

## ECHOCARDIOGRAPHY AS AN AID IN THE DIAGNOSIS OF PULMONARY THROMBO-EMBOLISM

N. Van Israël<sup>1</sup>, C. Clercx<sup>2</sup>, R.W. Else<sup>3</sup>.

<sup>1</sup>Animal CardioPulmonary Consultancy/University of Liege, Belgium;<sup>2</sup>University of Liege Belgium,<sup>3</sup>Royal (Dick) School of Veterinary Studies, Edinburgh

The ante-mortem diagnosis of pulmonary thrombo-embolism (PTE) remains often assumptive in veterinary medicine. Thoracic radiographical findings can be very unspecific. More advanced imaging techniques like pulmonary angiography, scintigraphy, spiral computed tomography and MRI angiography are not readily available, even in the more specialised institutions. Doppler colour echocardiography is a non-invasive and attractive tool in emergency conditions but the interference of excessive breathing with ultrasonographic image formation and the technical difficulties of pulmonary artery bifurcation imaging in severely dyspnoeic animals have limited its use. The aim of this retrospective study was to evaluate the echocardiographic findings (NVI) in 5 dogs with clinically (5), echocardiographically (5) and/or pathologically confirmed pulmonary thrombo-embolism (3). Echocardiography was technically challenging (sternal position, O<sub>2</sub> supplementation) but feasible in all 5 dogs. Left ventricular hypoperfusion (decreased left ventricular diameter in diastole) was present in all 5 dogs. The LA was small to normal in all dogs. Mitral regurgitation was absent in all 5 dogs. Paradoxical interventricular septal movement was present in 4/5 dogs. On M-Mode echocardiography the interventricular septum was flattened, indicating increased RV pressure, in 4/5 dogs. The pulmonary artery (PA) diameter exceeded the aortic root diameter in all dogs. Operator subjective appreciation of right ventricular dimension was quoted as eccentrically enlarged in all dogs (moderate in 1, severe in 4). The RA appeared enlarged in all animals (1 mild, 1 moderate and 3 severe). Tricuspid valve prolapse associated with tricuspid regurgitation (moderate in 2, severe in 3: velocity range from 3.5 to 4.3 m/s) was present in 4/5 dogs. Pulmonic valve prolapse was obvious in all 5 dogs, however pulmonic insufficiency was only present in 4/5 (mild in 1, moderate in 2 and severe in 1), and only one dog had a pulmonary insufficiency jet consistent with pulmonary hypertension (> 2.2 m/s). Despite the presence of a hyperechoic lesion indicative of a thrombus in all dogs the pulmonary velocity gradient remained normal in all dogs (range 0.6-0.7 m/s). A thrombus was localised in the common PA (just above the valve) in 2 dogs, in the right PA in 2 dogs and in both branches in 1 dog. A mild pericardial effusion was present in 1 dog.

In conclusion, in this study many echocardiographic variables were abnormal in dogs with PTE. Echocardiography can therefore, in the hands of experienced operators, be seen as an useful noninvasive tool for supporting the diagnosis of canine PTE.