Staphylococcus Infections

These infections are usually seen in poultry as “navel ill” (omphalitis), arthritis, and “bumblefoot.”

- A differential diagnosis for this would be *E. coli* or Salmonella.
- Not highly contagious, causes problem as chronic condition. Secondary infections occur due to poor management.
- High mortality seen with omphalitis from contaminated hatchers.
- Prevalent problem in replacement broiler breeders and turkeys, as arthritis.
Causative Agent

Bacterium, *Staphylococcus aureus*

- Gram pos. (+) cocci occurring in clusters.
- Most pathogenic staphs are coagulase positive (+).
- Very ubiquitous organism that is an opportunist.
- Infection usually follows traumatic or biological injury.

i.e.: Genetical Stress in Turkeys (stress of large breast size on hock joints causing “Cow hocked” stance); restrictive feeding; coccidial outbreaks; wing web inoculation; viral arthritis; moving and handling.
Comment

Replacement broiler breeders between 8-18 weeks, due to every-other-day feeding.

- Staph problems often occur following a coccidiosis outbreak and again between 20-24 weeks after birds are moved to laying quarters and onto slated floors due to trauma.

- Replacement broiler breeder males which are put onto slats and fed 12% protein restrictive rations.
Incubation Period

Three to four days in omphalitis

Two to three weeks with bumblefoot and arthritis
Course of Disease

One week to several weeks in chronic cases
Method of Spread

- Primarily through injuries which allow entrance of organism.
- Egg shell contamination in breeder house.
- Contaminated hatchers – failure to fumigate properly.
- Oral entrance possibly.
- Turkeys – entrance through respiratory system.
Mortality

- Suppurative synovitis/arthritis in replacement broiler breeder males may reach 4% per week between 20-24 weeks.
- Bumblefoot: usually low 3-6%. Debilitation is the problem.
- Omphalitis: 30-40% mortality within 3 to 4 days after hatching. 100% of the affected birds will die.
- 10-15% in laying hens acutely infected with septicemic “staph.”
Clinical Signs

IN CHICKS

- High mortality in 72 hours
- Large scab on navel
- Swollen, dark, greasy, abdomen
- Very putrid odor
Clinical Signs

IN ADULT CHICKENS

- “Bumblefoot” – injured footpad with severe swelling (abscess).
- Arthritis and synovitis. In slatted houses.
- Occasionally systemic (septicemia) but this is rare.
Clinical Signs

IN TURKEYS – Usually in Growing Toms

- Birds reluctant to move and are crippled.
- Swollen joints, synovial sheaths and bursas.
Omphalitis
Pododermatitis
Pododermatitis
Ophthalmalmitis
Postmortem Lesions

- **“Bumblefoot”** – usually there is a wound with caseous suppuration in an organized abscess (common in backyard flocks).

- **Omphalitis** – retained yolk in emaciated baby chicks or poults. The infection has putrid odor.

- **Arthritis** – suppuration in the joints and also, around synovial sheaths (e.g., tendon sheaths of the hocks, gastrocnemius tendon, stifle, and wing joints).
Pododermatitis
Tenosynovitis
Postmortem Lesions (Cont.)

- Breast blisters (synovial bursa over sternum) filled with suppurative exudate. Associated with coarse litter.

- Septicemic “staph” lesions are similar to other bacterial diseases but usually have dark brown or greenish edges on the liver lobes. This has been related to tibial dyschondroplasia and turkey osteomyelitis complex.
Keel Bursitis
Green Liver
Hepatitis
Osteomyelitis
Osteomyelitis
Osteomyelitis
Diagnosis

SUGGESTIVE

- Swelling in joints or foot pads with suppuration present (white & creamy occasionally with flocculence).
- High mortality in chicks with swollen abdomens and retained yolk sac (putrid odor) (second most common after E. coli), swollen foot pads and joints.
- Breast blisters are filled with creamy pus.
Diagnosis (Cont.)

- Osteomyelitis in tibial and femoral growth plates. Discrete 1-2 mm abscesses may be found in marrow cavity. Related to TD.

  TD will resolve with time but often associated with green livers.

- In septicemia, “staph” lesions are similar to those seen in fowl cholera or any other septicemic disease. This is rare.

  POSITIVE – Isolation and identification of the causative agent.
Differential Diagnosis

- The symptoms and lesions of arthritis are very similar to those found in infectious synovitis (MS) and chronic fowl cholera as well as other bacterial diseases.

- Must culture to differentiate.
Culture Swab
Culture Method

STAPHYLOCOCCUS AUREUS

Visceral organs (liver, spleen, etc…)  
And hock exudate (swab)

Blood agar  
White to yellow colonies  
Hemolytic variable

Gram (+) cocci

Coagulase test (+) or (staphyloslide* test)  
Staphtrac TM310 biochemical test strips
Colonies on Blood Agar
Sensitivity tests should dictate drug being used. Penicillin is usually effective.

Drugs of choice: Novobiocin (expensive), Penicillin

Others used: Chlortetracycline, Oxytetracycline, Erythromycin

Use broad spectrum antibiotics in Omphalitis at the rate of 1-2 gm per gal of water for 7-10 days.
Antibiotic Sensitivity Test
Treatment (Cont.)

REPLACEMENTS ONLY

- Potassium penicillin G water soluble powder must be used for 7-10 days in replacements.
- Re-treatment may be necessary before placement in laying houses (No chicken clearance).
Prevention

- Remove sharp objects from the litter and premises. Correct rough turkey ranges.
- Cleanliness and fumigation of incubators.
Prevention (Cont.)

- In turkeys, treatment of arthritis is actually a prevention method.
- No vaccine available.
- Anticoccidial & restrictive feeding programs in replacements can have impact on stress and resultant staph infection.