PULMONARY-VEIN-TO-PULMONARY-ARTERY RATIO HELPS TO IDENTIFY DOGS WITH CONGESTIVE HEART FAILURE SECONDARY TO MYXOMATOUS MITRAL VALVE DISEASE


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INTRODUCTION
Pulmonary-vein-to-pulmonary-artery ratio (RPV:RPA) has been proposed as a method of identifying various stages of cardiovascular disease, including congestive heart failure (CHF) and pulmonary hypertension (PH). However, few studies exist that have examined the diagnostic utility of RPV:RPA, or other PV or PA measurements in the diagnosis of CHF or PH. Therefore we analyzed how RPV and RPA indeces vary in dogs with myxomatous mitral valve disease (MMVD) at different stages and if they could be helpful to early distinguish dogs in CHF.

MATERIALS AND METHODS
M-mode echocardiographic evaluations derived from the 2D image were performed on 114 dogs (84 Cornell, 20 Perugia; 10 Rome) with MMVD +/-PH (tricuspid regurgitant velocity >3.5 m/s). The right ostium of the PV and the right PA were measured at the maximal and minimal diameters (mechanically timed), and at the peak of the QRS and end of the T-waves (ECG timed)(Fig 1). Left atrium and aorta were measured at the onset of diastole. Dogs were classified as being subclinical (B1, B2) or having CHF (C). Various indices of RPV and RPA were calculated. These indices were examined in a subset of dogs with similar LA:Ao but different clinical classifications (B2[n 56] vs C [n 27]) to determine the clinical utility of RPV:RPA in identifying CHF. RPV and RPA indices were also examined in MMVD dogs with (n 35) and without (n 26) PH to determine the clinical utility of identifying PH.

RESULTS
RPV:RPA_T at the optimal cut-off of 1.8 was 85% sensitive and 62 % specific for detecting CHF while RPV:Ao_QRS at the cut-off of 0.66 was 89% sensitive and 58 % specific (Fig. 2 and 3). RPA:Ao (measured at the smallest diameter or QRS) >0.45 was approximately 55% sensitive and 90% specific for identifying moderate PH (TR velocity >3.5 m/s) (Fig. 4). RPA distensibility index did not perform better to identify moderate PH (Fig. 5).

CONCLUSIONS
RPV and RPA echocardiographic indices might be useful in discriminating subclinical and CHF dogs with similar degrees of cardiac enlargement, and identifying dogs with moderate-severe PH.

- Increase sample size
- Investigate other factors (age, breed, respiratory and heart rate, blood pressure, specific primary PV and PA diseases) potentially influencing RPV and RPA dimensions and function.
- Analyze combinations of indexes (Es. RPV:RPA_T and RPV:Ao_QRS)

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