Radiographic Detection of Canine Cardiomegaly

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Question: Is the heart really enlarged?
Thoracic conformation and heart shape vary considerably between breeds. Use an objective measure, such as vertebral heart score, and also consider breed variation when deciding whether the heart is enlarged.

No

Cardiac silhouette is not enlarged

Consider other factors that could result in increased heart size:
- Chronic anemia
- Fluid overload
- Athleticism
In addition, consider results of other diagnostic tests, such as hematology and serum biochemical profiles, and the patient’s history (e.g., recent fluid therapy, athletic history).

No

Cardiac silhouette is enlarged

Question: Is cardiac disease present?
Cardiomegaly is not always a consequence of cardiac disease; consider other factors that may be responsible for increased heart size.

No

Yes

Consider other factors that could result in increased heart size:
- Chronic anemia
- Fluid overload
- Athleticism
In addition, consider results of other diagnostic tests, such as hematology and serum biochemical profiles, and the patient’s history (e.g., recent fluid therapy, athletic history).

Question: Is the cardiomegaly detected predominantly left-sided, right-sided, or generalized?
Thoracic radiographs cannot reliably determine individual chamber enlargement; the best test to determine chamber enlargement is echocardiography.

Mainly right-sided enlargement

Question: Is the patient more likely to have congenital or acquired disease?
Young dogs usually have congenital disease while older dogs typically have acquired disease.

CONGENITAL diseases leading to right-sided enlargement include:
- Pulmonic stenosis
- Tricuspid dysplasia
- Some shunting defects, especially those leading to pulmonary hypertension (e.g., VSD, ASD, PDA)

Differentiate with echocardiography

ACQUIRED diseases leading to right-sided enlargement include:
- Tricuspid insufficiency
- Pulmonary hypertension secondary to pulmonary vascular or respiratory disease

Differentiate with:
- Echocardiography
- Evaluate for respiratory disease
- Evaluate for Dirofilaria or Angiostrongylus vasorum (Europe)

Question: If the disease is predominantly affecting the right side of the heart, is there evidence of right-sided congestive heart failure (e.g., ascites and/or pleural effusion)?
Detection is assisted with physical examination, radiography, and abdominal ultrasound.
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**Investigation**

**Diagnosis**

**Result**

**Generalized enlargement or rounding of the cardiac silhouette**

**Generalized cardiac enlargement** may result from the heart being enlarged by diseases with right- and left-sided involvement. Another important consideration is pericardial disease, which is readily differentiated from other cardiac diseases using echocardiography.

**Question: What type of pericardial disease may be present?**

**CONGENITAL diseases** affecting the pericardium include:
- Pericardioperitoneal diaphragmatic hernia (PPDH)
- Pericardial cysts

**ACQUIRED diseases** affecting the pericardium include:
- Pericardial effusion, which is often idiopathic or secondary to neoplasia
- Restrictive pericardial disease may also occur but does not lead to cardiomegaly.

**Difference with echocardiography**

If pericardial disease causes signs of congestive heart failure to develop, the signs are usually those of right-sided heart failure.

**Question: Is there evidence of right-sided congestive heart failure (e.g., ascites and/or pleural effusion)?**

Detection is assisted with physical examination, radiography, and abdominal ultrasound.

**Mainly left-sided enlargement**

In the light of signalment, history, and physical examination, consider diseases that are likely to cause left-sided enlargement.

**Question: Is the patient more likely to have congenital or acquired disease?**

Young dogs usually have congenital disease while older dogs typically have acquired disease.

**CONGENITAL diseases** leading to left-sided enlargement include:
- PDA
- Mitral valve dysplasia
- VSD
- Aortic stenosis (more likely to cause concentric hypertrophy, which is not as evident on radiographs)

**ACQUIRED diseases** leading to left-sided enlargement include:
- Mitral insufficiency
- Dilated cardiomyopathy

These are the 2 most common acquired cardiac diseases in dogs. Prognosis for mitral valve disease seems to be associated with degree of cardiomegaly.

**Differentiate with echocardiography**

**Question: If disease is predominantly affecting the left side of the heart, is there evidence of left-sided congestive heart failure (i.e., dyspnea caused by pulmonary congestion and edema)?**

Detection is assisted by physical examination and radiography.

AGD = atrial septal defect; PDA = patent ductus arteriosus; VSD = ventricular septal defect

This algorithm can be downloaded and printed for use in your clinic at cliniciansbrief.com.