

# TANZANIA VETERINARY ASSOCIATION



PROCEEDING OF THE 35 SCIENTIFIC CONFERENCE OF THE TANZANIA VETERINARY  
ASSOCIATION HELD AT AICC ARUSHA, TANZANIA ON THE 5<sup>TH</sup> TO 7<sup>TH</sup> DECEMBER,  
2017

Volume 35

2017

ISSN 0856 - 1451

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### **All correspondences should be addressed to:**

Editor, Tanzania Veterinary Association, P.O. Box 3021, Chuo Kikuu, Morogoro, Tanzania.

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**Publishers: Tanzanina Veterinary Association.**

# Caudal mediastinal abscessation in an adult East African black headed Ewe -A case report

M. Makungu<sup>1</sup> and J. Malago<sup>2</sup>

<sup>1</sup>Department of Veterinary Surgery and Theriogenology, College of Veterinary Medicine and Biomedical Sciences, Sokoine University of Agriculture, P.O. Box 3020, Chuo Kikuu, Morogoro, Tanzania.

<sup>2</sup>Department of Anatomy and Physiology, College of Veterinary Medicine and Biomedical Sciences, Sokoine University of Agriculture, P.O. Box 3016, Chuo Kikuu, Morogoro, Tanzania.

**Email:** modesta\_makungu@yahoo.com; makunguliku@suanet.ac.tz

## SUMMARY

A 4-year-old East African black headed ewe was presented to Sokoine University of Agriculture Animal Hospital with a history of loss of body condition and respiratory distress. Clinical examination revealed poor body condition, severe leukopenia with neutrophilia and lymphopenia. Radiographic examination of the thorax revealed an elongated caudal mediastinal mass with soft tissue opacity dorsal to caudal vena cava and caudal to the carina. The ewe was humanely euthanised due to deteriorated body condition. At post-mortem examination the mass contained caseous creamy material with early laminated appearance surrounded by a whitish fibrous capsule suggestive of chronic abscessation of caudal mediastinal lymph node. *Corynebacterium pseudotuberculosis* was isolated on bacterial culture of pus sample. A diagnosis of an abscessed caudal mediastinal lymph node as a result of *Corynebacterium pseudotuberculosis* infection was made. Thoracic radiography should be considered in sheep with chronic progressive emaciation and respiratory distress. Further, in sheep with caudal mediastinal mass, caseous lymphadenitis should be considered as one of the differential diagnoses.

**Keywords:** sheep, thorax, radiography, mediastinum, caseous lymphadenitis, *Corynebacterium pseudotuberculosis*

## INTRODUCTION

The mediastinum is the space between the lungs. It extends from the thoracic inlet to the diaphragm (Thrall, 2007). The mediastinum may be divided into a cranial portion cranial to the heart, a middle portion at the level of and containing the heart, and a caudal portion caudal to the heart (Thrall, 2007). Further, it may also be divided into dorsal and ventral portions by a dorsal plane through the tracheal bifurcation (Thrall, 2007). Organs and structures within the mediastinum include; the oesophagus, trachea, thymus, nerves, lymph nodes, thoracic duct, heart and great vessels (Baines, 2008).

The most common sites for mediastinal masses are the cranial ventral and perihilar, however can occur anywhere within the mediastinum (Baines, 2008). There are various causes of mediastinal masses such as abscess, neoplasia, hernia and spirocerca lupi (Thrall, 2007). Mediastinal lymph node enlargement which is associated with various conditions is one of the most common causes of mediastinal mass (Thrall, 2007). Clinical signs such as dyspnea, coughing, exercise intolerance, and regurgitation may be observed in animals with mediastinal mass depending on the size and position (Baines, 2008).

Being one of the difficult areas to examine clinically, diagnostic imaging plays an important role in the detection and investigation of mediastinal

abnormalities and for initial screening radiography is the imaging modality of choice (Baines, 2008). Two orthogonal views of the thorax i.e. the lateral and dorsoventral (DV) or ventrodorsal (VD) views should be used to assess the mediastinum. The VD or DV view allows full assessment of the position of the mediastinum and is more sensitive for definitive diagnosis of mediastinal mass. The lateral view allows evaluation of many of the normal visible structures but does not allow assessment of mediastinal shift (Baines, 2008).

This case report on abscessation of the caudal mediastinal lymph node in East African black headed ewe as a result of *Corynebacterium pseudotuberculosis* infection.

## Case presentation

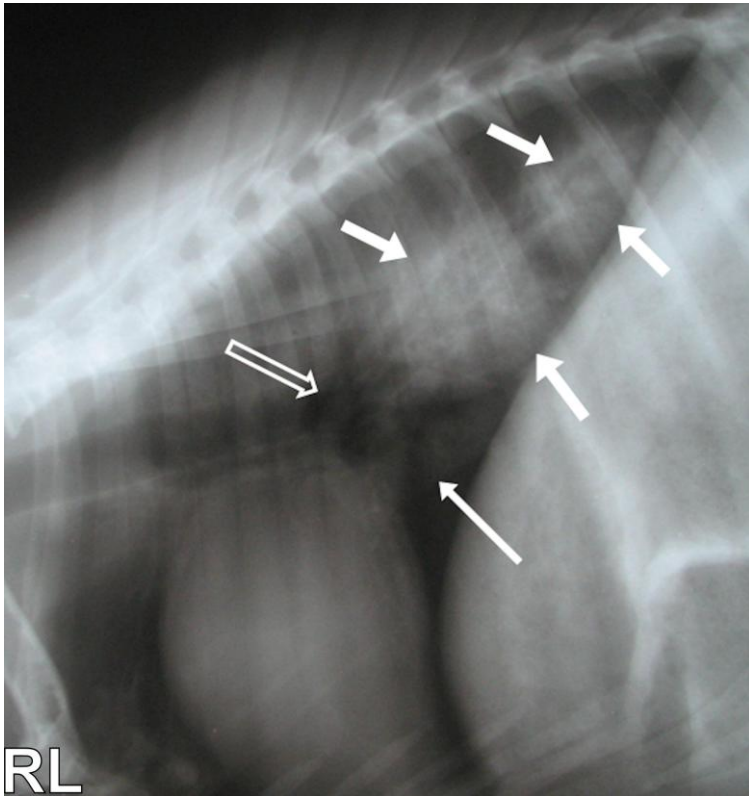
A four-year-old, 15 kg East African black headed ewe was referred to Sokoine University of Agriculture Animal Hospital with a history of loss of body condition and respiratory distress of two months duration. The ewe was treated with procaine penicillin and dihydrostreptomycin sulphate (Pen & Strep<sup>®</sup>, Norbrook, Ireland) but failed to improve significantly.

At referral, clinical examination was performed and radiography of the thorax was done. Clinical examination revealed; poor body condition,

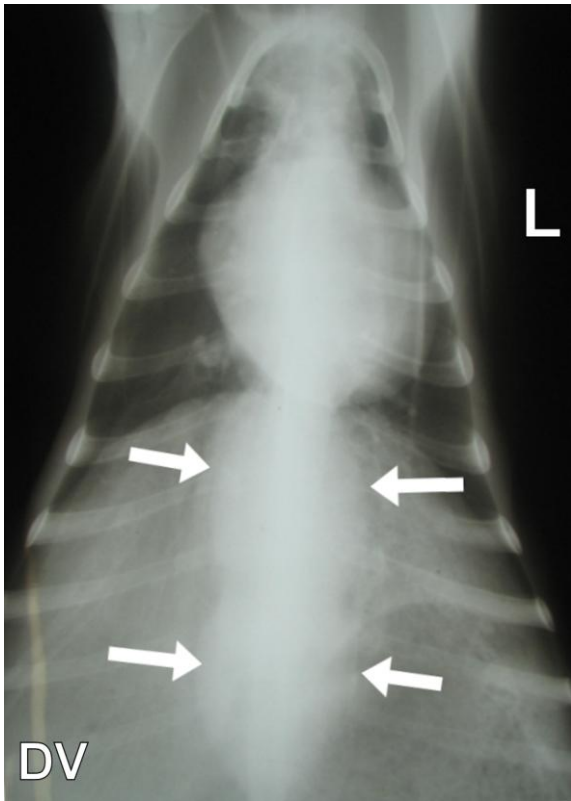
*Abscessation in sheep*

decreased rectal temperature (37.0°C, reference 39.1 ± 0.5), tachycardia (126 beats/min, reference 70-80 beats/min), and respiratory distress. Haematological parameters showed severe leukopenia (0.02, reference 4.0-12.0 x 10<sup>9</sup>/L) with neutrophilia (93.8%, reference 10.0-50.0%) and lymphopenia (6.2%, reference 40.0-75.0%). Mild anaemia (RBC: 8.42, reference 9.0-15.0 g/L; PCV: 26.9%, reference 27.0-45.0; Hgb: 8.3 g/dl, reference 9-15 g/dl) was also observed. Thoracic radiographs revealed a single, well marginated, bilobed and elongated

caudodorsal mediastinal mass dorsal to caudal vena cava and caudal to the carina (Figures 1 and 2). The mass had soft tissue opacity and measured 14.0 cm in length, 5.5 cm in height and 5.3 cm in width (Figures 1 and 2). Because of deteriorated body condition the ewe was humanely euthanised by intravenous injection of pentobarbitone (Euthapent<sup>®</sup>, Kyron laboratories [Pty] Ltd, South Africa).



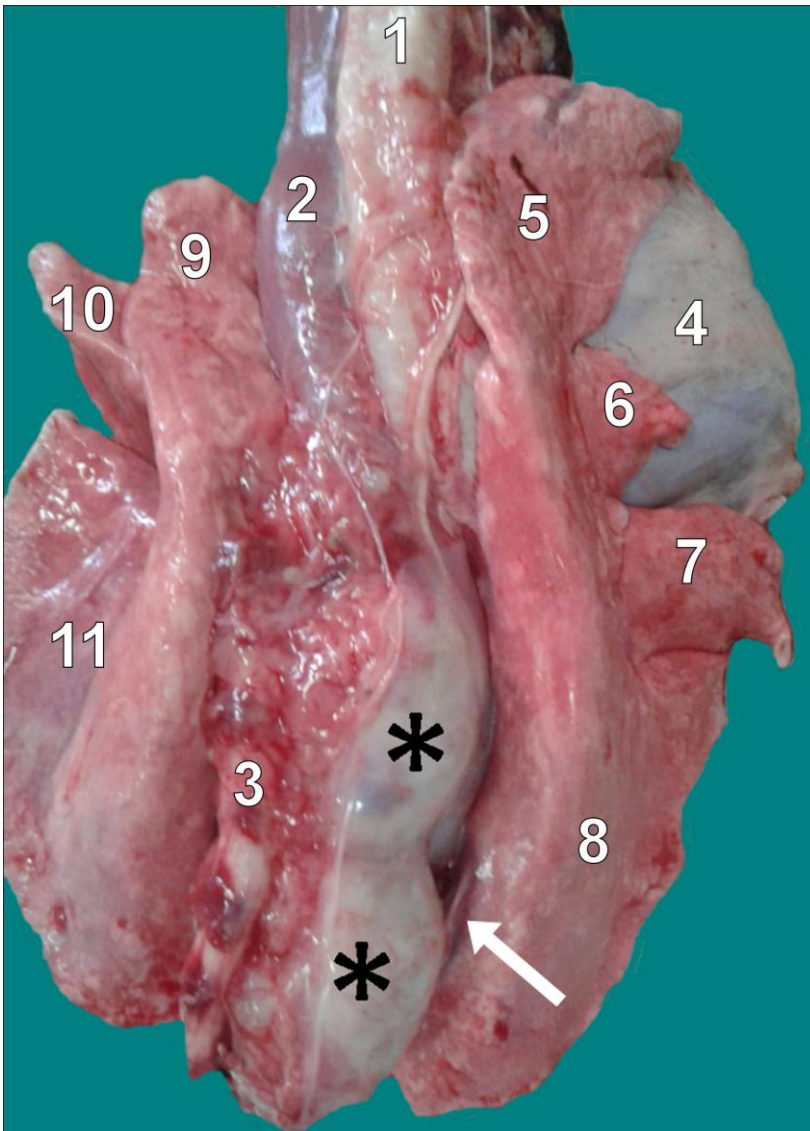
**Figure 1.** Right lateral thoracic radiograph of a four-year-old East African black headed ewe. Note the presence of an elongated bi-lobed mass with soft tissue opacity in the caudodorsal mediastinum (white arrows). The caudal vena cava and carina are indicated by a thin white arrow and an open white arrow, respectively. RL- right lateral.



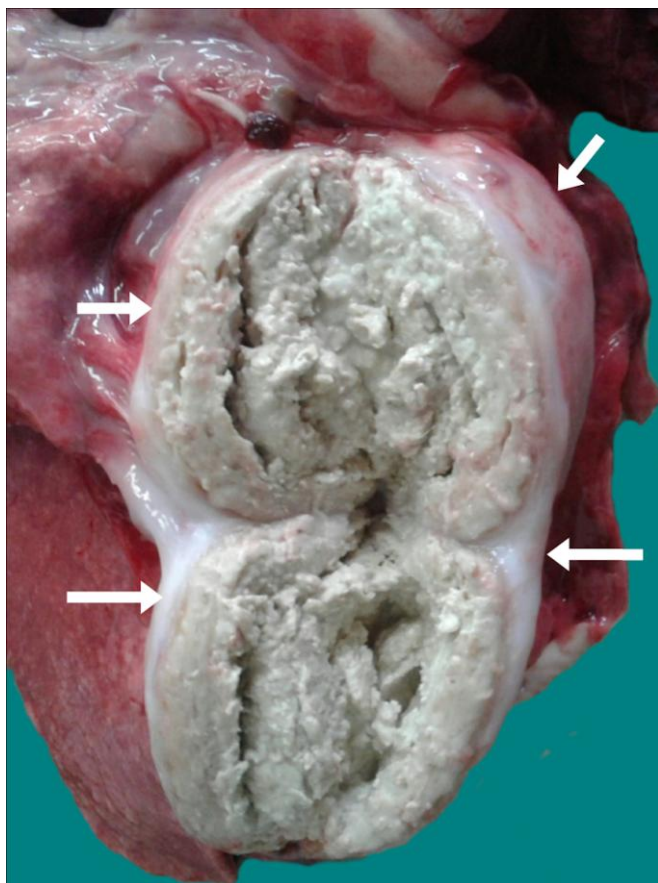
**Figure 2.** Dorsoventral thoracic radiograph of a four-year-old East African black headed ewe. The caudal mediastinal mass (white arrows) is superimposed with the spine and cranially is in contact with the caudal margin of the cardiac silhouette.

The necropsy confirmed the presence of an elongated bilobed mass in the caudal mediastinum ventral and to the right of the aorta between the caudal lung lobes (Figure 3). Adhesions were also observed between the mass and the lungs (Figure 3). The mass contained caseous (cheese-like) creamy material with early laminated appearance

surrounded by a whitish fibrous capsule (Figure 4) and was interpreted to be an abscessed caudal mediastinal lymph node. Pus sample from the abscess was submitted for bacterial culture and *Corynebacterium pseudotuberculosis* was isolated.



**Figure 3.** Dorsal photographic view of a gross specimen of lungs of a four-year-old East African black headed ewe. An elongated bi-lobed mass (asterisk) is seen between the medial surfaces of the caudal lung lobes (8, 11) and ventral to the right of the aorta (3). Note also the presence of adhesion (white arrow) between the mass and the right caudal lung lobe. 1, trachea; 2, oesophagus; 3, aorta; 4, heart; 5, cranial part of the cranial lobe of the right lung; 6, caudal part of the cranial lobe of the right lung; 7, middle lobe of the right lung; 8, caudal lobe of the right lung; 9, cranial part of the cranial lobe of the left lung; 10, caudal part of the cranial lobe of the left lung; 11, caudal lobe of the left lung.



**Figure 4.** Dorsal photographic view of an opened elongated bi-lobed mass. Note the presence of caseous cream material with laminated appearance surrounded by a whitish fibrous capsule (white arrows).

## DISCUSSION

Caseous lymphadenitis presents in two forms; namely external and internal (Baird and Fontaine, 2007; Fontaine and Baird, 2008; Serres *et al.*, 2011; Williamson, 2001). The internal form, also known as visceral form is characterised by development of abscesses in internal lymph nodes (mediastinal, bronchial and lumbar) (Baird and Fontaine, 2007; Fontaine and Baird, 2008; Serres *et al.*, 2011; Williamson, 2001) as it was observed in this case. Abscesses may be also seen in other viscera such as the lung, liver, kidneys, spleen and uterus (Williamson, 2001; Baird and Fontaine, 2007; Fontaine and Baird, 2008; Serres *et al.*, 2011). It is more common in sheep (Williamson, 2001) and the principal location of the lesions is the lung parenchyma and mediastinal lymph nodes (Baird and Fontaine, 2007). In latter, abscesses may become so large and put pressure on the oesophagus, interfering with swallowing and rumination leading to chronic ill-thrift (Baird and Fontaine, 2007)

In sheep, the prevalence of caseous lymphadenitis has been reported to be significantly higher in ewe than in rams (Al-Gaabary *et al.*, 2009) as it has been encountered in this case. Due to the chronic nature

of the disease, it was postulated that the disease was commonly observed in ewe as a result of being kept for many years compared to rams, which are slaughtered at a young age (Al-Gaabary *et al.*, 2009). It is most likely that the abscessed caudal mediastinal lymph node interfered with respiration, which led to respiratory distress in this case. Furthermore, the pressure exerted by the abscess on the oesophagus interfered with rumination and swallowing, which lead to chronic ill-thrift. Chronic progressive emaciation and respiratory distress have been reported by several authors in sheep with visceral form of caseous lymphadenitis involving the thoracic cavity (Baird and Fontaine, 2007; Oreiby *et al.*, 2015). Leukopenia, neutrophilia and lymphopenia that have been observed in the present case are the result of chronic inflammation and a response to stress (Benjamin, 1978). Neutrophilia and lymphopenia have also been reported in an ewe with internal form of caseous lymphadenitis (Serres *et al.*, 2011).

There are few reports on the radiographic appearance of visceral form of caseous lymphadenitis involving the thoracic cavity in ewes (Williamson, 2001; Oreiby *et al.*, 2015). The visceral form of caseous lymphadenitis involving the thoracic cavity has various radiographic

appearances depending on whether there is a single or multiple abscesses. In one case with a single abscess; a radiopaque mass was seen over the heart base (Oreiby *et al.*, 2015). Williamson (2001) reported the presence of multiple pulmonary nodules in the dorsal lung field in an ewe with multiple abscesses.

The caseous creamy material with early laminated appearance, which was observed in an abscessed caudal mediastinal lymph node in this case, is almost similar to other reported cases of caseous lymphadenitis in small ruminants (Williamson, 2001; Baird and Fontaine, 2007; Leasket *al.*, 2013).

Thoracic radiography should be considered in sheep with chronic progressive emaciation and respiratory distress. Further, in sheep with pulmonary nodules or mediastinal mass caseous lymphadenitis should be included in the differential diagnosis.

#### **ACKNOWLEDGEMENTS**

The authors would like to thank Mrs Sinao Kingongo and Mr Antony Mhando for their assistance during radiographic examination.

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