

Wound Infections

Penetration of skin by micro-organisms is difficult—Part of the innate defense

Wounds provide the most common access through the skin.

Disease production in infected wounds depends on

- Virulence of infecting organisms
- Infectious dose
- Immune status of the host
- Nature of the wound
 - Foreign material present?

Etiological agents

Gram positive cocci

- Staphylococcus aureus
- Enterococcus faecalis
- Beta Haemolytic Streptococci (Streptococcus pyogenes

Gram negative aerobic rods

- Pseudomonas aeruginosa

Gram negative facultative rods

- Escherichia coli
- Enterobacter species
- Klebsiella species
- Proteus species

Anaerobes

- Bacteroides
- Clostridium

Fungi

- Yeasts (Candida) and Aspergillus

Staphylococcal Wound Infections

- commonest pathogen isolated from subcutaneous abscesses and skin wounds.
- MRSA common cause of hospital-acquired wound infections.
- Symptoms
 - Pyogenic
 - Inflammation
 - Fever
 - Some strains produce toxic shock syndrome
- Virulence factors?

Staphylococcal wound infections

- Epidemiology
 - 30% to 100% due to patient's own flora
- Factors associated with infection include
 - Advanced age
 - Immunosuppression or poor general health
 - Prolonged postoperative hospital stay

Group A Streptococcal Infections

- *S. pyogenes*
 - "Flesh eaters"
- Common cause of wound infections

Two extracellular products responsible for virulence

- Pyrogenic exotoxin A
 - superantigen : toxic shock
- Exotoxin B
 - necrotizing fasciitis



Pseudomonas aeruginosa Infections

- *P. aeruginosa*
- Major cause of nosocomial infections
- Virulence factors?



Tetanus

- *Clostridium tetani*
- Bacterial spores prevalent in dirt and dust and GIT of humans, animals
- tetanospasmin toxin
 - blocks inhibition of motor neurons, causing paralysis
- Prevention: vaccination, treatment: antitoxin

Gas gangrene

Also referred to as **Clostridial myonecrosis**
Characterized by rapidly spreading **oedema**,
myositis, **necrosis** of tissues, **gas** production and
profound **toxaemia**

- *C. perfringens*- commonest cause
- Others: *C. septicum*, *C. novyi* type A, *C. histolyticum*, *C. fallax*, *C. bifermentans*

Actinomycosis

- Causative Agent
 - *Actinomyces israelii*
 - Filamentous, anaerobic, slow growing
- Characterised by formation of sinus tracts

Sporotrichosis: "rose gardener's disease"

- Causative Agent
 - *Sporothrix schenckii*
 - Dimorphic fungus
 - Lives in soil and on vegetation
- Associated with puncture wound from vegetation



Laboratory diagnosis

Specimen: Swabs (avoid contaminating specimen with commensal organisms from the skin); aspirate
Gram stain of the specimen; Z-N staining;
Giemsa/Wayson's staining; Dark field microscopy;
KOH

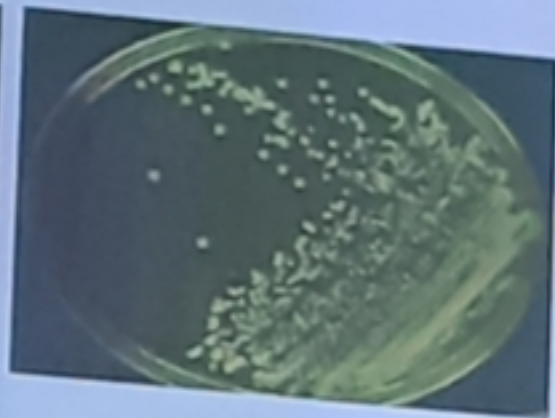
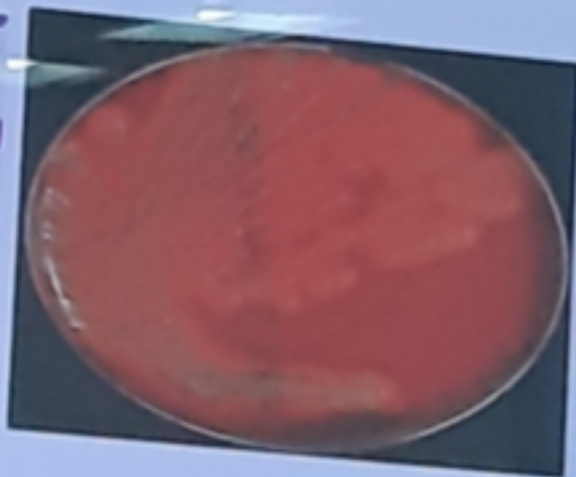
Culture

- BA, CBA, RCM
- Aerobically/ 5-10% CO₂ / anaerobically
- 35-37°C
- Describe the colonial morphology

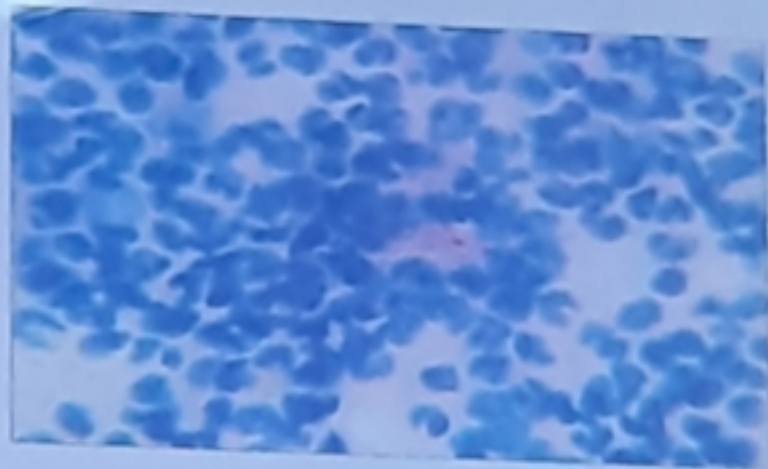
Specific identification tests

AST

Gram stain, culture and identification tests of an organism isolated from a wound. Most likely organism?



Photograph of chronic wound, microscopic appearance and culture results from a patient from Central Africa. Most likely organism?



Treatment and Prevention

- Depends on organism isolated, AST results and mode of transmission