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RADIOLOGY
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RADIOLOGY REPORT

Patient Information

Patient:		Patient ID:		Report Number:	451
Patient Birth Date:		Age:		Gender:	M
Study Description:	e+1 CT CHEST W/O	Accession:	8149386	Study Date:	
Species:	Tursiops truncatus	Breed:	Bottlenose dolphin	Modalities:	CT
Sedation Used:	Yes	Anesthesia Used:	No		
Facility:		Submitted:		Finalized:	

Annotated Images Requested: No

STAT Request: No

Anatomical Region: Head and Thorax

History

Findings

A head and thoracic CT obtained under sedation in sternal recumbency is available for review. Series include:
(1) caudal head and cranial thorax 2.5mm axial soft tissue images,
(2) head and cranial thorax 1.25mm sagittal soft tissue images,
(3) head and cranial thorax 3mm coronal soft tissue images,
(4 & 5) head and cranial thorax 15mm MIP [maximum intensity projection] coronal and sagittal images, and
(6) head and cranial thorax 1.25mm axial soft tissue images (this last series is labeled "Localizers").

The laterality of the patient is mislabeled based on the anatomical location of the nasal plug and the tracheal bronchus: both are right-sided structures but labeled as "L" in the study. The animal is tilted to the left. Both the tip of the rostrum and approximately 15cm of the caudal lung/thorax are not included in the study. Focal motion is noted at the level of the eyes/blowhole.

Thickened, broad-based hypoattenuating tissue is seen between the subdermal sheath (SDS) and the underlying temporalis muscle on the dorsal aspect of the head, to the right of midline, 8-9cm caudal to the blowhole. A hypoattenuating, flattened, irregular pocket is seen between fascial planes in this region. A hypoattenuating well-defined, rounded pocket is also present within the right temporalis muscle 13cm caudal to the blowhole. Further caudally, 15cm caudal to the blowhole, a hypoattenuating disruption is seen in the right semispinalis cervicis muscle near dorsal midline. This tear/disruption extends in a diagonal line caudally and to the right another 13cm. The osseous structures of the skull/ calvarium including the jugal bones (zygomatic arches), temporomandibular joints, and bullae are normal. There is mild right- and third- ventriculomegaly at the level of the bullae, however no clear evidence of an intracranial hematoma is noted (significant beam-hardening artifact is evident in the brain). A small volume of dependent fluid is seen within the ventral left pterygoid sinus.

There is a short oblique non-displaced fracture of the capitulum of the right 1st rib; the rib is focally widened at the fracture site. This same capitulum is also subluxated laterally 8mm from its articulation with the parapophysis of C7. The dorsal 5cm of the left 1st rib (including the capitulum and tuberculum) articulates normally with the vertebral column but is discontinuous from the ventral remainder of the rib. The articulation between these two rib segments is smooth and does not have any evidence of trauma or remodeling. The left 4th rib is single-headed, with only a tuberculum and no capitulum present. The left 5th costal rib is fractured at the level of the mid-thorax. The rib is focally expanded at the fracture site. Only two sternebrae are present (rather than three to four as seen in most Tursiops). The two sternebrae are not fused; this may or may not be normal depending on the animal's age. Only the first three sets of ribs articulate with the sternum (rather than four). Multiple physes are still visible within the thoracic limbs.

Diffuse, patchy, moderate pathology is seen throughout the lung parenchyma. There are a multitude of variably sized round to ovoid nodules in the periphery of the lung, particularly dorsally and peripherally. Some are irregularly marginated. They do not appear associated with airways or vasculature. Ventrally, there are several regions of variably well-defined peribronchiolar consolidation. These include the ventral branches of the tracheal bronchus and the 1st and 2nd most ventral branches of the left primary bronchus, among others. Numerous septal/parenchymal bands are noted in the periphery of the lung (right dorsal and also left ventral lung, extending ventrally to the diaphragm). There is no clear evidence of pleural space disease, mediastinal lymphadenopathy, or cardiovascular abnormalities.

The marginal lymph nodes are likely enlarged for a subadult; they are challenging to measure precisely on CT but are estimated using multiplanar reconstructions to be 5.9-6.0cm in length bilaterally. The superficial cervical lymph nodes are upper limit of normal size (1.4-1.8cm in medial-to-lateral width, bilaterally).

The small portion of the cranioventral abdomen included is unremarkable.

Impressions

LATERALITY IS MISLABELED IN STUDY

1. Mixed moderate diffuse pulmonary pattern: Patchy ventral peribronchiolar consolidation + peripheral and dorsal nodular lesions. An infectious process +/- secondary pneumonitis is suspected. Consideration is given to both bacterial and fungal processes. This diffuse distribution of lung disease is somewhat less commonly seen in Tursiops in human care (infectious lesions in captive animals are often more severe ventrally, and the diffuse nodularity is uncommon).

2. Suspected marginal lymphadenopathy secondary to lung pathology (ultrasonographic confirmation recommended)

3. Evidence of muscle tear/damage and suspected hemorrhage/hematoma formation associated with R temporalis & R semispinalis cervicis muscles. May be due to reported self-trauma (aberrant navigation) against enclosure wall.

4. Mild right lateral and 3rd ventriculomegaly. No clear evidence of intracranial hematoma. The reported behavior and findings in this study may not be related, however an infectious process of the CNS (such as brucellosis) causing both mild ventriculomegaly and the potentially neurologic behavior described on presentation cannot be ruled-out. No evidence of skull trauma. Note that MR (not CT) is the diagnostic imaging modality of choice for CNS pathology.

5. Healed left 5th rib fracture. Suspect subacute right 1st rib fracture.

6. Multiple skeletal anomalies (ribs, sternum) as described, likely congenital.

7. Mild left pterygoid sinusitis

Recommendations

1. Detailed thoracic ultrasonography, to assess the current [baseline] appearance and to allow for follow-up non-invasive, frequent serial assessments to detect progression/regression of lung disease and response to treatment. Ultrasonography could also be used to evaluate muscle damage described and monitor healing or detect/drain intramuscular abscess/seroma formation.

2. Airway sampling. If bronchoalveolar lavage is possible, it would be the ideal diagnostic step for cytology and culture/sensitivity to guide appropriate antimicrobial therapy. If not, blowhole swab/culture may be of some benefit. If a relatively large peripheral lesion is detected ultrasonographically, it could be sampled percutaneously under local block +/- sedation.

3. Consider analgesia, given the evidence of trauma reported

3. For academic purposes rather than clinical relevance, consideration could be given to [blubber or other] toxicology testing, given the animal's history of stranding coupled with the fact that some of the congenital rib changes present have been reported in humans and laboratory animals exposed to teratogenic toxins.

NOTE: The findings, impressions, and recommendations listed are based on the history and clinical information provided. Interpretation should be performed by a licensed veterinarian serving as the primary clinician for the animal. The images in this report may not be reproduced without permission of the Brookfield Zoo/Chicago Zoological Society.

Report on 11/15/2017 6:25:23 AM UTC signed by:

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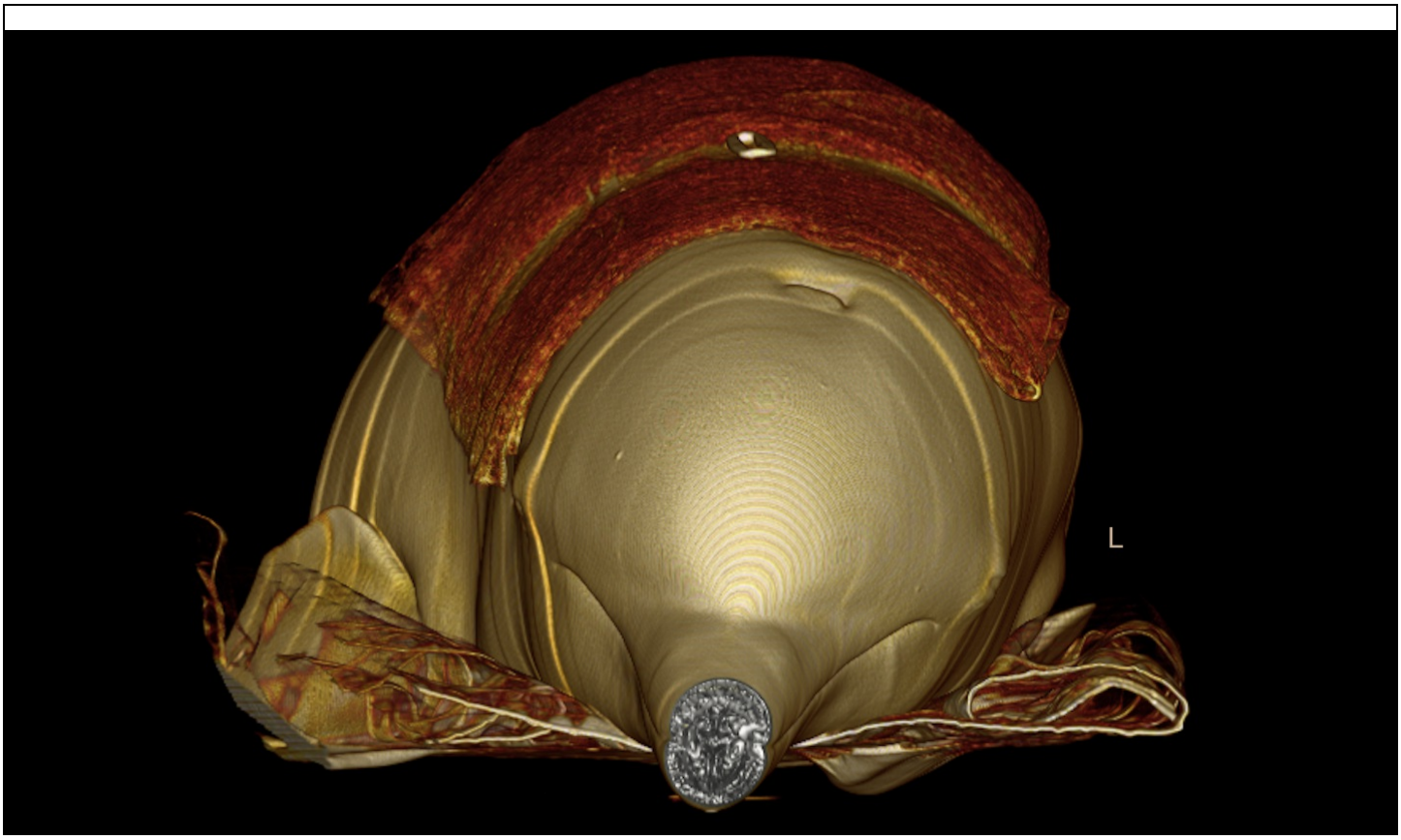
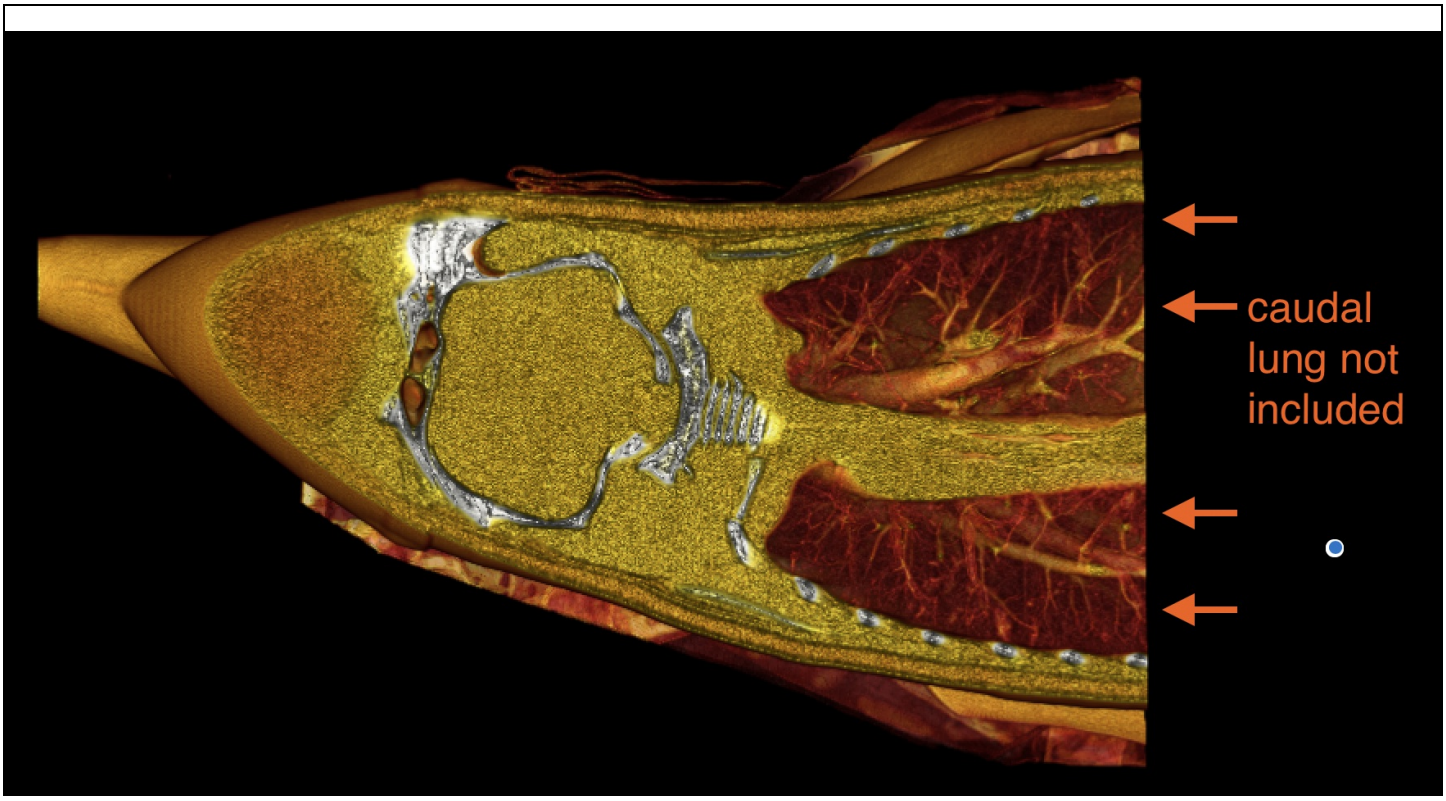
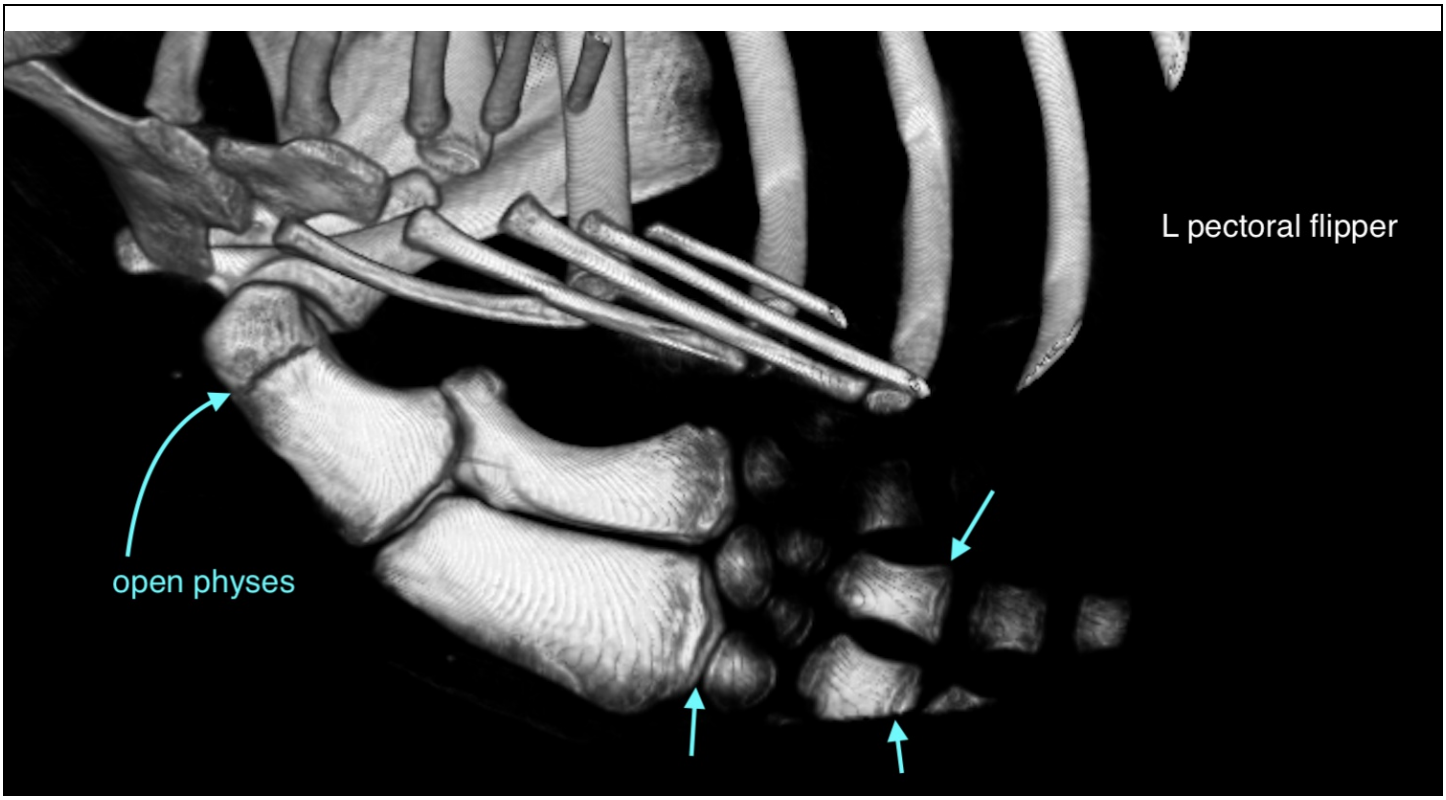
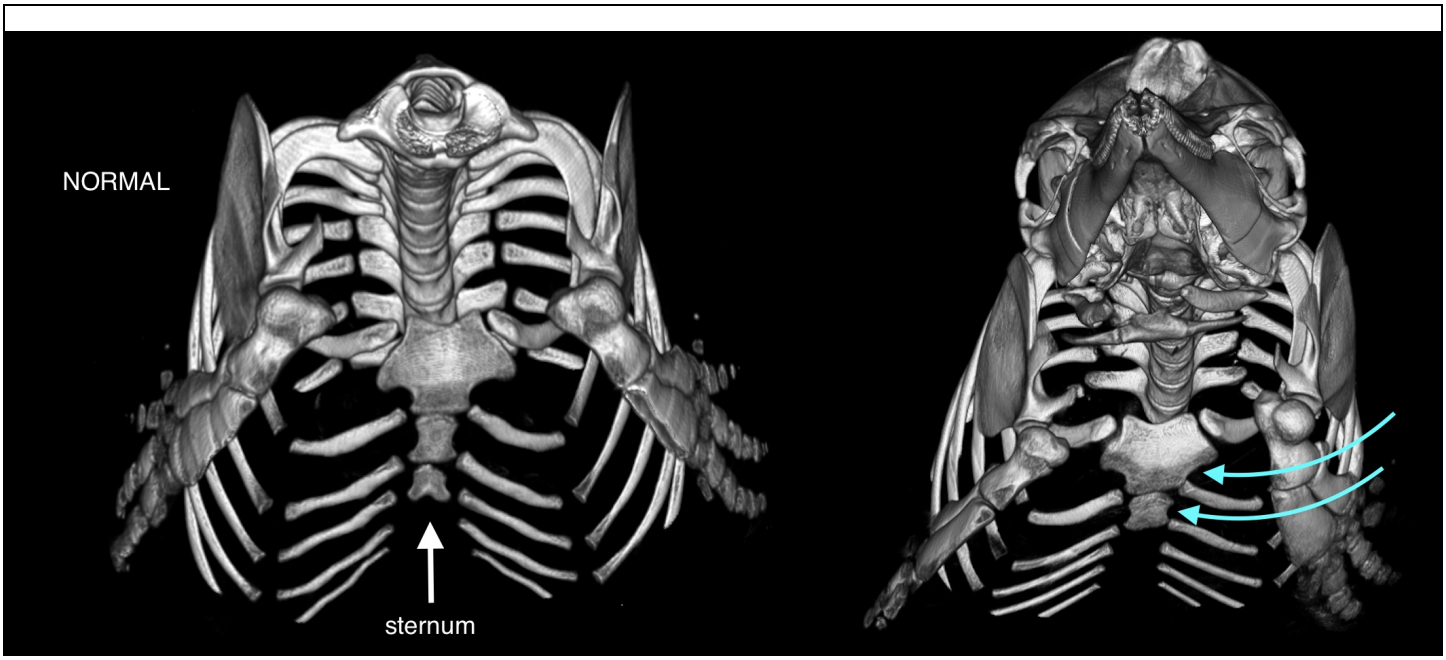
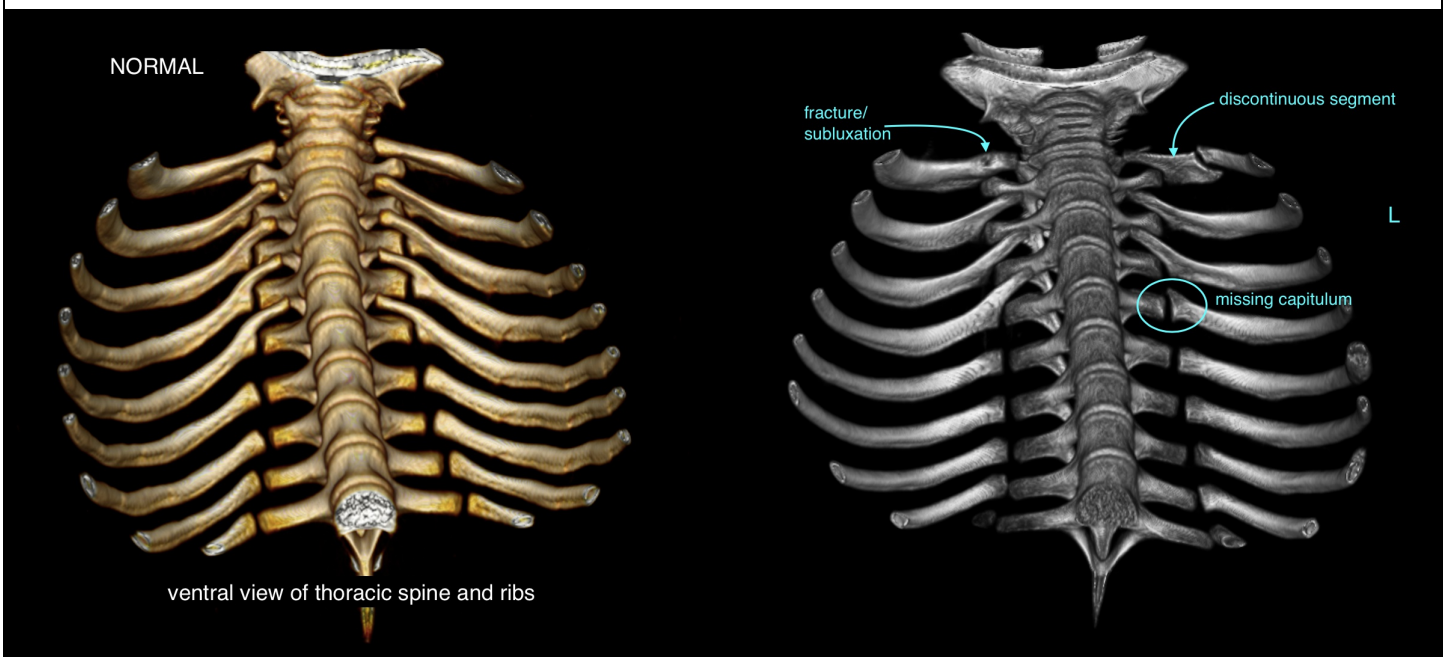
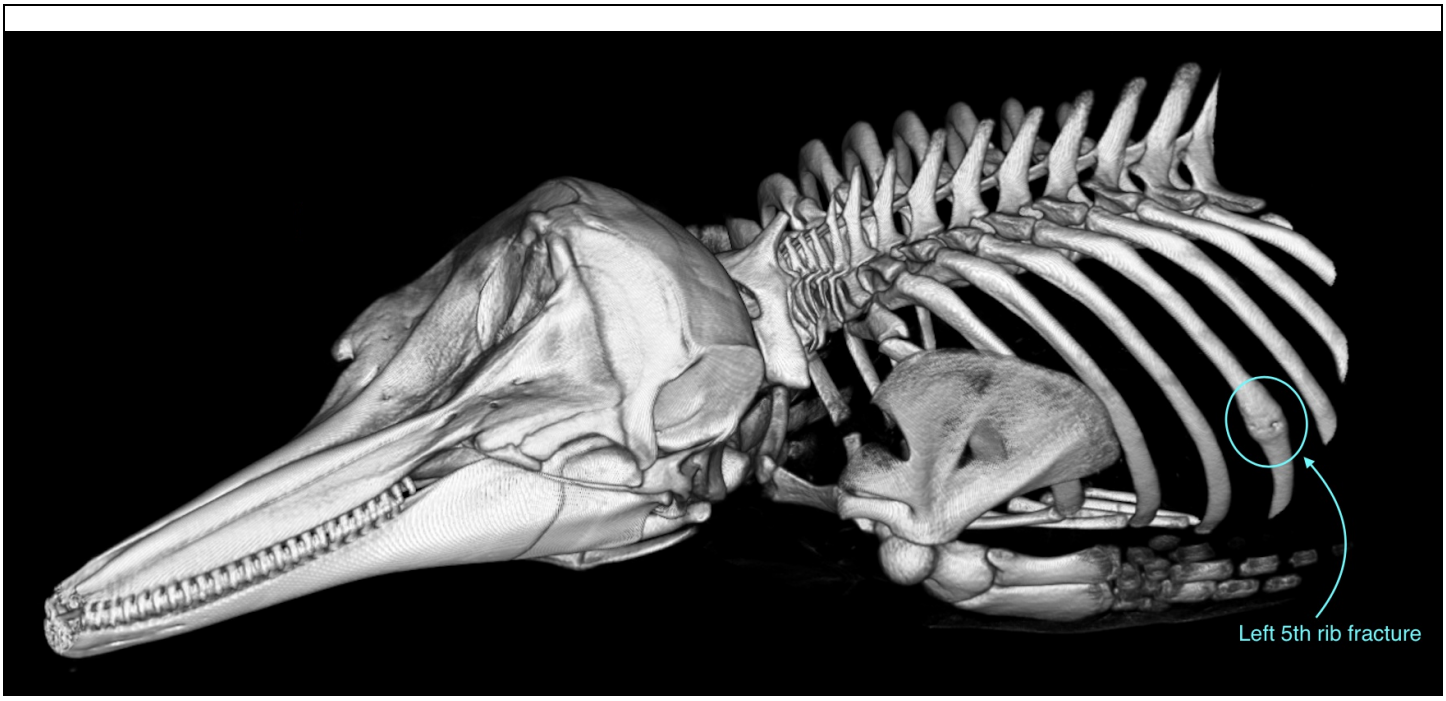

L

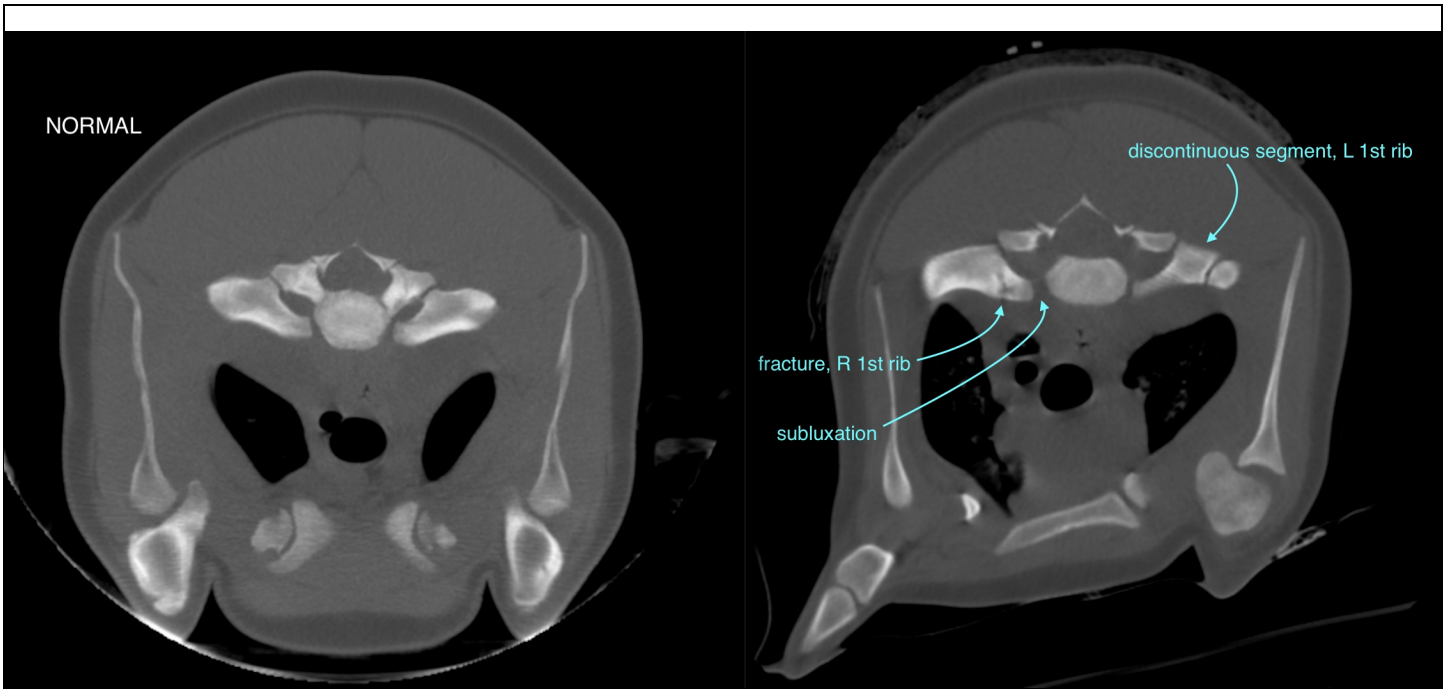

caudal
lung not
included

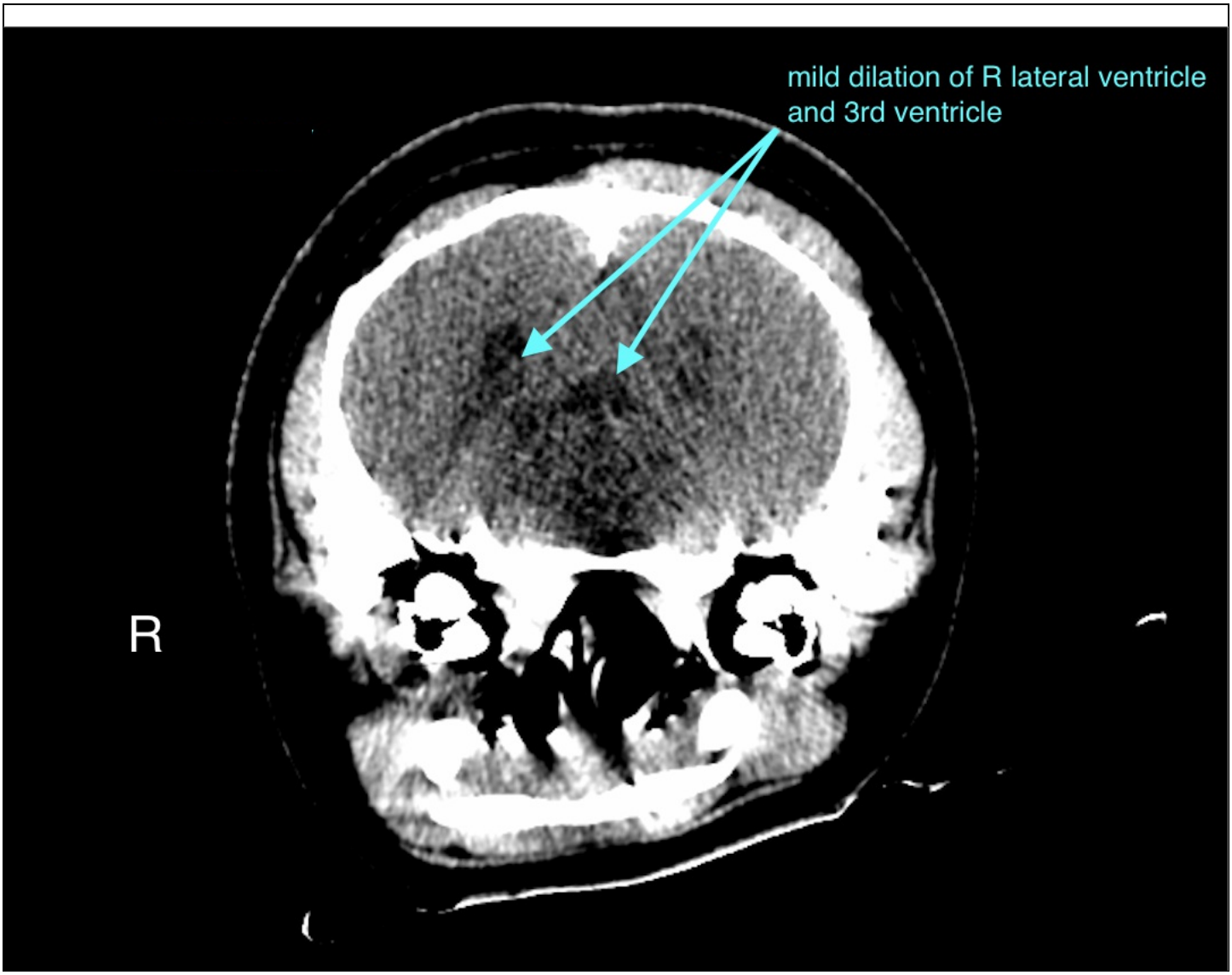

L pectoral flipper
open physes

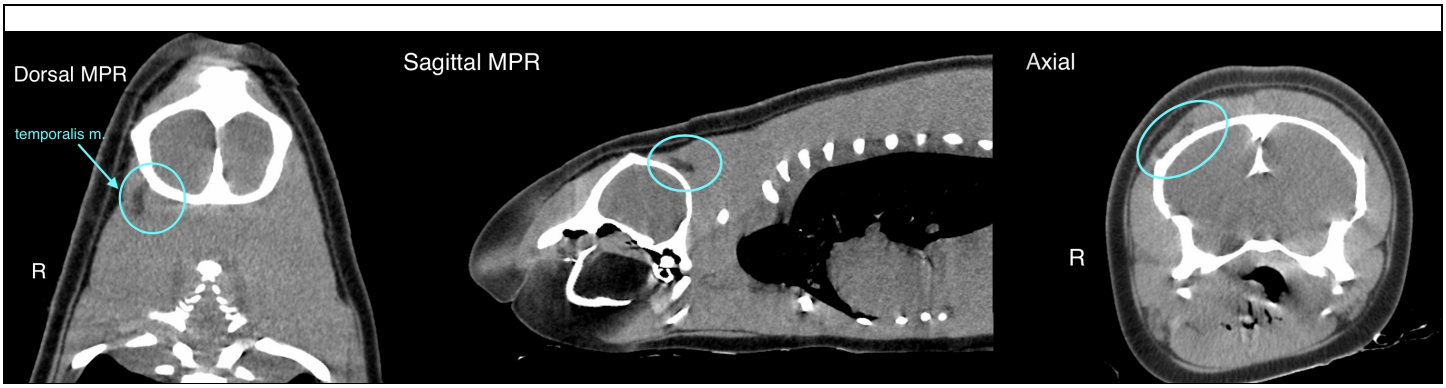

NORMAL
sternum

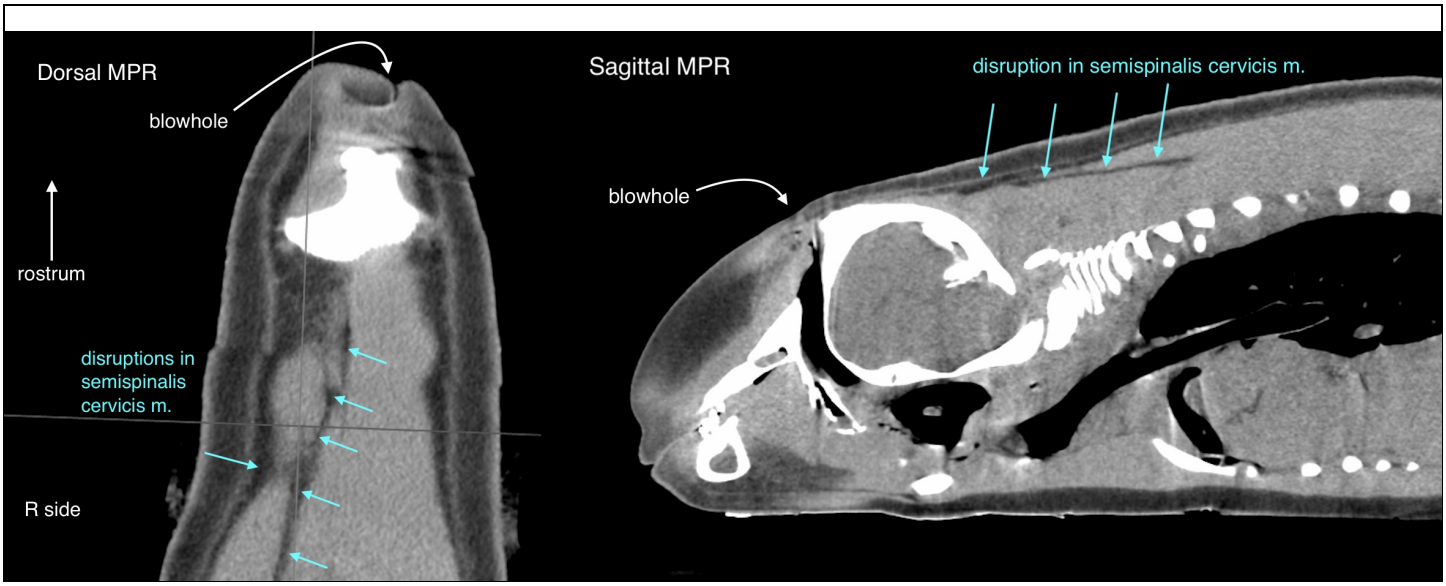

NORMAL
ventral view of thoracic spine and ribs
fracture/
subluxation
discontinuous segment
L
missing capitulum

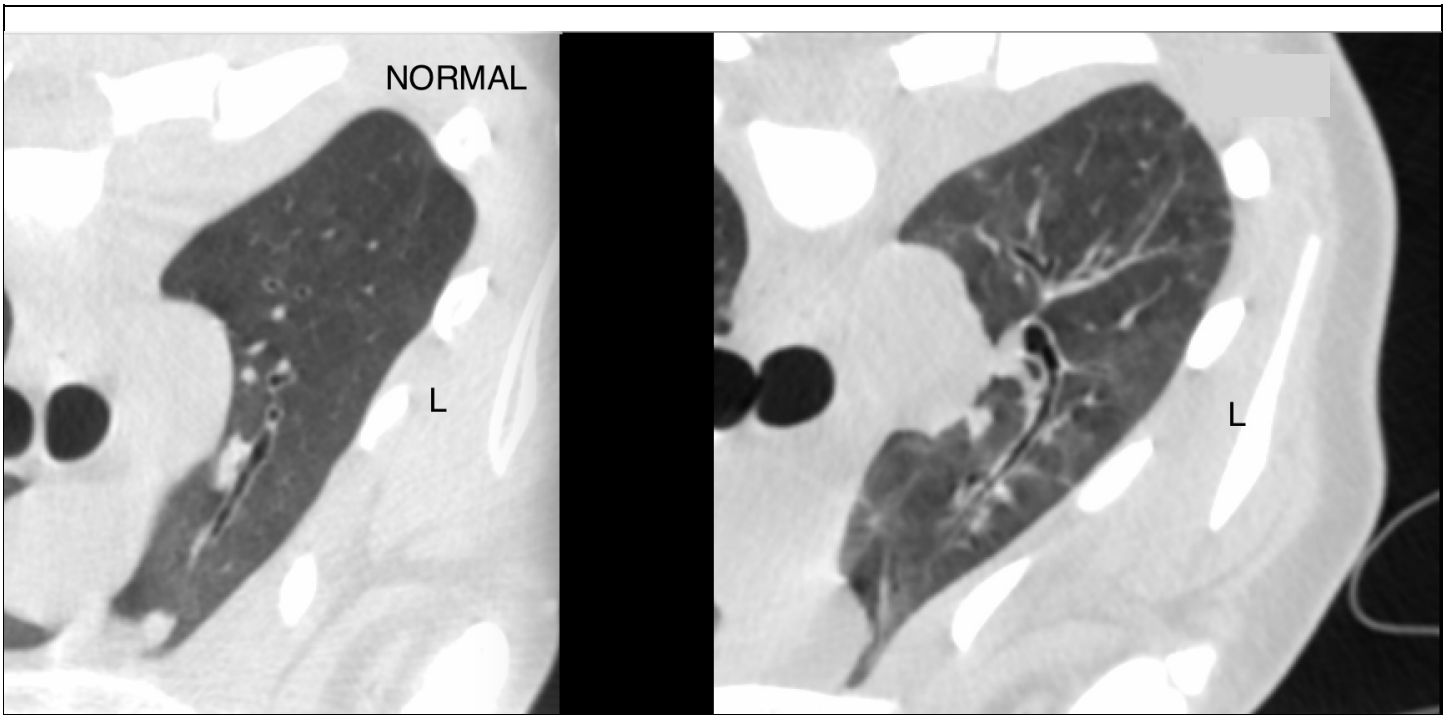

Left 5th rib fracture

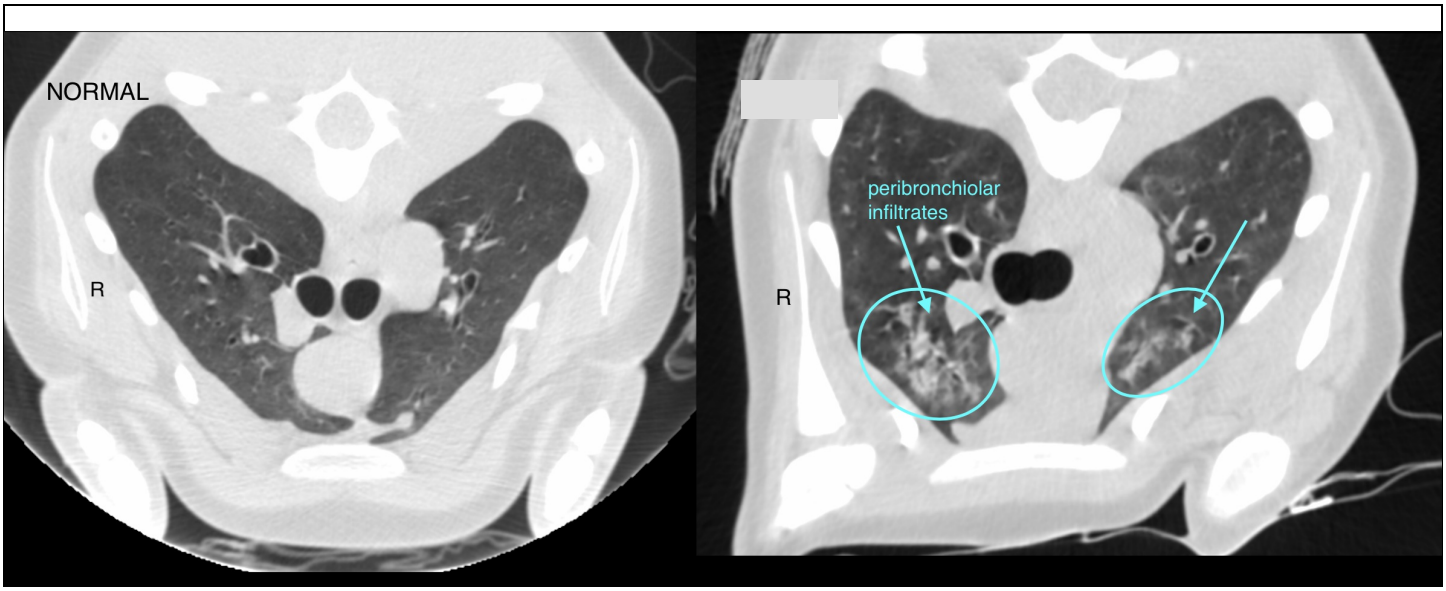

NORMAL
discontinuous segment, L 1st rib
fracture, R 1st rib
subluxation

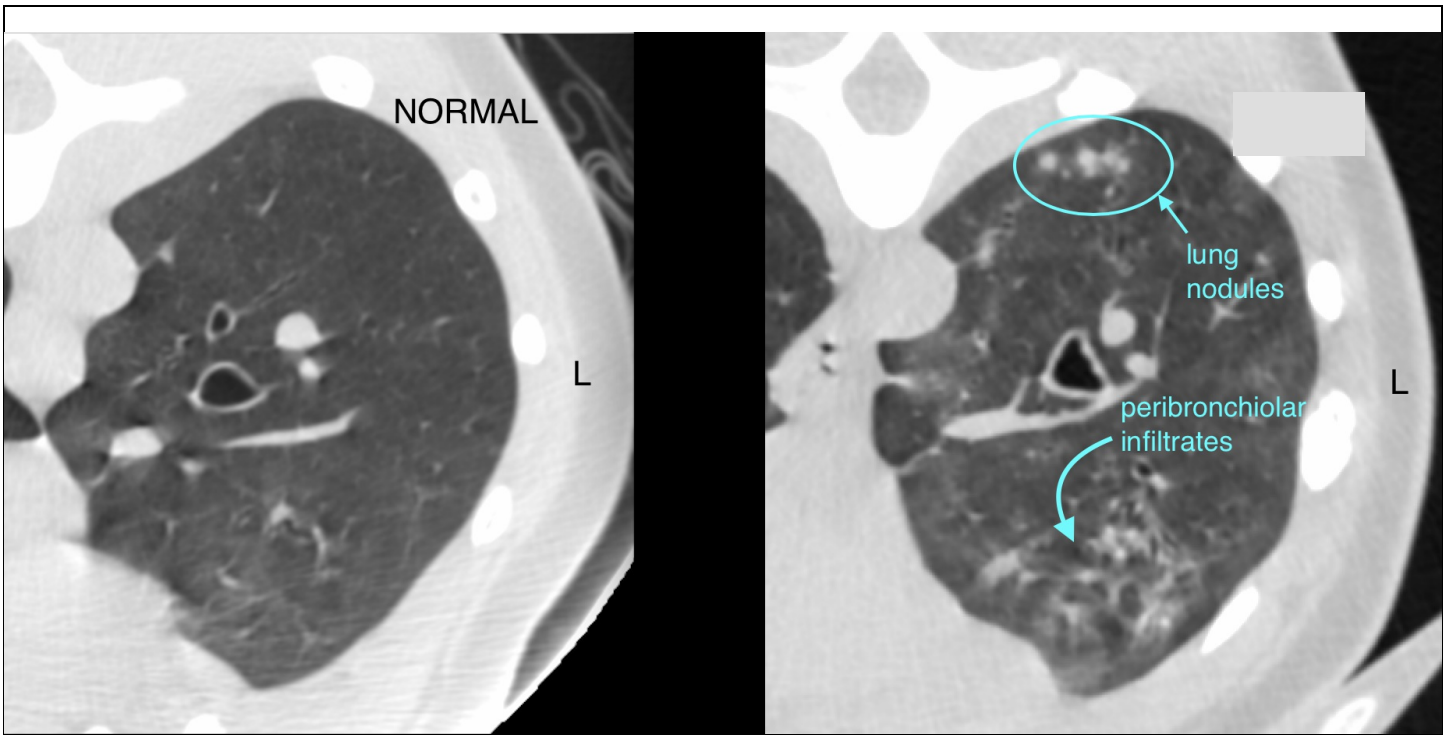

mild dilation of R lateral ventricle
and 3rd ventricle
R

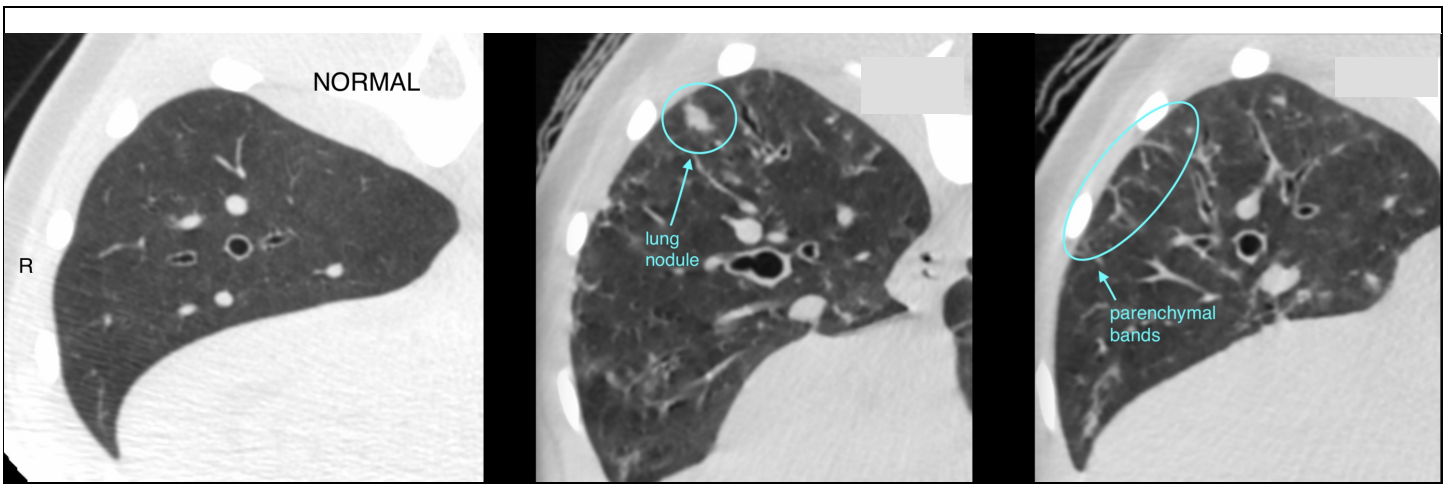

Dorsal MPR
temporalis m.
R
Sagittal MPR
Axial
R

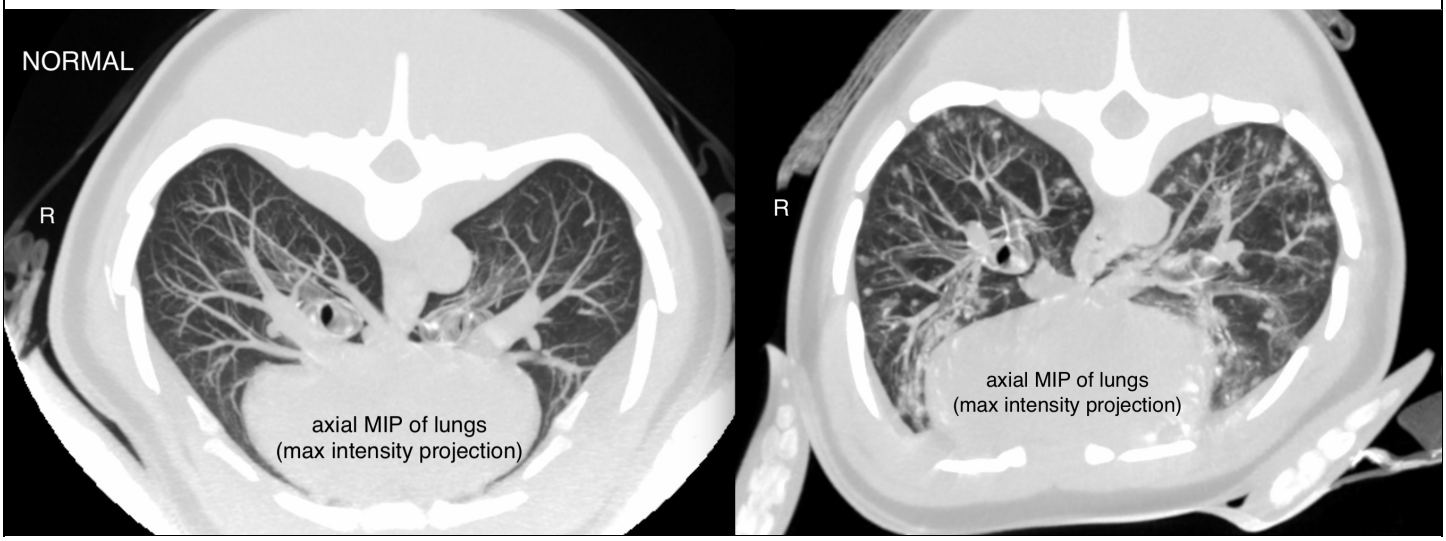

Dorsal MPR
blowhole
rostrum
disruptions in semispinalis cervicis m.
R side
Sagittal MPR
disruption in semispinalis cervicis m.
blowhole

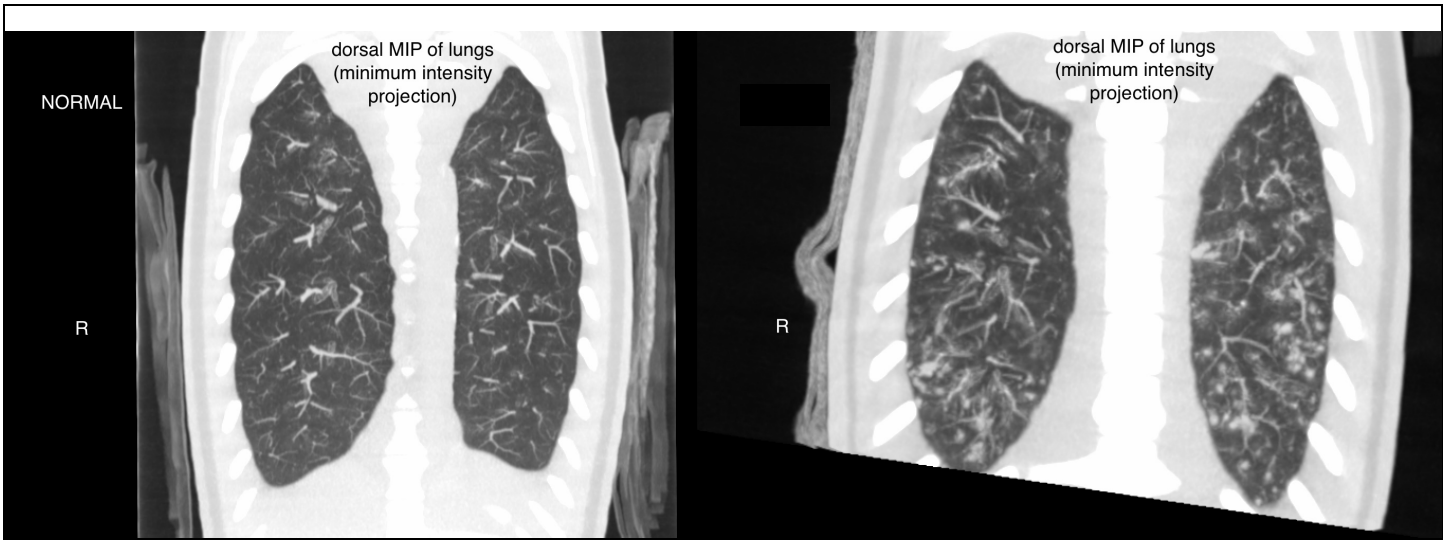

NORMAL
L
L


NORMAL
R
peribronchiolar
infiltrates
R


NORMAL
L
lung
nodules
peribronchiolar
infiltrates
L


NORMAL
R
lung
nodule
parenchymal
bands


NORMAL
R
axial MIP of lungs
(max intensity projection)
R
axial MIP of lungs
(max intensity projection)


NORMAL
R
dorsal MIP of lungs
(minimum intensity
projection)
R
dorsal MIP of lungs
(minimum intensity
projection)