

Chapter 10 - Lesson 6

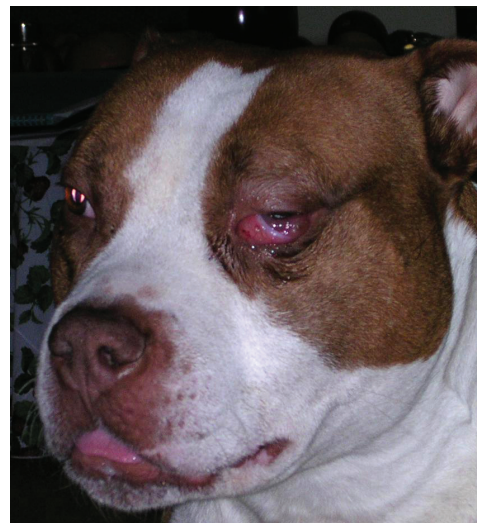


Infectious Diseases: Musculoskeletal & Nervous Systems

Muscles

Myositis is an inflammation of muscle. Necrotic myositis is death of inflamed muscle. Once pink muscle decays in a live animal, the muscle tissue turns dark. This necrotic condition caused by clostridial bacteria occurs in intestinal and body muscles.

Clostridia are a spore-forming group of bacteria that naturally inhabit the soil and intestinal tract of animals. Clostridia bacteria cause black muscle diseases (necrotic myositis) in ruminants (primarily cattle) and infect animals when they ingest bacterial spores in the soil. Ingested spores of some species remain latent (dormant) in intestinal muscle and others migrate to body muscles. Disease normally occurs following various triggers allowing the bacteria to break out of dormancy and transfer from the inactive spore stage in muscles to an active, multiplying vegetative stage that produces toxins resulting in black necrotic myositis. The breaking out of dormancy is recrudescence. Spores of malignant edema enter through a wound, transform in decayed tissues without oxygen (anaerobic) to vegetative bacteria, multiply, and produce toxins. Toxins are destructive to the infected tissues and are absorbed into the blood (toxemia), resulting in disease and death. Factors that may trigger the recrudescence of specific bacteria include fast growth and exertion injury of the leg muscles (*C. chauvoei* - blackleg); diet change and overload of intestines (*C. perfringens* B, C, D - backgut); trauma injury to neck muscles (*C. sordellii* - blackneck); and anaerobic wound and needle contamination of muscle tissue (*C. septicum* - malignant edema).



Masticatory muscle myositis.

Bone Joints

Arthritis is an inflammation of a bone joint; polyarthritis is inflammation of multiple joints. Examples of infectious arthritic diseases include caprine arthritis and encephalitis (CAE) common in goats and caused by a virus, mycoplasmosis in cattle, and haemophilosis in swine and cattle caused by bacteria.

Brain and Meninges

Meningitis is an inflammation of the meninges (brain covering). Encephalitis is inflammation of the brain tissue. Meningitis often occurs with encephalitis, a condition known as meningoencephalitis. Most brain

diseases cause a certain degree of necrosis (destruction) to the brain tissue. Meningoencephalitic diseases produce the following symptoms: depression, blindness, partial or complete paralysis, wobbling, seizures, coma, and delirium. Since the causative agents are resistant to chemotherapeutic compounds and cause terminal diseases, use of available vaccines for protection is important. Meningoencephalitic diseases caused by viruses include rabies, equine encephalomyelitis, canine distemper and parvovirus, feline leukemia, and swine pseudorabies; those caused by bacteria include tetanus, haemophilosis of swine and cattle; those caused by protozoa include equine protozoal myeloencephalitis (EPM), canine neosporosis, and toxoplasmosis of dogs and cats; and those caused by prions include bovine spongiform encephalopathy and scrapie of sheep; and by fungi include cryptococcosis and coccidiodomycosis of dogs and cats.

Reference

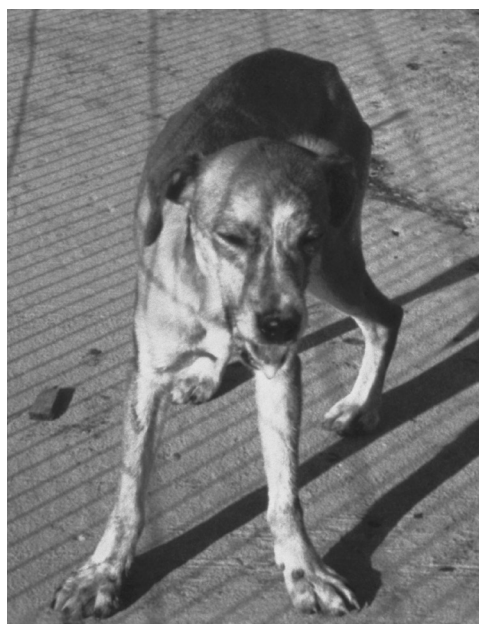
Kahn, C. M. (Ed.). (2010). *The Merck veterinary manual* (10th ed.). Whitehouse Station, NJ: Merck.

Questions

- Describe the following abnormal conditions:
 - Meningoencephalitis
 - Encephalitis
 - Meningitis
 - Myositis
 - Necrotic myositis
 - Arthritis
- List some of the infections bacteria can cause in the muscular system.
- List some of the infections bacteria and viruses can cause in the skeletal system.
- List some of the infections viruses can cause in the nervous system.
- List some of the infections bacteria can cause in the nervous system.
- List some of the infections protozoa can cause in the nervous system.
- List some of the infections prions can cause in the nervous system.
- List some of the infections fungi can cause in the nervous system.



Canine distemper.



Dog infected with rabies.

Activities

- Observe a variety of animals diagnosed with muscular infections and record the presence or absence of clinical symptoms.
- Observe a variety of animals diagnosed with skeletal infections and record the presence or absence of clinical symptoms.
- Observe a variety of animals diagnosed with nervous infections and record the presence or absence of clinical symptoms.