

CASE REPORT

Bovine Stephanofilarial Dermatitis in Alberta

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Abstract

The nematode, *Stephanofilaria stilesi* was recovered from two mature beef cattle in Alberta. The appearance of the skin and the histological lesions are described. The life cycle of the parasite and the development of lesions are reviewed.

Key words: *Stephanofilaria stilesi*, bovine, dermatitis.

Résumé

Deux cas de dermatite due à *Stephanofilaria stilesi*, chez des bovins de l'Alberta

Les auteurs rapportent deux cas d'une dermatite due à *Stephanofilaria stilesi*, chez autant de vaches à boeuf de l'Alberta. Ils en décrivent les lésions macroscopiques et microscopiques. Ils présentent aussi une revue du cycle vital du parasite et du développement des lésions.

Mots clés: *Stephanofilaria stilesi*, bovin, dermatite.

Introduction

Stephanofilaria stilesi is a small filarial nematode responsible for the dermatitis of cattle known as stephanofilariasis. This disease is characterized by one or more circular or oblong areas of scaly, depilated, crusted skin at or near the umbilicus.

This disease has been documented in most areas of the United States, and it is seen with higher frequency in beef cattle on western and southwestern rangelands (1-5). There is only one report of the occurrence of this parasite in Canada. In 1954, while conducting a survey for *S. stilesi* in the western United States, Maddy (5) found this nematode to be present in beef cattle

imported from Alberta. He did not state how long these Alberta cattle were present in the United States before being examined for *S. stilesi*.

The horn fly (*Haematobia irritans*) has been shown to be the intermediate host of *S. stilesi* in North America (6). Although horn flies tend to congregate on the backs and head regions of cattle during cool weather, at higher ambient temperatures they move to the underside of the body. Here they feed on blood and lymph and in so doing ingest viable microfilariae of *S. stilesi*. Within the horn fly, microfilariae grow and moult twice. The larvae migrate to the salivary glands of the horn fly and 18-21 days after entering the insect, become infective. As these flies feed on the underside of cattle the larvae migrate from the mouth parts of the insect into the skin. Six to eight weeks later the worms mature and begin to pass microfilariae into the skin (6).

The signs of infection appear along the midventral line of the body, between the brisket and navel when cattle are eight to ten months old. For the first two or three years, the lesions remain open and hemorrhagic, sometimes covered with serous exudate. Gradually, resolution takes place and by the time the animals are five to seven years of age, the skin has become dry and thickened. Successive eruptions may develop along the abdomen, udder, teats, scrotum or flanks. The skin normally regains its normal texture and thickness by the age of seven to eleven years but it is often sparsely covered with hair along the affected midventral area (6,7).

The clinical and histopathological findings of two cases of stephanofilariasis in cattle in Alberta are described in this report.

History

Case 1 — In June 1983, a mature Hereford cow from Bear Canyon, Alberta was submitted to the Peace River Regional Veterinary Laboratory for necropsy. This was a nursing cow in good physical condition. Signs of illness had not been observed prior to death. Postmortem examination revealed that this animal died of bloat. Incidental postmortem findings included circular to oblong areas of darkened, scaly, alopecic, crusted skin near the umbilicus and along the midventral line of the body. These areas ranged from 20 mm to 150 mm in diameter. Portions of these scaly areas were minced using a scalpel and incubated in normal saline at 37°C overnight. They were then centrifuged and a sample of sediment stained with methylene blue was examined microscopically. The nematodes demonstrated by this method were identified as the adults and microfilariae of *Stephanofilaria stilesi* according to the criteria described by Hibler (6). Portions of these lesions were fixed in 10% buffered formalin and processed for histological examination.

Case 2 — In September 1983, an eight year old Charolais-cross cow from Sylvan Lake, Alberta was submitted to the Airdrie Veterinary Laboratory for necropsy. This was one of two animals that had died on pasture from a pasture-induced atypical interstitial pneumonia. Small circular areas of scaly, alopecic skin were found along the midventral line of this cow. These circular areas were not as dark a color as in case 1 but some crusting of the epidermis was evident. Representative samples of the areas affected were fixed in 10% buffered formalin and were forwarded to the



FIGURE 1. Adult *Stephanofilaria stilesi* within dilated lymphatics. H & E. Bar = 100 μ m.

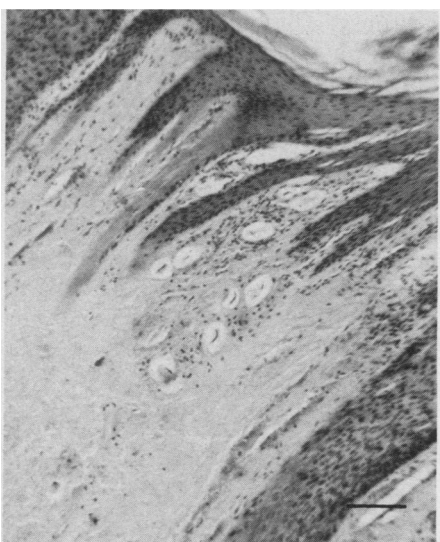


FIGURE 2. Microfilaria of *Stephanofilaria stilesi* in the upper dermis. H & E. Bar = 100 μ m.

Peace River Regional Veterinary Laboratory for parasitological examination. As fresh tissue was not submitted, nematodes could not be recovered by incubation in normal saline, as was done in case 1.

Histopathology

Tissues were fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 6 μ m and stained with hematoxylin and eosin.

Case 1 — The adult forms of *S. stilesi* were identified histologically associated with a hair follicle deep in the

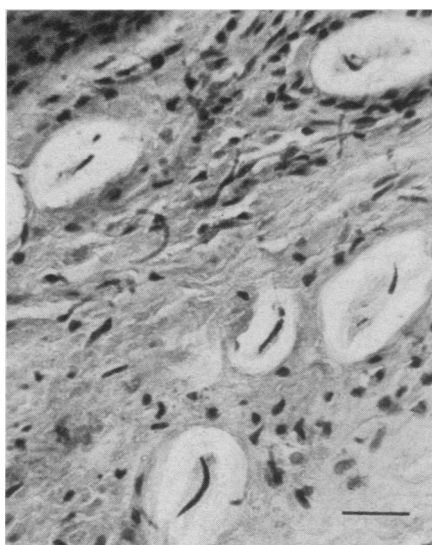


FIGURE 3. The microfilaria of *Stephanofilaria stilesi* within their own semirigid fluid filled membrane are seen within lymphatics. H & E. Bar = 25 μ m.

dermal layer and within a dilated lymphatic duct (Figure 1). Microfilariae of *S. stilesi* were demonstrated in semirigid fluid filled membranes within dilated lymphatics in the upper dermis. (Figures 2 and 3). Epidermal thickening was the result of a superficial crusting of exudated serum, accumulations of degenerating neutrophils and both cellular and amorphous debris. Focally in the epidermis there was evidence of parakeratosis, hyperkeratosis, acanthosis, elongated rete ridges and ulceration.

Case 2 — The inflammatory reaction was more generalized and severe than in case 1. Epidermal changes were similar to those of case 1. The reaction within the dermis was associated mainly with hair follicle sheaths. Neutrophils were present in higher numbers than case 1. Only one adult *S. stilesi*, associated with a hair follicle and clearly within a dilated lymphatic was seen deep in the dermis. Many empty dilated lymphatics were evident.

Discussion

The lesions of bovine stephanofilarial dermatitis are commonly limited to

the umbilical region of cattle and therefore may be overlooked in the live animal. The lesions are the result of a mild local reaction, but have no systemic effect.

The incidence of bovine stephanofilarial dermatitis in Canada is unknown as a survey has never been attempted. The importance of this condition lies in the disfigurement of the skin which may reduce the value of hides and occasionally may disqualify registered animals from public exhibitions (8). Practicing veterinarians should be aware of bovine stephanofilarial dermatitis, if only to rule out a significant, detrimental dermatitis.

Footnote

Tissue sections containing adults and microfilariae of *Stephanofilaria stilesi* from the skin of these two cases have been deposited in the National Museum of Natural Sciences Invertebrate Collection (Parasites), Invertebrate Zoology Division, Ottawa, Canada. Accession # NMCPD 1984 — 0472 and 0473.

Acknowledgments

Thanks are extended to Dr. Murray Kennedy, Alberta Department of Agriculture, Animal Health Division for confirmation of identification of *Stephanofilaria stilesi*.

References

1. DIKMANS G. Nematodes as the cause of a recently discovered skin disease of cattle in the United States. *North Am Vet* 1934; 15: 22-25.
2. ———. Observations on stephanofilariasis in cattle. *Proc Helminthol Soc Wash* 1934; 1:42.
3. ———. Skin lesions of domestic animals in the United States due to nematode infection. *Cornell Vet* 1948; 38: 3-23.
4. LEVINE ND, MORRILL CC. Bovine stephanofilarial dermatitis in Illinois. *J Am Vet Med Assoc* 1955; 127: 528-530.
5. MADDY KT. Stephanofilarial dermatitis of cattle. *North Am Vet* 1955; 36: 275-278.
6. HIBLER CP. Development of *Stephanofilaria stilesi* in the horn fly. *J Parasitol* 1966; 52: 890-898.
7. DUNN AM. *Veterinary helminthology*, 2nd ed. London, England: William Heinemann Medical Books Ltd. 1978.
8. JENSEN R, MACKAY DR. *Diseases of feedlot cattle*, 3rd ed. Philadelphia: Lea & Febiger. 1979.