

DIASTOLIC FUNCTION AFTER PDA CLOSURE IN 35 DOGS

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Abnormal relaxation has been implied as a part of the pathophysiology of deteriorating LV myocardial function in people after closure of PDA. Dogs with PDA follow an individual course, independent of pre-existing heart failure. Some dogs survive with few clinical signs and live a normal life span without intervention. Some dogs deteriorate despite closure of their PDA.

The aim of the study was to evaluate the diastolic function of dogs after closure of PDA and to establish if diastolic dysfunction might be a factor in those animals that continue to deteriorate despite intervention.

Left ventricular diastolic function was assessed non-invasively by analysis of the transmitral flow patterns (E:A waves, Edt), pulmonary venous flow characteristics (S:D), and isovolumetric relaxation time (IVRT). Left ventricular diastolic filling was classified in groups of normal, impaired relaxation, pseudonormal or restrictive pattern on the basis of a combination of the above factors.

Thirty-seven dogs presented at the Edinburgh University Hospital between 1990-2000 for closure of a left-to-right shunting PDA were represented for echocardiographic follow-up. Two dogs were excluded because of the presence of atrial fibrillation.

Mitral E:A wave reversal occurred in 7 dogs (19%), was normal in 27 dogs (73%) and showed a restrictive pattern in one dog (3%). Linear regression analysis between age and E:A reversal in this population showed a trend towards declining E:A ratio with advancing age but this did not achieve statistical significance. IVRT was normal in 23 dogs (62%), increased in 5 (14%) and decreased in 6 (16%). Furthermore, 3 dogs (8%) had abnormal pulmonary venous flow patterns. Edt was shortened in 10 dogs (27%), normal in 20 (54%) and prolonged in 3 dogs (8%).

In total 8 dogs (22%) had all diastolic function variables normal, 17 (46%) had one variable abnormal, and 10 had two variables abnormal (27%). None had more than 3 variables abnormal.

Eight animals were classified as having normal diastolic function, 21 as having some degree of impaired relaxation, two as being restrictive, and 4 were classified in the pseudonormal group.

Diastolic dysfunction in its different forms was common in this study population. In conclusion, it appears that abnormal relaxation might be part of the pathophysiology of PDA, as implied in humans. However, it is advisable that more diastolic function studies are performed in animals with a PDA before definite conclusions are made.