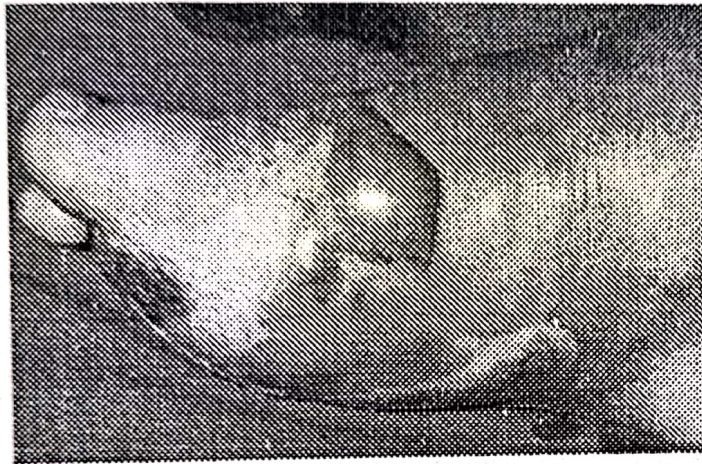


# Clostridium perferingens SGD

40 year soldier presented in ER with open wound, edema, cellulitis and bloody exudate. She has history of war wound few weeks back. Blood agar showed double zone of hemolysis.



1. Name the disease and the organism causing this pathology?
2. What is the role of alpha toxin in disease? What other toxins are produced?
3. What is the other disease caused by this organism and its pathogenesis?
4. Discuss the laboratory diagnosis.
5. What is the role of egg yolk agar in diagnosis?

## KEY

1. Clostridium perfringens and gas gangrene
  2. Multiple toxins cause gas gangrene (7 lethal factors & 5 enzymes) **alpha toxin, lecithinase** that hydrolyzes lecithin in cell membrane, resulting in destruction of membrane & widespread cell death.
  3. Superantigens
- **Source:** Soil, dust, intestinal tract of animals and humans
  - **Illness:** Infection (toxin released on sporulation)
  - **Symptoms:** Intense abdominal cramps and diarrhea
  - **Foods:** Temperature abuse of prepared foods such as meats, meat products, and gravy
  - **Transmission:** Spores present in raw foods
  - **Control:** Proper time/temperature control; preventing cross-contamination of cooked foods
4. **Gram stain:** Smears of tissue & exudate samples: large gram-positive rods.  
**Blood agar:** Large beta-haemolytic colonies produced (most food-poisoning strains are non-haemolytic). Some strains produce a double zone of haemolysis.  
**Neomycin blood agar** (selective medium): For isolation of C. perfringens from sites having several organisms, e.g. from wounds.  
**Robertson's cooked meat medium (RCMM):** A saccharolytic reaction shown by reddening of meat with rancid smell due to carbohydrate decomposition. A proteolytic reaction shown by blackening of meat with very unpleasant smell due to protein decomposition.  
**Nagler's reaction:** Positivity
  5. Egg yolk agar used to demonstrate the presence of lecithinase.  
**Nagler's reaction:** C. perfringens produces an opacity in medium containing lecithin due to lecithinase C activity (alpha toxin). This opacity inhibited by applying specific antitoxic serum to medium which inactivates lecithinase.