



REPORTING SERVICE: CT

Report number: VETCT-961

Report date: 14/02/2013

Referring Veterinarian: Dr

Referring Practice: XXX

Email address: info@vetctspecialists.com

Owner: XX

Patient: Fred

Species: Feline Breed: Chinchilla

Sex: Male Entire

Age: 11 months

Previous report number: VETCT-960

Clinical History:

11-month-old male DSH cat that has had a history of regurgitation since being weaned. The cat has lived with the problem until now when it has developed a swelling in the ventral cervical region just cranial to the thoracic inlet and has presented in an emaciated body condition. A barium swallow done by the referring vets has shown an oesophageal obstruction level with the cranial aspect of the cardiac silhouette. Have performed a CT thoracic angiogram to ascertain if a vascular ring anomaly is encircling the oesophagus.

Questions to be answered:

Is this consistent with a vascular ring anomaly? Is there a persistent right aortic arch? Knowledge required to help determine which approach R vs L thoracotomy??

Number of series / images: 5 / 601

Study dated: 14/02/2013

Study received: 14/02/2013

Anatomic regions: Thorax

Details of study and technical comments:

A CT study of the thorax is available for interpretation. The study consists of pre and post-contrast images processed with soft tissue and bone filters with 0.625 and 5mm slices. The study is of diagnostic quality

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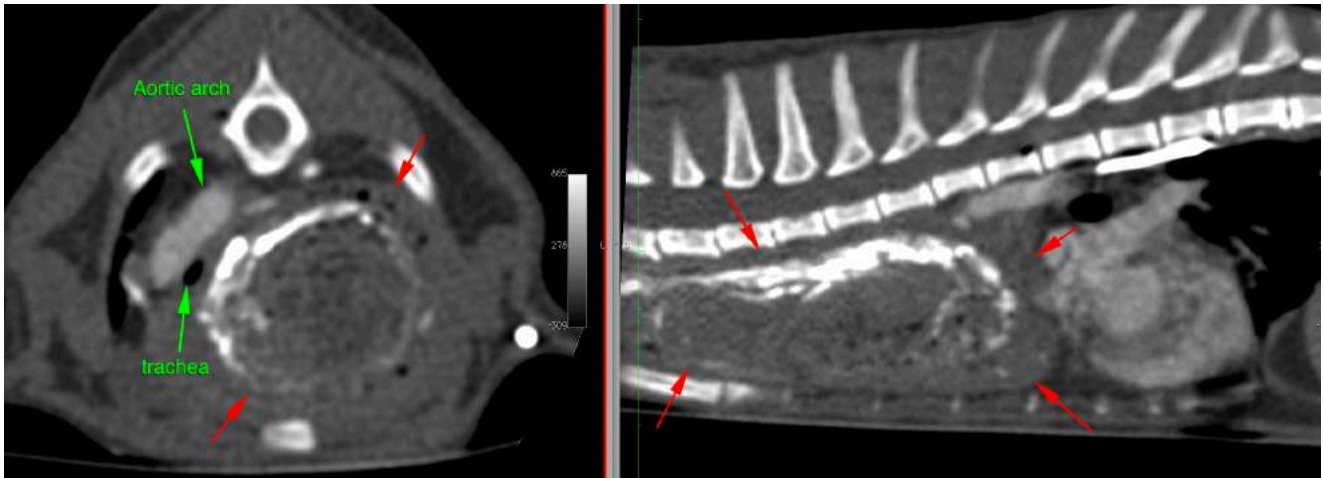
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This report is based on the available history and radiographic interpretation only and not on a physical examination of the patient. It must therefore only be interpreted by a currently licensed and registered veterinary surgeon responsible for the care of this patient.

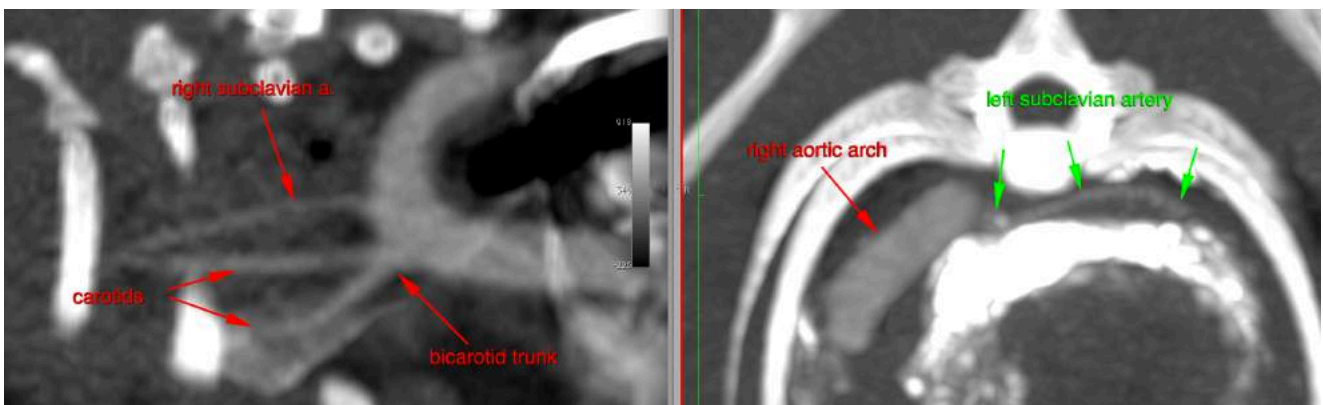
Diagnostic interpretation:

There is severe dilation of the oesophagus cranial to the heart base (image below, red arrows). Caudally, the oesophagus is normal. The distended oesophagus measures up to 4 cm in diameter and occupies almost the entire cranial mediastinum, causing severe displacement and compression of the trachea to the right. The tracheal diameter is particularly narrowed at the level of T5, where it is compressed between the aortic arch and the oesophagus (image below, left).



The aortic arch is located on the right side of the oesophagus, indicating the persistence of the right aortic arch. The branches of the aortic arch cannot be evaluated in detail due to the limited amount of contrast within them, probably due to vascular compression caused by the oesophagus. The anatomical distributions of the branches, is however anomalous (images below):

- The first branch is a bicarotid trunk, which divides immediately after its origin into the two carotids. This branch should normally be a brachiocephalic trunk.
- The second branch is the right subclavian, which should originate from the brachiocephalic trunk. Its anatomical location is otherwise normal.
- The third branch is the left subclavian (as expected). However its trajectory is abnormal. It crosses from the right aortic arch to the left side of the cranial mediastinum over the oesophagus.



The oesophageal compression is located at the heart base itself, and the left subclavian artery does not cause indentation or decrease in compression of the oesophageal lumen.

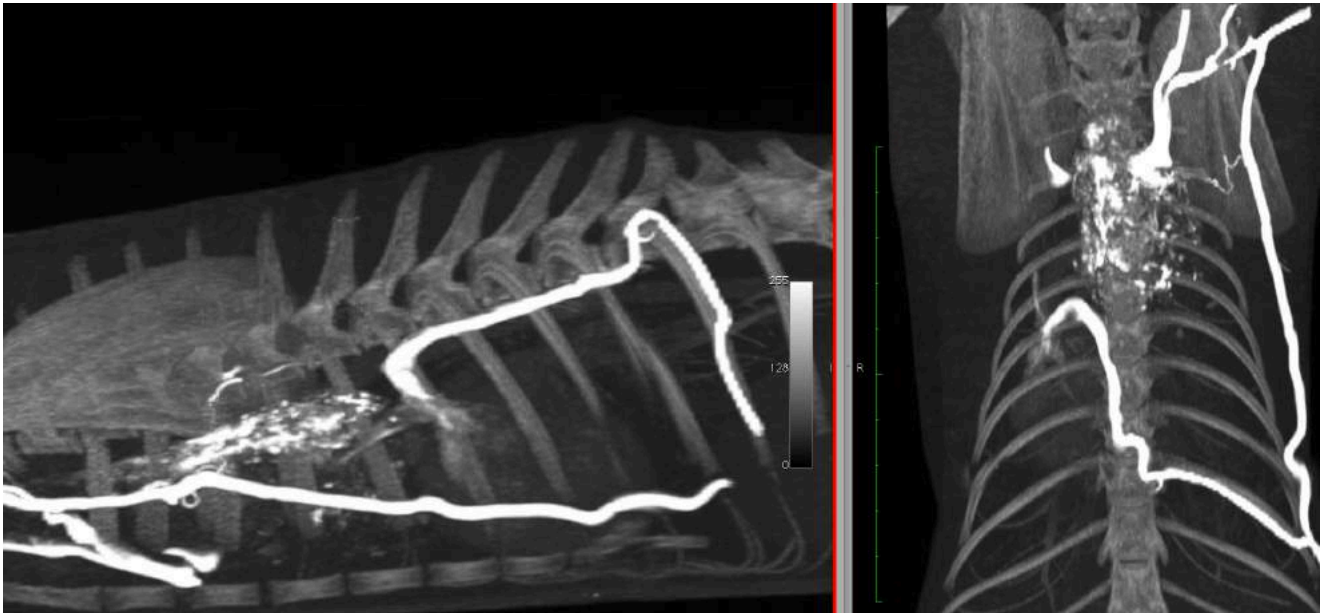
The contrast injected in the left cephalic vein has been diverted through an enlarged branch of the axillary vein (probably the thoracodorsal vein), into the 10th intercostal vein and into the azygos vein (image below). At this point it finally enters the cranial vena cava, which is compressed cranially by the oesophagus.

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The cranial lung lobes are caudally displaced due to the enlarged oesophagus. The lung fields are otherwise normal, with no evidence of aspiration pneumonia.

Conclusions:

1. Vascular ring anomaly:

- Persistence of the fourth right aortic arch
- Aberrant left subclavian artery
- Suspected left sided ligamentum arteriosum.

2. Secondary focal megaesophagus cranial to the heart base, causing compression of the cranial mediastinal vascular structures. The blood returning from the cranial part of the body is partly diverted through the intercostal veins.

Additional comments:

The type of ring anomaly is described in the literature. The ligamentum arteriosum cannot be directly visualised, but considering the location of the oesophageal compression it must be a left ligamentum arteriosum. If it was in the right, the only compression expected would be the one caused by the aberrant subclavian. In this case the aberrant left subclavian is stretched by the oesophagus and is not contributing to the compression, which is further caudally. Therefore I believe that the compression is due to the left ligamentum arteriosum, and this is the structure that will probably need to be surgically removed. However I am a radiologist, I have no surgical training and I am not aware of the current surgical literature and techniques. I am therefore not in a position to decide which side would be preferred for the surgical approach.

The degree of tracheal compression is very severe. In my experience this is not common, and it is probably due to the severe distension of the oesophagus.

You can find diagrams of similar vascular anomalies in text books. Very useful ones can be found in *Veterinary Surgery, Small Animals* by Karen Tobias and Spencer Johnston (volume two, page 1470, figure G. This diagram is also used in other books such as *Slatter* and is originally from *Compendium of Cont. Educ. Pract. Vet*), or *veterinary computed tomography* by Tobias Schwarz and Jimmy Saunders (page 234, figure 23.6 "type 3"). However be aware that the CT book diagrams (also found in some articles by Joly and D'Anjou) is very useful from the radiology point of view, but the heart diagrams are specular images of what the anomaly would look like in a real patient (left is on the right), and therefore they can induce to error when surgery is being planned.

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I will share this interesting case with my colleagues. If they can contribute to the image interpretation, I will let you know. If you require further anatomical detail about the anomaly, feel free to contact us.

Reporting Radiologist:

Dr XXXX Dr. Med. Vet. CertVDI DipECVDI MRCVS

If you have any queries regarding this report then please contact the reporting radiologist on the above email address or contact info@vetctspecialists.com

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