

CASE REPORT

MYCOPLASMA ARTHRITIS IN CALVES

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Introduction

Mycoplasmas are a group of micro-organisms widely distributed in nature, a number of species of which are pathogenic to both man and animals (1, 7).

In the bovine species, mycoplasmas have been recognized for many years as the causative agent in contagious bovine pleuropneumonia (2). More recently, the organisms have been isolated from cases of pericarditis (1), mastitis, various reproductive disorders and arthritis (4, 5).

Mycoplasma arthritis in calves was reported in the United States in 1956 (8). Subsequent cases were observed in Australia in 1963 (9), and in 1966 (3).

The purpose of this paper is to report the first known cases of mycoplasma arthritis in calves in Canada.

History

Two groups of affected calves were admitted to the Ontario Veterinary College during the months of December 1970 and January 1971. Both cases involved six to nine month old Hereford calves which had been purchased from southern Ontario stockyards. Case 1 involved a group of calves which recently had arrived from western Canada. Two weeks after purchase, three out of 143 animals were slightly lame. Case 2 involved nine of 84 calves which were slightly lame at the time of purchase. In both instances, the calves were housed inside and fed hay and a limited amount of grain.

Clinical Findings

The early signs observed by the owners included a slightly elevated rectal temperature and a reluctance of affected calves to rise. When urged to stand and move, the calves were extremely stiff and quickly resumed a recumbent position. Appetites were not noticeably affected and the joints during the early stage were only slightly enlarged. At the time of admission to the Ontario Veterinary College a few days later, the calves were less stiff but

the affected joints by this time were greatly enlarged (Figure 1). Most frequently affected were the hock, stifle and elbow joints.

Radiographs of the affected joints revealed primarily a soft tissue swelling. In the left elbow joint of one animal from Case 1, osteophyte production was evident between the olecranon and the posterior proximal surface of the radius.

Laboratory Findings

No hematological changes were observed with respect to hemoglobin, packed cell volume, total leukocyte count or differential leukocyte percentage. Serum glutamic oxaloacetic transaminase (SGOT) and serum alkaline phosphatase levels were also within the normal range. Aspirated synovial fluid was thick, opaque and straw colored. The cytology of the synovia from three joints is shown in Table I.



FIGURE 1. Swelling of the elbow joint due to mycoplasma arthritis in clinical case I.

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TABLE I
CYTOLOGICAL EXAMINATION OF SYNOVIA FROM JOINTS OF CALVES
AFFECTED WITH MYCOPLASMA ARTHRITIS

	Case 1		Case 2
	Left elbow	Right hock	Left hock
Leukocytes/mm ³	97,000	17,500	60,000
Segmented			
Neutrophils %	99	85	92
Lymphocytes %	0	2	1
Macrophages %	1	13	7

Aspirated joint fluid was submitted for microbiological culture. Mycoplasma isolations were attempted using Difco PPLO agar or broth supplemented with 1% Albimi¹ yeast autolysate, 0.1% glucose, 1000 units per ml penicillin G potassium, 1:4000 thallium acetate and 15% unheated horse serum.² The broth also contained .002% phenol red and the final pH was adjusted to 7.6.

Agar cultures were incubated at 37°C in a moist atmosphere with the addition of 5–10% CO₂. The broth cultures were incubated aerobically and subcultured to agar plates after 48 hours.

After 48–72 hours incubation, typical mycoplasma colonies were observed. "Film and spots" appeared after three to six days incubation. A weak acid reaction was noted in the broth cultures in two to four days and a delicate film was observed on the surface.

Routine cultures for bacteria were made on five percent citrated bovine blood in trypticase soy agar base³ with a staphylococcus streak, incubated at 37°C in 5–10% CO₂. No bacteria were isolated but the mycoplasma grew as very tiny alpha-hemolytic colonies after five to six days incubation.

No viruses or chlamydia were isolated.

The mycoplasma isolate did not grow in medium without serum and was not inhibited by antiserum to *Mycoplasma laidlawii* NCTC 10116, *M. bovirhinis* NCTC 10118, or *M. bovirhinis* M 103/66 (PG 11), in growth inhibition tests. Antiserum prepared against *M. agalactiae* var *bovis* M41/67 Donetta, was not suitable for growth inhibition tests.

A culture was submitted to the Mycoplasma Reference Laboratory in England and was identified by growth inhibition tests as *Mycoplasma agalactiae* var *bovis*, (bovine group 5).

¹Albimi Laboratories, Flushing, New York, New York, U.S.A.

²Grand Island Biological Company, New York, New York, U.S.A.

³Baltimore Biological Laboratories, Baltimore, Maryland, U.S.A.

Arthritis was reproduced in experimental calves with the isolate recovered from Case 1. These experiments will be the subject of a further report (Ruhnke, Cazabon, Singh in preparation).

Treatment

Affected calves from Case 1 were treated symptomatically with 400,000–600,000 I.U. crystalline penicillin⁴ intra-articularly. Oxytetracycline⁵ also was administered intravenously at 4 mg per pound body weight for seven days. After isolation of mycoplasma, 500 mg aqueous chloramphenicol⁶ was administered intra-articularly followed by 50 mg three days later.

Calves from Case 2 were given 2 mg per pound tylosin⁷ intramuscularly daily for seven days. Treated calves did not improve during the seven to ten days of hospitalization. Both owners, however, reported that the calves had recovered 14 to 21 days after being returned home.

Discussion

The isolation of *M. agalactiae* var *bovis* from calves in Ontario appears to be the first reported case of this organism producing arthritis in feedlot cattle in Canada. The arthritis observed appears similar to cases reported from the United States of America in 1956 (8) and Australia in 1963 (9) and 1966 (3). These workers isolated mycoplasma from affected joints but the species involved was not determined at that time. The mycoplasma isolated from the Australian cases in 1963 was later classified in bovine serological group 7

⁴Penicillin G. Potassium Crystalline, Connaught Medical Research Laboratories, Toronto, Ontario, Canada.

⁵Liquamicyn-100, Pfizer Company Ltd., Montreal, Quebec, Canada.

⁶Rogar-Mycine (succinate), Rogar/STB, St. Hyacinthe, Quebec, Canada.

⁷Tylocine, Corvel Division, Eli Lilly and Company (Canada) Ltd., Scarborough, Ontario, Canada.

(6). In each instance, arthritis was reproduced either by intra-articular or intravenous injection of the recovered organism. The naturally occurring and experimental arthritis was fibrinopurulent during the acute stage and fibrinous in nature in chronic cases.

Arthritis has been observed in association with mycoplasma mastitis in dairy cows in California (4, 5). Affected joints yielded mycoplasma serologically similar to that causing the mastitis. The strains isolated from mastitis were found to belong to the *M. agalactiae* var *bovis* species (5).

Previous attempts to treat bovine mycoplasma arthritis have been unrewarding. Intravenous tylosin tartrate at 2.5 mg to 5.0 mg per kg body weight daily for six days was found not to be of value by Australian workers (3). Others administered oxytetracycline at 250 mg intra-articularly as well as 500 mg intramuscularly. The intramuscular treatment was repeated for two more days. This treatment alleviated the lameness but the organism could be recovered five months after treatment (9). The interpretation of the response of calves treated by us is difficult because untreated control animals were not used. It would appear, however, that with adequate care, affected calves may recover over a period of four to six weeks.

Summary

Mycoplasma arthritis manifested by joint swelling and lameness in Hereford calves in Ontario feedlots is reported. *Mycoplasma agalactiae* var *bovis* was isolated from aspirated joint fluid. Treatment intra-articularly with aqueous chloramphenicol and systemically with oxytetracycline and tylosin did not result in an immediate response. Affected animals however, recovered two to three weeks later without further treatment.

Résumé

On rapporte chez des bouvillons de parcs d'élevage en Ontario des arthrites à

mycoplasma se manifestant par une boiterie et une enflure de l'articulation. Les seuls organismes cultivés à partir du matériel aspiré, furent *Mycoplasma agalactiae* var *bovis*. Une thérapie intra-articulaire au chloramphénicol complétée systématiquement par l'oxytétracycline et la tylosine n'a pas donné d'amélioration clinique immédiate. Toutefois, il y eut amélioration appréciable chez les sujets traités deux à trois semaines plus tard.

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ABSTRACT

Dixon, R. T. (1969). A preliminary evaluation of Rn²²² gamma radiation therapy in horses. Aust. vet. J. 45, 389-394. (Univ. Sydney, New South Wales 2006).

As a source of gamma radiation, radon (Rn²²²) is more readily available in Australia than Co⁶⁰ or Ra²²⁶. In horses Rn²²² therapy was valuable in treating aseptic inflammatory

conditions of the limbs such as splints and sesamoiditis, and in controlling excessive granulation tissue and neoplasms. It had no apparent value in suspensory ligament sprains, and was effective against arthritis only where the articular cartilage was undamaged.

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