DIAGNOSTIC IMAGING REPORT

Facility		**Modality**	Radiography
Referring Doctor		**Study**	Neck/Larynx
Animal ID		**Date of Study**	
Signalment	*Zalophus californianus*	**Date of Report**	

History

Technique

Seven digital radiographs of the cervical region are available for review, including four orthogonal projections (DV and L lateral) views dated 20 Sept 2016 and three left lateral projections dated 27 Sept 2016. One of the DV views does not include a marker. The studies are compared to radiographic, CT, and MR studies of *Z. californianus* conspecifics, both awake and under anesthesia, and anatomical manuscripts.

Findings

20 September 2016

Soft tissue thickening/swelling is present at the base of the tongue, caudal to the air-filled nasopharynx/soft palate, ventral to the occiput, and dorsal to the basihyoid/thyrohyoid bones. All borders of the epiglottis are obscured due to surrounding soft tissue. The abnormalities are best seen on the lateral projection time-stamped 8:14:32PM. No radiopaque foreign body is noted. The perilaryngeal tissues caudal to this are normal (these extend from the level of the caudal margin of the thyrohyoid/atlas to the caudal margin of the cricoid cartilage/C2-3). The laryngeal lumen is gas-filled between the arytenoid cartilages; air within the larynx has a normal contour. There is little to no

evidence of mineralization of the laryngeal cartilage as can be seen in older *Zalophus*. No soft tissue asymmetry is present on DV projections. The larynx is positioned slightly to the right of midline. At level of C4-5, the cervical trachea measures 3.2cm in dorsoventral height and 3.6-3.8cm in left-to-right width. This is considered normal; the trachea is normally wider than taller in this region (the tracheal rings in *Zalophus* are dorsally incomplete/open). The skeletal structures (including the hyoid apparatus) are unremarkable.

27 September 2016

The soft tissue thickening seen previously has decreased in severity, but is persistently abnormal. More air is now present within the pharynx given some decrease in swelling; air can be seen within the oropharynx, dorsal to the epiglottis, and cranial to the arytenoid cartilages. However, in image time-stamped 6:40:37PM, the attenuated, undulating gas column dorsal to the thyrohyoid bones is abnormal and suggests soft tissue thickening rostral and ventral to it (possibly involving the epiglottis). The air-soft tissue interface also highlights the irregular, somewhat scalloped margins of the soft palate. The laryngeal gas contour (caudal to the hyoid) is again normal/unremarkable. The cervical trachea again measures 3.2-3.4cm (dorsoventral height) at the level of C4-5; it is normal/static.

Impressions

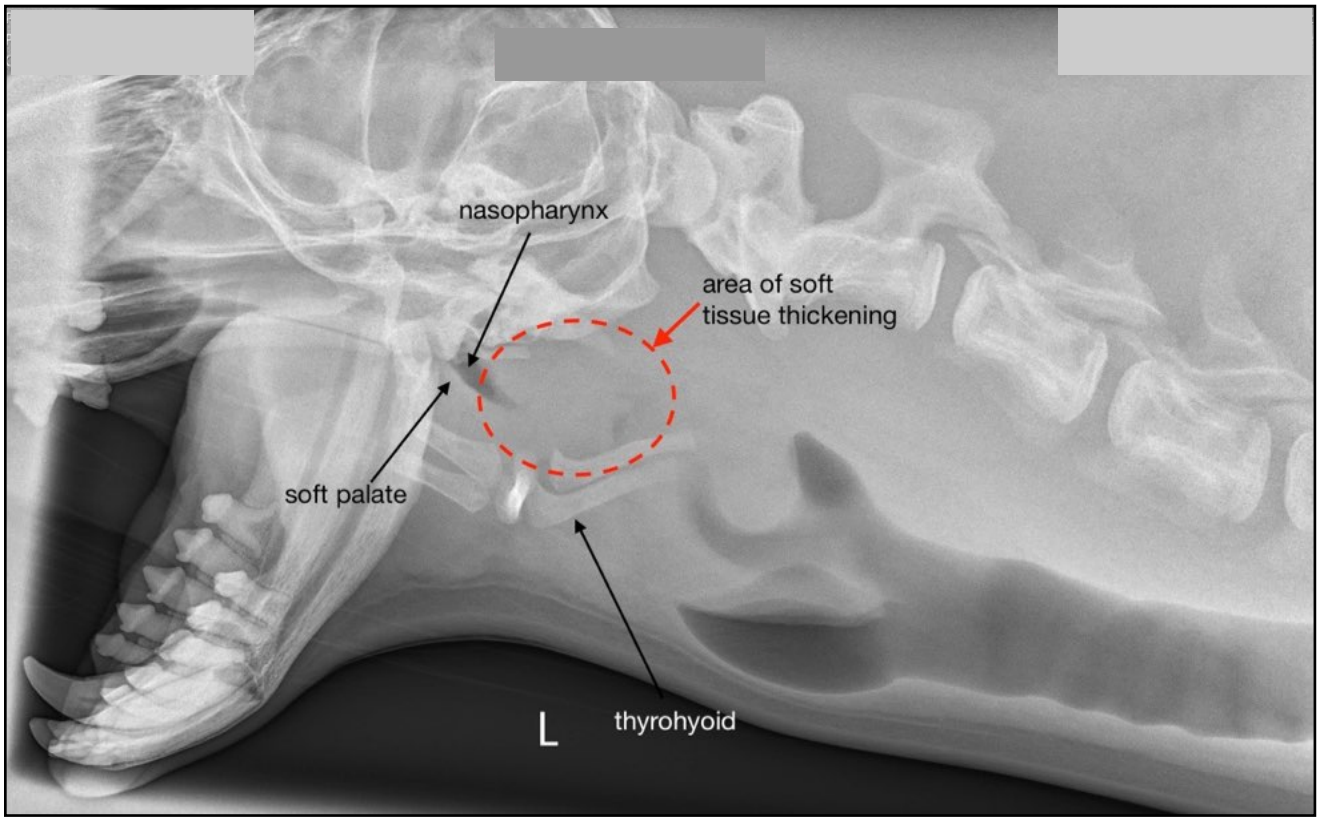
Moderate to severe caudal pharyngeal soft tissue swelling (involvement of base of tongue and/or epiglottis is suspected). One week follow-up: partial resolution. Acute inflammation is felt most likely, however if the abnormalities are repeatable radiographically (i.e. several months later), additional diagnostics may be needed to rule-out other differentials. Normal larynx/hyoid apparatus.

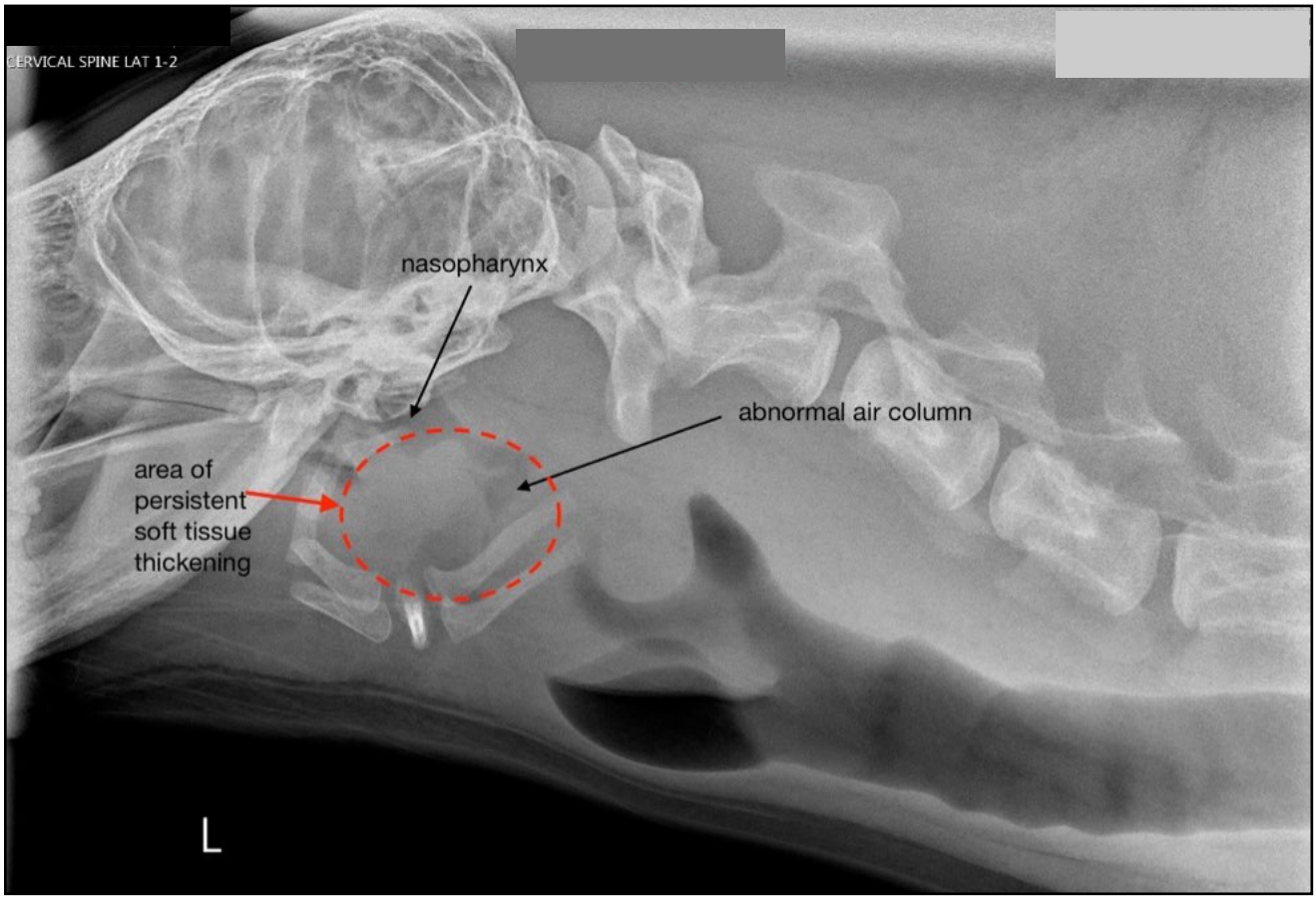
Recommendations

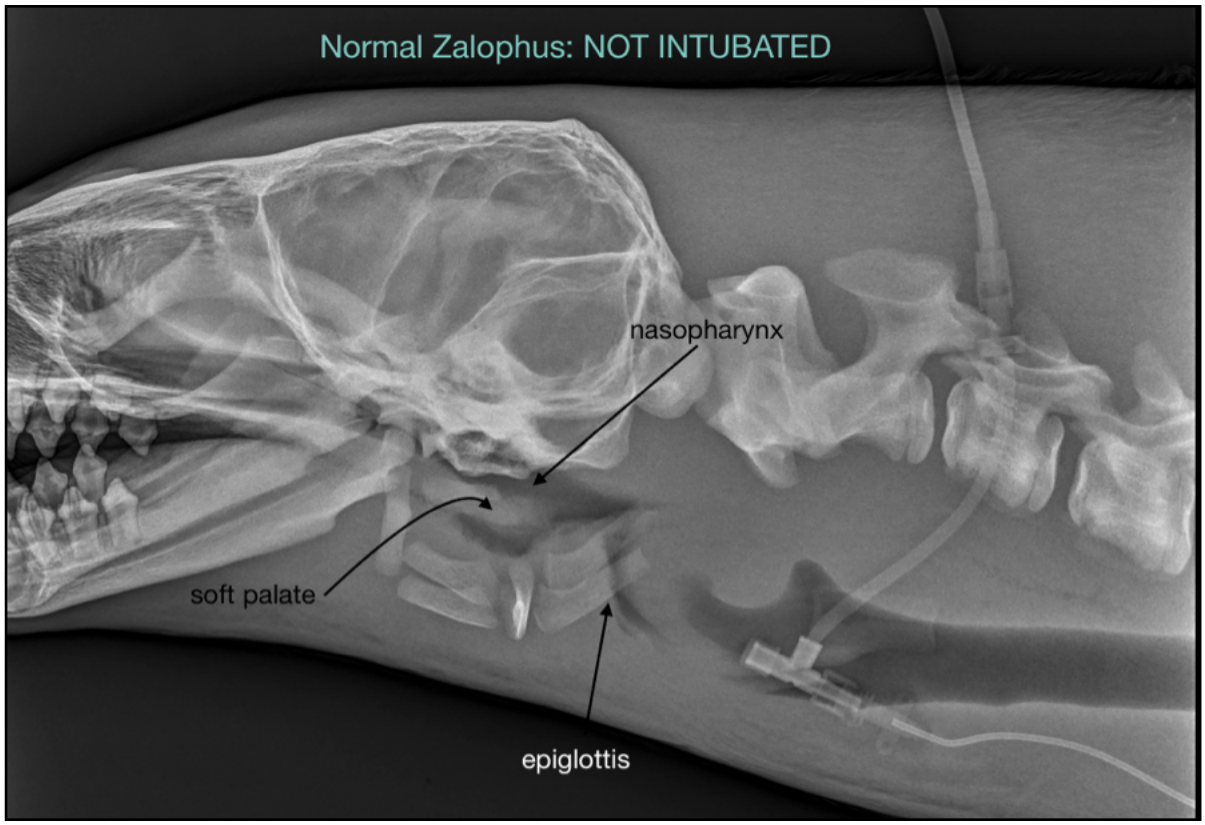
If clinical signs recur or abnormalities are again seen radiographically, consider detailed sedated/anesthetized oral exam with laryngoscopy (+/- perilaryngeal/perimandibular ultrasonography to assess mandibular lymph nodes and other soft tissues of this region). Contrast CT could also be of diagnostic value.

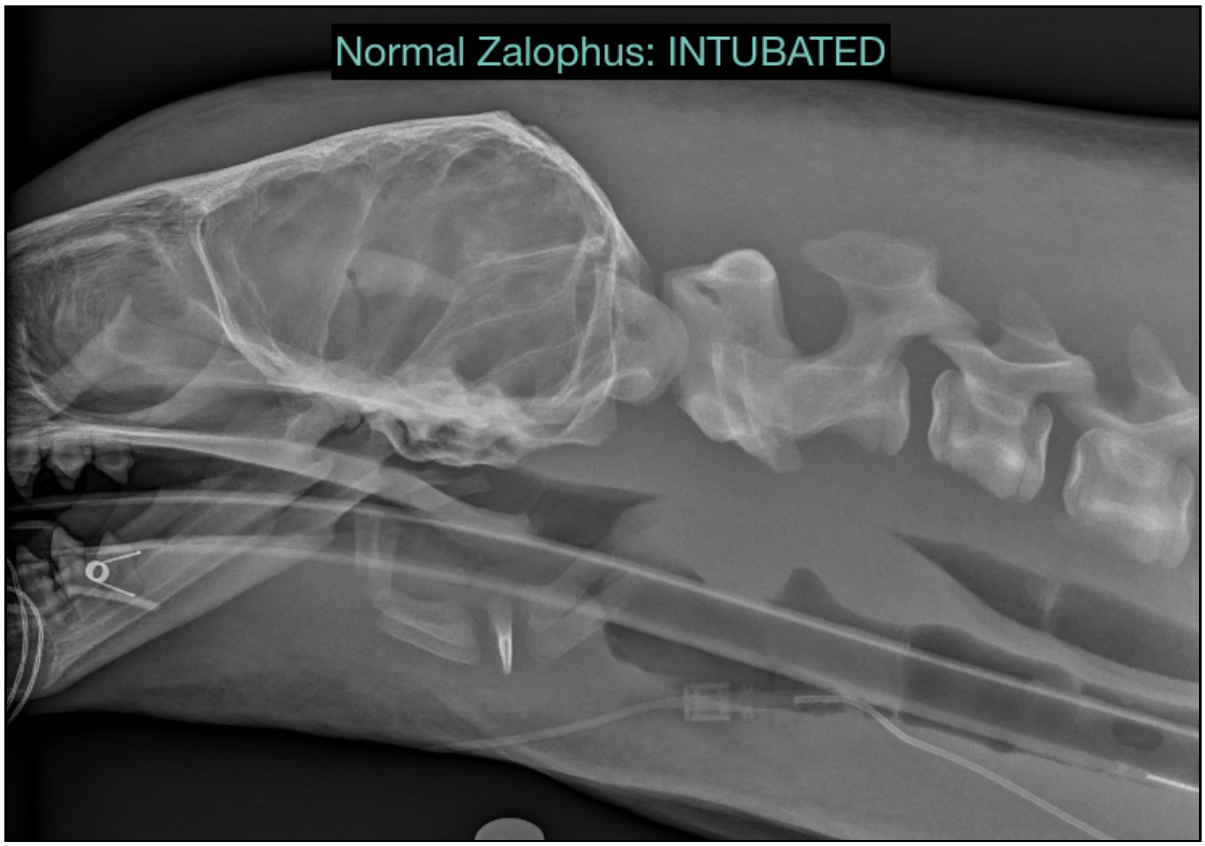
Marina Ivančić, DVM, DACVR
Veterinary Radiologist
Brookfield Zoo / Chicago Zoological Society

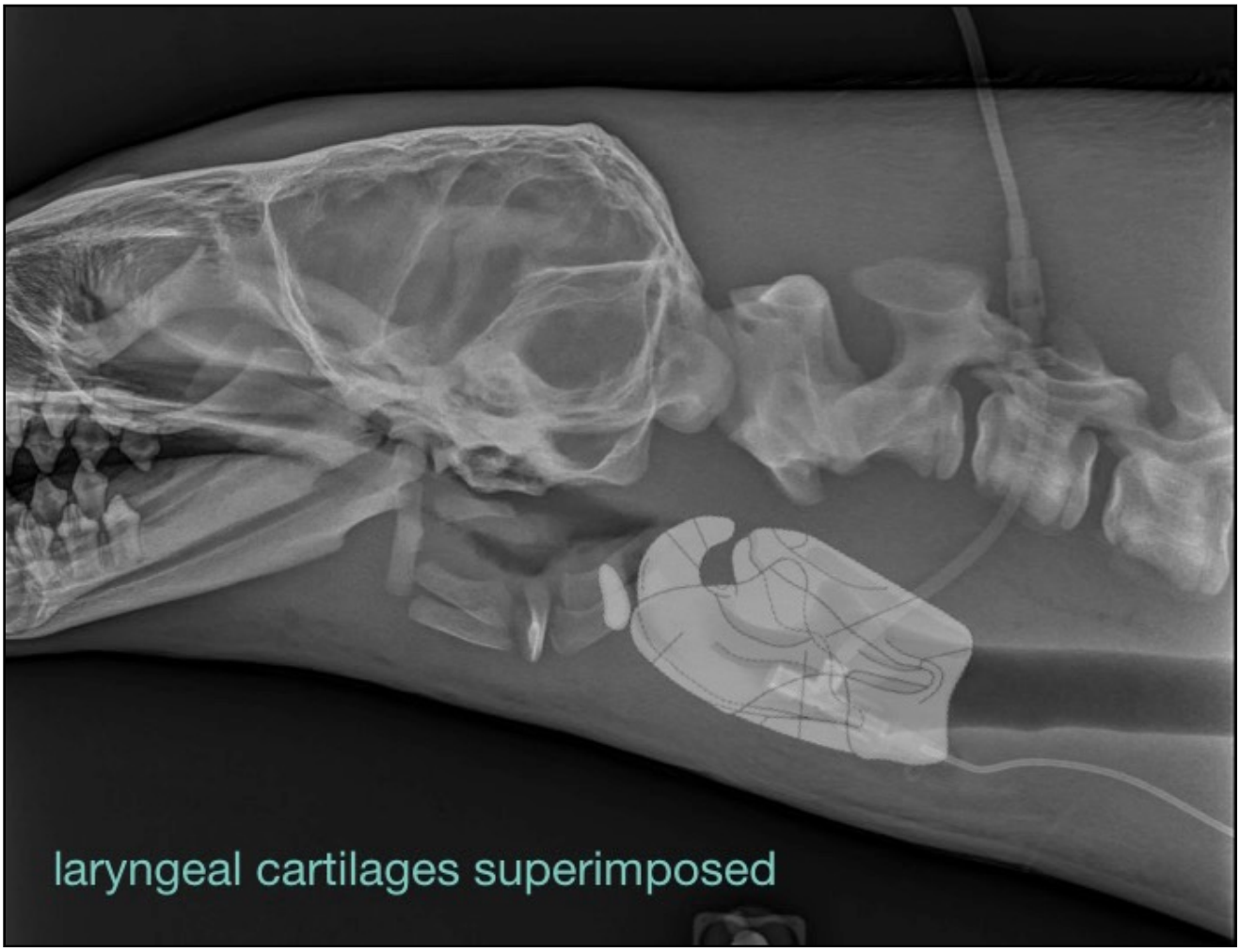
Note: The findings, impressions, and recommendations listed are based on the history and clinical information provided. Interpretation should be performed by a licensed veterinarian serving as the primary clinician for the animal.

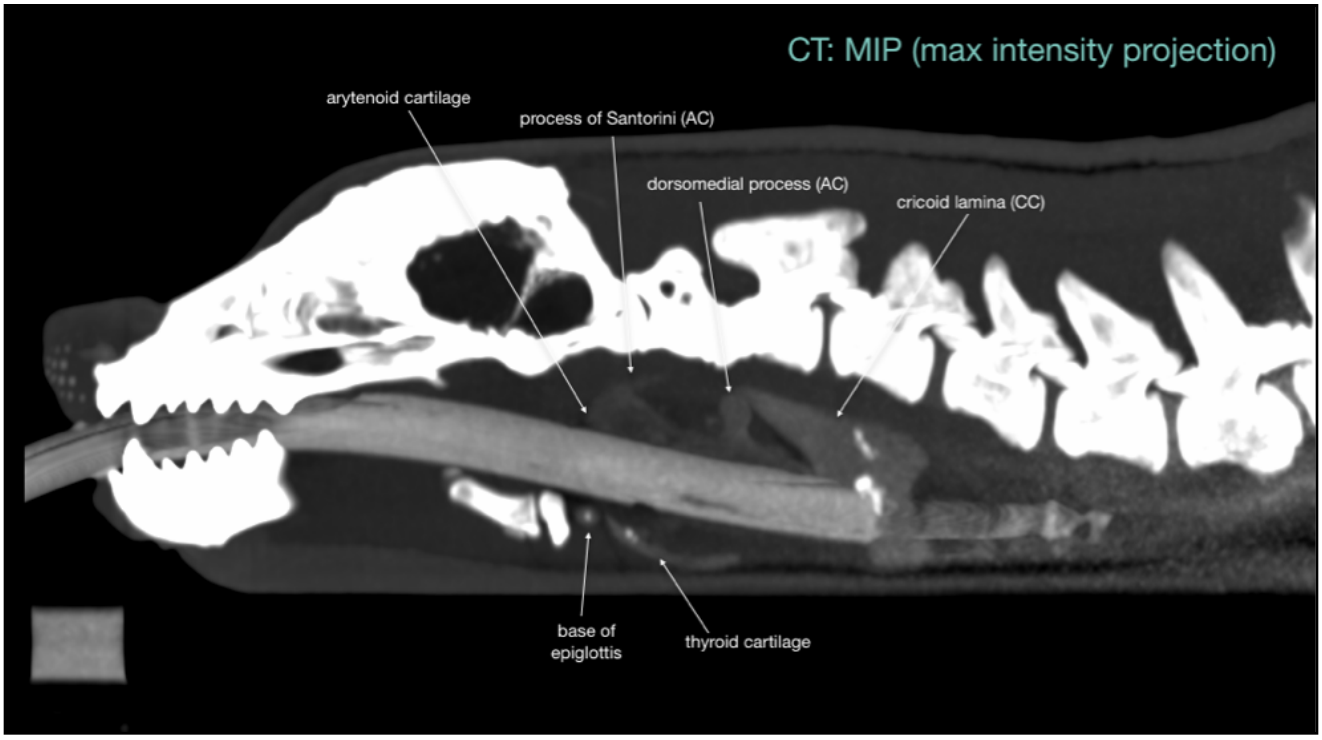

nasopharynx
area of soft tissue thickening
soft palate
thyrohyoid
L

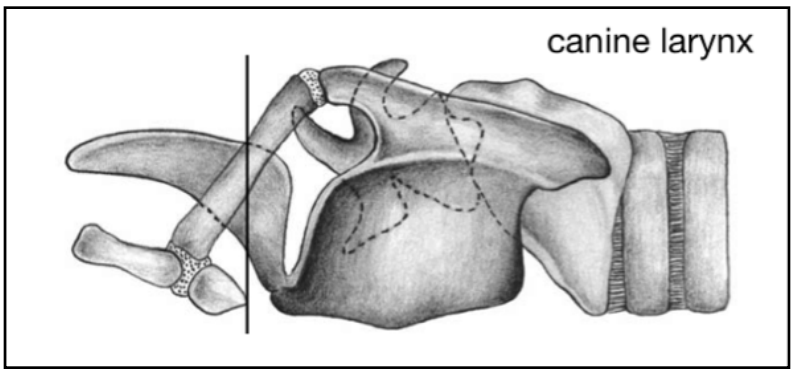

CERVICAL SPINE LAT 1-2
nasopharynx
abnormal air column
area of persistent soft tissue thickening
L

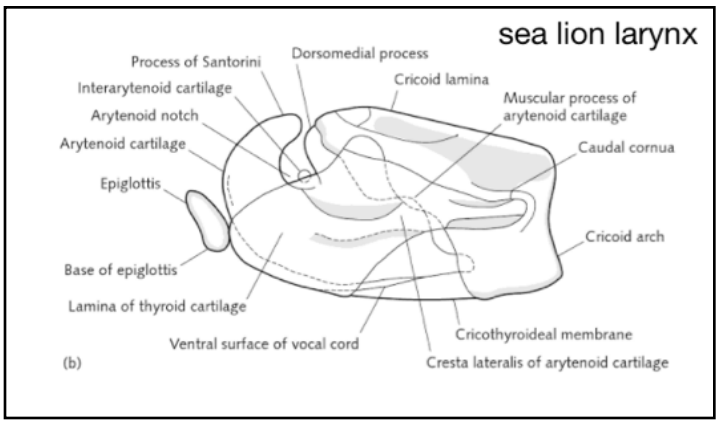

Normal Zalophus: NOT INTUBATED
nasopharynx
soft palate
epiglottis

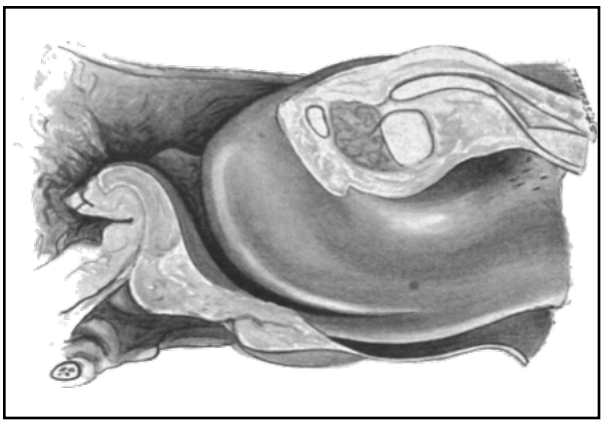

Normal Zalophus: INTUBATED

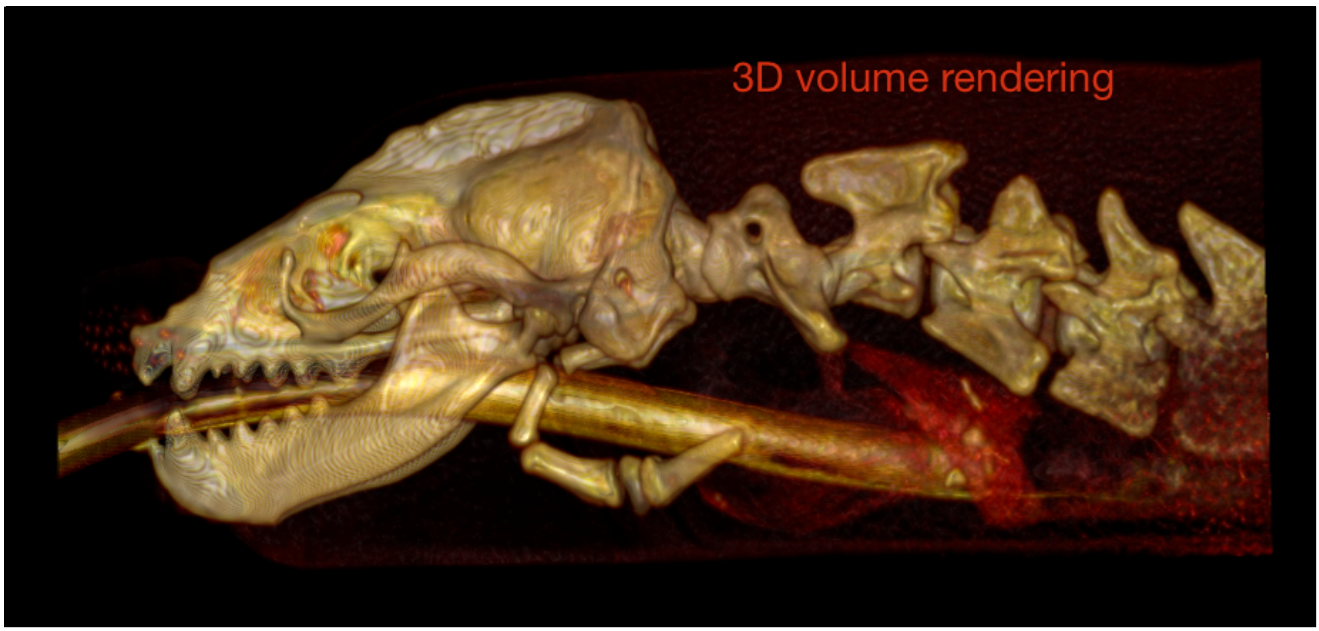

laryngeal cartilages superimposed


CT: MIP (max intensity projection)
arytenoid cartilage
process of Santorini (AC)
dorsomedial process (AC)
cricoid lamina (CC)
base of epiglottis
thyroid cartilage


canine larynx


sea lion larynx
Process of Santorini
Dorsomedial process
Interarytenoid cartilage
Cricoid lamina
Arytenoid notch
Muscular process of arytenoid cartilage
Arytenoid cartilage
Caudal cornua
Epiglottis
Cricoid arch
Base of epiglottis
Lamina of thyroid cartilage
Cricothyroideal membrane
Ventral surface of vocal cord
Cresta lateralis of arytenoid cartilage
(b)




3D volume rendering