

# PERICARDIAL EFFUSION IN DOGS – FOUR CLINICAL CASES

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Four dogs (3 male, 1 female) of age 5 to 14 years were presented to the small animal medicine ward of N.T.R Gannavaram during the period of June 2014 to April 2015 with a history of Lethargy, poor exercise tolerance, respiratory distress and abdominal distention and inappetence. Physical examination findings revealed tachycardia, tachypnoea, muffled heart sounds, ascites and pale mucous membranes. Haematology revealed slightly fall in haemoglobin, PCV and neutrophilia. Serum biochemistry findings were increased levels of ALT, creatinine and CKMB. Thoracic radiography revealed plural effusions, pericardial effusions and cardiomegaly. Electrocardiographic findings were sinus tachycardia, low R amplitude and ventricular premature contractions. M-mode echocardiography revealed a highly significant elevation in values of LA/AO and significant elevation in values of EDV and ESV was observed in dogs with pericardial effusions. Whereas the decrease in LVIDd, LVIDs, LVPWd, LVPWs, IVSd, IVSs and EPSS observed was statistically non significant. Two dimensional Echocardiographic evaluation of the heart was recognized as anechoic space between the epicardium and pericardium. The anechoic effusion was surrounded the heart within the pericardium.

**Keywords:** Pericardial effusion, Dogs.

Pericardial effusion (PE) is a common cardiac condition in dogs resulting in the accumulation of fluid within the pericardial space (Tobias, 2005). Pericardial effusion was a common feature of pericardial diseases which resulted in clinical signs (Humm *et al.*, 2009). The incidence of pericardial diseases account for one to eight percent of all cardiovascular disorders in dogs and most of the affected dogs had pericardial effusion (Tobias, 2005). Large breed dogs were more likely to have Idiopathic pericardial effusion, whereas all dogs with mesothelioma were of small or medium breeds (Stepien *et al.*, 2000). Jennifer (2001) opined that cases with acute pericardial effusion included pallor, hypotension, weakness and syncope. In chronic pericardial effusion clinical signs included right sided congestive failure, ascites, hepatomegaly pleural effusion and jugular distension. Early recognition of pericardial effusion in dogs is of clinical importance. The present study documents the four clinical cases in dogs with pericardial effusion.

## Materials and Methods

The study was conducted in 4 dogs (1 German Shepherd, 1 Dachshund, 2 Mongrel), presented in TVCC of NTR College of Veterinary Science, Gannavaram,

with the complaint of Lethargy (4 dogs), poor exercise tolerance, respiratory distress and abdominal distention (2 dogs) and inappetence (4 dogs).. Age of the affected animals varied between 5 and 14 years. Physical examination findings in general noticed by the dogs were tachycardia, tachypnoea, muffled heart sounds, ascites and pale mucous membranes. All these dogs suspected of cardiovascular involvement were subjected to further diagnostic tests *viz.*, serum biochemistry, radiography, electrocardiography( Plate I) and echocardiograph(Plate II). Thoracic radiography was done in lateral and dorsoventral views. ECG was done in all the 4 dogs in right lateral recumbence using standard bipolar limb lead II which is the most commonly used lead for diagnosing different cardiac abnormalities in dogs. Echocardiography was performed 2D, M-mode and Doppler mode. All the cases were diagnosed as Pericardial effusion (PE) based on Signalment, patient history, results of physical examination, serum biochemistry, thoracic radiography, electrocardiography and echocardiography. Ten apparently healthy dogs brought for routine general checkup and vaccination were selected as control groups for obtaining normal data for comparison of parameters under study.

**PLATE-I**



**COMPUTERISED ECG UNIT**

**PLATE-II**



**ECHOCARDIOGRAPHIC MACHINE**

**Results and Discussion**

The incidence of pericardial effusion was found to be higher in 5-8 years age group with an incidence of 50 per cent (2/4) followed by 9-14 years with an incidence of 25 percent and 0-4 years with an incidence of 25 percent (1/4). The average age of dogs affected with pericardial effusion is  $8 \pm 1.22$  years. The incidence of pericardial effusion in male dogs was 75 per cent (3/4) while in female dogs was 25 per cent (1/4). The prominent clinical signs observed in dogs with pericardial effusion were lethargy (100 percent), poor exercise tolerance, respiratory distress and abdominal distention (50 per cent) and inappetence (100 per cent). The clinical signs in dogs with pericardial effusion were attributed to diastolic failure described by MacGregor *et al.*, (2005). In pericardial effusion, the physical examination findings observed are tachycardia (100 per cent), tachypnoea (75 per cent), muffled heart sounds (50 per cent), ascites (50 per cent) and pale mucous membranes (25 per

cent). Muffling of heart sounds was associated with presence of fluid in pericardial sac. The tachycardia, tachypnoea and pale mucous membranes in dogs with pericardial effusions were due to diastolic failure as also mentioned by Ceribasi *et al.*, (2013). Haematology revealed slightly fall in haemoglobin ( $10.13 \pm 0.59$  g/dl), PCV ( $31.67 \pm 0.66$  per cent) and neutrophilia ( $15647.33 \pm 1464.78$ ) when compared to control dogs (Hb  $12.27 \pm 0.45$  g/dl, PCV  $36.30 \pm 1.28$  per cent, neutrophil count ( $7819.4 \pm 294.75$ ), this might be due to inappetance and anorexia, neutrophilic leukocytosis might be attributed to inflammatory reaction possibly associated with increased levels of TNF and IL1 reported by Singh *et al.*, (2014). Serum biochemistry findings were increased levels of ALT ( $73.77 \pm 8.75$  IU/dl) when compared with control group ( $33.74 \pm 1.3$  IU/dl). Creatinine ( $1.85 \pm 0.70$  mg/dl) and CKMB ( $20.77 \pm 1.09$  u/l) when compared with control group ( $0.84 \pm 0.38$  mg/dl

and  $19.82 \pm 0.62$  u/l respectively), this might be due to organ congestion due to low cardiac output in dogs with CHF. Radiographic findings were plural effusions and pericardial effusions 50 per cent each and cardiomegaly 25 per cent (1/4). The ECG findings were tachycardia 75 per cent (3/4) and ventricular premature contractions 25 per cent (1/4). The reason for the reduced R amplitude and arrhythmias was due to the effusions which lowered the electrical alternans was due to the swinging motion of the heart in pericardial fluid. A highly significant

elevation in values of LA/AO and significant elevation in values of EDV and ESV was observed in dogs with pericardial effusions. Whereas the decrease in LVIDd, LVIDs, LVPWd, LVPWs, IVSd, IVSs and EPSS observed was statistically non significant. Significant decrease in values of FS and EF was observed in dogs with pericardial effusion (Table-1). Echocardiographic evaluation of the heart were recognized as anechoic space between the epicardium and pericardium (Fig.1).

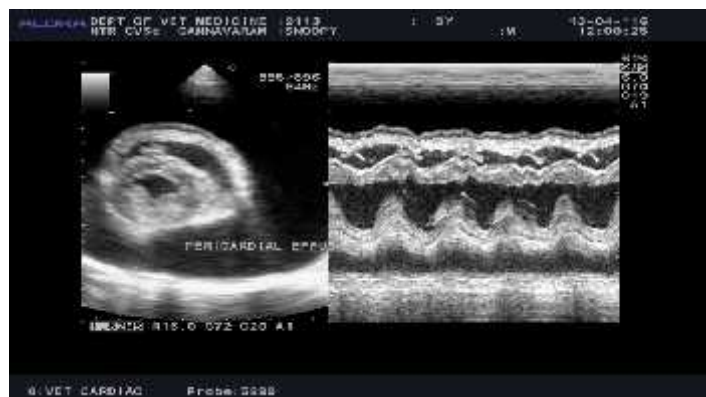
**Table-1 Mean  $\pm$  SE Echocardiographic values in control and pericardial effusion**

Parameter	Control	Pericardial effusion(n=4)
LVIDd(cm)	$4.24 \pm 0.16$	$4.3^{NS} \pm 0.26$
LVIDs(cm)	$2.8 \pm 0.03$	$2.86^{NS} \pm 0.03$
LVPWd(cm)	$0.84 \pm 0.04$	$0.77^{NS} \pm 0.05$
LVPWs(cm)	$1.29 \pm 0.06$	$1.21^{NS} \pm 0.04$
IVSd(cm)	$0.89 \pm 0.04$	$0.83^{NS} \pm 0.14$
IVSs(cm)	$1.29 \pm 0.04$	$1.36^{NS} \pm 0.08$
LA/AO	$0.89 \pm 0.01$	$1.33^{**} \pm 0.66$
EPSS(cm)	$0.41 \pm 0.02$	$1.30^{**} \pm 0.04$
FS(%)	$34.84 \pm 0.74$	$25.55^{*} \pm 0.84$
EF(%)	$68.66 \pm 1.07$	$52.22^{*} \pm 1.85$
EDV(ml)	$70.66 \pm 2.67$	$94.54^{*} \pm 5.21$
ESV(ml)	$25.26 \pm 1.67$	$57.88^{*} \pm 2.03$

\* -Statistically significant(p 0.05)

\*\* - Statistically highly significant(p 0.01)

NS - Statistically not significant



**Fig.1. Pericardial effusion in dog.**

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