

No development of lung atelectasis seen in sedated dogs examined with computed tomography

Development of lung atelectasis during thoracic CT-scan is a well-known problem that can complicate image interpretation. With modern multidetector CT-scanners, sedation has come up as a faster and more cost-effective alternative to anesthesia, but few studies are done on how sedation affects lung parenchyma.

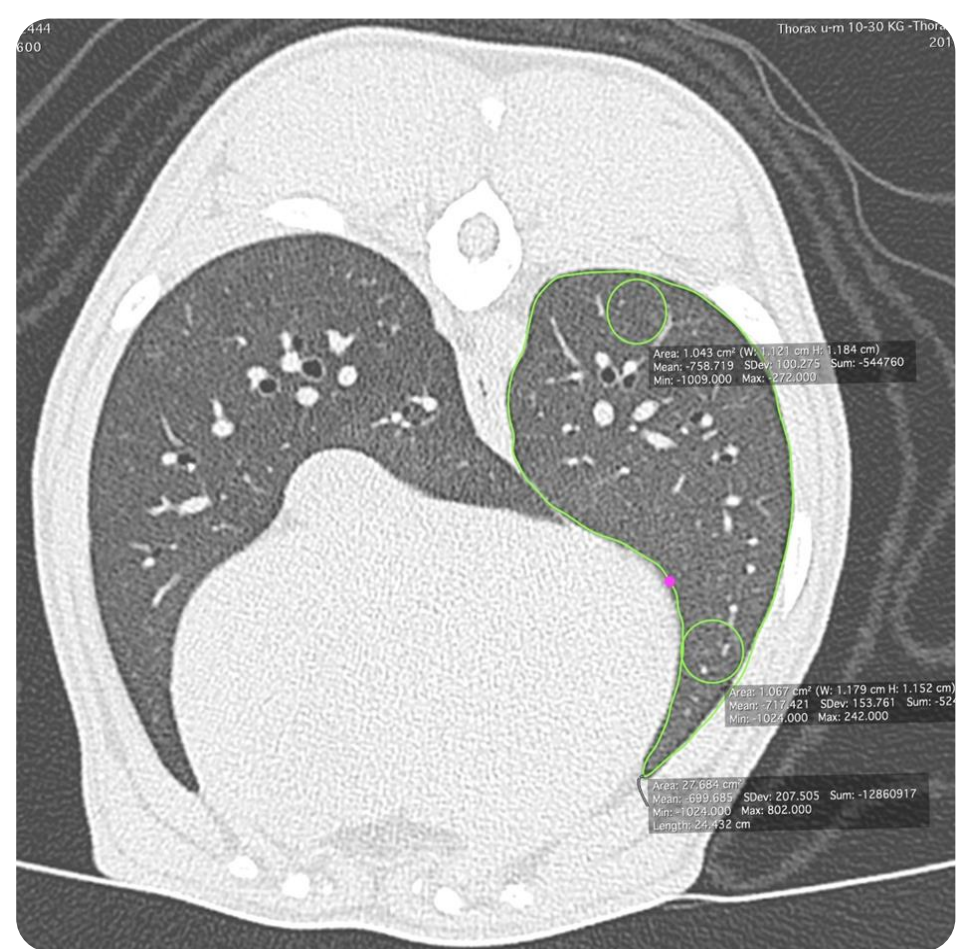
The objective of this study was to investigate the prevalence of lung atelectasis in healthy dogs receiving intravenous sedation examined with CT in sternal recumbency. 20 dogs without known lung pathology were included.

Method

Intravenous sedation with dexmedetomidine and butorphanol

Three consecutive thoracic CT-scans in sternal recumbency

Lung attenuation measured in the ventral and dorsal part, and as a mean for each lung lobe, as shown in image to the right.

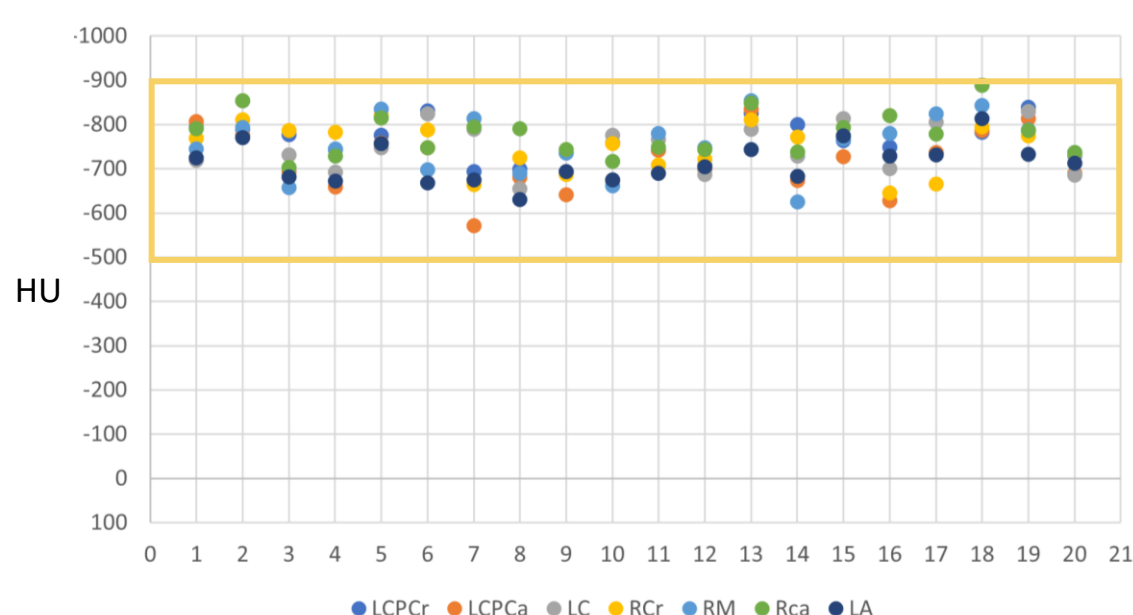


Key results

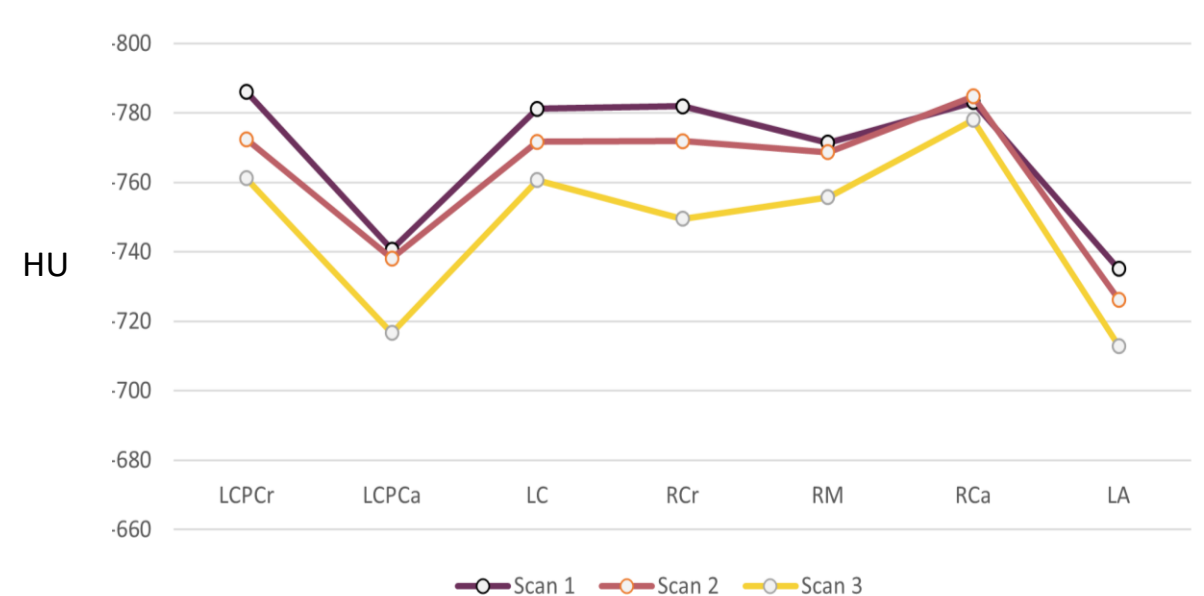
All measured areas correlated to a value of “normally aerated lung tissue”, defined as a value between - 501 to -900 HU ⁽¹⁾ (yellow square); hence no atelectasis was detected.

A statistically significant increase in lung density was seen in the ventral part of the lobes between Scan 1 and Scan 2 ($p=0.0323$) and between Scan 1 and Scan 3 ($p=0.00036$).

Lung attenuation in ventral lung lobe at SCAN 3



Mean lung attenuation of ventral lung lobe at SCAN 1,2,3



1. Staffieri F, Franchini D, Carella GL, Montanaro MG, Valentini V, Driessen B, et al. Computed tomographic analysis of the effects of two inspired oxygen concentrations on pulmonary aeration in anesthetized and mechanically ventilated dogs. Am J Vet Res. 2007 Sep;68(9):925–31.

Conclusion

This study indicates that healthy dogs who receive rapid intravenous sedation and are kept positioned in a sternal recumbency have a low risk of developing lung atelectasis during CT-scan. An early increase in lung density was noted but did not progress over time.