

Computed tomographic assessment of a systemic to pulmonary shunt mimicking a persistent ductus arteriosus in a dog

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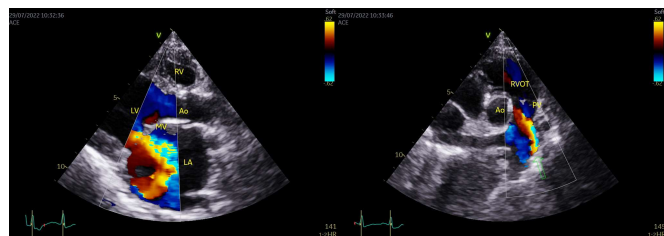
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CASE PRESENTATION

A 6-years-old female neutered French Bulldog was presented with clinical signs compatible with left-sided congestive heart failure. At physical examination the dog presented a grade 3/6 continuous heart murmur over the left heart base.

Echocardiography showed severe left-sided volume overload with atrial and left ventricular dilation, and retrograde continuous blood flow with a maximum velocity of 3.5 m/s in the left mainstem pulmonary artery, thought to be consistent with left to right shunting ductal arterial flow.



A computed tomography (CT) angiography was performed for further evaluation. Images of the thorax were obtained with a Toshiba Aquilion CT 64-slice™ scanner with a slice thickness of 500 µm, before and after injection of 2 mL/kg of iodinated contrast medium (Omnipaque®).



Fig. 3. Network of aberrant vessels around trachea and oesophagus

CONCLUSION

In conclusion, arteriovenous shunts should be considered a possible diagnosis in a dog with a low-intensity continuous murmur. CT-angiography can be a useful tool for both diagnosis and surgical planning of this clinical condition.

CT-ANGIOGRAPHY FINDINGS

An enlarged right broncho-oesophageal artery originates of the 6th right intercostal artery and forms a dense complex network of tortuous vessels that surrounds the trachea and oesophagus along their entire length. A larger vessel arises from the network, making a few loops before merging into the left main pulmonary artery. The enlarged vessels surrounding the caudal part of the oesophagus end in a dilated left gastric artery.

Systemic-to-pulmonary fistulae with presence of extensive oesophageal varices were diagnosed.

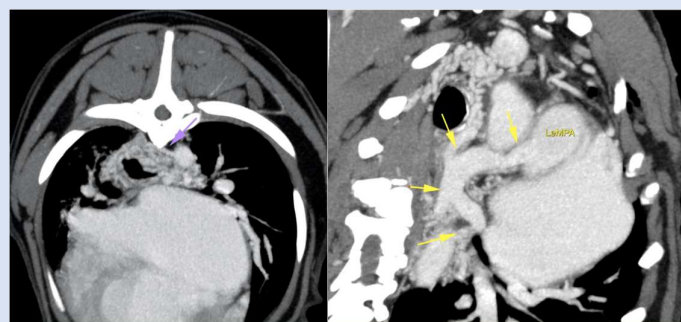


Fig. 1. Enlarged right broncho-oesophageal artery (arrow)

Fig. 2. Larger aberrant vessel entering the left main pulmonary artery (arrows)

DISCUSSION

The characteristics of this vascular anomaly are similar to those observed in PDA: a continuous murmur at the left base of the heart and echocardiographic signs of left heart volume overload with retrograde systolic-diastolic flow in the pulmonary artery. Other differential diagnoses include aortopulmonary shunts, aorticopulmonary window and coarctation of the aorta, although they are relatively rare compared with PDA's in dogs. Even though echocardiography is an effective test to identify a left-to-right shunt, both a PDA and a systemic-to-pulmonary shunt demonstrate the same bi-dimensional characteristics. For this reason, the use of CT, that allowed three-dimensional visualization of the shunt, can make it possible to differentiate a PDA from another vascular anomaly.



Fig. 4. 3D reconstruction of vascular anomalies

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