

Parafilariasis

*Parafilariasis,
Summer Bleeding Disease,
Verminous Nodules*

Last Updated: August 2009



the Center for
Food Security
& Public Health

IOWA STATE UNIVERSITY®

College of Veterinary Medicine
Iowa State University
Ames, Iowa 50011
Phone: 515.294.7189
Fax: 515.294.8259
cfsph@iastate.edu
www.cfsph.iastate.edu



INSTITUTE FOR
INTERNATIONAL
COOPERATION IN
ANIMAL BIOLOGICS

Iowa State University
College of Veterinary Medicine
www.cfsph.iastate.edu/IICAB/

Importance

Parafilariasis, a nematode infestation of cattle, is characterized by focal hemorrhages on the skin and damage to the subcutaneous tissues that resembles bruising. The main impact of this disease is economic. Losses are caused by damage to the hide and trimming of the carcass during meat inspection. In animals with extensive lesions, the entire carcass may be condemned. The cost of controlling the parasite and its vector, together with economic losses in the slaughterhouse, can be significant.

Etiology

Parafilariasis is caused by infestation with the nematode parasite *Parafilaria bovicola*, a member of the family Filariidae.

Species Affected

Parafilariasis affects cattle and water buffalo (*Bubalus bubalis*).

Geographic Distribution

P. bovicola occurs in Africa, parts of Asia and some countries in Europe including Sweden, France and Belgium. *P. bovicola* has also been imported into other countries where it did not become established.

Transmission

P. bovicola is transmitted by flies in the genus *Musca*. The licking flies *M. xanthomelas*, *M. lusoria* and *M. nevillei* are vectors in Africa, and the face fly *M. autumnalis* transmits the parasite in Europe. *M. vitripennis* might be a vector in Asia.

Flies become infected when they feed on lesions in cattle and ingest parasite eggs or free larvae. The parasite develops to the infective third stage larva inside the fly; this process takes approximately 10 to 12 days in South Africa and 20 days in Sweden. These larvae are transmitted to susceptible animals when the fly feeds on wounds or ocular secretions. They migrate under the skin, developing into adults in 5 to 7 months. Gravid female worms break the skin when they deposit eggs, which are shed in the exudates and blood. Mature parasites do not appear to survive in lesions from year to year; infestations are newly acquired each year.

Incubation Period

Bleeding points appear in 7 to 10 months, when gravid female nematodes break the skin and begin to lay eggs.

Clinical Signs

The clinical signs of parafilariasis are focal hemorrhages (“bleeding points”) in the skin, and areas of edema or nodules in the subcutaneous tissues. These lesions are most common on the skin of the back, neck and withers, although they may also occur in other locations. Blood may trickle from the small wound for minutes to hours. After the bleeding stops, another bleeding point may develop nearby.

Post Mortem Lesions

In affected animals, evidence of bleeding points is found on the skin, especially along the neck, back and withers. The subcutaneous tissues and fascia contain irregular, edematous lesions that resemble bruises. Most of the lesions are superficial, but in more severe cases, the underlying muscles can be extensively involved. Acute lesions are usually opaque, yellowish–green, and gelatinous. Older lesions are usually greenish dirty brown. As the lesions age, they also develop a characteristic metallic, unpleasant smell. Live or dead worms may be found in the subcutaneous lesions; however, parasites are not always present, as they tend to move after the eosinophilic reaction develops.

Morbidity and Mortality

In temperate regions, bleeding points are most common in the spring and early summer. In tropical areas, the lesions occur mainly after the rainy season. Large

numbers of cattle can be affected. Lesions have been reported in 35% of the young cattle raised on pastures in Sweden, and in more than 50% of the cattle in some parts of southern Africa. In Belgium, where the parasite was introduced recently, one survey suggests a herd prevalence of approximately 14%. Parafilariasis is not usually a problem in cattle managed indoors. Deaths do not occur.

Diagnosis

Clinical

Parafilariasis should be suspected in cattle with bleeding points. In carcasses, the lesions resemble bruising but contain an unusually large number of eosinophils and may have a distinctive smell.

Differential diagnosis

In live animals, injuries caused by biting insects, ticks, wire, thorns or other sharp objects should be considered. In carcasses, parafilariasis resembles bruises from trauma.

Laboratory tests

The diagnosis is usually based on clinical signs in endemic areas, but it may be confirmed by finding eggs or microfilaria in exudates from bleeding points. It is important to identify *P. bovicola* where this parasite has not been found previously. Parasite eggs and microfilaria can be found by centrifuging blood from a bleeding point. Dried blood mixed with saline solution can also be used. Microscopic examination of the sediment should reveal *P. bovicola* eggs (approximately 45 x 30 µm) containing microfilaria, or free microfilaria.

In the carcass, the lesions can be differentiated from bruises by the presence of numerous eosinophils in Giemsa-stained impression smears, and in older lesions, by the characteristic unpleasant metallic smell. Affected carcasses usually contain only small numbers of adult worms; the tissues can be incubated in warm saline to improve the recovery of parasites. *P. bovicola* is a slender white worm. Adult females are 50-65 mm long, and males are 30-35 mm.

Significant antibody titers to *P. bovicola* appear approximately three months after the animal has been exposed. An enzyme-linked immunosorbent assay (ELISA) has been described.

Samples to collect

Before collecting or sending any samples from animals with a suspected foreign animal disease, the proper authorities should be contacted. Samples should only be sent under secure conditions and to authorized laboratories to prevent the spread of the disease.

Either fresh or dried blood from a bleeding point should be collected into 0.85% saline. These samples should be kept cool and sent to a laboratory familiar with parafilariasis. A biopsy of a skin sample may also be taken and shipped in 10% formalin. Serum may be collected if serological tests are available.

Recommended actions if parafilariasis is suspected

Notification of authorities

Parafilariasis should be reported immediately upon diagnosis or suspicion of the disease.

Federal: Area Veterinarians in Charge (AVIC):

www.aphis.usda.gov/animal_health/area_offices/

State Veterinarians:

www.usaha.org/Portals/6/StateAnimalHealthOfficials.pdf

Control

Parafilariasis is not directly contagious between animals; development to the infectious form occurs inside the fly vector. However, it is critical to prevent this parasite from being transmitted to arthropod vectors in areas where *P. bovicola* is not endemic.

In endemic areas, insecticides and permethrin-impregnated ear tags have been used to control the fly vector. Keeping cattle indoors during the fly season can also help prevent this disease. Anthelmintics may decrease the number of bleeding points during the patent period and improve the quality of the meat at slaughter. Antiparasitic drugs are not thought to be effective during the prepatent period, when only immature worms are present.

Public Health

There is only one report of a human infection with *P. bovicola*, in an elderly man in Thailand who developed conjunctivitis. A single adult worm, which was described as a threadlike, curly object moving under the conjunctiva, was removed with the tip of a surgical blade. The patient was treated with ophthalmic antibiotics and recovered without complications.

Internet Resources

Food and Agriculture Organization of the United Nations. Manual on Meat Inspection for Developing Countries <http://www.fao.org/docrep/003/t0756e/T0756E00.HTM>

The Merck Veterinary Manual <http://www.merckvetmanual.com/mvm/index.jsp>

References

- Bech-Nielsen S. Parafilariasis in cattle. In: Foreign animal diseases. Richmond, VA: United States Animal Health Association; 1998. p. 332-43.
- Bhaibulaya M, Yoolek A, Kobkijcharoen M. *Parafilaria bovicola* Tubangui 1934 from a human eye in Thailand. Southeast Asian J Trop Med Public Health. 2004;35(4):817-9.
- Borgsteede FH, van Wuijckhuise L, Peutz J, Roumen T, Kock P. Import of *Parafilaria bovicola* in the Netherlands. Vet Parasitol. 2009;161(1-2):146-9.

- Herenda D, Chambers PG, Ettriqui A, Seneviratna P, da Silva TJP. Manual on meat inspection for developing countries [online]. FAO animal production and health paper 119. Publishing and Multimedia Service, Information Division, FAO; 1994 (reprinted 2000). Parafilariasis. Available at: <http://www.fao.org/docrep/003/t0756e/T0756E04.htm>. Accessed 22 Aug 2009.
- Kahn CM, Line S, editors. The Merck veterinary manual [online]. Whitehouse Station, NJ: Merck and Co; 2006. *Parafilaria bovicola*. Available at: <http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/71807.htm>. Accessed 21 Aug 2009.
- Losson B, Saegerman C. First isolation of *Parafilaria bovicola* from clinically affected cattle in Belgium. *Vet Rec*. 2009;164(20):623-6.
- Nevill EM. Preliminary report on the transmission of *Parafilaria bovicola* in South Africa. *Onderstepoort J Vet Res*. 1975;42:41-48.
- Nevill EM, Sutherland B. The colonization and life-cycles of *Musca lusoria*, *Musca xanthomelas* and *Musca nevillei*, vectors of *Parafilaria bovicola* in South Africa. *Onderstepoort J Vet Res*. 1987;54(4):607-11.
- Swan GE, Soll MD, Gross SJ. Efficacy of ivermectin against *Parafilaria bovicola* and lesion resolution in cattle. *Vet Parasitol*. 1991;40(3-4):267-72.
- Taylor MA, Coop RL, Wall RL. *Veterinary parasitology*. 3rd ed. Ames, IA: Blackwell Publishing; 2007. *Parafilaria bovicola*; p. 129-30.
- Viljoen JH. The parasitic life cycle of *Parafilaria bovicola* and its pathogenesis in cattle [PhD thesis]. [Pretoria (South Africa)]: University of Pretoria; 1982.