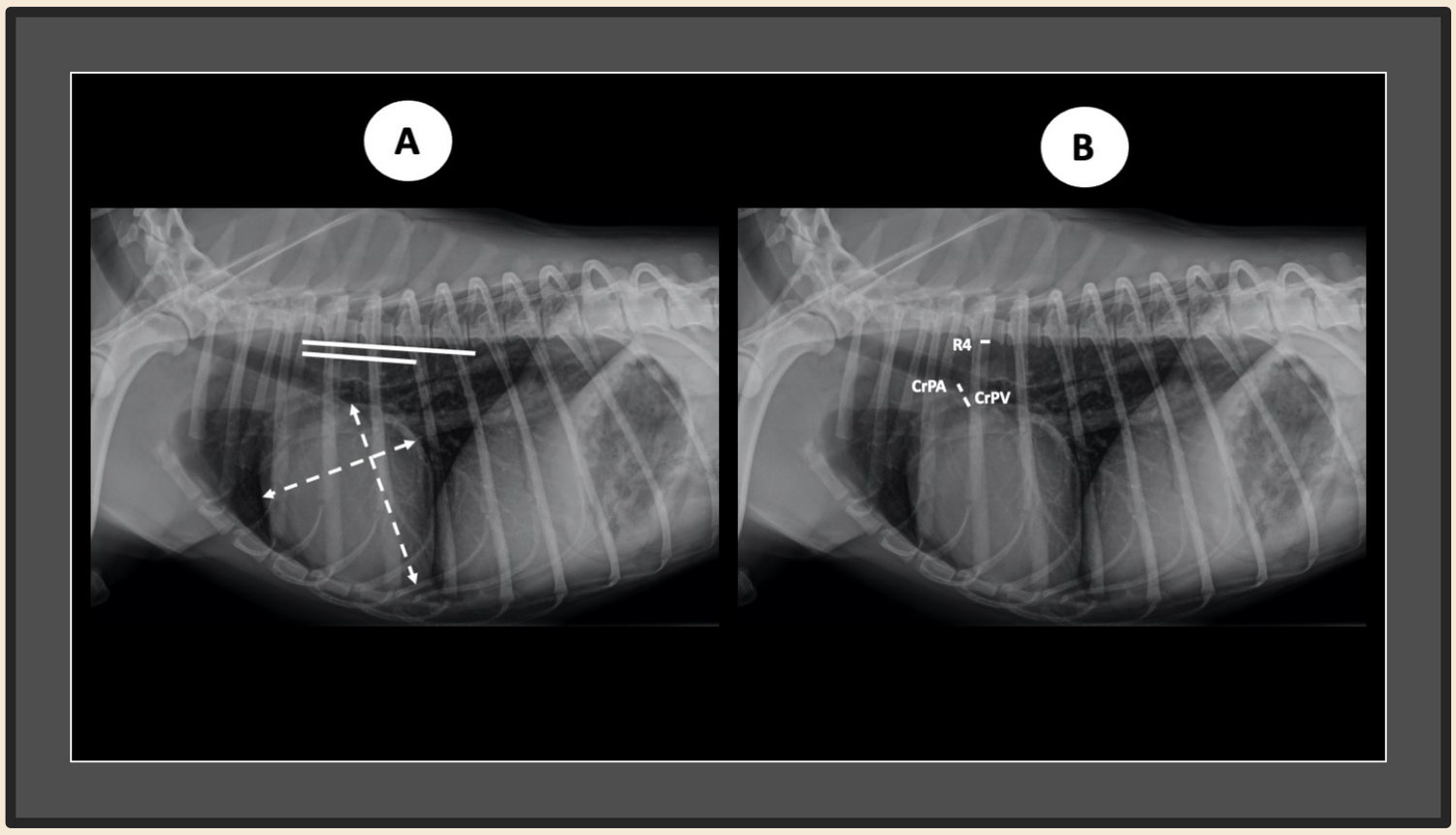

Figure 1A. Measurement of the vertebral heart score (VHS) of a thoracic radiography in LL recumbency of a dog infected by *Dirofilaria immitis.* 1B. Measurement of the P:R ratio in the same dog. Diameter of the right cranial lobar artery (CrPA), Diameter of the right cranial lobar vein (CrPV), diameter of the fourth rib (R4).

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