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Diagnostic evaluation and therapeutic management of dilated cardiomyopathy (DCM) in a Labrador retriever

Saahithya Rajamohan, Harish Lompiyan Janarthanan, M Chandrasekar and K Jeyaraja

Abstract
A male Labrador retriever of 9 years of age was presented with severe abdominal distension, exercise intolerance and inappetance. On physical examination, tachycardia, weak femoral pulse, fluid thrill on percussion of distended abdomen and dyspnoea were appreciated. Electrocardiography showed atrial fibrillation. In radiograph, cardiomegaly was noticed and vertebral heart score of 12 was measured. Echocardiography was performed.
The dog was diagnosed with Dilated cardiomyopathy. For long time support, it was treated with Pimobendan @ 0.25mg/kg b.wt BID P/O, Diltiazem, a calcium channel blocker @ 2mg/kg b.wt TID P/O along with enalapril maleate @ 0.5mg/kg b.wt and furosemide @ 1.5mg/kg b.wt. The owner was further informed that the treatment was to prolong the life span of dog with better quality of life.

Keywords: Dog, Labrador retriever, dilated cardiomyopathy (DCM), pimobendan, echocardiography, radiography, electrocardiography, therapeutic management

1. Introduction
Dilated cardiomyopathy (DCM) in canines is a syndrome characterized by vitiated myocardial contractility. It causes impaired systolic function. The heart becomes markedly enlarged and the myocardium appears pale, soft and flabby.
The condition is common in large and giant breeds of dogs. The prevalence of DCM is high in Great Danes, Labrador Retrievers, Boxers, Newfoundlands [5].
The possible etiologies proposed for DCM are familial and genetic basis, nutritional abnormalities, viral etiologies, immune mediated disorders and tachycardia induced myocardial failure. In some cases, it may be idiopathic. DCM expresses itself in two forms viz., asymptomatic occult phase overt clinical phase. The diagnosis of DCM is done primarily by taking into consideration of right from the initial history, clinical signs, physical examination, radiography, electrocardiography and echocardiography with color flow Doppler. The clinical signs are varied in both the phases.
The major treatment options in management of DCM involve the use of diuretics with positive inotropic therapy. The therapeutic regimen is usually followed according to the severity of DCM (moderate or chronic). Usually, in most of the cases the prognosis is poor and the dogs are clinically managed in prolonging the lifetime of the animal [1, 2, 6, 9].

2. Materials and Methods
A nine year old male Labrador retriever was brought to the Teaching Veterinary Hospital of Madras Veterinary College, Chennai 600-007 with a history of inappetance, severe abdominal distension and exercise intolerance.

2.1 Physical examination
General and system wise examination was done as per guidelines given by Defarges (2015) [3].
The animal was stabilized initially and the complete history of the case was obtained. Based on the clinical history and symptoms, a set of differentials for the case was noted down.

2.2 Haematology and Serum biochemistry
Two millilitres of whole blood was collected aseptically from the dog by venepuncture of cephalic vein in vacutainers coated with 10% Ethylene Diamine Tetra Acetic Acid (EDTA) as anticoagulant. Haematological analysis was done using the automated haematology analyzer

(Mindray – BC-2800 VET). Peripheral blood smears were prepared and examined for changes in blood picture.

2.3 Radiography
The dog was subjected to radiography (computerized 500mA X-ray machine) of the lateral view of thorax and abdomen and Ventrodorsal view of thorax as described in earlier reports [7, 8].

2.4 Electrocardiography
The dog was subjected to standard 6 lead Electrocardiography and the readings were analyzed.

2.5 Echocardiography
The dog was placed in lateral recumbency and standard conventional echocardiography and Doppler examination was performed to obtain the images of heart through B-mode and 2D echocardiography.

3. Results and Discussion
On physical examination of the dog, tachycardia, weak femoral pulse, fluid thrill on percussion of distended abdomen and dyspnoea were appreciated.

Fig 1: A 9 years old male Labrador retriever presented to the Teaching Veterinary Clinical Complex, MVC

Haematological parameters were within normal range and biochemical parameters like total proteins and albumin were mildly below the normal range.
Electrocardiography showed atrial fibrillation. In radiograph, cardiomegaly was noticed and vertebral heart score of 12 was measured.

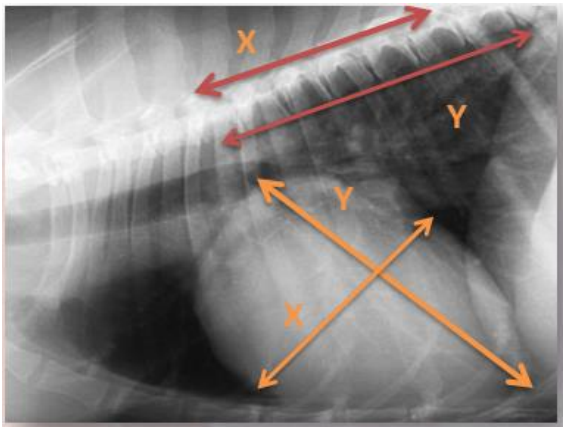

Fig 2: Radiograph-X is short axis and Y is Long axis. Vertebral heart score = X+Y=12

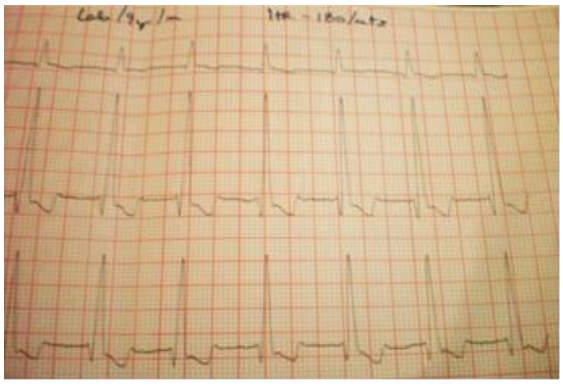

Fig 3: Electrocardiograph (ECG)-Indication of atrial fibrillation and blood pressure of 180 beats per minute

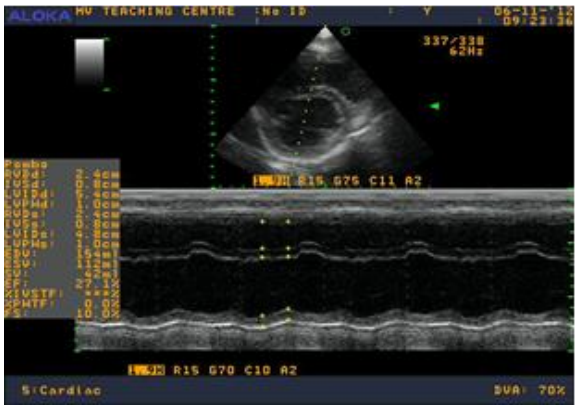

Fig 4: B-mode echocardiography: LVID at systole-4.8cm and at diastole - 5.4cm (higher than normal range)

Fig 5: 2D Echocardiography -Right parasternal axis view at the level of aorta – Increased LA/AO ratio

Fig 6: Simpson's method of Disc summation-Ejection fraction was 38.5 percent.

Echocardiography revealed an increased left ventricular internal dimension in diastole of 5.4cm, left ventricular internal dimension in systole of 4.8cm, reduced fractional shortening of 10 percent in M-mode. On 2-D echocardiography, dilated left atrium and increased LA/AO ratio (left atrium / aorta) was recorded and an Ejection fraction of 38.5%.

Based on the above findings, the case was diagnosed as Dilated cardiomyopathy. It was initially treated with Enalapril maleate, an angiotensin converting enzyme inhibitor @ 0.5mg/kg b.wt BID P/O, Furosemide, a loop diuretic @ 2mg/kg b.wt. TID P/O and digoxin, which is an inotrope increases myocardial contractility @ 0.005mg/kg b.wt. BID P/O.

In a couple of weeks, the case showed gastrointestinal signs due to digoxin toxicity. Hence the owner was advised to procure Pimobendan as soon as possible. For long time support, it was treated with Pimobendan @ 0.25mg/kg b.wt BID P/O, Diltiazem, a calcium channel blocker @ 2mg/kg b.wt TID P/O along with Enalapril maleate @ 0.5mg/kg b.wt and furosemide @ 1.5mg/kg b.wt.

The owner was further informed that goal of the treatment was to prolong the life span of dog with better quality of life.

The clinical signs were in correlation with Jeyaraja *et al*. (2015) [6]. In this case, the hematological parameters were within the normal range. However, Sesh *et al*. (2013) [9] reported the occurrence of decrease in haematocrit values with overall blood picture indicative of ischemia and acute infection.

The electrocardiography, radiography and echocardiographic values were in accordance with the earlier reports. In this case, the dog was managed with Pimobendan which is a novel cardiotonic vasodilator when used as adjunctive therapy can prolong the survival period [4].

4. Conclusions

The present case describes the successful therapeutic management of Dilated cardiomyopathy in a Labrador retriever.

5. Acknowledgments

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