



RIGHT HEART DISEASE IN AN ADULT DOG: A CASE STUDY

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INTRODUCTION

Disease affecting the right heart in dogs can occur as a congenital condition or as an acquired one in the later life. Congenital heart diseases causing a left to right shunt or valvular dysplasia causing stenosis or regurgitation can result in right heart disease. Any condition occurring in adult life causing increased pulmonary vascular resistance or PA pressure can result in right heart disease. In this present paper, incidence and management of dilated cardiomyopathy with marked right heart involvement of a 4 year old male Labrador dog is reported.

Case history and observation:

Sheru, 4 year old male Labrador sniffer dog of CISF, Thumba was presented in the District Veterinary Centre on 11th November 2008, with a history of exercise intolerance, cough, lethargy, reduced intake of food and abdominal enlargement. Clinical examination revealed marked ascitis, tachypnoea, abnormal lung sounds and profound tachycardia. Body temperature was normal (102^oF). Blood samples were obtained for routine

examination and radiographs (ventrodorsal and lateral views) were acquired. ECG was recorded on limb leads I, II and III. Wet film examination revealed negative for microfilaria.

X ray finding (Fig1 and 2) showed rounding of the sternal border in the lateral view and the reverse 'D' appearance in the Ventro-dorsal view, apart from increased visibility of pulmonary vasculature.

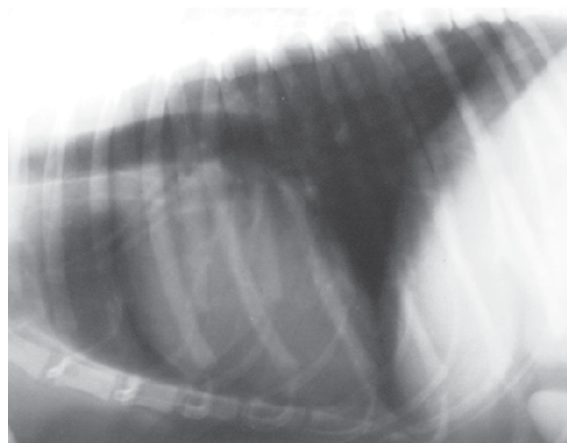


Figure 1: Lateral view showing rounded ventral border covering 3 sternibrae.

Blood picture (table1) revealed normal white cell counts and hemoglobin.

Hb	WBC	Neutrophils	Lymphocytes	Eosinophil
11.5g%	9500/mm ³	57%	38%	5%

Serum chemistry (table 2) showed elevated values for all the parameters measured.

BUN	Creatinine	ALT	AST	Serum bilirubin
30mg/dL	1.6 mg/dL	68U/L	45U/L	0.6/dL

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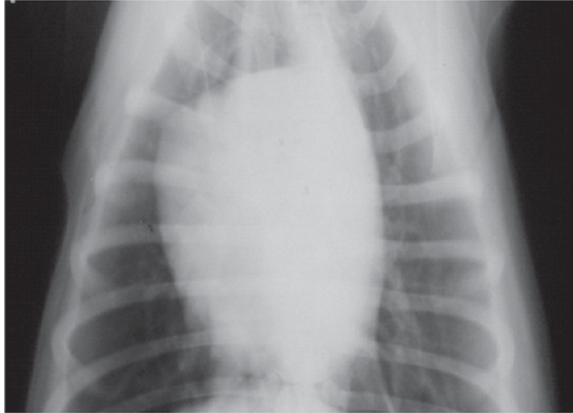


Figure 2: Dorso-ventral view showing reverse 'D' appearance of heart

with increased visibility of pulmonary vasculature and haziness of lung area.

ECG finding

Lead II ECG showed normal sinus rhythm with tachycardia and high amplitude for 'R' wave (>1 mV). QRS duration was normal (<0.04 sec).

Diagnosis: The condition was tentatively diagnosed as Congestive heart failure with right heart involvement. There was with significant general venous congestion and hepatic congestion. Since the animal was asymptomatic so far and the onset of this clinical episode was recent, it was assumed that this condition is not of congenital etiology.

Treatment 1

Diethyl carbamazene 125mg BID, orally was prescribed for one month, with advise to restrict exercise and salt intake.

Review 1

Animal was reviewed weekly and improvement in general health, appetite, activity, exercise tolerance, and reduced occurrence of cough were noticed. However the condition deteriorated in one month with anorexia, increased respiratory rate and worsening of ascitis. Laboratory (table 3), X ray (Figure 3) and ECG investigations were repeated.

Serum chemistry (table 3) after one month showed moderate reduction in values for all the parameters measured.

BUN	Creatinine	ALT	AST
21mg/dL	1 mg/dL	52U/L	40U/L

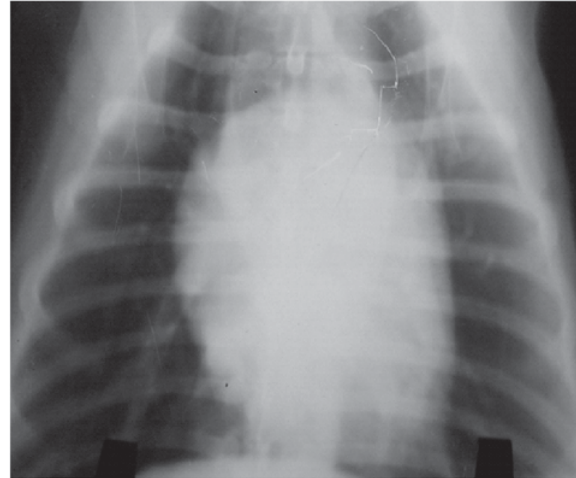


Figure 3: Ventro-Dorsal view showing reduced right heart enlargement with reduced visibility of pulmonary vasculature and haziness of lung area.

ECG: The ECG showed no marked variation compared to the previous one.

Impression: There was marked reduction in the right heart enlargement. The inverted 'D' appearance is reversed indicating reduction of RA enlargement. Reduced visibility of pulmonary vasculature is also noticed indicating reduced pulmonary congestion. Serum enzyme values have also marginally reduced. However CHF, right ventricular enlargement and general venous stasis were seen persisting and the treatment for the same was initiated.

Treatment 2: It was advised to give Frusamide 40mg BID, Digoxin 0.5 mg BID and Enalapril maleate 2.5 mg SID with advise to restrict exercise and salt intake.

Review 2: Complete clinical review of the animal was done after 5 months, during May 2009. Laboratory (table 4), X ray (Figure 4 and 5) and ECG investigations were repeated.

Animal was free from the above symptoms. Mild to moderate exercise could be tolerated by the animal. Appetite and general activity were normal. There was no ascitis or respiratory symptoms. Lung auscultation was normal. Heart rate and pulse rate were normal.



Serum chemistry (table 4) after 5 months showed marked reduction in ALT and AST values and increased BUN and Creatinine values

BUN	Creatinine	ALT	AST	Serum bilirubin
26mg/dL	2 mg/dL	33U/L	30U/L	0.5mg/dL

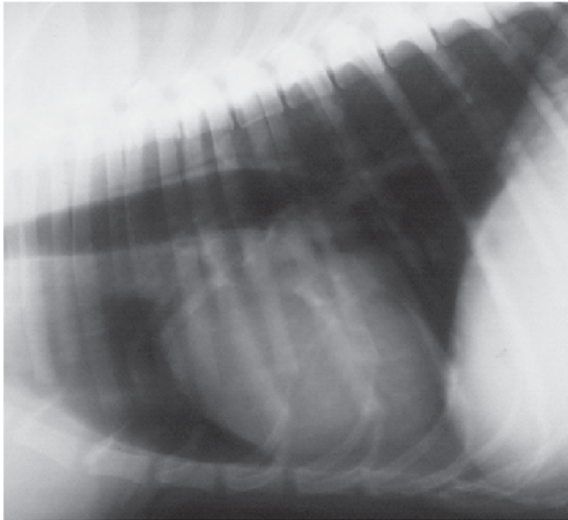


Figure 4: Lateral view showing reduction in right heart enlargement with ventral border only covering 2 ribs.

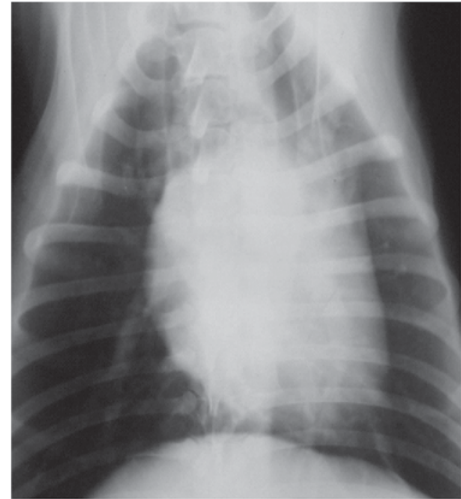


Figure 5: Ventro-dorsal view showing nearly normal heart and lung.

Review 3: Clinical review of the animal was repeated after 14 months, during July 2010. The treatment was discontinued during this period. At the time of presentation, animal showed moderate exercise intolerance with reduced femoral artery pulse rate of 45-50 per minute. Interestingly chest auscultation revealed a higher heart rate of 80 to 100 beats per minute. Animal also showed presence of microfilaria

in the peripheral blood. Animal was otherwise clinically normal with respect to general activity and appetite. No discernable ascitis or peripheral edema could be detected. Dorsoventral X ray (Figure 7), ECG and echocardiography (Fig 8) were acquired. X ray revealed reappearance of 'Inverted D' indicating right heart enlargement.

Limb lead ECG revealed typical 2nd degree atrio-ventricular block of Mobitz type II pattern as evidenced by multiple 'p' waves denoting multiple regular atrial activity (short arrows) followed by QRS complex and the same is seen well on the M mode impressions of the septum. The 'R' wave has high

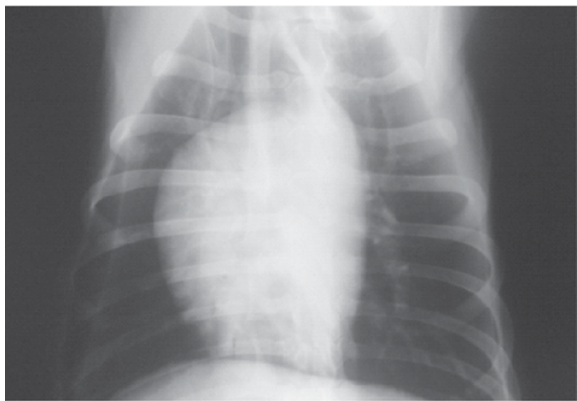


Fig. 6, Dorsoventral X ray showing recurrence of inverted D appearance

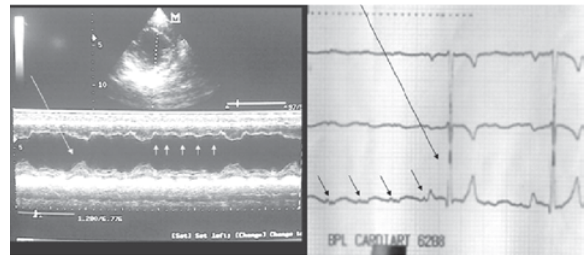


Fig 7: Right parasternal short axis echocardiographic view



amplitude (big arrow) denoting ventricular hypertrophy/enlargement. Right parasternal short axis M mode echocardiographic view showed multiple septal contractions (small arrow) followed by definite left ventricular wall contraction denoting good left ventricular function. Left ventricular ejection fraction and fractional shortening as measured by Techoltz method were also normal indicating normal left ventricular function. The multiple septal contractions with out ensuing left ventricular free wall contraction denotes conduction block. B mode and Doppler echocardiography revealed normal valvular function and absence of any left to right shunts. Presence of pulmonary artery stenosis or evidence of right ventricular dysfunction could not be ascertained by echocardiography.

The treatments were restarted as in the treatment schedule 2

Review: 4 Clinical review was repeated after 3 months (24/10/2010). Moderate exercise tolerance reported. Body temperature was normal(102.3 F) Femoral artery pulse rate was 58/mts. Chest auscultation revealed heart rate of 80/mts. No ascitis symptoms. No microfilaria found in the peripheral blood smear. Appetite and general activity were normal. Conducted Rapid Test for Heart Worm Ag and was found to be negative



Fig.8. Rapid Test Kit - Heart Worm Ag

It was advised to continue Digoxin 0.5 mg BID and Enalapril maleate 2.5 mg SID

DISCUSSION

Animals with right heart disease show clinical symptoms of generalized venous congestion such as weight loss, diminished exercise tolerance, lethargy, poor condition, cough, dyspnoea, syncope, and abdominal distension. Depending upon the severity of right heart affliction, pulsating jugular vein with distension, hepato-splenomegaly with ascitis is also noticed. The animals with typical right heart disease show a radiographic picture of rounding of the sternal

border in the lateral view and the reverse 'D' appearance in the ventro-dorsal view indicating right heart enlargement. Apart from this there can be increased levels of serum enzymes indicating venous stasis. In animals with congenital heart condition, the clinical symptoms are noticed within 6 to 12 months of age and have a limited life span depending on the severity of the condition. Hence an adult animal with the above findings may probably indicate an acquired condition of right heart disease. The treatment adopted in this case was generally based on a report by Ettinger *et al*. This consisted of Furosemide as a loop diuretic to reduce fluid load, Enalapril an ACE inhibitor for reducing peripheral vascular resistance for reducing the work load on the heart and Digoxin for positive inotropic effect, for improving the general perfusion. The clinical symptoms could be alleviated by this treatment, however the onset on conduction disorder indicates that this treatment could not affect the progress of cardiomyopathy. Similar observation on the outcome was made by Rajesh *et al*.

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