

### **Brief biography**

Robert M. Kirberger  
BVSc, DVSc, MMedVet(Rad), Dip Tertiary Teaching  
Diplomate European College of Veterinary Diagnostic Imaging

Robert is professor of diagnostic Imaging in the Department of Companion Animal Clinical Studies at the Veterinary Faculty of the University of Pretoria in South Africa. Robert's primary interests are diagnostic imaging of wild carnivores, small animal diagnostic ultrasound and radiology and thoracic CT. He has been a National Research Foundation category B2 researcher since 2011. His current research projects include diagnostic imaging of blunt and penetrating thoracic and abdominal trauma as well imaging aspects of spirocercosis.

### **Abbreviated CV**

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**Date and place**

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**Work address**

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### **Society memberships**

South African Veterinary Association  
European Association of Veterinary Diagnostic Imaging  
International Veterinary Radiological Association

### **International committee memberships**

Director, International Veterinary Radiology Society, 2000 - current  
Vice president International Veterinary Radiology Society 2012-2015  
Director, International Elbow Working Group, 1998 - current

### **International examiner**

Member of the European College of Veterinary Diagnostic Imaging examination committee 2006-2008

### **Post graduate studies promoter**

Dr S L Fourie: "The relationship of cervical spinal cord diameter to vertebral dimensions: A radiological study" - dissertation for MMedVet(Rad). Completed 1999  
Dr W M Wagner: "Bildgebende Verfahren beim Strauben (*Struthio camelus*)" - Free University of Berlin – German dissertation. Completed 2003  
Dr W M Wagner: "Diagnostic imaging of the normal common marmoset (*Callithicus jaccus*)" - dissertation for MMedVet(Diag Im). Completed 2003  
Dr L Koma: "Abdominal splanchnic haemodynamics in a canine normovolaemic anaemia model and uncomplicated canine babesiosis: A comparative Doppler study" Thesis for PhD. Completed 2005  
Dr T Spotswood. "Echocardiographic changes of left ventricular function in an experimental canine normovolaemic anaemia model. MMedVet(Diag Im) Completed 2006  
Dr L Sweers. "The scintigraphic evaluation of the pulmonary perfusion pattern of dogs hospitalised with babesiosis" MMedVet(Diag Im) 2007  
Prof A Carstens "Tracheal dimensions in the horse" MMedVet(Diag Im) Completed 2008  
Dr R I Millward "Comparative popliteal and mesenteric computed tomographic lymphography of the caudal canine thoracic duct  
Dr R Elliot. "Canine CT anatomy for laparoscopy" MMedVet (Chir)  
Dr M Hartman "Anatomy of the reproductive tract of the female African lion" MMedVet(chir) in progress.  
Prof A Carstens "The value of dGMRIC in equine joints" – PhD co-promoter – in progress  
Dr CK Lim "Normal echocardiographic values in Dachshunds" MMedVet in progress

**Publications** – more than 85 peer reviewed articles in ISI journals

### **Books**

- 2001 Aids to Small Animal Radiological Differential Diagnosis. R Dennis, R M Kirberger, R H Wrigley, F Barr.
- 2003 The Asian-Oceania Textbook of Radiology. 2003 Editors W C G Peh,, Y Hiramatsu Chapter 53: Veterinary Diagnostic Imaging. R M Kirberger and P Corr 1245-1258
- 2006 BSAVA Manual of Canine and Feline Musculoskeletal Imaging. Editors: F Barr and R M Kirberger. Includes writing 3 chapters in book
- 2010 Handbook of Small Animal Radiology and Ultrasound: Techniques and Differential Diagnoses. R Dennis, R M Kirberger, F Barr, R H Wrigley. W B Saunders 2010.
- 2011 BSAVA Manual of Small Animal Diagnostic Ultrasound. Editors L Gaschen and F Barr. Chapter 4. Interventional ultrasound. Kirberger RM and Stander N.
- 2011 Veterinary Computed Tomography. Editors T Schwarz and J Saunders Wiley-Blackwell. Chapter 25. The Mediastinum. Petite A, Kirberger RM.

### **Presentations**

Robert is a regular speaker at local branch and national congresses and has presented numerous Diagnostic Imaging CPD courses over the years. He has also given more than 80 international congress presentations, many of which as key note imaging speaker at the British as well as World Small Animal Veterinary Association congresses.

### **Publications R M Kirberger**

- 1 **Kirberger RM.** Congenital malformation and variation of the lumbar vertebrae in a dog. J SA Vet Ass 1989;60:111-112.
- 2 **Kirberger RM,** Gottschalk RD. Developmental kyphoscoliosis in a foal. J SA Vet Ass 1989;60:146-148
- 3 **Kirberger RM.** Doppler echocardiography: Facts and physics for the practitioner. Comp Cont Ed 1991;13:1679-1686
- 4 **Kirberger RM.** Mitral valve E point to ventricular septal separation in the dog. J SA Vet Ass 1991;62:163-166
- 5 **Kirberger RM,** Berry W. Atrial septal defect in the dog: The value of Doppler echocardiography. J SA Vet Ass 1992;63:43-48
- 6 **Kirberger RM,** Roos CJ, Lubbe AM. The radiological diagnosis of thoracolumbar disc disease in the Dachshund. Vet Radiol 1992;33:255-261
- 7 **Kirberger RM,** Jacobson L. Perinephric pseudocysts in a cat. Aust Vet Prac 1992;22;160-163
- 8 **Kirberger RM,** Bland-van den Berg P, Darazs B. Doppler echocardiography in the normal dog: Part I. Velocity findings and flow patterns. Vet Radiol 1992;33:370-379

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- 10 **Kirberger RM**, Wrigley R. Myelography in the dog: Review of patients with contrast medium in the central canal. *Vet Radiol & Ultrasound* 1993;34:253-257
- 11 **Kirberger RM**, van den Berg JS. Pulsed wave Doppler echocardiographic evaluation of intracardiac blood flow in normal sheep. *Res Vet Sc* 1993;55:189-194
- 12 **Kirberger RM**, Lambrechts N. The ultrasonographic appearance of black grain eumycetoma in the abdominal cavity of the dog. *JAAHA* 1993;29:477-479
- 13 Lubbe AM, **Kirberger RM**, Verstraete FJM. Pediculectomy for thoracolumbar spinal decompression in the Dachshund. *JAAHA* 1994;30:233-238
- 14 **Kirberger RM**. Lumbar myelography in the dog: Recent developments. *Comp Cont Ed* 1994;16:847-854
- 15 Jacobson LS, **Kirberger RM**, Nesbit JW. Hepatic ultrasonography and pathological findings in dogs with hepatocutaneous syndrome: New concepts. *JVIM* 1995;9:399-404
- 16 **Kirberger RM**, van den Berg JS, Gottschalk RD, Guthrie AJ. Duodenal ultrasonography in the normal adult horse. *Vet Radiol & Ultrasound* 1995;36:50-56
- 17 **Kirberger RM**, Roos CJ. Radiographic artifacts. *J SA Vet Ass* 1995;66:85-94
- 18 **Kirberger RM**. Imaging artifacts in diagnostic ultrasound - A review. *Vet Radiol & Ultrasound* 1995;36:297-306
- 19 Jacobson LS, **Kirberger RM**. Canine multiple cartilaginous exostosis: unusual manifestations and a review of the literature. *JAAHA* 1996;32:45-51
- 20 Milner RJ, Engela J, **Kirberger RM**. Arachnoid cyst in cerebellar pontine area of a cat - diagnosis by magnetic resonance imaging. *Vet Radiol & Ultrasound* 1996;37:34-36
- 21 **Kirberger RM**, Gottschalk RD, Guthrie AJ. Radiological appearance of air introduced during equine regional limb anaesthesia. *Eq Vet J* 1996;28:298-305
- 22 **Kirberger RM**, Jacobson LS, Davies J, Engela J. Hydromyelia in the dog. *Vet Radiol & Ultrasound* 1997;38:30-38
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- 24 **Kirberger RM**, Lobetti R. *Pneumocystis carinii* in the miniature dachshund: Radiologic changes. *Vet Radiol & Ultrasound* 1998;39:313-317
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- 27 Fourie SL, **Kirberger RM**. Relationship of cervical spinal cord diameter to vertebral dimensions: A radiographic study of normal dogs. *Vet Radiol & Ultrasound* 1999;40:137-147
- 28 **Kirberger RM**. Radiograph quality evaluation for exposure variables: A review. *Vet Radiol & Ultrasound* 1999;40:220-226

- 29 Dvir E, **Kirberger RM**, Terblanche AG. Magnetic resonance imaging of otitis media in a dog. *Vet Radiol & Ultrasound* 2000;41:46-49
- 30 Mohr AJ, **Kirberger RM**. Arrhythmogenic right ventricular cardiomyopathy in a dog. *J SA Vet Ass* 2000;71:125-130
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- 84 Hartman M, Monet E, **Kirberger RM**, Schoeman J et al. Laparoscopic sterilization of the African lioness (*Panthera leo*)" *Veterinary Surgery* 2013
- 85 Pazzi P, Thompkins S, **Kirberger RM**. Canine spirocercosis-associated extraskeletal osteosarcoma with central nervous system metastasis. *JSAVA* 2013:84(1) Art. #71 86
- 86 Lim CK, **Kirberger RM**, Lane EP, Elliott D. imaging diagnosis – computed tomography of a leopard tortoise (*Geochelone pardalis pardalis*) with confirmed pulmonary fibrosis. *Acta Vet Scan* 2013: 55; 35

## Extracts from recent articles

### COMPUTED TOMOGRAPHIC AND RADIOGRAPHIC CHARACTERISTICS OF AORTIC LESIONS IN 42 DOGS WITH SPIROCERCOSIS

ROBERT M. KIRBERGER, NERISSA STANDER, NICKY CASSEL, PAOLO PAZZI, VARAIZO MUKORERA, JEVAN CHRISTIE, ANN CARSTENS, ERAN DVIR

*Spirocerca lupi* is a common cause of vomiting, regurgitation, and sudden death in dogs that live in tropical or subtropical regions. Sudden death due to aortic rupture may occur with no preceding clinical signs. The purpose of this prospective study was to compare radiographic and computed tomographic (CT) characteristics of aortic lesions in a cohort of 42 dogs with endoscopically confirmed spirocercosis. Dorsovenral and right lateral recumbent thoracic radiographic findings were compared with pre- and postcontrast thoracic CT findings. Aortic mineralization was detected using CT in 18/42 dogs (43%). Three dogs had faint diffuse aortic wall mineralization. Using CT as the reference standard, radiographs had a sensitivity and specificity of 0% and 90%, respectively, for detecting aortic mineralization. A total of 20 aortic aneurysms were detected using CT in 15/42 dogs (36%). Using CT as the reference standard, radiographs had a sensitivity and specificity of 80% and 50%, respectively, for detecting aortic aneurysms. Respiratory motion, aortic displacement by esophageal masses and *Spirocerca* nodules adjacent to the aorta mimicked aneurysm formation on radiographs. Aortic thrombi were seen in two dogs in postcontrast CT images. Findings from this study indicated that aortic mineralization and aneurysm formation are common in dogs with spirocercosis. Findings also supported the use of pre- and postcontrast CT as effective methods for detecting and characterizing these lesions. © 2013 *Veterinary Radiology & Ultrasound*.

**Key words:** Aneurysm, aorta, CT, dog, mineralization, radiography, *Spirocerca lupi*, thrombus.



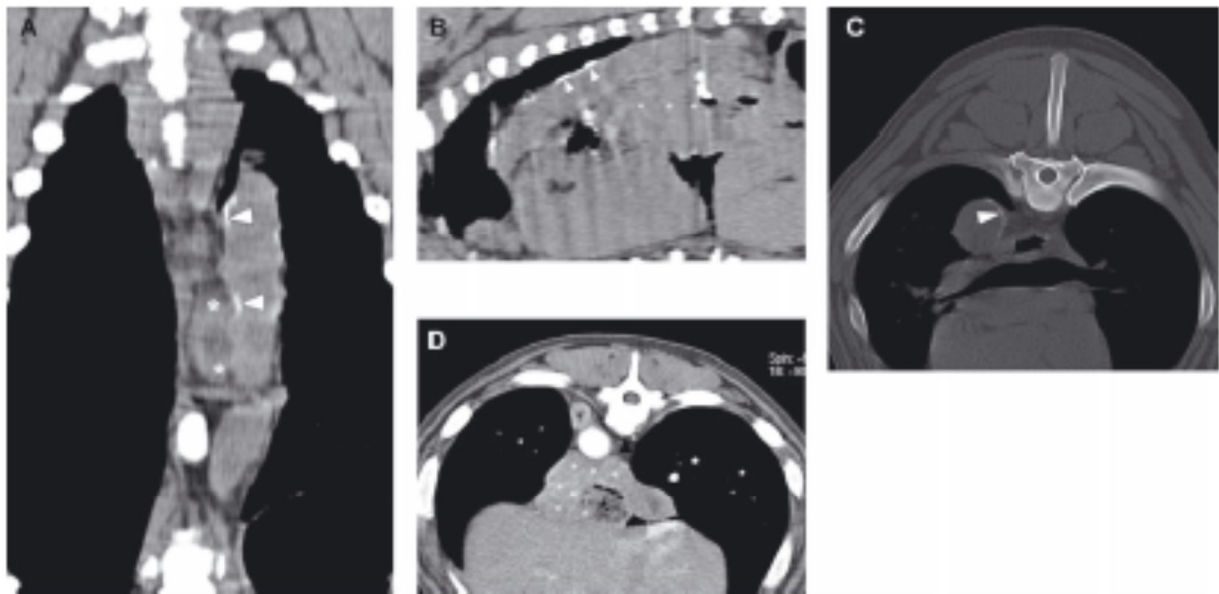


FIG. 1. Boerboel 6.5 years old with a neoplastic esophageal mass (white\*\*). CT images (A) Dorsal and (B) sagittal images through thoracic descending aorta in a mediastinal window WW 400, WL40. Note irregular outline of the initial descending aorta with straggly mural mineralization (white arrowheads). (C) Transverse image in a bone window. WW 1500, WL 430. Note mineralized wall of aorta medially. Patient's left is always on the left of the image on transverse images. (D) Transverse image postcontrast in a mediastinal window. WW 400, WL40. Note additional nodule (black\*) dorsolaterally to the aorta, which on radiographs could mimic an aneurysm. Adjacent spondylitis (black arrowhead) and an esophageal mass are present ventral to the aorta.

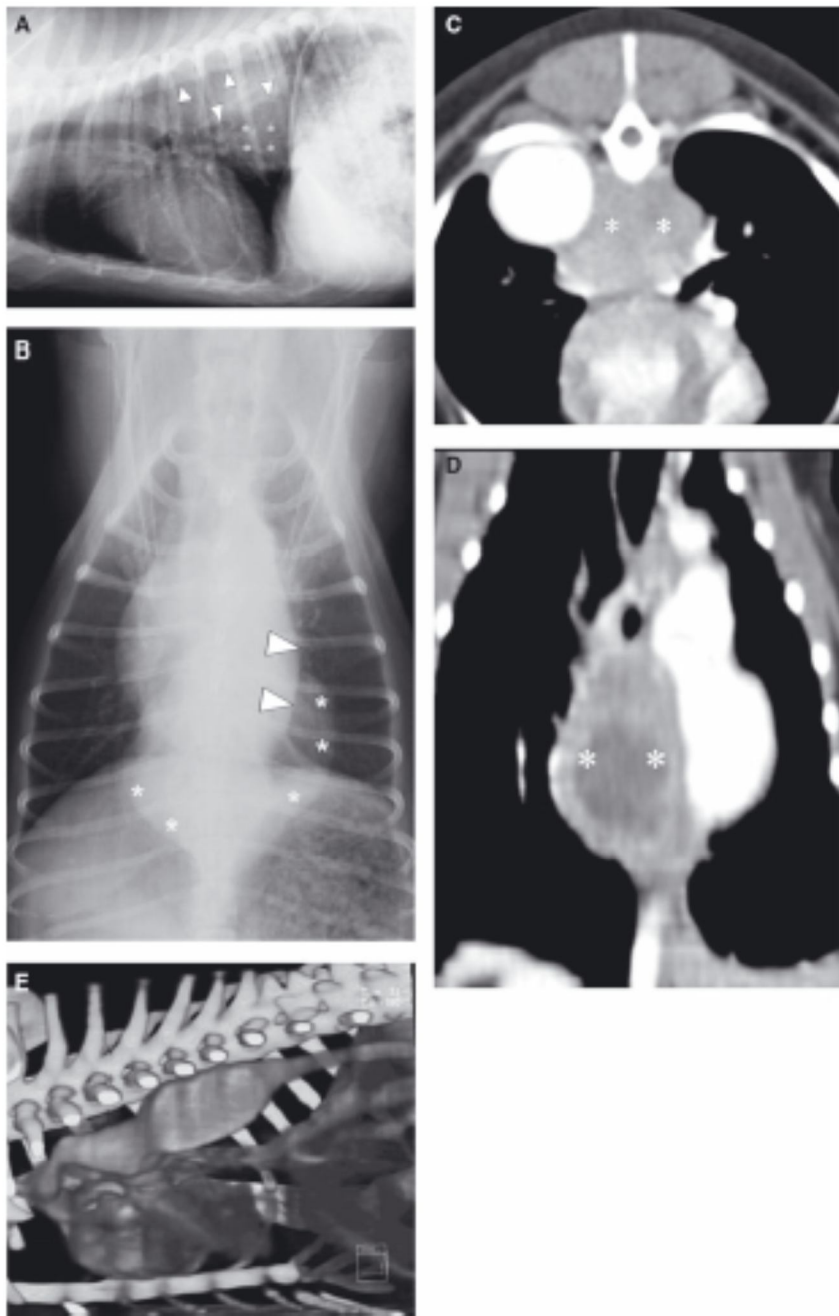


FIG. 5. Male 10 years old with a non-neoplastic esophageal mass (white\*\*) and a large aortic aneurysm dorsolateral to it. (A) Lateral and (B) DV thoracic radiographs (white arrowheads delineate edge of aneurysm, which ventrally superimposes on mass). (C) Transverse, (D) dorsal, and (E) volume rendered postcontrast CT images in a mediastinal window. WW 400, WL40.

## Ultrasonographic and laparoscopic evaluation of the reproductive tract of the captive female African lion (*Panthera leo*)

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### Abstract

The use of transabdominal ultrasonography to assess the oestrous cycle has not been previously described in the African lion (*Panthera leo*). Twelve sexually mature lionesses and five female cubs had their reproductive organs assessed by transabdominal ultrasound. Ovarian findings were compared to laparoscopic findings while performing laparoscopic ovariectomy or salpingectomy. Vaginal cytology was performed and serum progesterone levels were determined. By combining all data the oestrous cycle stage of each lion was determined. One lion was far pregnant and was not operated on. In adults a uterine body could be seen ultrasonographically in 67% of lions while mural structures could be distinguished in 44% of lions. Five uterine horns could be seen in 3 lions. In 12 adults 10 ovaries were found of which eight had discernable follicles or luteal structures. During laparoscopy 12 active ovaries were seen with luteal structures seen in 11 ovaries and follicles in 2 ovaries. Using laparoscopy as the gold standard, ultrasonography had a sensitivity of 66% and specificity of 83% to detect ovarian reproductive activity. Two uterine cysts and a cluster of periovarian cysts were seen in three different lions. Three lions were pregnant, two were in oestrus, three in a luteal phase (dioestrus), and four were in anoestrus. Transabdominal ultrasound in combination with serum progesterone levels and vaginal cytology can be used to assess ovarian cyclical activity with reasonable accuracy in captive bred lions. © 2011 Elsevier Inc. All rights reserved.

**Keywords:** Cyclical activity; Laparoscopy; Lioness; *Panthera leo*; Reproduction; Ultrasound



**Lioness being prepared for diagnostic ultrasound and laparoscopy**



**Diagnostic ultrasound of the reproductive tract of the lioness in a field hospital**

**CASE REPORT**

**Open Access**

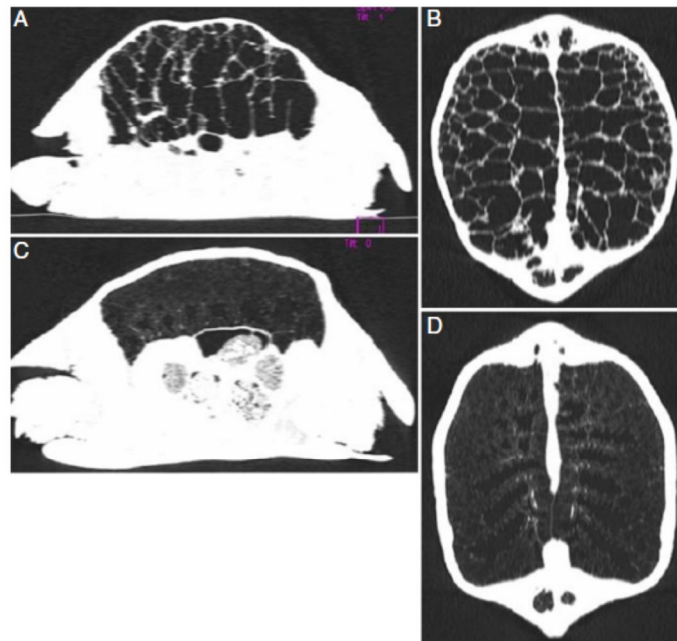
## Computed tomography imaging of a leopard tortoise (*Geochelone pardalis pardalis*) with confirmed pulmonary fibrosis: a case report

Chee Kin Lim<sup>1\*</sup>, Robert M Kirberger<sup>1</sup>, Emily P Lane<sup>2</sup> and Dorianne L Elliott<sup>3</sup>

### Abstract

An approximately 20-year-old, female Leopard tortoise (*Geochelone pardalis pardalis*) was presented with dyspnea, wheezing, anorexia and depression. Whole body radiographs revealed generalized diffuse unstructured 'interstitial lung pattern' with thickened pulmonary septae while computed tomography (CT) showed emphysematous lung parenchyma and thickened pulmonary septae bordered by irregular ground-glass opacity with smaller areas of 'honeycombing'. These imaging findings together with histopathologic findings were compatible with chronic, extensive 'interstitial' pulmonary fibrosis.

**Keywords:** Chelonian, Pulmonary fibrosis, Radiography, Computed tomography



**Figure 2** Comparison of sagittal and dorsal MPR CT images of the affected Leopard tortoise with the normal Leopard tortoise in lung window (WL -600, WW 1200). The affected tortoise (A & B) shows the thickened pulmonary septae and the normal tortoise (C & D) shows a normal diffuse reticular lung pattern.