Parafilariasis

Parafilariosis,
Summer Bleeding Disease,
Verminous Nodules

Last Updated: July 2020

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. Other species of *Parafilaria* can cause similar lesions in other hosts.

Species Affected

P. bovicola is known to affect cattle, water buffalo (*Bubalus bubalis*) and yaks (*Poephagus grunniens*). Other species, especially those closely related to these animals, might be susceptible.

Zoonotic potential

P. bovicola does not normally affect humans, but at least one parasite has been found in an aberrant location (conjunctiva).

Geographic Distribution

P. bovicola has become established in Africa, parts of Asia and some countries in Europe.

Transmission

P. bovicola is transmitted by flies in the genus *Musca*. Species reported to be vectors include *M. xanthomelas*, *M. lusoria* and *M. nevilli* in Africa, *M. autumnalis* in Europe and *M. vitripennis* in Asia. *P. bovicola* larvae are thought to be transmitted to susceptible animals when the fly feeds on wounds or ocular secretions. The larvae migrate under the skin, developing into adults in 5 to 7 months. Approximately 2 months later, the gravid female worms break the skin to deposit their eggs, and the eggs and free (L1) larvae are shed in the discharge of blood or serohemorrhagic fluid. Flies become infected when they feed on these lesions. The parasite develops to the infective third stage larva inside the fly in approximately 10- 20 days, depending on the climate. Mature parasites do not appear to survive in lesions from year to year; infestations are newly acquired each year.

Disinfection

No disinfectants appear to be listed for *Parafilaria* eggs or larvae, but if needed, an agent effective against nematodes should be used.

Incubation Period

Cases usually become apparent 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 from small punctures (bleeding points) in the skin, and areas of edema or nodules in the subcutaneous tissues. The lesions are painful on palpation, and are most common on the skin of the back, neck, shoulders and withers. Blood or serohemorrhagic fluid may trickle from the small wound for minutes to hours. Later, another bleeding point may develop nearby. Although the lesions usually heal without complications, secondary issues can include myiasis, bacterial infections including abscesses, and the development of cutaneous ulcers or necrosis. Discomfort from extensive lesions may result in weight loss or reduced milk yield.

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Post Mortem Lesions

In affected animals, there is evidence of bleeding points on the skin, and the subcutaneous tissues and fascia contain irregular, edematous lesions that resemble bruises. Most lesions are superficial; but extensive involvement of the muscles can be seen in more severe cases. Occasionally, there may be a few localized lesions in internal organs and tissues of the abdominal cavity, thoracic cavity or other sites.

Acute lesions are usually opaque, yellowish–green, edematous or gelatinous, and occasionally hemorrhagic, with congested blood vessels. Older lesions are typically less edematous and greenish brown, yellow-brown or 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.

Diagnostic Tests

In endemic regions, the diagnosis is usually based on clinical signs, though it may be confirmed by finding eggs or microfilaria in bleeding points. However, it is important to identify *P. bovicola* in regions where this parasite has not been previously diagnosed. Parasite eggs and microfilaria can be detected in a sample of either fresh or dried blood/ exudate collected from a bleeding point (generally into 0.85% saline), which is then centrifuged and the sediment examined under the microscope. Samples may contain *P. bovicola* eggs (approximately 45 x 30 µm) containing microfilaria, free microfilaria or both. A PCR test that can be used with exudates was recently published.

Lesions in carcasses or biopsies can be distinguished from bruises by the presence of numerous eosinophils in Giemsa-stained impression smears, and in older lesions, by the characteristic smell. Parasites may be observed in some cases; however, affected carcasses usually contain only small numbers of adult worms, which may be difficult to find. *P. bovicola* is a slender white worm, with adult females 50-65 mm in length, and males 30-35 mm. Incubation of tissues in warm saline can improve their recovery. Adult worms are not necessarily detected in lesions from live animals.

Serology has been used occasionally, mostly in surveillance. Significant antibody titers to *P. bovicola* appear approximately three months after the animal has been exposed. An enzyme–linked immunosorbent assay (ELISA) was described, but the scarcity of reagents made this test impractical and it is unlikely to be in use.

Treatment

Parafilariasis has been treated with various anthelmintic agents, particularly injectable macrocyclic lactones (e.g., ivermectin, moxidectin), nitroxynil and injectable or topical levamisole. Oral or pour-on formulations of macrocyclic lactones seem to be less effective, with oral ivermectin and pour-on moxidectin having little or no effect in some reports. Delaying slaughter of the animal for 70-90 days after treatment can reduce economic losses by allowing the lesions to resolve. Anthelmintics are reported to be ineffective against immature larvae.

Control

Disease reporting

Veterinarians who encounter or suspect parafilariasis should follow their national and/or local guidelines for disease reporting. In the U.S., state or federal veterinary authorities should be informed immediately.

Prevention

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

In endemic regions, topical insecticides and insecticide–impregnated ear tags have been used to control the vectors. Keeping cattle indoors during the fly season may also help limit their exposure.

Morbidity and Mortality

Bleeding points typically occur from December to July in the Northern Hemisphere, then disappear. They are most common in the spring and early summer. In tropical areas, the lesions occur mainly after the rainy season. Parafilariasis is not usually a problem in cattle managed indoors.

Large numbers of cattle can be affected in endemic areas. 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, one survey suggested a herd prevalence of approximately 14% soon after the parasite was introduced. *P. bovicola* appears to have recently expanded its range in Europe, with reports of its presence in several new countries. However, increased awareness may also play a role: bleeding points can resemble various common conditions, and investigation of some incidents found evidence that the parasite had been present in the area for years before being recognized. Deaths do not occur, but discomfort from large numbers of parasites may cause weight loss or decreased milk production.

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 subsequently 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
https://www.merckvetmanual.com/

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