



Dilated Cardiomyopathy (DCM) in Doberman Pinscher dog and its Clinical Management

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ABSTRACT

A two year old female Doberman Pinscher dog was presented to the TVCC hospital Veterinary college Shivamogga with the history of laboured breathing, inappetence and exercise intolerance. The detailed clinical examination revealed weakness, abnormal heart sounds and tachypnea. Initial electrocardiogram was suggestive of cardiomyopathy with M shaped "P" wave, small positive deflection ('blip') in "QRS" (Epsilon wave) and "ST" slurring. Plain radiograph of lateral view of thorax revealed pulmonary edema, enlarged cardiac silhouette. Ultrasonography of the thorax revealed pleural effusions, enlargement of ventricles with hypoechoic flashing structures at tricuspid valve. Based on these clinical examination and diagnostic procedures it was diagnosed as Dilated Cardiomyopathy (DCM). Treatment was initiated with the Enalapril @0.5 mg/Kg Once daily P.O(Envas®, Cadilla Healthcare Ltd) as an antiarrhythmic drug. The dog responded to the treatment which was clinically manifested by increased feed intake decreased dyspnea and increased activity after one week of therapy. Even though the prognosis for this case is poor the condition is managing with above treatment.

Key words: Dilated Cardiomyopathy (DCM), Doberman Pinscher, Dog

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INTRODUCTION

Dilated Cardiomyopathy (DCM) which is also called as heart muscle disease is prevalent in certain breeds of dogs like Doberman Pinscher, Great Dane, Saint Bernard and Cocker Spaniel [1]. Exact cause of the DCM is unknown but it is probably the result of damage to the myocardium produced by a variety of toxic, metabolic, or infectious agents [2]. Nutritional deficiency of taurine and carnitine has been found to contribute to the incidence of DCM in Doberman Pinscher. Some breeds have genetic susceptibility to the disease and male dogs are more prone for the disease when compared to the females [3].

DCM is characterised by loss of heart muscle function leading to the enlargement of heart. Enlarged ventricle may lead to decreased cardiac output to lungs leading to fluid accumulation in lungs. Soon the enlarged heart becomes overloaded which leads to Congestive Heart Failure (CHF). The present report discusses the diagnosis and therapeutic management of DCM in Doberman Pinscher.

CASE HISTORY AND OBSERVATION:

A two year old female Doberman Pinscher dog was presented to the TVCC hospital Veterinary college Shivamogga with the history of laboured breathing, inappetence and exercise intolerance. Clinical examination revealed tachycardia, abnormal heart sounds and tachypnea. Haemato-biochemical values were within normal range (Haemoglobin:14.3 g%, RBC: 7.1 million/cmm, Serum creatinine: 1.1 mg/dl, ALT:31.9U/L).

DIAGNOSIS

The condition was diagnosed as DCM based on the results obtained from the following diagnostic techniques.

- 1) **Electrocardiogram (ECG):** The ECG of the animal was taken with 12 lead ECG machine (Cardiart 6208, BPL Company Ltd) on right lateral recumbency, which revealed cardiomyopathy with M shaped "P" wave, small positive deflection ('blip') in "QRS" (Epsilon wave) and "ST" slurring (Fig. 1).

- 2) **Radiography:** Plain radiograph of lateral view of thorax revealed pulmonary edema, enlarged cardiac silhouette, left atrial dilation, pleural effusions and elevation of trachea (Fig. 2).
- 3) **Ultrasonography:** Ultrasonography of the thorax revealed pleural effusions, enlargement of ventricles with hypoechoic flashing structures at tricuspid valve, semilunar valve of aorta towards ventricle side and at the origin of pectinate muscles. Thinning of interventricular septum with hyper-echoic borders. Trans-abdominal sonography showed peritoneal effusions (Fig 3, 4 and 5).

TREATMENT

Treatment was initiated with the Enalapril @0.5 mg/Kg Once daily P.O(Envas®, Cadilla Healthcare Ltd) as an antiarrhythmic drug, the combination of diuretics like frusemide and spiranolactone @ 2mg/Kg twice daily P.O (Lasilactone®, Aventis Pharma Ltd). The dog was also treated with the nutritional supplement like Cardio strength® capsules (MSD Animal Health) to support cardiovascular health and function. Aminophyllin was used on the first day as a supportive treatment for emergency bronchodilation @ 2 mg/Kg i/v (Aminophyllin inj I.P® Harson Lab).

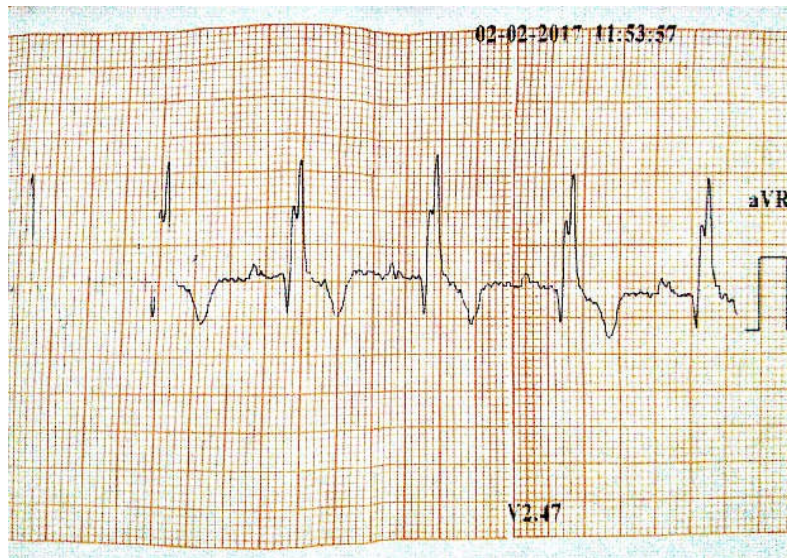


Fig 1: Electrocardiogram of the dog taken at 50 mm speed and 1mv amplitude showing rat toothed “P” wave (M shaped), small positive deflection (“blip”) in “QRS” (Epsilon wave) and “ST” slurring .

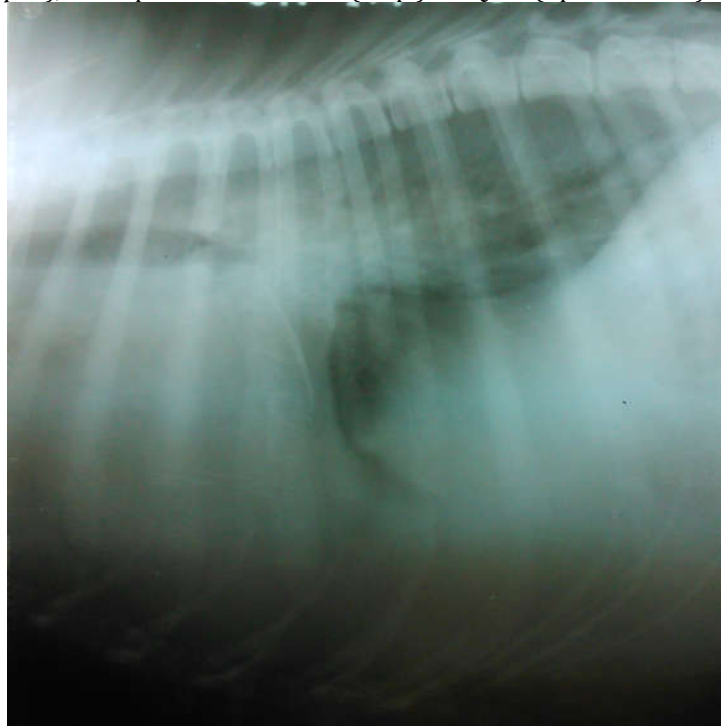


Fig 2: Cardiac enlargement, elevation of trachea and pleural effusion seen in lateral thoracic radiograph.

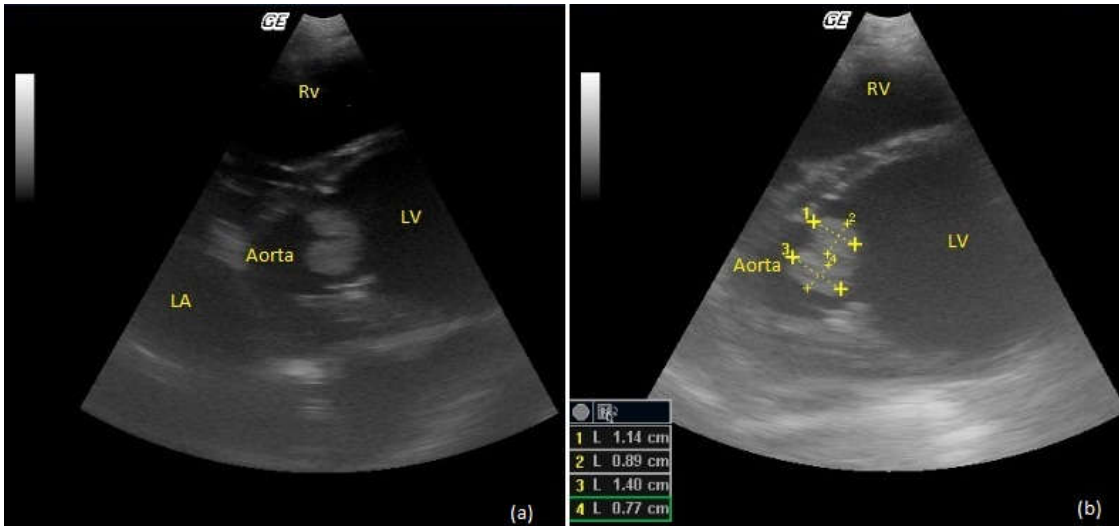


Fig3:(a) and (b) Ecocardiogram of right parasternal long axis view showing dilated cardiomyopathy and couple of homogeneous oval shaped vegetative lesions on ventricular side of aortic valve.

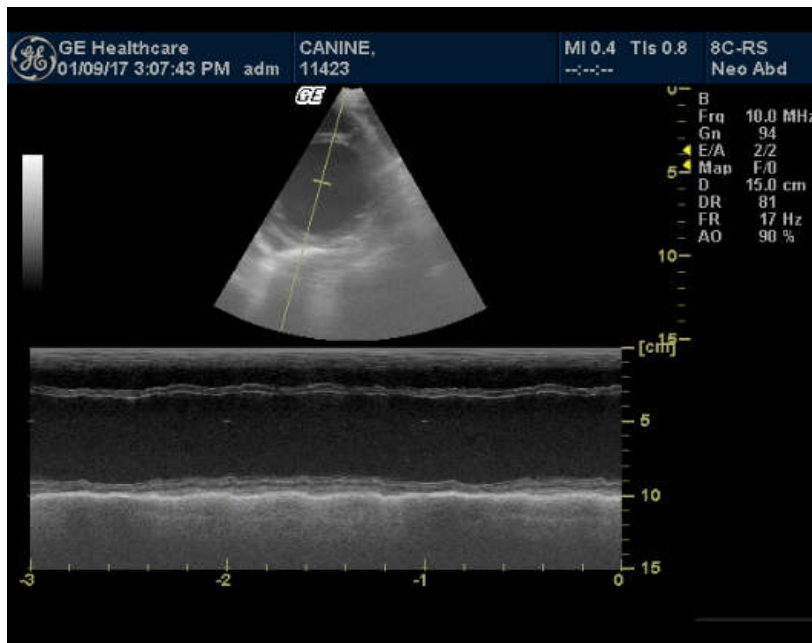


Fig 4: M-mode image showing dilation and spherical shape of left ventricle with systolic dysfunction.

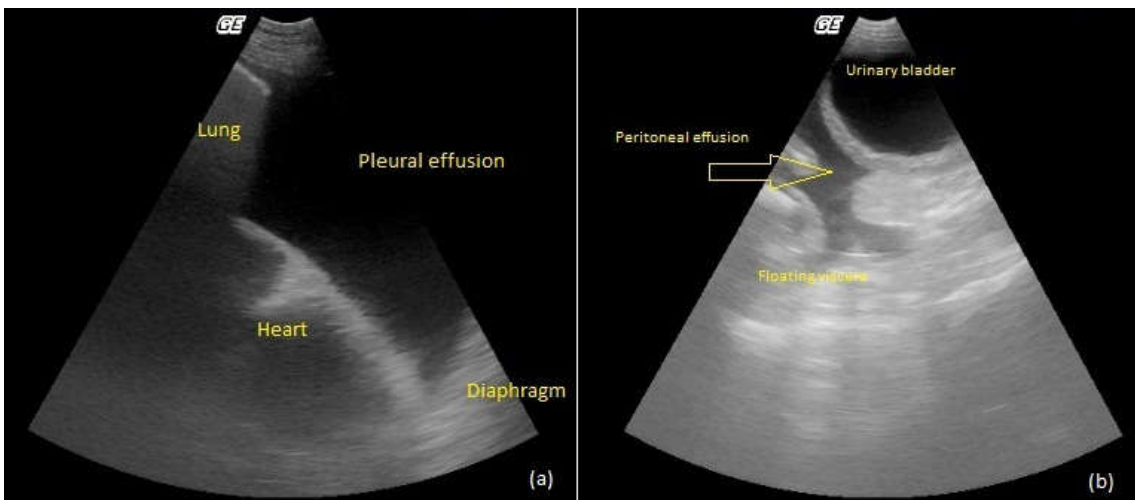


Fig 5: Ultrasound image of (a) pleural effusion and (b) peritoneal effusion

DISCUSSION

Congestive heart failure due to DCM was found in different breeds of dogs like Doberman Pinscher, Great Dane, Saint Bernard and Cocker Spaniel with higher prevalence in Doberman Pinscher [4]. McEwan [5] and opined that the DCM is slowly progressive primary myocardial disease. The clinical signs of the present case like severe cough, exercise intolerance, dyspnea, panting were in accordance with the findings of Tidholm and Johnson [6]. The ECG recordings were suggestive of DCM and small positive deflection ('blip') in QRS complex was a characteristic finding in DCM as per Anderson [7]. The thoracic radiography revealed rounding and enlargement of heart which were in accordance with the results of Tidholm and Johnson [6] and McEwan [5].

Two dimensional, M-mode ultrasonography of the heart showed dilatation of both ventricles with hypochoic flashing structures at tricuspid valve, semilunar valve of aorta towards ventricle side and at the origin of pectinate muscles were in agreement with the findings of Tidholm and Johnson [6] and Boon [8].

The treatment was directed towards restoring and maintaining sinus rhythm with antiarrhythmic drugs i.e rate control [9]. Angiotensin Converting Enzyme (ACE) inhibitor such as Enalapril helps in lowering the blood pressure by inhibiting the conversion of peptide hormone angiotensin I to angiotensin II, which is one of the prime vasoconstrictor of blood vessels resulting in increase in blood pressure [10].

The combination of drugs like furosemide and spironolactone were primarily used as diuretic and antihypertensive. The furosemide is most commonly used loop diuretic in dogs which helps in treatment of CHF by excreting excess fluid through kidney along with electrolytes. Spironolactone acts as aldosterone antagonist and helps in potassium retention in the body. Spironolactone may be used alone or with furosemide to treat difficult cases of CHF [11].

The dog was also treated with the amino acid taurine and carnitine supplements (Cardio strength®) to improve the heart function. The taurine plays a role in the development and function of heart muscle and carnitine is necessary for heart muscle cells to make the energy needed for them to contract.

DCM can lead to two distinct cardiac outcomes; sudden death or death due to progressive heart failure. Kaplan Meier survival analysis of dogs with DCM confirmed the overall guarded prognosis for this condition. Survival period will differ for each case but some studies suggest that the dog surviving beyond 7 months have a reasonable probability of becoming long term survivors [12].

CONCLUSION

The ECG, ultrasound and radiography are very useful in diagnosis of DCM. The line of treatment with antiarrhythmic drugs with diuretics are helpful in managing the DCM in dogs.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in relation to this article.

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