

Heart Disease in Dogs and Cats



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Goals of 5 weeks

- First 2 weeks
 - Heart disease
 - Respiratory tract
- Following 2 weeks
 - Hematological disease
 - Systemic infections
- Last week
 - Other remarkable notes



SIXTH EDITION

Small Animal Internal Medicine



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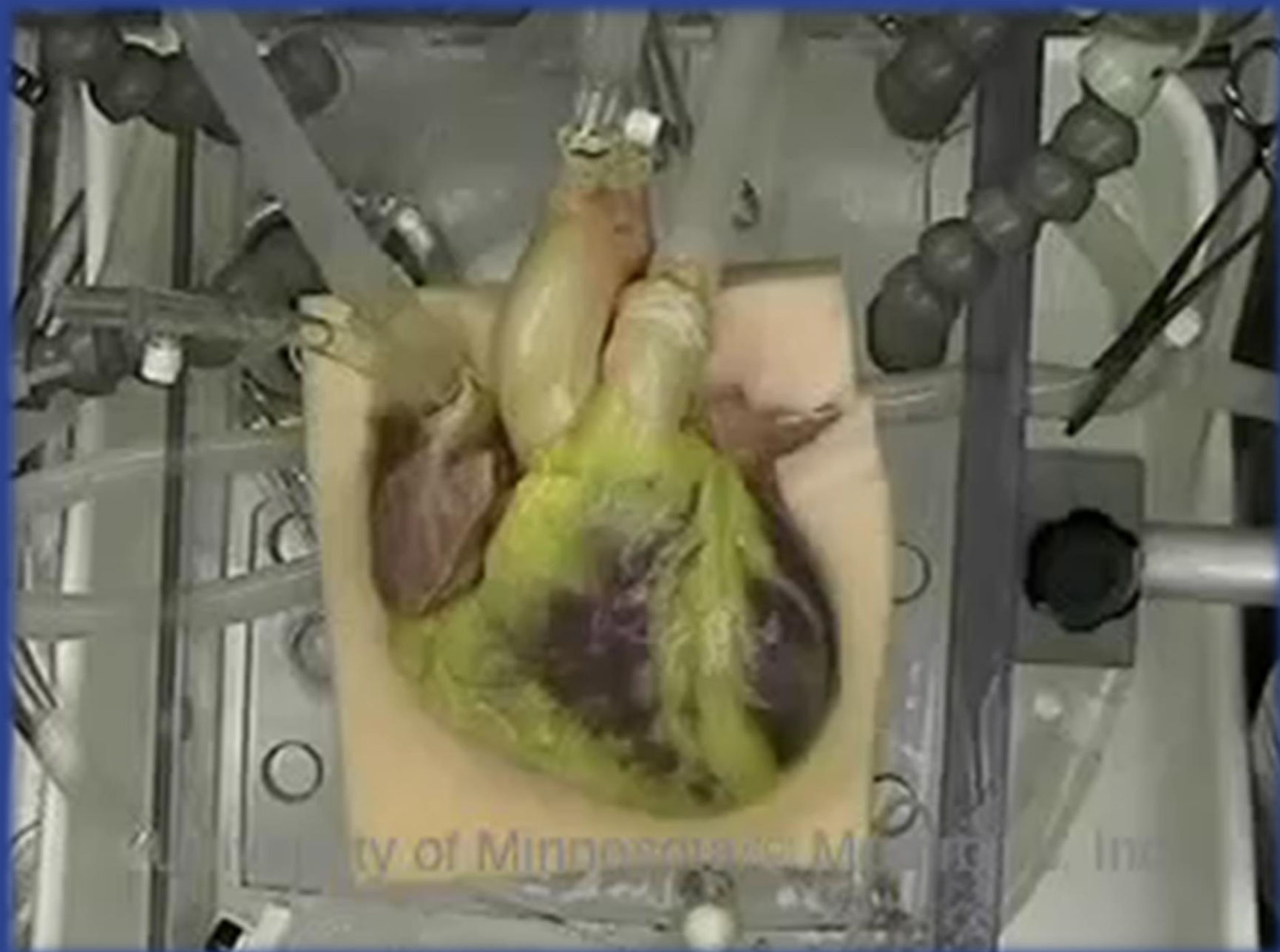
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ELSEVIER





Clinical Manifestations of Cardiac Disease

- Exercise intolerance
- Weakness
- Syncope
- Cough
- Dyspnea
- Tachypnea
- Blindness
- Paralysis
- Cachexia
- Ascites



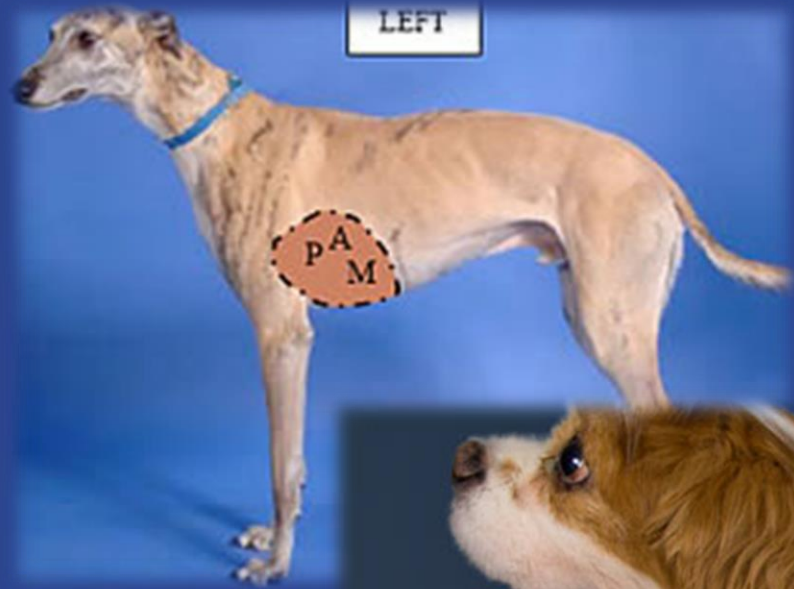
Physical Examination

- Historical background (age, breed, coughing?, panting?, fainting? Etc)

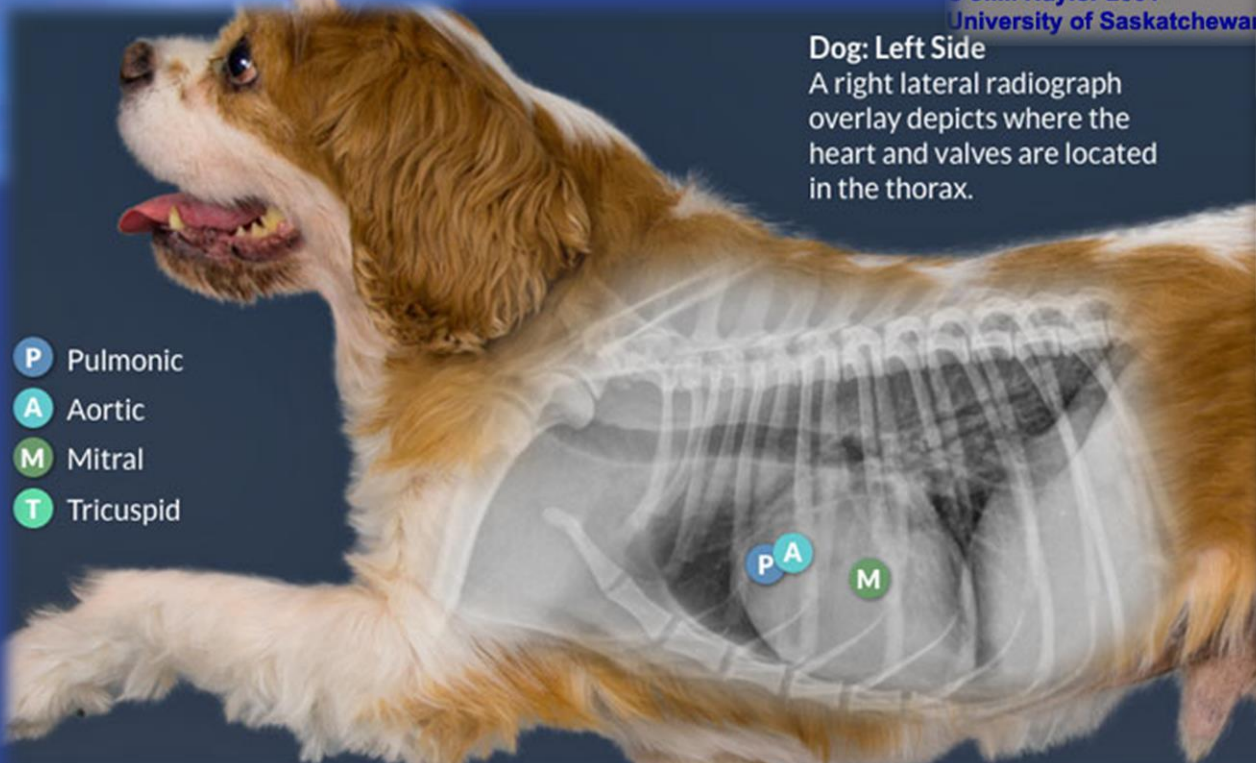




Cardiac Auscultation

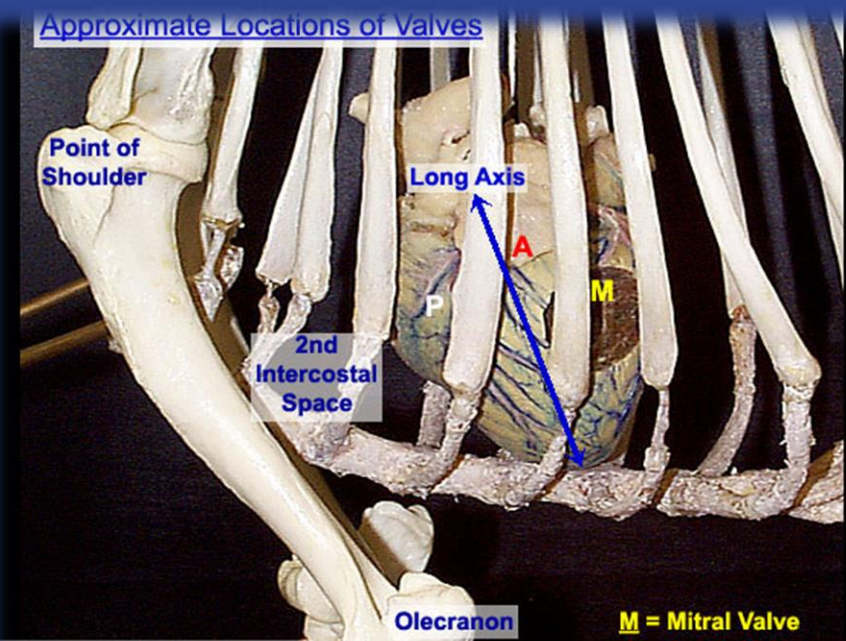


LEFT



Dog: Left Side
A right lateral radiograph overlay depicts where the heart and valves are located in the thorax.

- P Pulmonic
- A Aortic
- M Mitral
- T Tricuspid

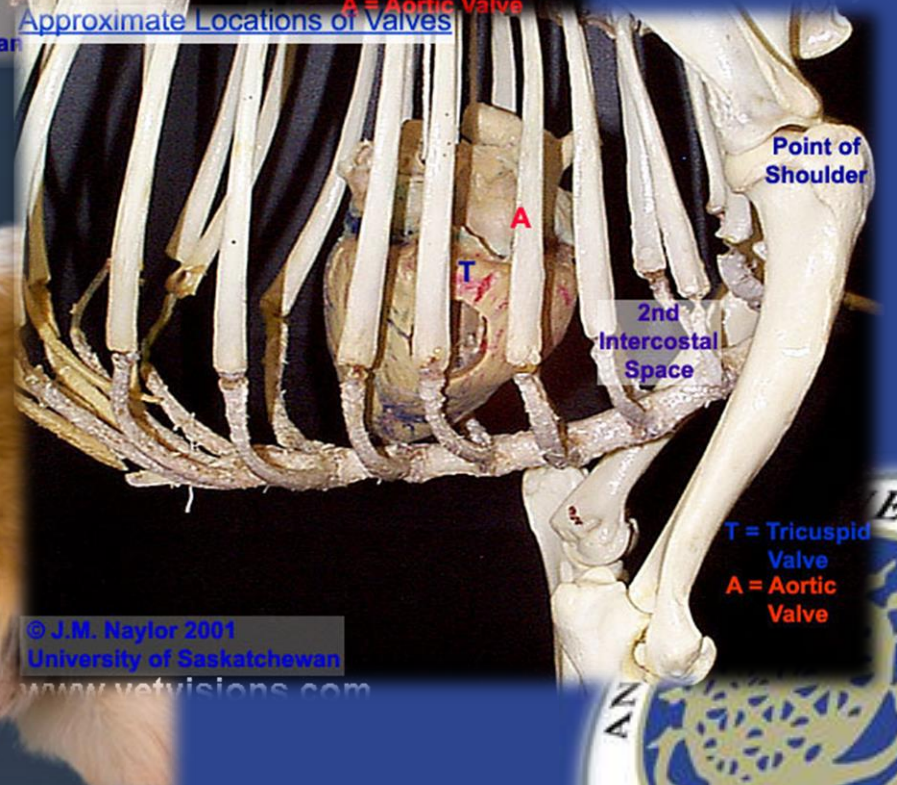


Approximate Locations of Valves

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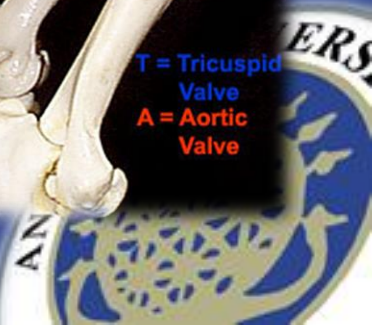
Approximate Locations of Valves

M = Mitral Valve
A = Aortic Valve



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T = Tricuspid Valve
A = Aortic Valve

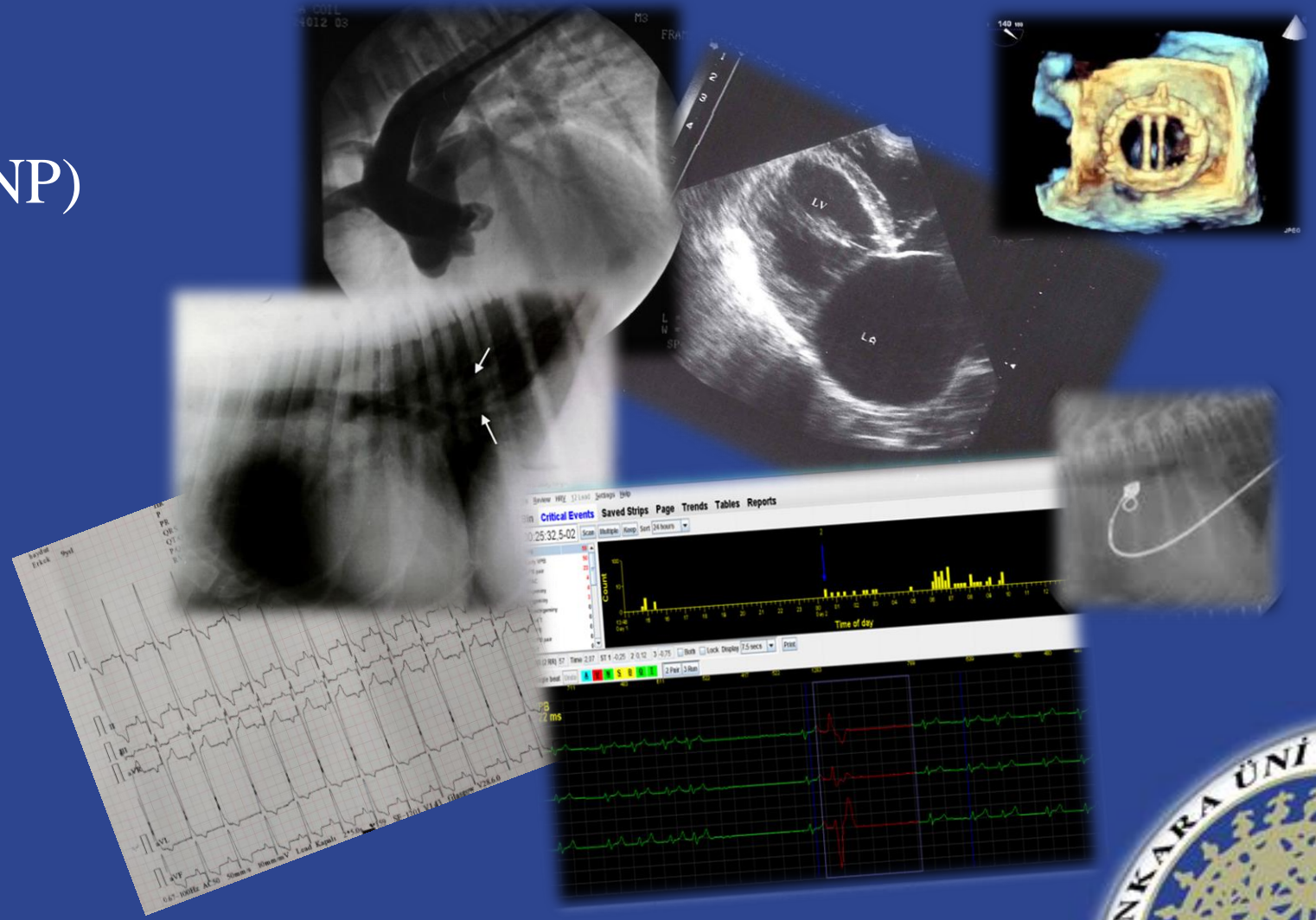


Cardiac Auscultation




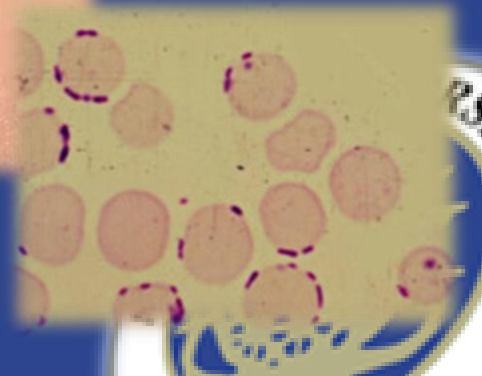
Diagnosis of the Cardiac Disease

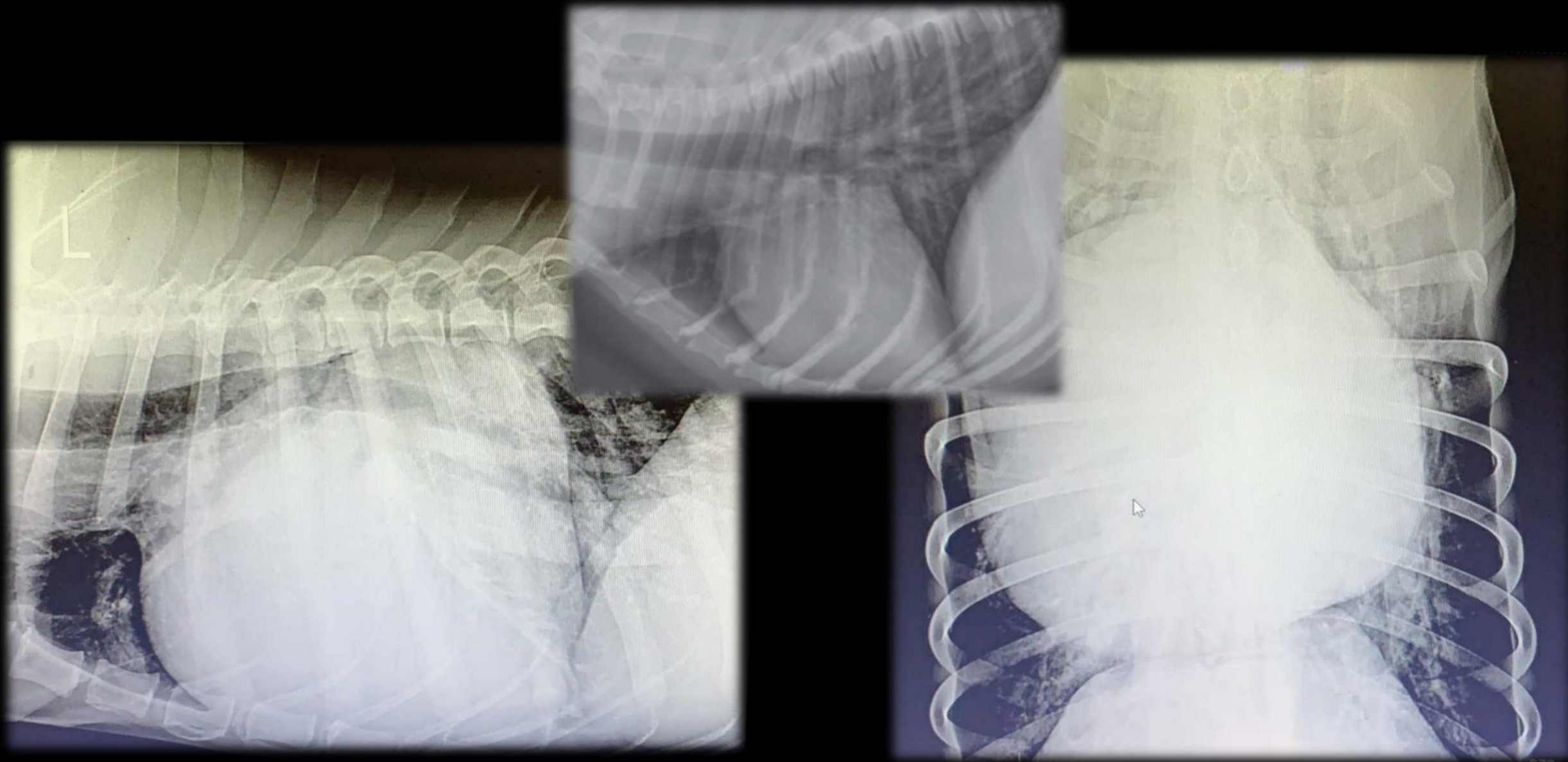
- Blood tests (CnTI, Pro BNP)
- Radiography
- Echo
- ECG
- Holter
- MR
- Interventional Cardiology



Associated disease with cardiology

- Chemo
- SIRS, Sepsis, Leucocytosis (Pyometra...)
- Uremia...
- Nutritional reasons... 
- Endocrinopathies (Hypothyroidy, Hyperadren, Hypoadren, Hiyperaldos, Diabet..)
- Infections (Mycoplasma spp, Lyme, Ehrlichia, Leish..)
- Congenital-familal reasons...
- Virus (Parvovirus...)
- İdiyopatik

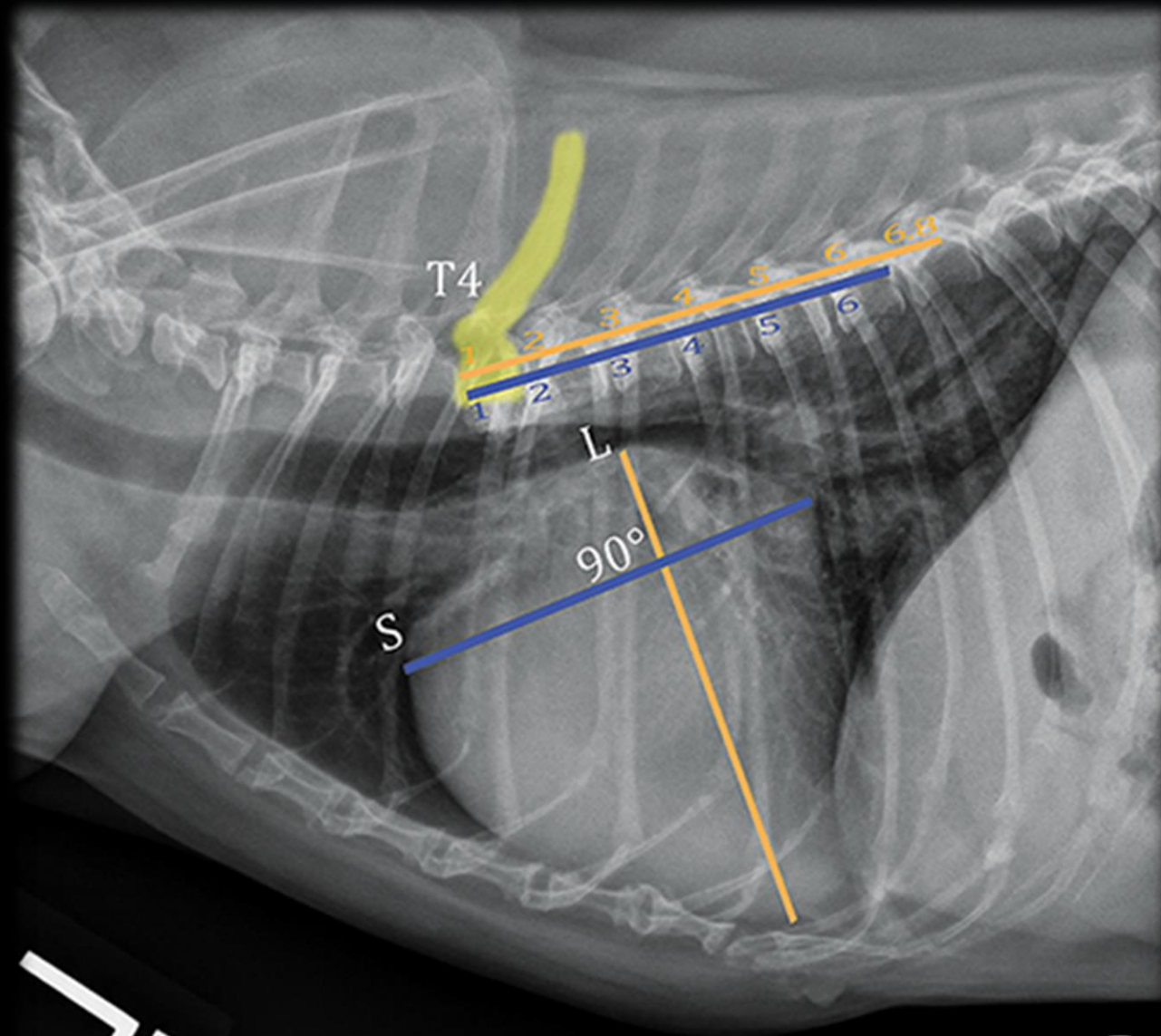




Kangal, 3 year-old, DCM

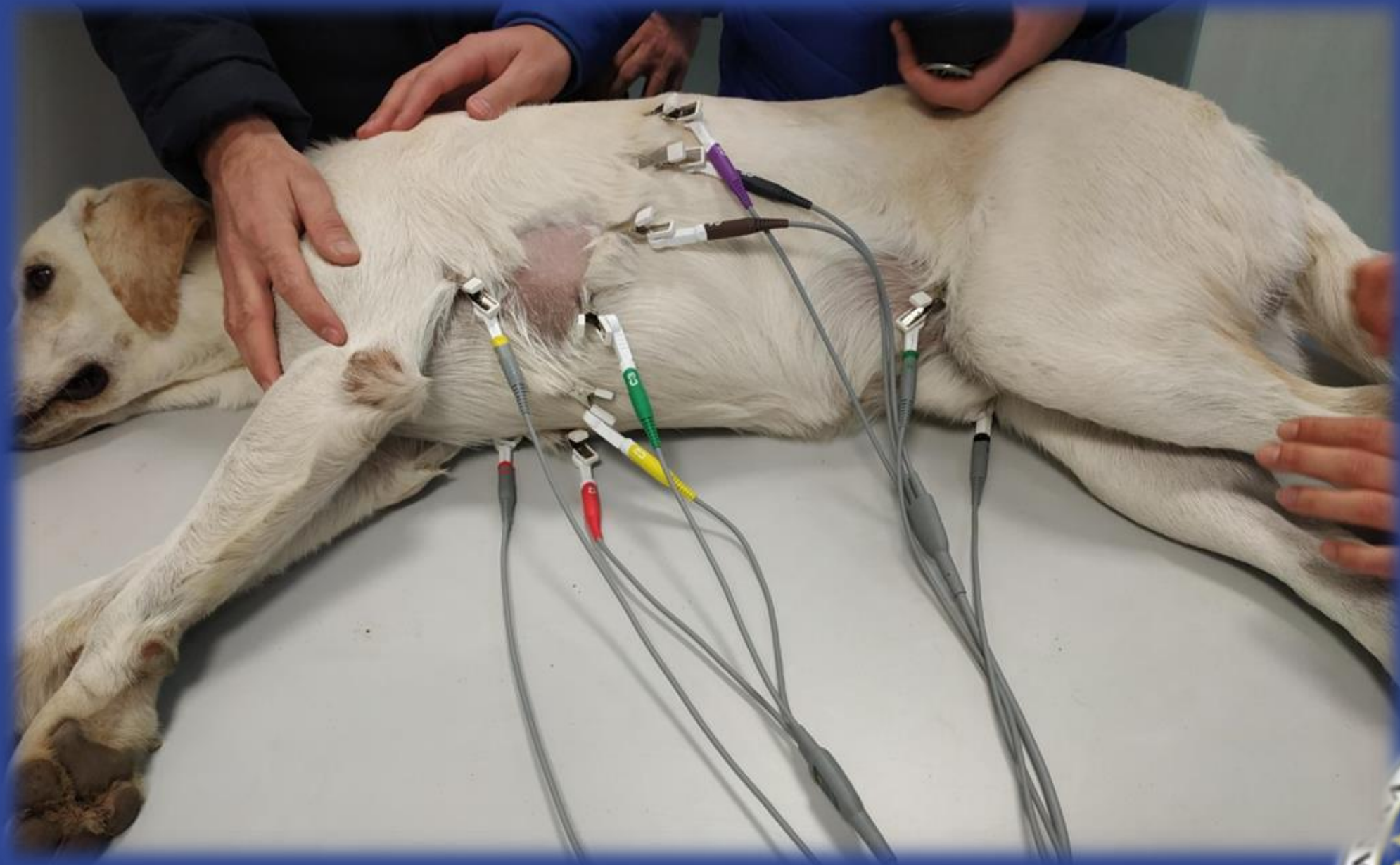
How big a heart !!!

VHS



$$6(S) + 6.8(L) = 12.8(VHS)$$

2C

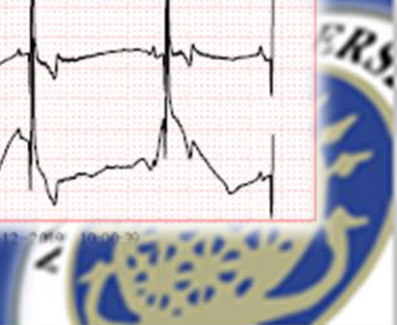
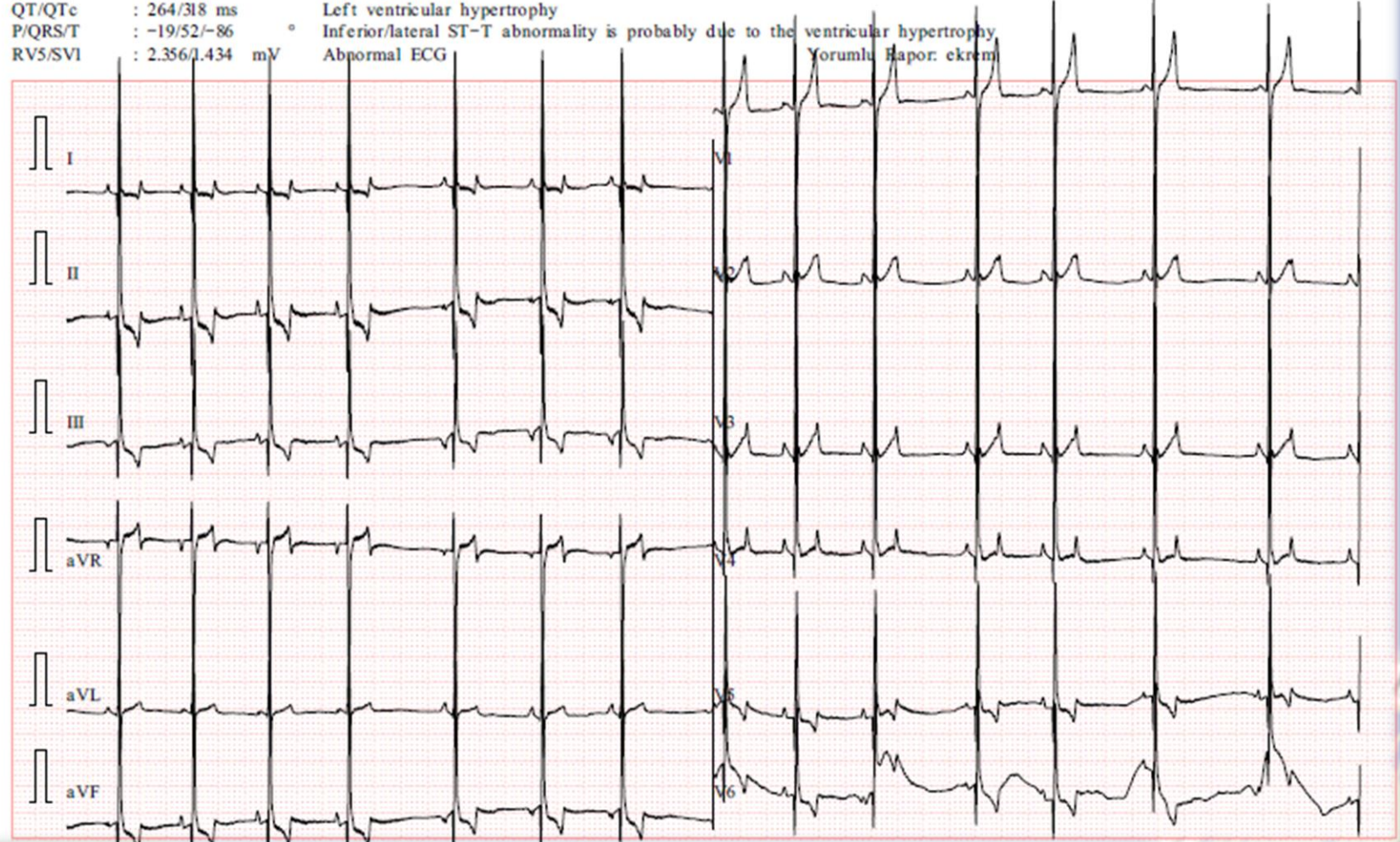


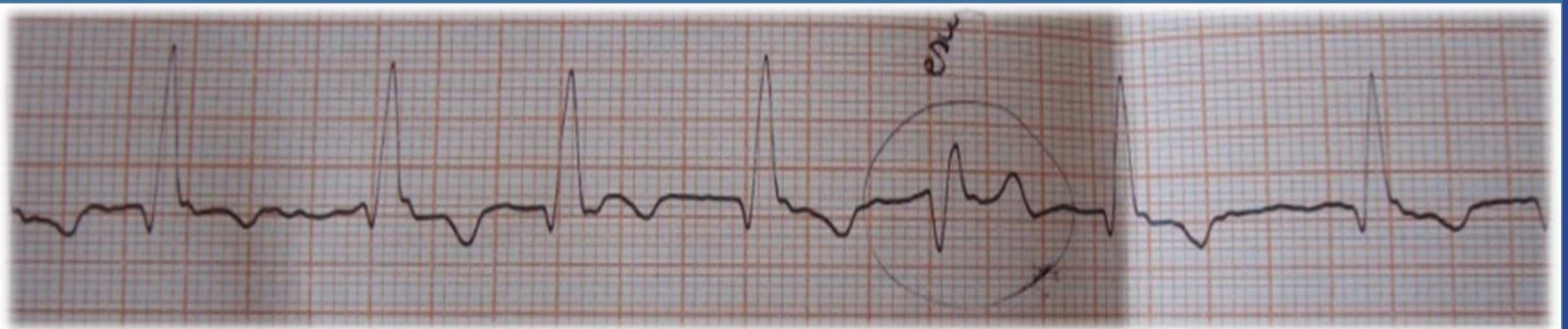


Ankara Univ Vet Fak Kardiyoloji Birimi EKG RAPORU

ID : 8 post 2yıl Erkek

| | | Teşhis Bilgisi |
|---------|------------------|--|
| HR | : 87 bpm | --- |
| P | : 76 ms | --- Interpretation based on pediatric criteria --- |
| PR | : 86 ms | Irregular ectopic atrial bradycardia |
| QRS | : 76 ms | Short QT interval |
| QT/QTc | : 264/318 ms | Left ventricular hypertrophy |
| P/QRS/T | : -19/52/-86 | ◦ Inferior/lateral ST-T abnormality is probably due to the ventricular hypertrophy |
| RV5/SVI | : 2.356/1.434 mV | Abnormal ECG |





50 mm/s, 10 mm/mV, II

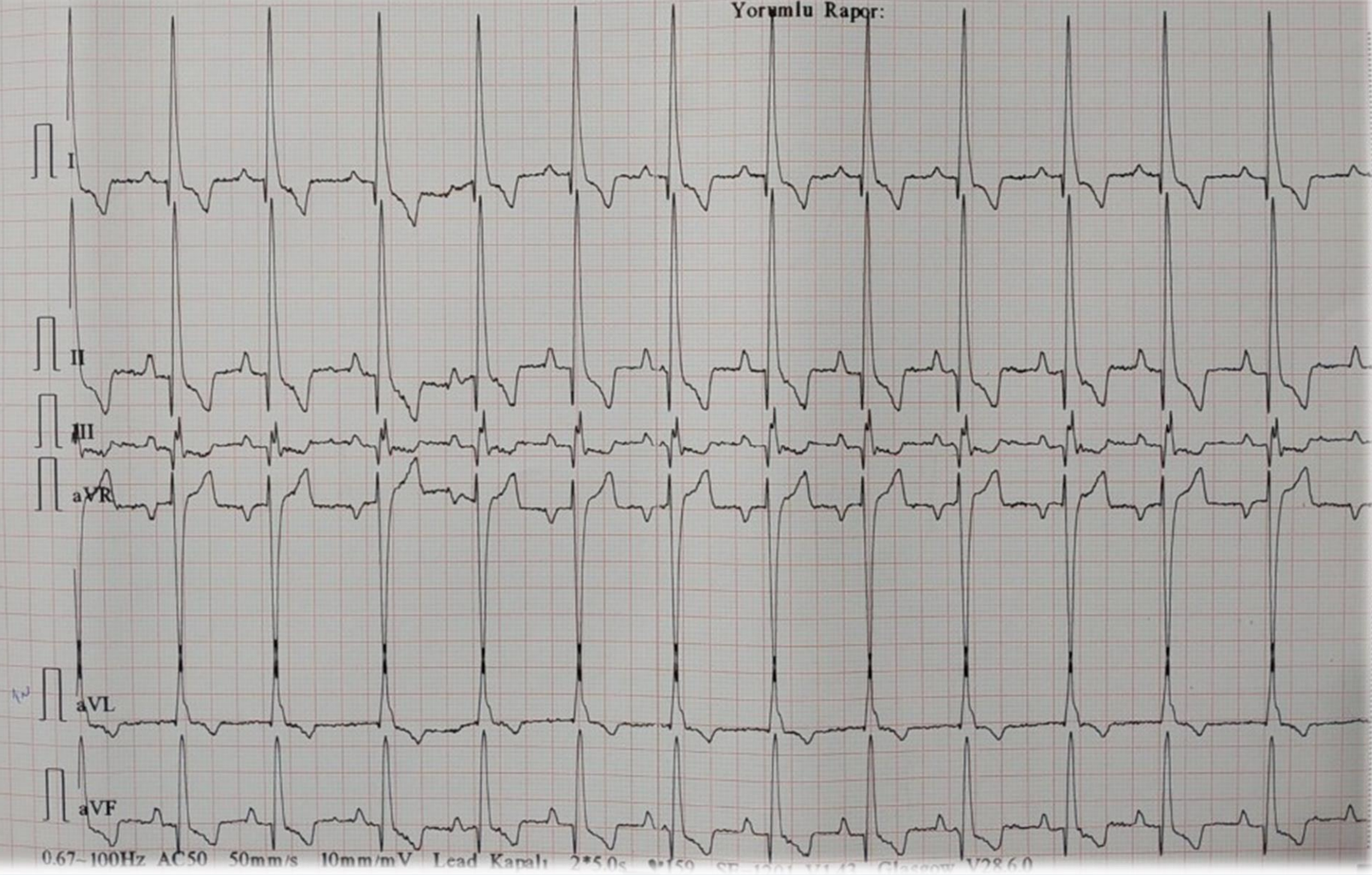




50 mm/s, 10 mm/mV

KV5/SV1 : 7° mV

Yorumlu Rapor:

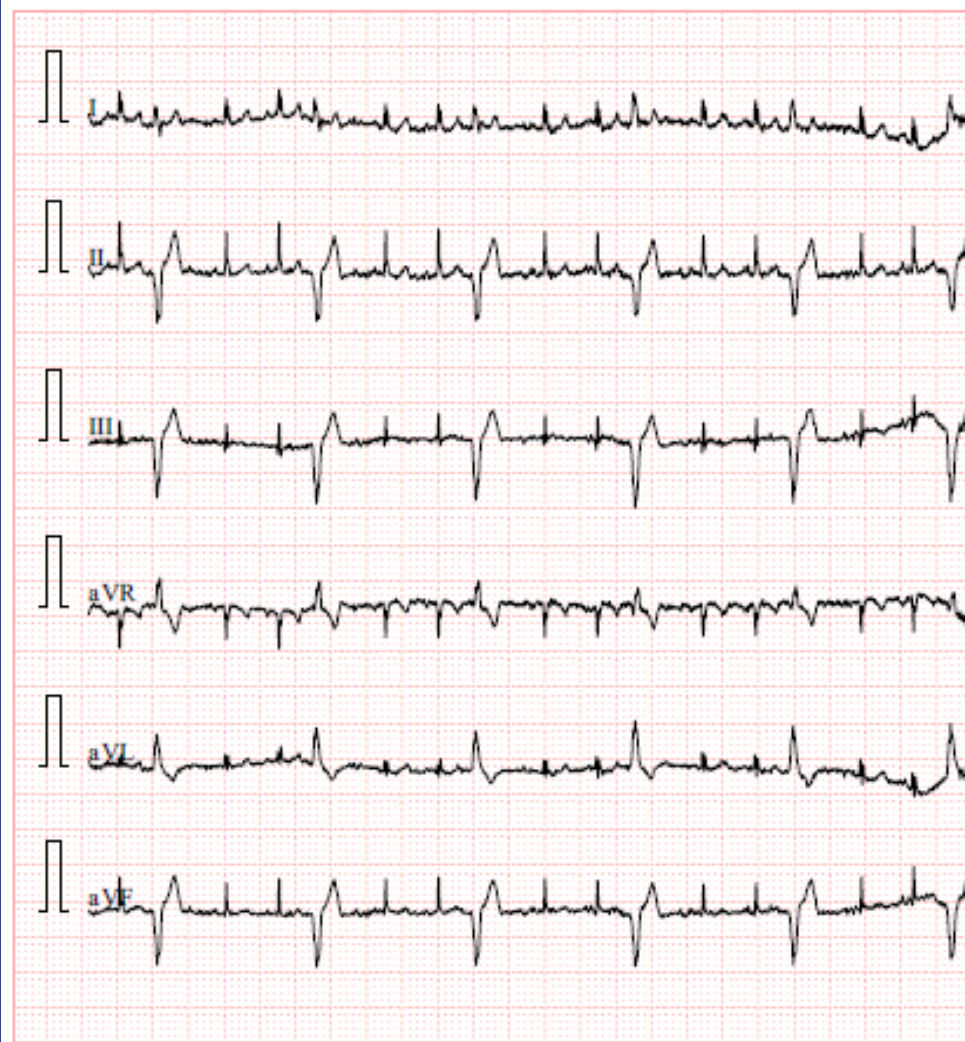


0.67-100Hz AC50 50mm/s 10mm/mV Lead Kapalı 2*5.0s *150 SP 100 31.62 Classon V28.60



ID : 6 banbam 4yil Erkek

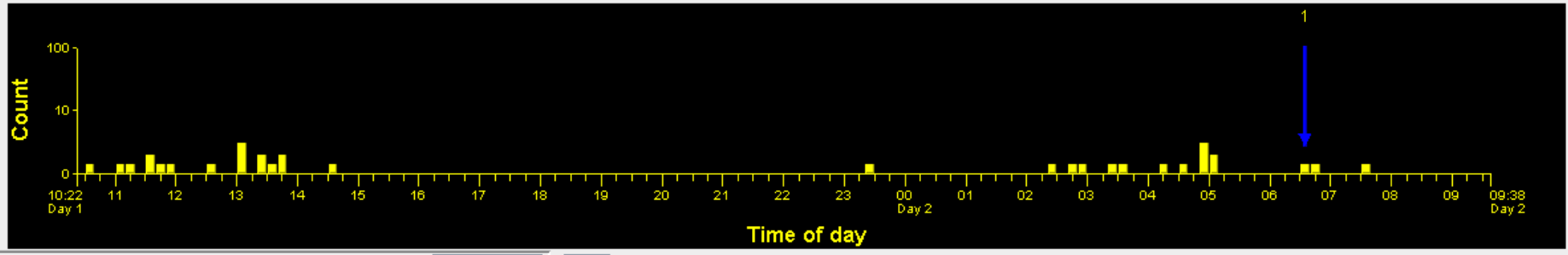
| | | |
|---------|---------------|--|
| HR | : 196 bpm | Teşhis Bilgisi |
| P | : 94 ms | --- Interpretation based on pediatric criteria --- |
| PR | : 104 ms | --- Technically unsatisfactory tracing --- |
| QRS | : 74 ms | Technical error |
| QT/QTc | : 248/437 ms | |
| P/QRS/T | : -132/50/-83 | ° |
| RV5/SVI | : */* mV | |





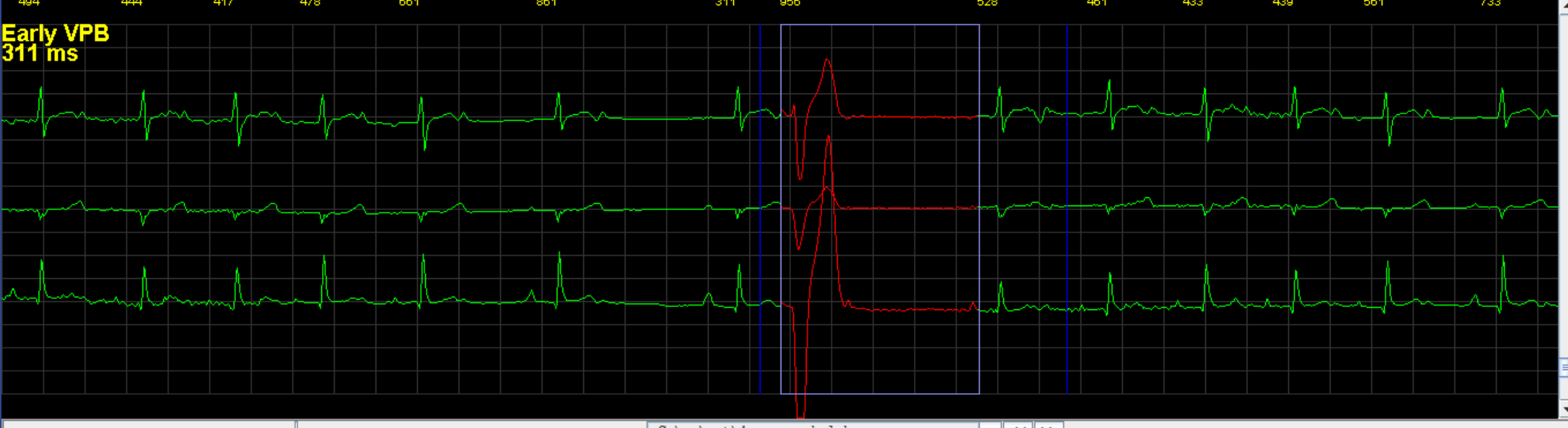
06:35:33,2-02 Scan Multiple Keep Sort 24 hours

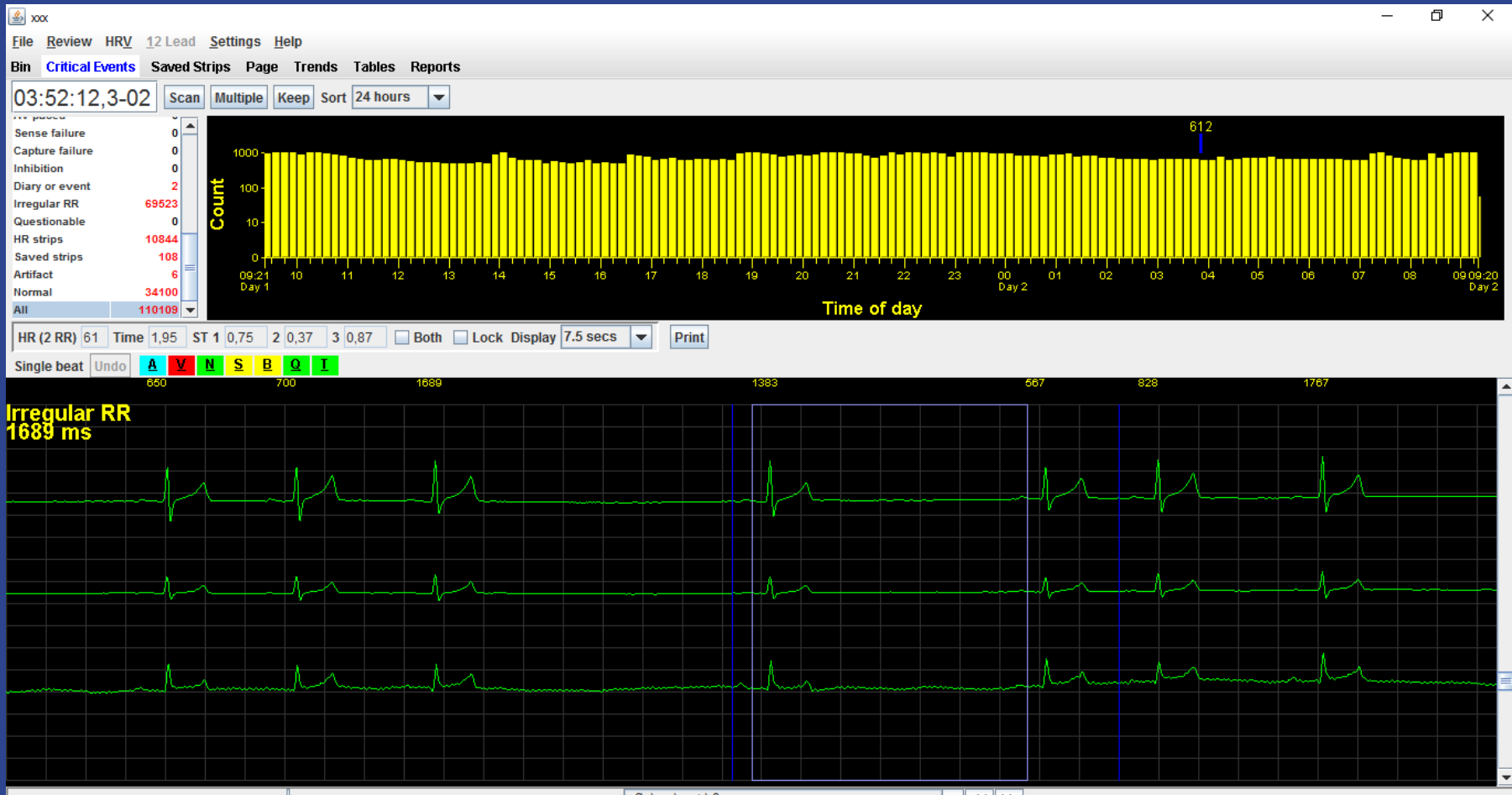
| | |
|---------------|-----|
| VPB | 42 |
| Early VPB | 33 |
| VPB pair | 1 |
| VTAC | 0 |
| Bigeminy | 4 |
| Trigeminy | 0 |
| Quadrigeminy | 0 |
| R on T | 81 |
| SVPB | 194 |
| SVPB pair | 31 |
| SVT | 203 |
| Abnormal SVPB | 0 |



HR (2 RR) 80 Time 1,48 ST 1 -0,75 2 0,37 3 -1,37 Both Lock Display 7.5 secs Print

Single beat Undo A V N S B Q I 2 Pair 3 Run





Cardiac Disease

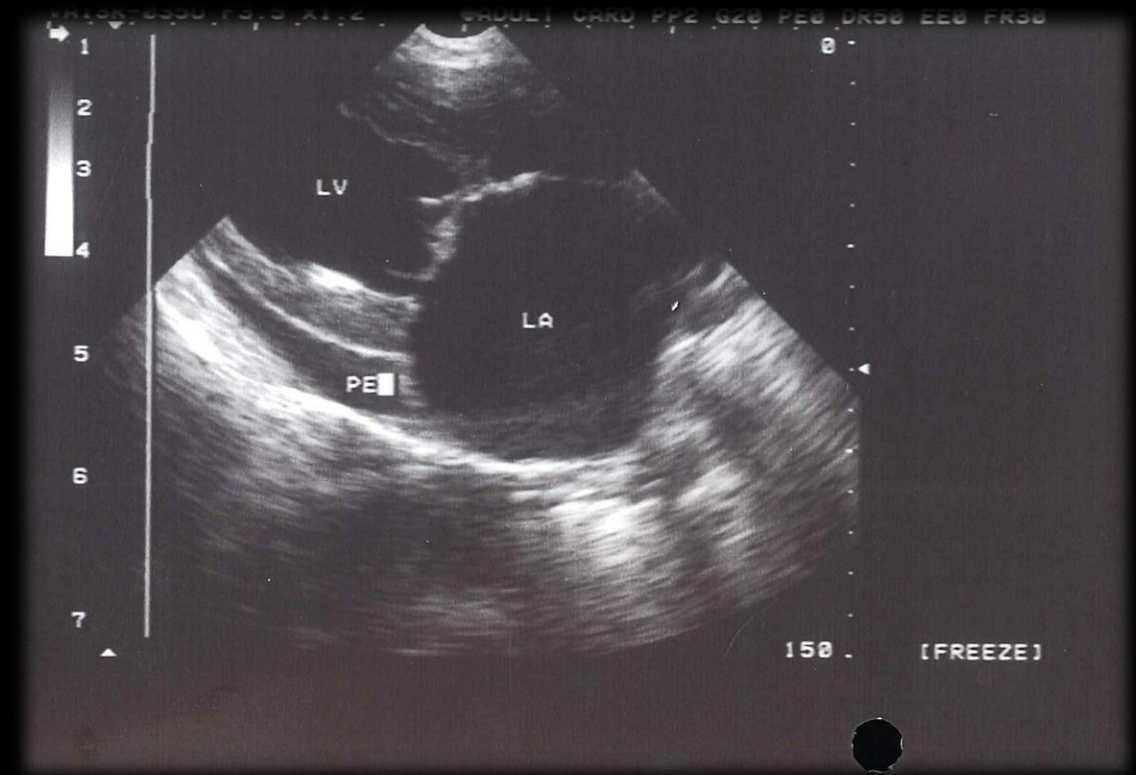
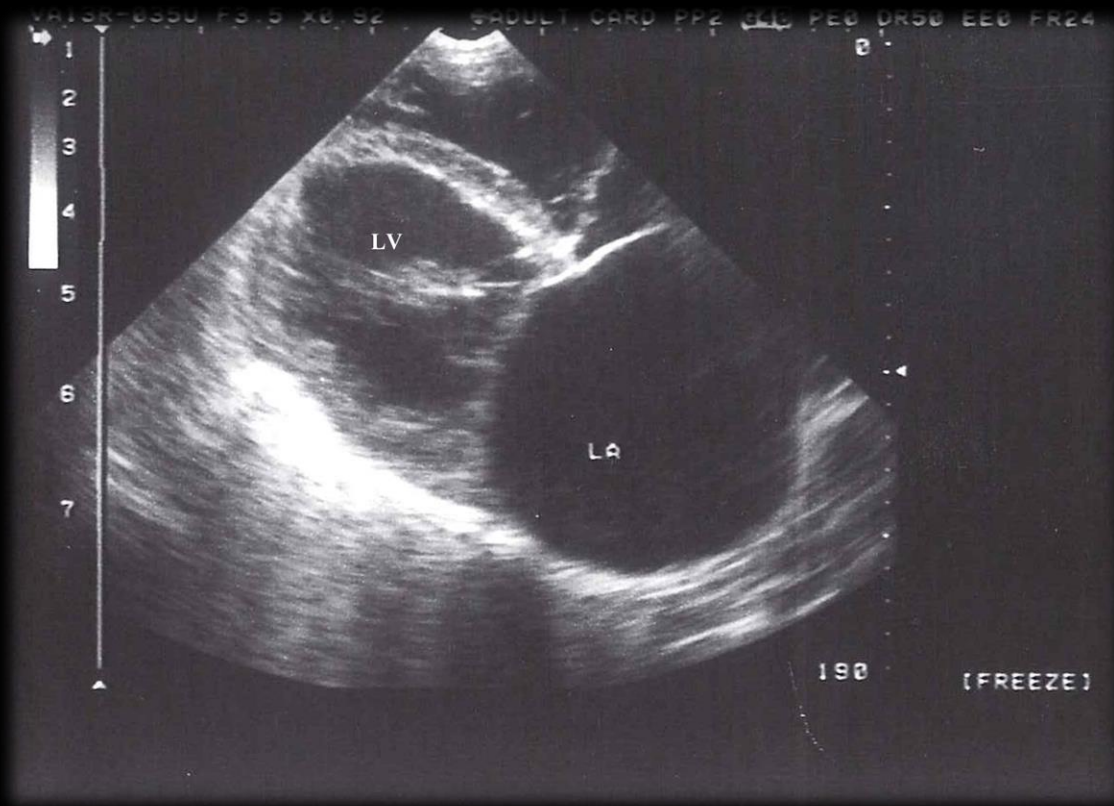
| CLASSIFICATION | DEGREE OF SEVERITY |
|--|---|
| Modified AHA/ACC Heart Failure Staging System | |
| A | No apparent structural disease, yet considered "at risk" for developing heart disease (for example, breed-associated risk for DCM in Doberman Pinschers, and CMVD in Cavalier King Charles Spaniels) |
| B | Structural cardiac abnormality is evident (such as a murmur), but no clinical signs of heart failure have occurred |
| B1 | Asymptomatic disease, with no/minimal radiographic or echo evidence of cardiac chamber enlargement/remodeling |
| B2 | Asymptomatic disease, but cardiac chamber enlargement is evident |
| C | Structural cardiac abnormality evident, with clinical signs of heart failure either in the past (resolved with therapy) or currently present Note: Some clinicians subdivide stage C based on current signs of CHF into C1 – No current signs; C2 – mild congestive signs (low/medium grade); C3 – overt/severe CHF (high grade) |
| D | Persistent or end-stage heart failure signs, refractory to standard therapy (e.g., require \geq 8-12 mg/kg/day of furosemide) |

Common Causes of Congestive Heart Failure (CHF)

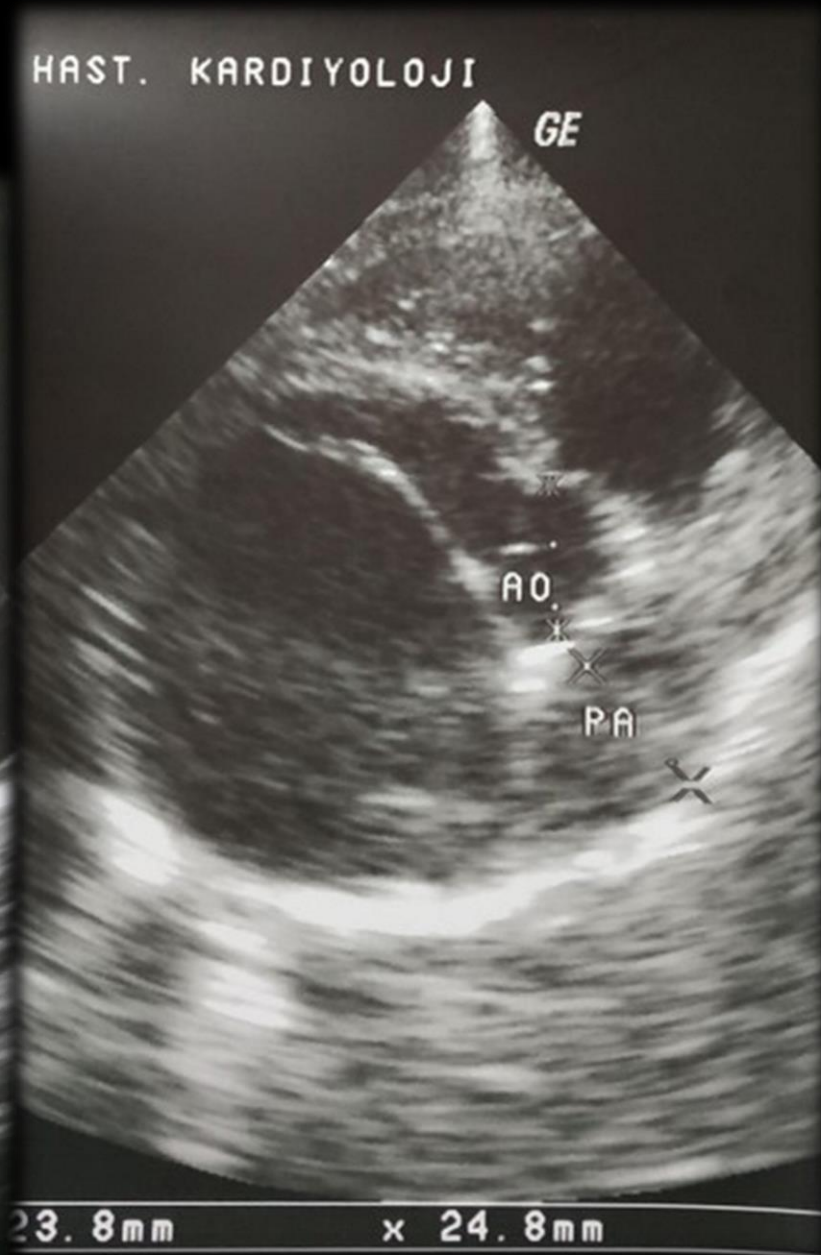
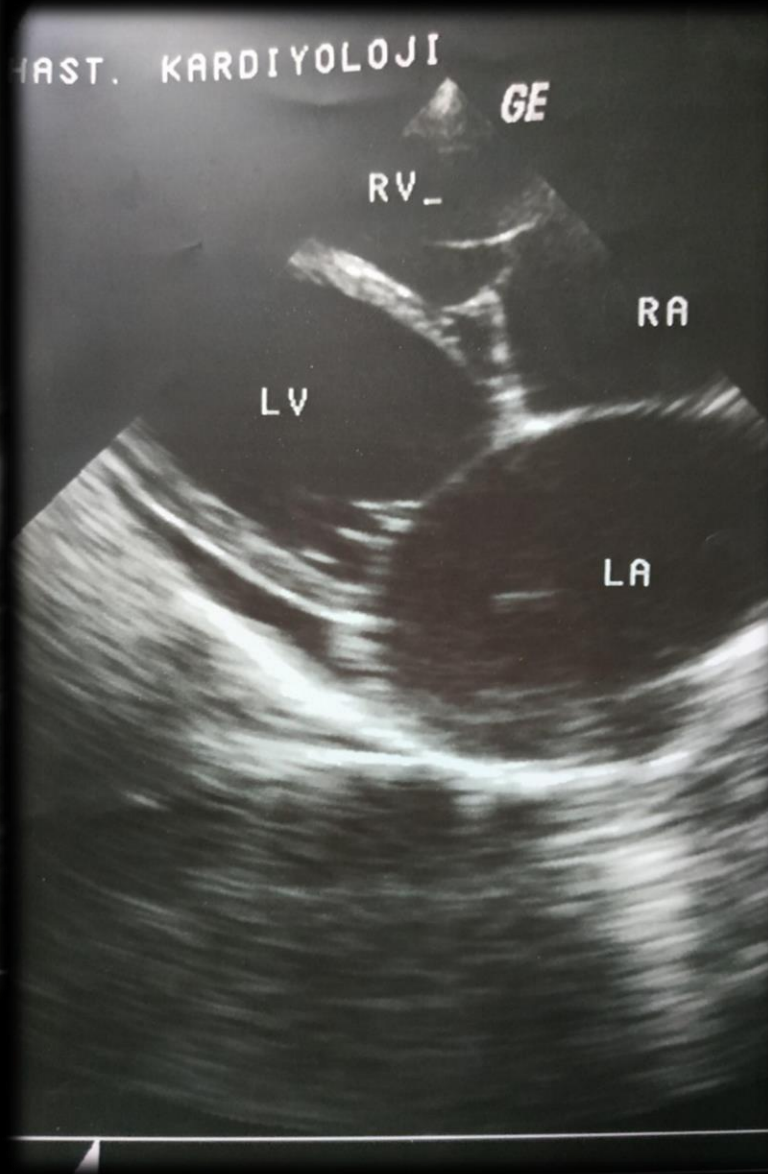
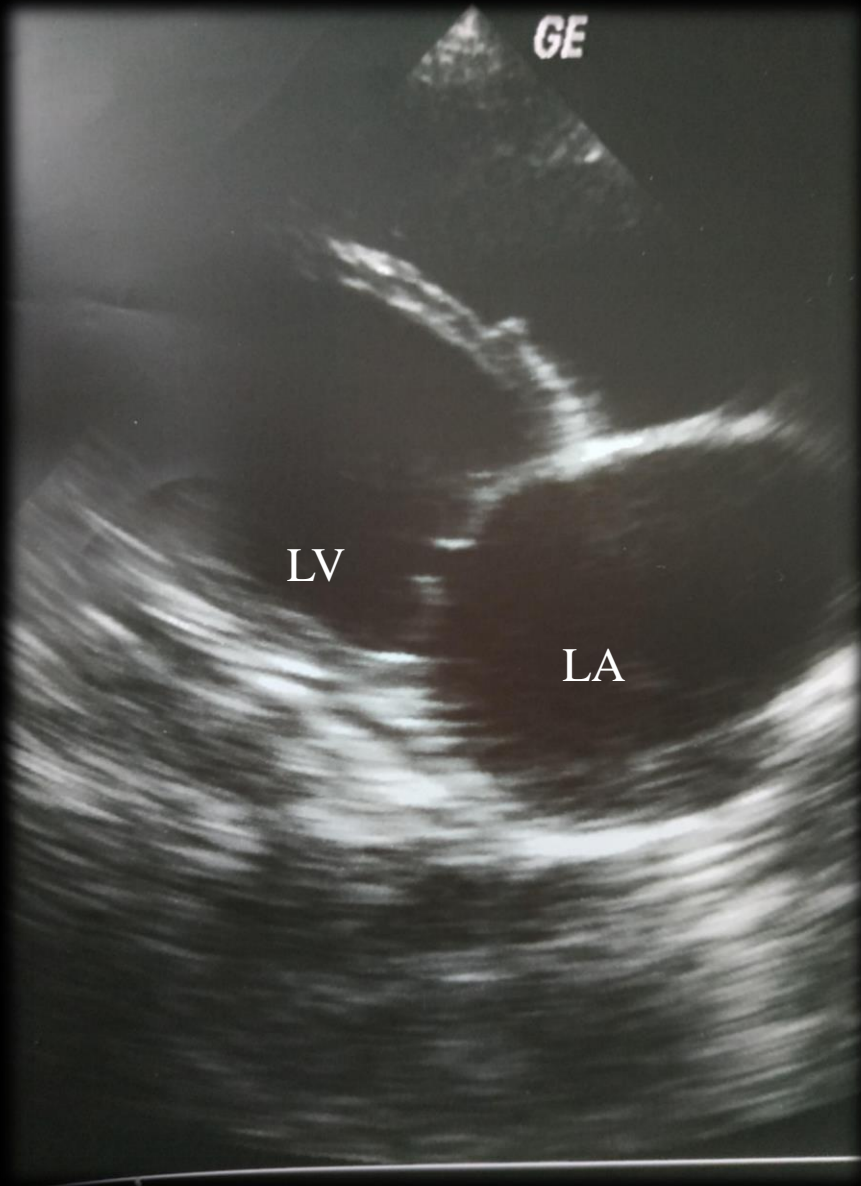
| MAJOR PATHOPHYSIOLOGY | TYPICAL CHF MANIFESTATION* |
|---|----------------------------|
| Myocardial Failure | |
| Idiopathic dilated cardiomyopathy | Either L- or R-CHF |
| Infective myocarditis | Either L- or R-CHF |
| Drug toxicities (e.g., doxorubicin) | L-CHF |
| Myocardial ischemia/infarction (rare) | L-CHF |
| Volume-Flow Overload | |
| Mitral valve regurgitation (degenerative, congenital, infective) | L-CHF |
| Aortic regurgitation (infective endocarditis, congenital) | L-CHF |
| Ventricular septal defect | L-CHF |
| Patent ductus arteriosus | L-CHF |
| Tricuspid valve regurgitation (degenerative, congenital, infective) | R-CHF |
| Tricuspid endocarditis (rare) | R-CHF |
| Chronic anemia | Either L- or R-CHF |
| Thyrotoxicosis | Either L- or R-CHF |
| Pressure Overload | |
| (Sub)aortic stenosis | L-CHF |
| Systemic hypertension | L-CHF (rare) |
| Pulmonic stenosis | R-CHF |
| Heartworm disease | R-CHF |
| Pulmonary hypertension | R-CHF |
| Impaired Ventricular Filling | |
| Hypertrophic cardiomyopathy | L- \pm R- CHF |
| Restrictive cardiomyopathy | L- \pm R- CHF |
| Cardiac tamponade | R-CHF |
| Constrictive pericardial disease | R-CHF |



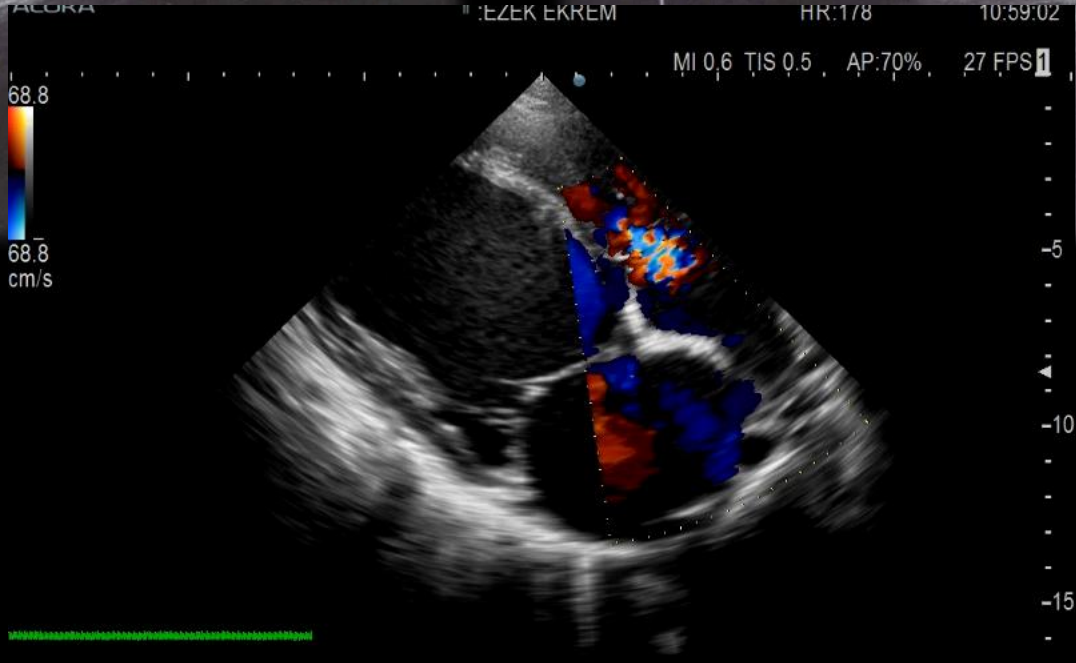
Echocardiographic diagnosis-DCM



Dobi, 10 years old, female

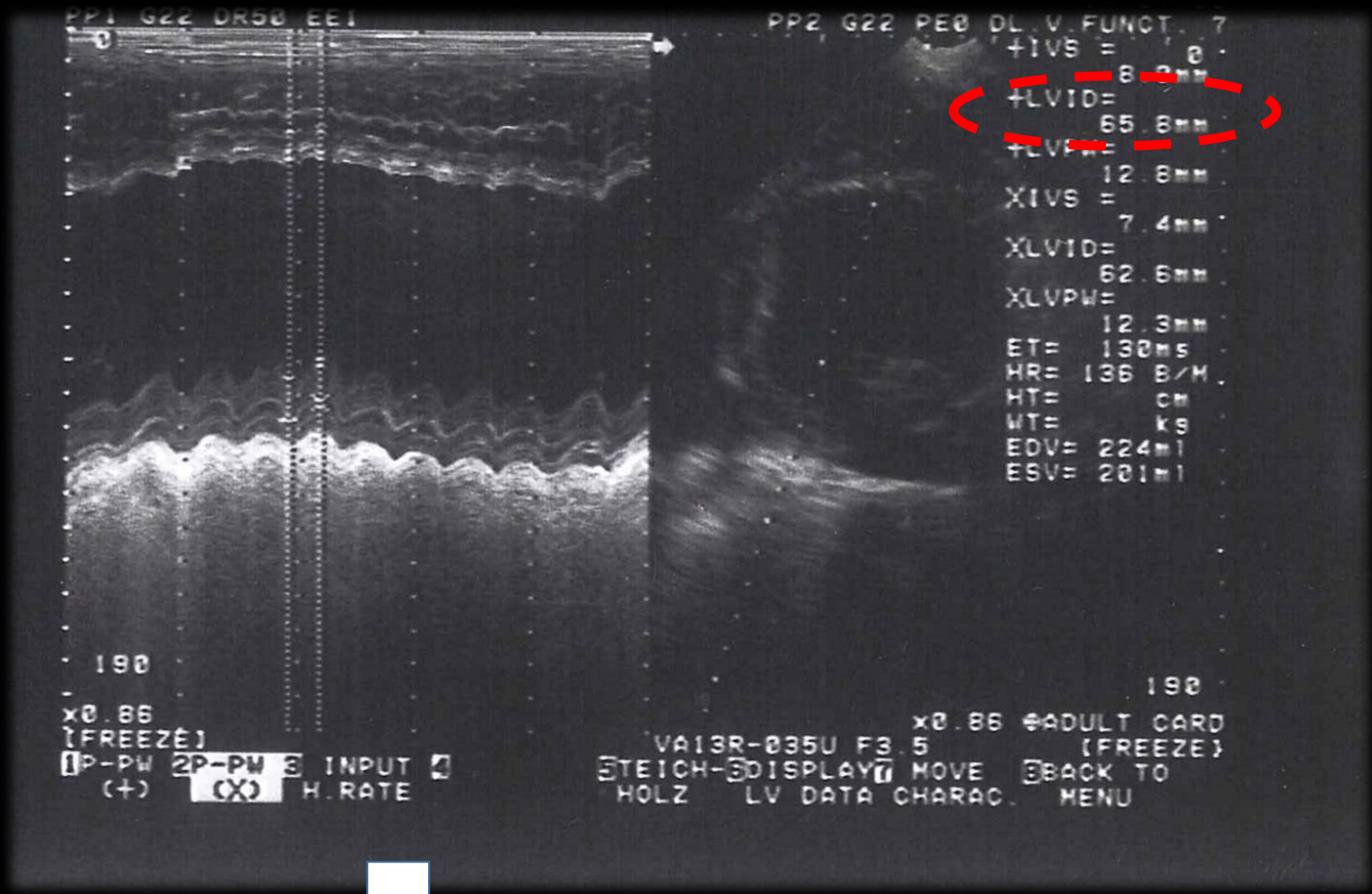


Kangal, 11 yo, Male

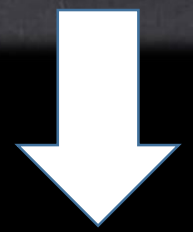


FmT-1.7S R:17.0 BG:60 BD:78
4.5k/2.50MHz CG:100
Adult Heart Probe:S211

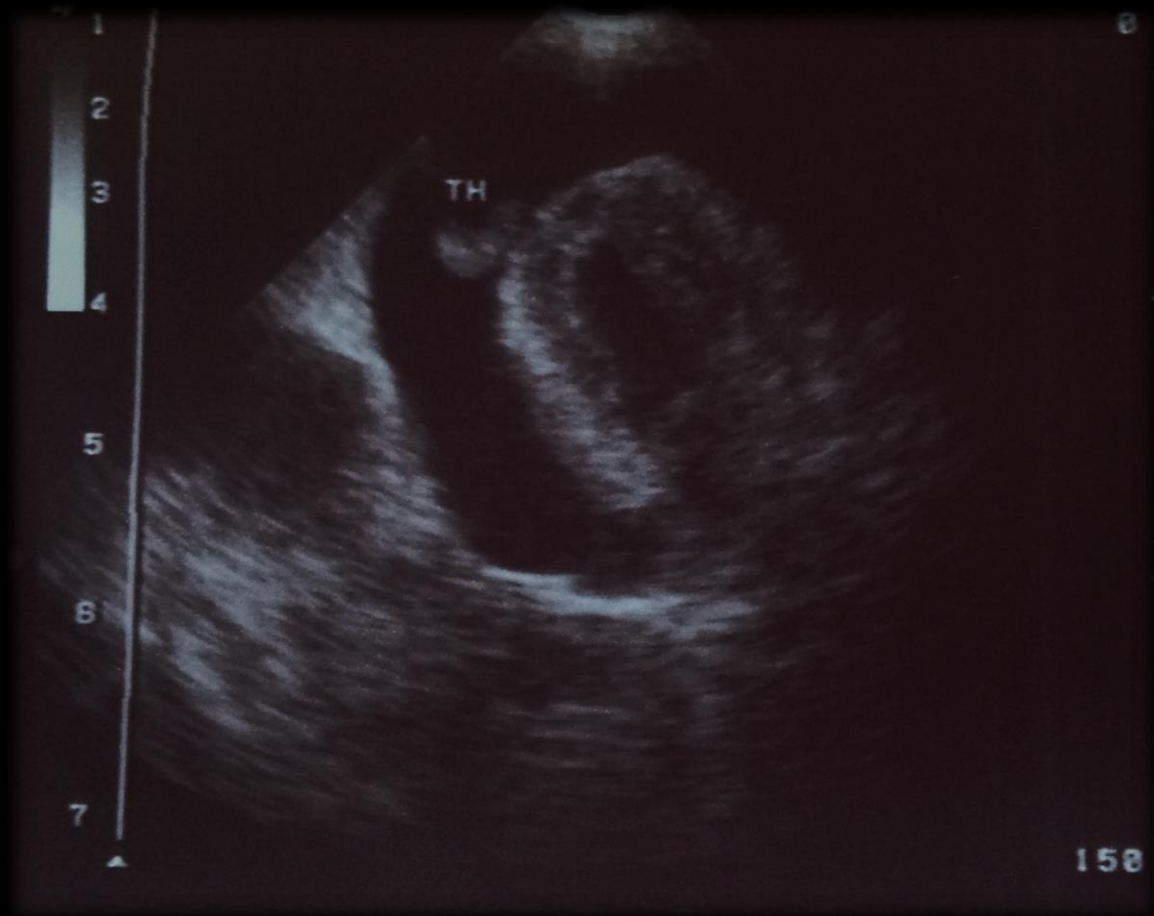
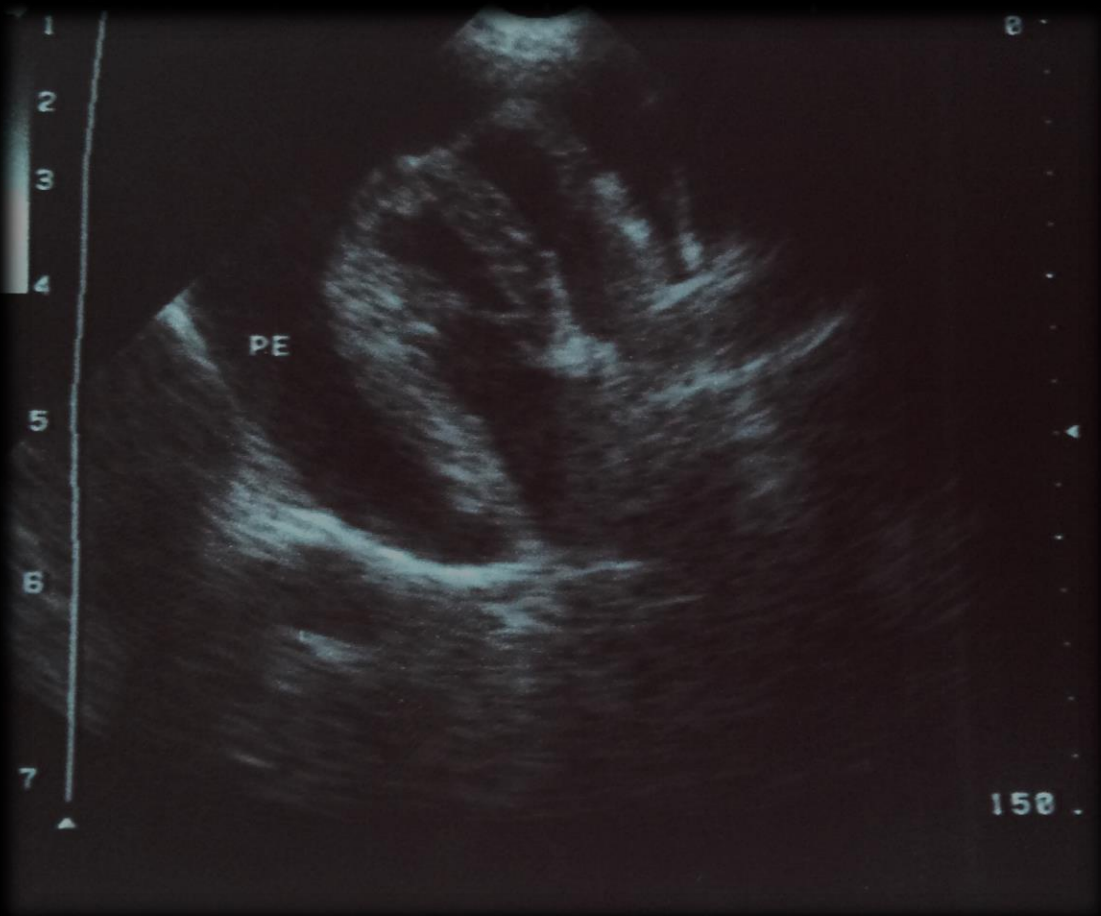
198 [FREEZE]



FS, EF, CO



LVIDd < 40 mm



Echo Diagnosis-HCM

< 20g

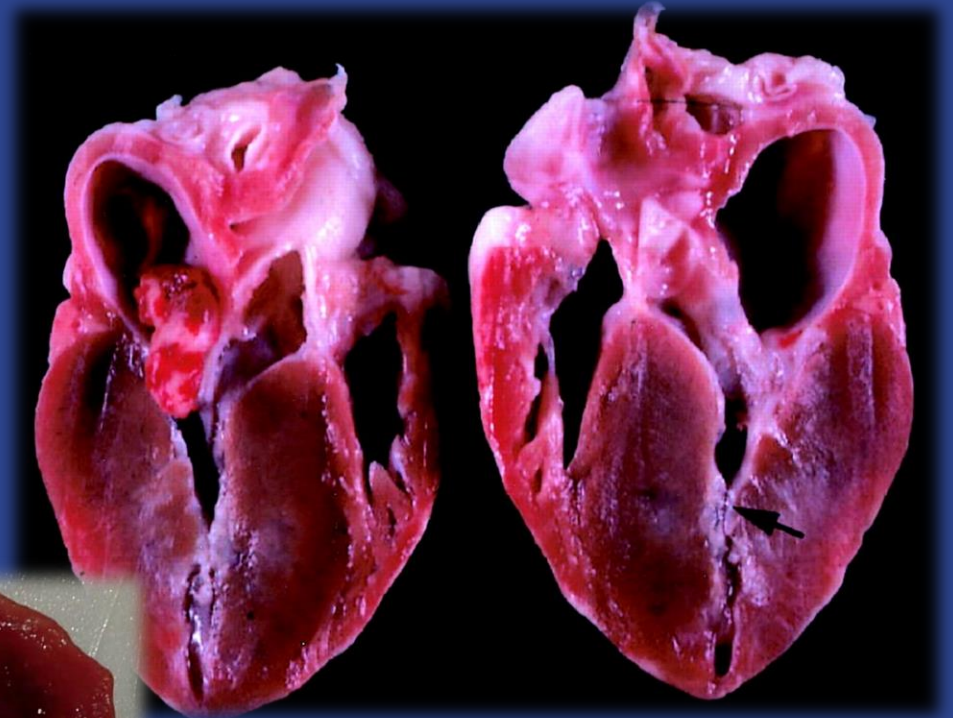
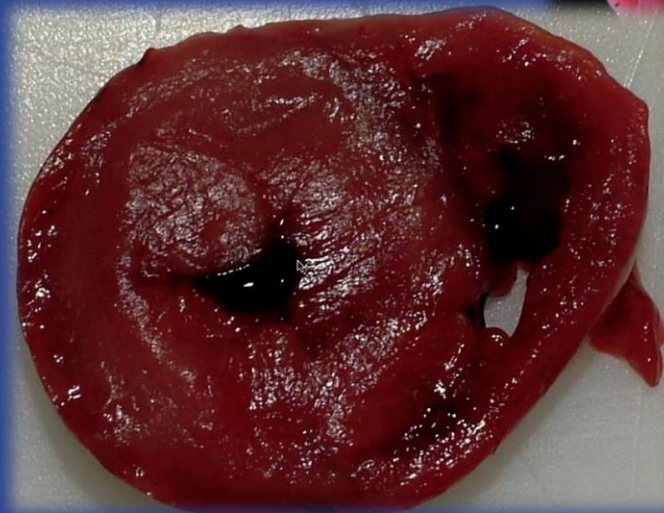
HCM

HOCM

HOCM

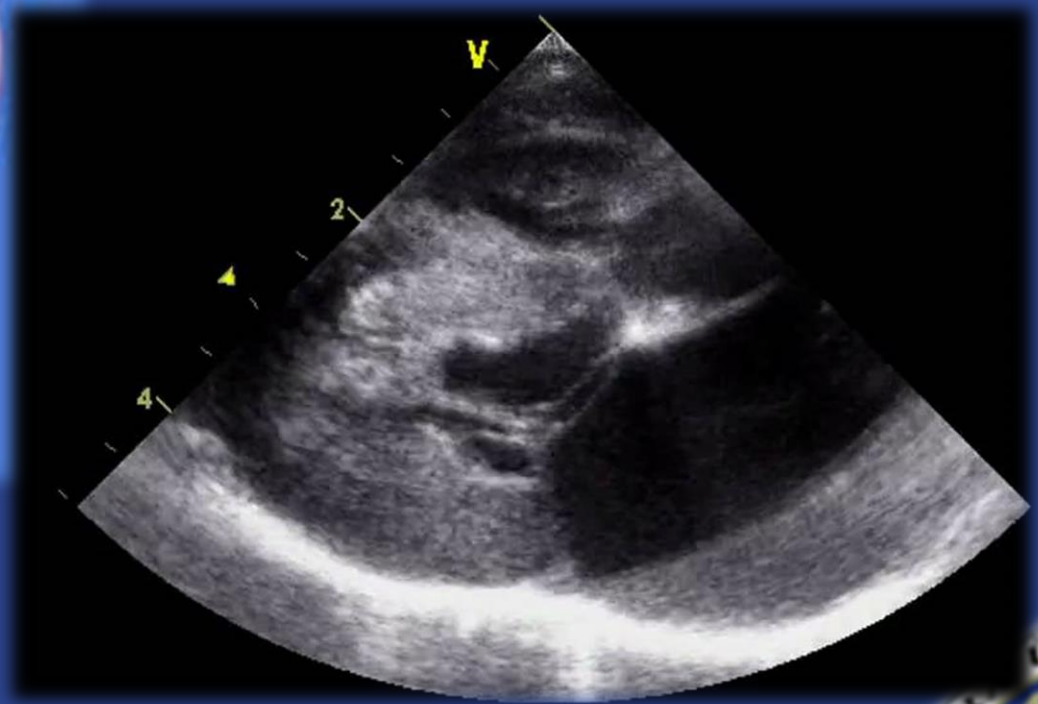
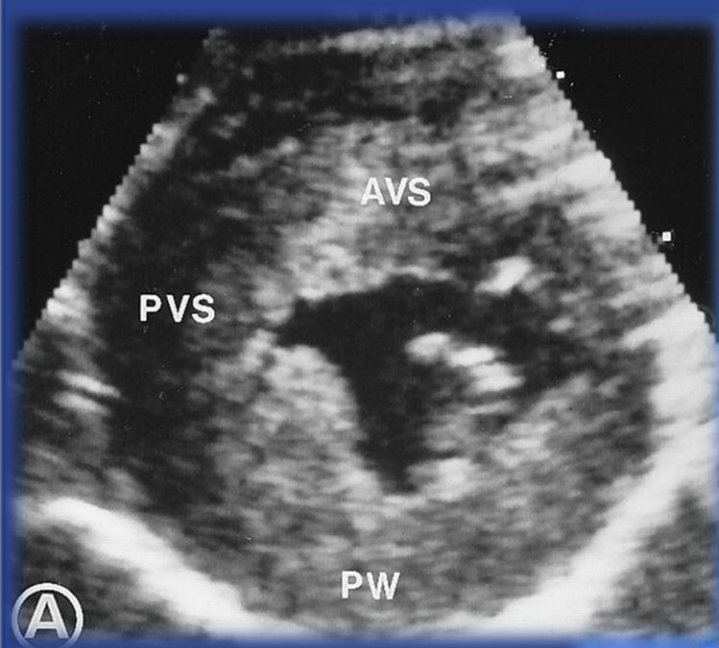


29-37g



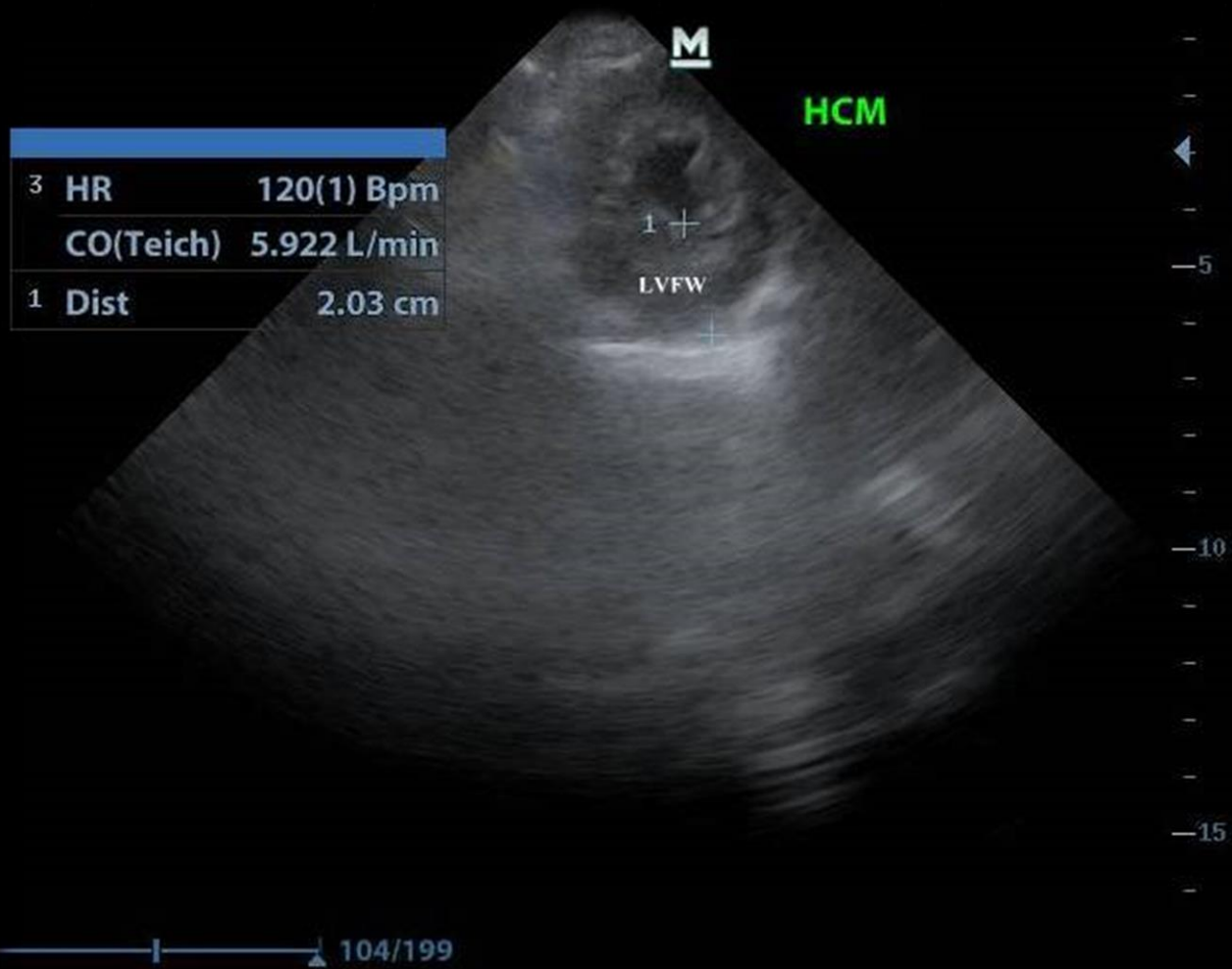
• Genetik





- LVFWd < 6 mm





| | | |
|---|-----------|-------------|
| 3 | HR | 120(1) Bpm |
| | CO(Teich) | 5.922 L/min |
| 1 | Dist | 2.03 cm |

Cardiac
B
F H3.6M
D 16.6
G 20
FR 40
DR 135
iClear 4

Treatment

- Diuretic (*1-4 mg/kg ya da >*)
 - Furosemid
 - Spironolaktone
 - Tiazides
- Pimobendan
- Dopamin (*2-8 mcg/kg/dk*)
- ACEI (Lisinopril, enalapril)
- AF
 - Digoxin (*0.003 mg/kg*)
 - Aspirine (*10 mg/kg BID*)
 - Diltiazem (*0.5-2 mg/kg*)
- O₂
- Fluid therapy (*30-40 ml/kg/gün*)
- Restriction of severe exercise
- Feeding supplements (Taurin, l-carniten, etc)



Treatment

- Heparine (220 U/kg),
- Clopidogrel ($18.75/\text{ledi}$)
- Butarphenol ($0.1-1.0 \text{ mg/kg}$)
- Hospitalization



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