Avian Staphylococcosis

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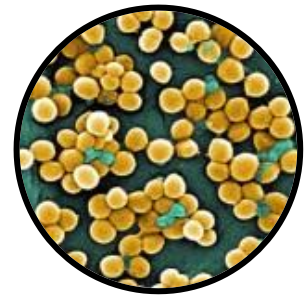


Staphylococcosis

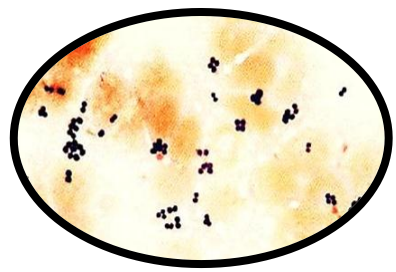
- Staphylococcosis is a systemic disease of birds characterized most frequently by purulent arthritis and tenosynovitis.
- The disease condition can **vary depending on where and how the bacteria enter the host**; infections have been **reported in the bones, joints, tendon sheaths, skin, sternal bursa, navel, yolk sac, liver, lungs, and eyelids**.

Occurrence:

- It affects **all classes of birds**.
- Most diseases produced by Staph. sp. is associated with a break in the skin.
- Toxigenic strains capable of causing food poisoning.

Etiology

- *S aureus* is a **gram-positive coccus** that appears in grape-like clusters on a stained smear.
- It is usually isolated on blood agar, on which it produces circular, smooth, white to orange colonies within 24 hr.
- *S aureus* is facultatively anaerobic,
- *S aureus* is **β hemolytic**, **catalase positive and coagulase positive**.
- **Toxins** produced by *Staphylococci* **increase virulence**.



Transmission

- *S aureus* and other *Staphylococcus* species are part of the normal flora on the skin and mucous membranes and are not thought to produce disease unless there is some breakdown in an environmental or immune system barrier.
- Most infections occur because of a wound, damage to the mucous membranes, or both.
- Infection can also occur in the hatchery as a result of contamination of an open navel.

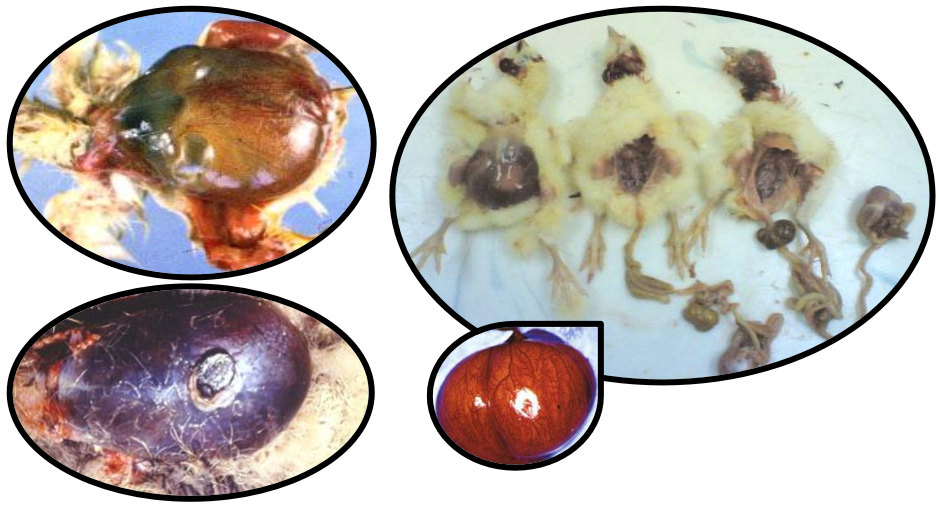
Clinical disease and lesions

- **Gangrenous dermatitis**:

  Affected areas of the skin red, moist, thickened and clearly demarcated from adjacent normal skin. Usually traumatic lesions such as punctures or scratches are present. It is occur secondary to immunosuppression.

Omphalitis:

Although yolk sac infection occur, they are less common than caused by other bacteria. Sources of bacterium include the breeder flock, hatchery environment and hatchery workers.



Cellulites: A purulent inflammation is present in subcutaneous tissues. The overlying skin tends to be dry and discolored.

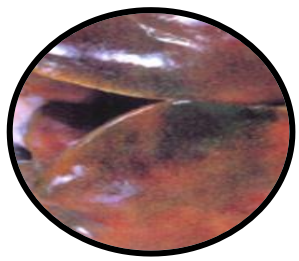
- **Abscesses**: There are localized purulent lesions in the skin. The planter surface of the foot is a common site and results in bumble foot. It is usually occur after wound or traumatic infection.

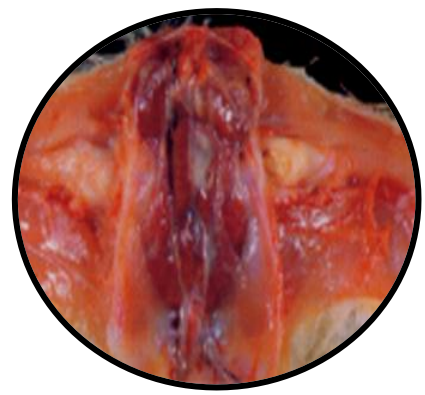





Septicemia:

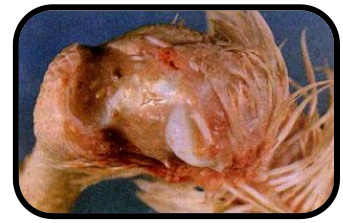
- There is acute increase in mortality with congestion of the internal organs. It is usually associated with trauma. In acute infections, necrosis and vascular congestion is observed in the liver, spleen, and/or kidneys.
- Green liver has been a problem in turkeys and has been associated with osteomyelitis and synovitis at the processing plant. Liver spots and granulomas have been a cause of liver condemnation.





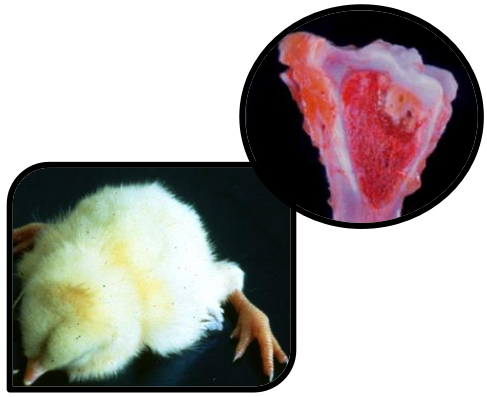
Arthritis/synovitis:

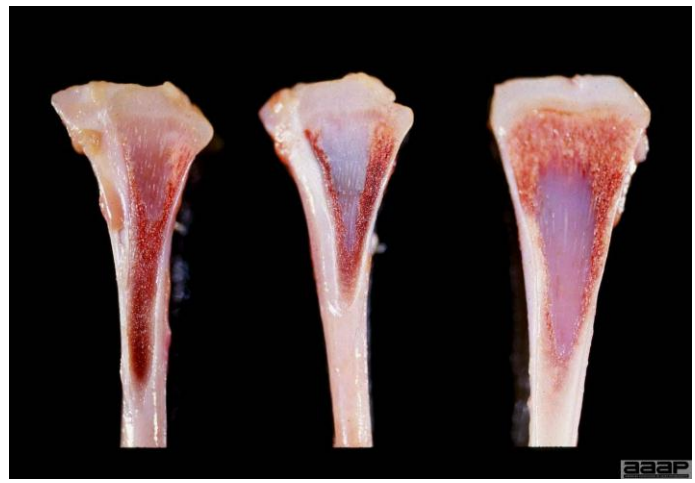
- Any joint, tendon sheath or synovial bursa can be affected. It is clinically as swollen, hot joints, especially hock joints.
- It occurs as a sequel to septicemia. Initially the affected tissue contains white to yellow fibrinopurulent exudates, then become caseous, fibrosis occur late.



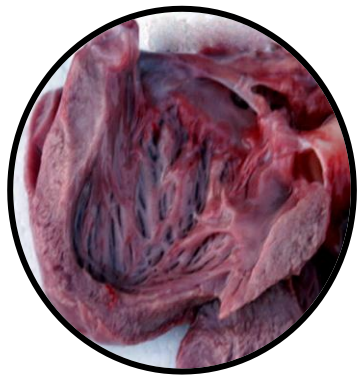
- **Spondylitis**: The joints of articulating thoracolumbar vertebrae are affected. The process spreads to affect adjacent vertebrae. Subsequent developing of lesions may results in pressure on the spinal cord causing paresis and paralysis.

- **Osteomyelitis**: This is a sequel to septicemia. Bacteria localize in metaphyseal vessels invading the cartilage of the growth plate of actively growing bones. There are pale yellow, friable bone especially at a proximal tibia and metatarsus. Necrotic areas and abscesses are seen later.





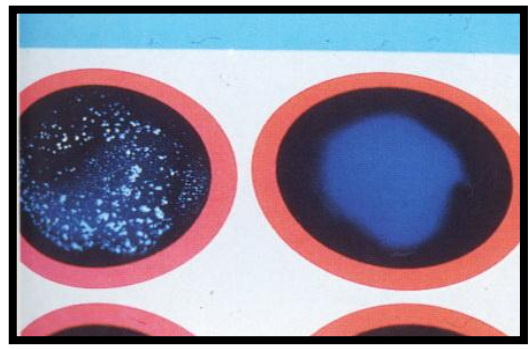
- **Endocarditis**: This is an uncommon sequel to septicemia. There are vegetations on the mitral and/or aortic valves. Emboli from valve lesions cause infarcts in the brain, liver and spleen.



Peristernal bursitis

Diagnosis:

- Gross lesions are suggestive.
- Identifying the typical cocci in tissue smears can make presumptive diagnosis.
- Bacterial isolation and identification.
  - *S aureus* is easily isolated from stab swabs of affected material on sheep or bovine blood agar. Swabs can be streaked onto selective media such as mannitol-salt agar or phenylethyl alcohol agar. These media inhibit the growth of gram-negative bacteria.
  - The coagulase test is used to establish the significance of an isolate; only coagulase-positive isolates are considered to be pathogenic.



Latex agglutination test for identification of *S. aureus*. This alternative coagulase test procedure utilizes latex spheres that are coated with plasma. Fibrinogen bound to the latex detects clumping factor, while the immunoglobulin also present on the latex detects protein A on the surface of the staphylococci. Mixing of colonial material of *S. aureus* with the latex reagent results in rapid agglutination (*left*). A coagulase-negative staphylococcus is also shown (*right*). (Courtesy of Wellcome Diagnostics, Research Triangle Park, NC)

Control:

- Elimination of the source and reservoir of infection.
- Avoid of immunsupression causing diseases and stress-conditions.
- Adopt measures to reduce the occurrence of traumatic lesions and damage of intestinal mucosa.
- **Splinters in litter, sharp rocks, wire from cages, sharp edges or nails on floor slats, and fighting** have been associated with the disease, as well as **beak and toe trimming** procedures in young chickens and turkeys.
- **Hatchery sanitation** .
- Recently, **exposing turkeys to a specific strain of Staphylococcus epidermidis (strain 115) by aerosol at 10 days and again at 4-5 weeks substantially reduce losses from arthritis/synovitis**.

Treatment

- High levels of antibiotics effective against staph. may be helpful if given early in the course of the disease.
- Staphylococcosis can be successfully treated with antibiotics, but a **sensitivity test** should be performed because antibiotic resistance is common.
- Antibiotics used to treat *Staphylococcus* infections include **penicillin, erythromycin, lincomycin, tetracycline, flouroquinolones and spectinomycin**.