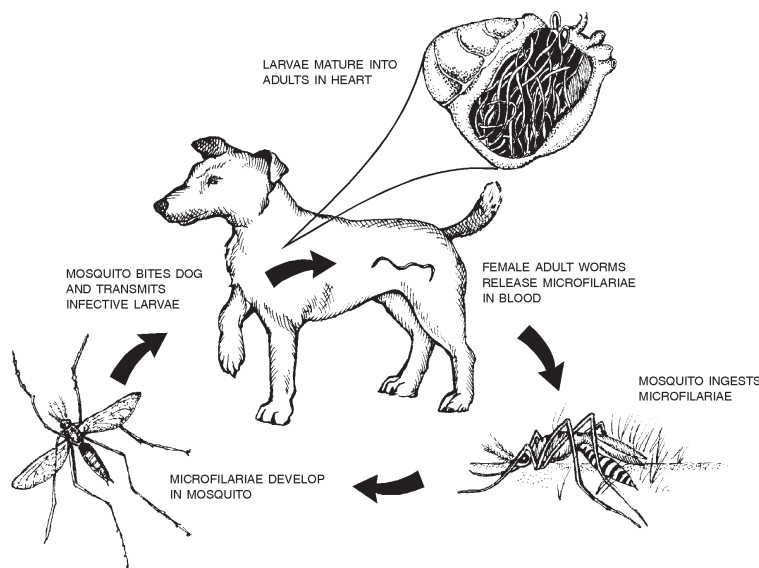


Chapter 10 - Lesson 5



Infectious Diseases: Cardiovascular & Lymphatic Systems



Life cycle of heartworms.

Heart and Blood Vessels

Myocarditis is an inflammation of the heart muscle (myocardium). Endocarditis is inflammation of the heart lining (endothelium) and valves. Pericarditis is an inflammation of the heart sac (pericardium). Inflammation of arteries is arteritis and of veins is phlebitis. Causative infectious agents of heart and blood vascular diseases in animals include bacteria (streptococcus, staphylococcus, salmonella, clostridium, borrelia, actinobacillus, and actinomyces); viruses (parvovirus, encephalovirus, hepatovirus, lymphovirus, pneumovirus, and hemovirus); and arthropod-borne hemoparasites (trypanosome, dirofilaria). Physical examination, digital imagery, and blood tests are utilized to diagnose the specific diseases.

The prevalence of dog heartworms or dirofilaria (a nematode) is higher in areas of high rainfall, high humidity, and large mosquito populations. Bites from infected mosquitoes transmit heartworms to dogs and occasionally cats and ferrets. These nematodes mature in the heart and the adult worms live for about a year in the right chambers (atrium and ventricle) of the heart and the pulmonary artery. Disease results when large numbers of worms interfere with the flow of blood through the heart chambers and the pulmonary artery. Clinical signs of heartworm disease include exhaustion, weakness, rapid breathing, coughing, and ascites (excessive peritoneal cavity fluid, swollen abdomen). Female worms produce larvae (microfilariae) that circulate in the blood. Mosquitoes that feed on

the dog pick up the microfilariae and transmit them to other dogs. Procedures for detection of the presence adult heartworms include echocardiography, antigen detection blood test, direct blood smear, and modified Knott's blood technique. Detection of microfilariae in peripheral blood must be microscopically differentiated from the larvae of the dipetalonema skin worm.

Blood Cells

Systemic viral blood diseases transmitted through vectors include equine infectious anemia (EIA, swamp fever) in horses and bluetongue and leucosis in cattle. Symptoms include fever, anemia, jaundice (yellow tissues), weight loss, and abortion. Serological laboratory tests are used to detect viral diseases in animals.

Direct blood smears and serological tests are laboratory procedures used to diagnose rickettsial diseases in blood cells. Diseases and modes of transmission are as follows:

- Anaplasmosis in cattle (Anaplas) Transmitted by horseflies, deerflies, instruments, and ticks.
- Eperythrozoonosis in swine (Epe) Transmitted by sucking lice and instruments.
- Ehrlichiosis in dogs (Tick Fever) Transmitted by brown dog tick, instruments, and blood transfusion.
- Rocky Mountain Spotted Fever in dogs (RMSF, Tick Fever) Transmitted by American dog tick, instruments, and blood transfusion.
- Ehrlichiosis in horses (Potomac Horse Fever) Transmission is unknown.

Lymph Nodes and Lymph Vessels

Lymphadenitis is an inflammation of the lymph nodes and lymphangitis is an inflammation of the lymph vessels. Lymphadenitis is commonly associated with abscesses of the lymph gland producing purulent pus. Caseous pus is pasty to cheesy in consistency.

Bacterial diseases of the lymphatic system include caseous lymphadenitis (CL) in sheep and goats, streptococcal lymphadenitis (jowl abscess) in pigs, ulcerative lymphangitis (pigeon breast) in horses, and streptococcus lymphadenitis (strangles, distemper) in horses. Transmission occurs through close contact with infected animals or contaminated environment. Diagnosis is confirmed by bacterial cultures.

Reference

Kahn, C. M. (Ed.). (2010). *The Merck veterinary manual* (10th ed.). Whitehouse Station, NJ: Merck.

Questions

1. Describe the following abnormal conditions:
 - a. Myocarditis
 - b. Endocarditis
 - c. Pericarditis
 - d. Lymphadenitis
 - e. Lymphangitis
2. List some of the infections parasites can cause in the cardiovascular system.
3. List some of the infections viruses can cause in the cardiovascular system.
4. List some of the infections bacteria can cause in the cardiovascular system.
5. List some of the infections rickettsiae can cause in the cardiovascular system.
6. List some of the infections bacteria can cause in the lymphatic system.
7. Of the diseases discussed in this lesson, which is likely to be the most contagious among animals?

Activities

1. Observe a variety of animals diagnosed with cardiovascular infections and record the presence or absence of clinical symptoms.
2. Observe a variety of animals diagnosed with lymphatic infections and record the presence or absence of clinical symptoms.