



Case Report

Malignant Catarrhal Fever in a Calf in Espírito Santo State, Brazil: Report of the First Case

Priscila M. S. Carmo¹, Krishna D. Oliveira², Graziela Barioni³,
José C. Oliveira-Filho¹, Tayse D. Souza⁴

¹Programa de Pós-Graduação em Medicina Veterinária, área de concentração em Patologia Veterinária, Centro de Ciências Rurais, Universidade Federal de Santa Maria (UFSM).

²Doutoranda em Patologia Veterinária Experimental e Comparada, FMVZ/USP, Laboratório de Oncologia Experimental - Dep. Patologia, Fac. Medicina Veterinária e Zootecnia – USP.

³Docente de Clínica de Ruminantes, Curso de Medicina Veterinária, Centro Universitário Vila Velha - UVV.

⁴Docente de Patologia Veterinária, Curso de Medicina veterinária, Centro Universitário Vila Velha - UVV.

Corresponding Author: Priscila M. S. Carmo, Departamento de Patologia, Universidade Federal de Santa Maria (UFSM), Av. Roraima, 1000 - CEP 97105-900, Santa Maria, RS, Brazil.
E-mail: priscilamcarmo@gmail.com

Submitted September 27th 2010, Accepted December 1st 2010

Abstract

A case of malignant catarrhal fever (MCF) is described in a 9-month-old, male, mixed breed calf from Espírito Santo State, southeastern Brazil. MCF had not yet been described in this region. The clinical course was 5 days and clinical signs included proprioceptive deficits, depression, dyspnea, coughing, nasal discharge, and erosive-ulcerative lesions in the oral cavity. Necropsy findings included erosive-ulcerative lesions in the alimentary tract and bronchopneumonia. Histopathological exam revealed widespread lymphoplasmacytic vasculitis associated with fibrinoid necrosis of vessel walls, mainly in the vessels of carotid rete mirabile. The diagnosis of MCF was made based on clinical, necropsy and histological findings.

Key Words: Diseases of cattle, viral diseases, malignant catarrhal fever, pathology.

Malignant catarrhal fever (MCF) is a highly fatal, viral disease of cattle and other ungulates occurring worldwide. It is caused by a herpesvirus (genus *Rhadinovirus*, subfamily *Gammaherpesvirinae*). The disease affects mostly cattle but has been described in more than 30 other species of ruminants (16). Affected cattle may develop a peracute, acute, or chronic disease, and the clinical signs are characterized by cutaneous, digestive, respiratory, neurological, and ocular disorders (9, 11, 13). Two epidemiologically distinct forms of the disease have been described in cattle. The wildebeest-associated MCF (WA-MCF) occurs in Africa and is transmitted by *Connochaetes taurinus* and *C. gnu*. This form of MCF is caused by the alcelaphine herpesvirus-1 (AHV-1) (4). The sheep-associated MCF (SA-MCF) occurs in Europe, America, Australia, and New Zealand. The etiologic agent in these cases is the ovine herpesvirus-2 (5).

The first report of MCF in Brazil occurred in 1924 in the northeastern region (17). After the first report the disease has been reported in several other areas such as southeastern (10), center-west (6), northeastern (9) and south (5, 13). In this short communication we describe a case of MCF in a calf in Espírito Santo state, southeastern Brazil.

A case of MCF in a 9-month-old, male, mixed breed calf from the municipality of Guarapari, Espírito Santo state, southeastern Brazil is described. The calf had strict contact with sheep in the farm and started to develop clinical signs after exposition in an agricultural fair. Clinical signs included weakness, anorexia, depression, proprioceptive deficits, stiff gait, conjunctivitis, coughing, dyspnea, mucopurulent nasal discharge, serous ocular discharge, and erosive-ulcerative lesions in the oral cavity. After 5 days the animal presented with seizures and died spontaneously.

Necropsy was performed in the Departamento de Anatomia Patológica from the Centro Universitário Vila Velha (UVV) in May, 2008. Grossly there were numerous erosions and ulcers covered by fibrin throughout the oral and abomasal mucosae. Generalized lymphadenomegaly and leptomenigeal hyperemia were also observed. Lungs were dark red and heavy and did not collapse after opening of the thoracic cavity. A mucopurulent content was observed oozing out from the pulmonary cut surface. Several tissues were immersed in 10% formalin, routinely processed to histology, and stained with hematoxylin and eosin. Histological examination revealed widespread lymphoplasmacytic arteritis mostly in the vessel walls from intestinal submucosa, kidney, liver, lungs, and brain. Small arteries from carotid *rete mirabile* also showed lymphoplasmacytic arteritis predominantly in the adventitia and in a lesser degree in the tunica media. Fibrinoid necrosis of the tunica media was also observed in these blood vessels (Fig.1). Marked inflammatory infiltrate was seen surrounding and within the lumen of numerous bronchi, bronchioli, and in the alveolar walls (bronchointerstitial pneumonia). The lining epithelium from the digestive and respiratory tract and from the renal tubules showed multifocal areas of necrosis associated with lymphoplasmacytic arteritis.

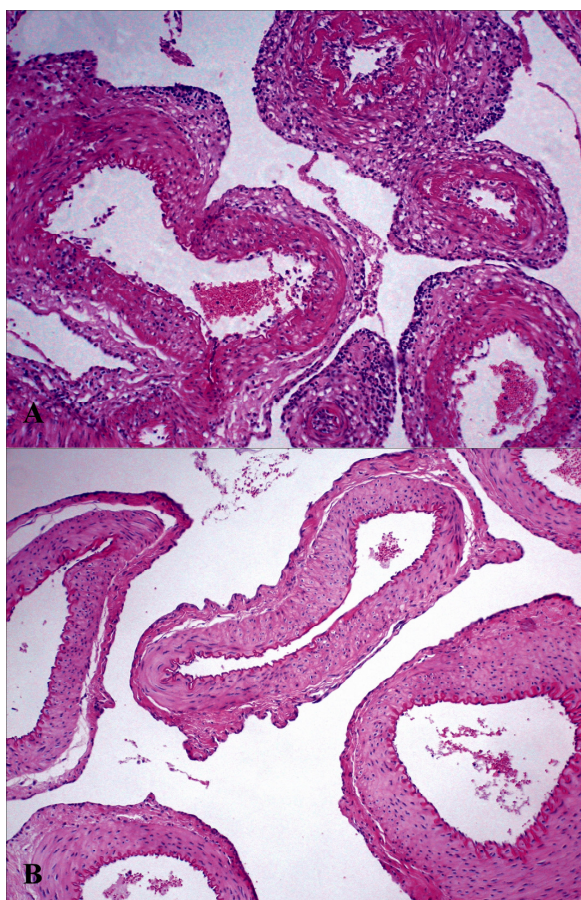


Figure 1. A. Malignant catarrhal fever in a calf. Rete mirabile. The arterial walls are infiltrated by lymphoplasmacytic cells, observed predominantly in the tunica adventitia and is associated with fibrinoid necrosis of the tunica media. H&E, obj. 10x. B. Rete mirabile of normal bovine. H&E, obj. 10x.

The transmission of MCF occurs by the contact with sheep during the parturition period (14, 16). The calf herein described was kept in close contact with sheep and presented with clinical signs after had been held in an agricultural fair. It is possible that potential stressing conditions during the exposition could have played a role in the reactivation of a previous latent virus (3). The diagnosis of MCF was made based on clinical signs, gross findings, and histopathology. The vascular changes observed in this case are important in the diagnosis of MCF as the disseminated vasculitis has been for long time described as characteristic for MCF (7, 8). Moreover, histopathology is considered a definitive diagnostic tool by some authors (2, 12, 15).

Rabies, meningoencephalitis by bovine herpesvirus, MCF, and Aujeszky's are the five neurological viral diseases that have been reported in Brazilian cattle (1). It is important to make a clear distinction among these diseases due to the importance of the Brazilian bovine spongiform encephalopathy surveillance system. The examination of the carotid *rete mirabile*, pituitary gland, and Gasserian ganglia is recommended in all cases of neurological disease in cattle. This procedure might be important in the differentiation between MCF and other diseases of central nervous system in cattle (5).

The clinical differential diagnosis of MCF should also include bovine viral diarrhea/mucosal disease, foot and mouth disease, blue tongue, rinderpest, and vesicular stomatitis. It is possible to rule out some of these infections by epidemiological features as MCF causes high mortality and low morbidity. Additionally, cattle affected by MCF will develop lymphoplasmacytic vasculitis with fibrinoid necrosis in the vessels of the carotid *rete mirabile* (2). The present report is important under the scope of the epidemiological aspects of MCF in Brazil, since no cases of this disease have been documented in Espírito Santo.

References

1. BARROS CSL., DRIEMEIER D., DUTRA I., LEMOS R. Febre catarral maligna. Doenças do sistema nervoso de bovinos no Brasil. Montes Claros: Valée, 2006, 36-43.
2. BROWN CC., BAKER DC., BARKER IK. The alimentary system. MAXIE MG. Eds. Jubb, Kennedy, and Palmer's Pathology of domestic animals. 5.ed. Philadelphia: Saunders Elsevier, 2007, v.2, 152-8.
3. CORTEZ PP., PEREIRA PD., CORTEZ A., MENDONÇA C., THOMPSON G. Três casos confirmados de febre catarral maligna em Portugal. Revista Portuguesa de Ciências Veterinárias, 2002, 97, 42-6.
4. COULTER LJ., WRIGHT H., REID HW. Molecular genomic characterization of the viruses of

- malignant catarrhal fever. *J. Comp. Pathol.* 2001, 124, 2-19.
5. GARMATZ SL., IRIGOYEN LF., RECH RR., BROWN CC., ZHANG J., BARROS CSL. Febre catarral maligna em bovinos no Rio Grande do Sul: transmissão experimental para bovinos e caracterização do agente etiológico. *Pesq. Vet. Bras.*, 2004, 24, 93-106.
 6. LEMOS RAA., RECH RR., GUIMARÃES EB., KADRI A., DUTRA IS. Febre catarral maligna em bovinos do Mato Grosso do Sul e de São Paulo. *Ciência Rural*, 2005, 35, 932-4.
 7. LIGGIT HD., DeMARTINI JC. The pathomorphology of malignant catarrhal fever. 1. Generalized lymphoid vasculitis. *Vet. Pathol.*, 1980a, 17, 58-72.
 8. LIGGIT HD., DeMARTINI JC. The pathomorphology of malignant catarrhal fever. 2. Multisystemic epithelial lesions. *Vet. Pathol.*, 1980b, 17, 73-83.
 9. MACÊDO JTSA., RIET-CORREA F., SIMÕES SVD., DANTAS AFM., NOBRE VMT. Febre catarral maligna em bovinos na Paraíba. *Pesq. Vet. Bras.*, 2007, 27, 277-81.
 10. MARQUES LC., ALESSI AC., BECHARA GH., THOMAZ BW., GUERRA L. Surtos de febre catarral maligna em bovinos no Estado de São Paulo. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*, Belo Horizonte, 1986, 38, 719-729.
 11. MENDONÇA FS., DÓRIA RGS., SCHEIN FB., FREITAS SH., NAKAZATO L., BOABAID FM., PAULA DAJ., DUTRA V., COLODEL EM. Febre catarral maligna em bovinos no Estado de Mato Grosso. *Pesq. Vet. Bras.*, 2008, 28, 155-60.
 12. PLOWRIGHT, W. Malignant catarrhal fever virus. MOREIN B., DINTER Z. *Virus infections of ruminants.* Amsterdam: Elsevier Science Publishers BV, 1990, 946-57.
 13. RECH RR., SCHILD AL., DRIEMEIER D., GARMATZ SL., OLIVEIRA FN., RIET-CORREA F., BARROS CSL. Febre catarral maligna em bovinos no Rio Grande do Sul: epidemiologia, sinais clínicos e patologia. *Pesq. Vet. Bras.*, 2005, 25, 97-105.
 14. REID HW., POW I., BUXTON D. Antibody to alcelaphine herpesvirus-1 (AHV-1) in hamsters experimentally infected with AHV-1 and the "sheep-associated" agent of malignant catarrhal fever. *Res. Vet. Sci.*, 1989, 47, 383-6.
 15. REID HW., VUUREN MV. Malignant catarrhal fever. COETEZER JAW., TUSTIN RC. *Infectious diseases of livestock with special reference to Southern Africa.* 2.ed. Cape Town: Oxford University, 2004, v.2, 895-908.
 16. RUSSELL GC., STEWART JP., HAIG DM. Malignant catarrhal fever: A review. *Vet. J.*, 2009, 179, 324-35.
 17. TORRES S. Óca, mal do chifre ou coryza gangrenosa dos bovinos. *Boletim da sociedade brasileira de medicina veterinária*, 1924, 1, 144-59.
-