Hospital Course Summary

- And now, for a narrative, by Mike O'Neill

Clostridial Myonecrosis (Gas gangrene)

- Myonecrosis (clostridial gas gangrene) may be distinguished from necrotizing fasciitis by the progressive invasion and destruction of healthy muscle tissue.
  - Skin and fascia are spared.
- 2 Major Types:
  - Traumatic
    - Particularly deep penetrating wounds, but also associated with abortion, PROM, IM injection (usually C. perfringens)
  - Spontaneous
    - generally occurs via hematogenous seeding of muscle with bacteria (usually *Clostridium septicum*) from a gastrointestinal tract portal of entry.

Traumatic Gas Gangrene

- 70-80% of cases caused by *C. perf*
  - Alpha (hemolytic) and theta toxins
  - Alpha toxin causes vasculature to be impermeable to PMNs
    - No PMNs seen on gram stain (differs from Necrotic soft tissue infections)
- Compromised blood supply
  - anaerobic environ/acidic pH
  - necrosis within 24-36 hrs of trauma
- Symptoms:
  - sudden onset pain at site of surg/trauma
  - Exquisitely tender skin, bullae present
  - Systemic symptoms

A lil bit more ‘bout C. perf

- Many extracellular toxins are produced by C. *perfringens*; of these, only alpha and theta toxins have been implicated in pathogenesis
  - Alpha toxin
    - hemolytic toxin
    - essential toxin in pathogenesis of C. perf
  - Theta toxin
    - contributes to pathogenesis by its effects on cells of the vascular and immune systems
    - Not essential in pathogenesis of C. perf

Traumatic Gas Gangrene (cont)

- Diagnosis:
  - Pain at a site of traumatic injury together with signs of systemic toxicity and gas in the soft tissue
    - crepitus in the soft tissue is the most sensitive and specific finding
  - demonstration of large, gram-variable rods at the site of injury
- Treatment:
  - Surgical debridement of devitalized tissue
  - Antibiotics
    - Penicillins, Clinda, Tetracycline
      - Clinda and tetracycline with greatest efficacy given inhibition of toxin formation
    - Some species are penicillin resistant – consider Vanco, Metronidazole

Necrotizing Soft Tissue Infections

- Most easily distinguished during surgery
- Include cellulitis, fasciitis, spontaneous gangrenous myositis
  - Necrotizing cellulitis divided into two groups:
    - clostridial anaerobic cellulitis
    - nonclostridial anaerobic cellulitis
  - Necrotizing Fasciitis:
    - Type I – polymicrobial infection
      - One anaerobic plus one facultative anaerobic strep species (other than group A) and members of the Enterobacteriaceae (E. coli, Klebsiella, enterococci)
    - Type II – single organism
      - Most often Group A strep infection
      - Can also include other Beta hemolytic strep and MRSA
  - Spontaneous gangrenous myositis
    - Group A or Beta hemolytic strep
    - No gas formation

Necrotizing Cellulitis – Clinical Features

- C. perfringens, less often, C. septicum
- thin, dark, sometimes foul-smelling wound drainage (often containing fat globules) and tissue gas formation.
- Pain, swelling, and systemic toxicity are not prominent features
- Crepitus is observed in the skin, but there is sparing of the fascia and deep muscles

Necrotizing Fasciitis – Clinical Features

- infection of the deeper tissues
  - results in progressive destruction of the muscle fascia and overlying subcutaneous fat
- muscle tissue is frequently spared because of its generous blood supply
- Infection typically spreads along the muscle fascia due to its relatively poor blood supply
- development of anesthesia of affected area
  - precedes the appearance of skin necrosis
  - clue to the presence of necrotizing fasciitis
- Marked swelling and edema
  - Can produce compartment syndrome with complicating myonecrosis requiring fasciotomy

Nec Soft Tissue Infxn Mgmt

- Surgery
  - Both diagnostic and therapeutic
- Antibiotics
  - empiric antibiotic therapy for necrotizing infection is
  - should consist of broad-spectrum antimicrobial therapy
    - Carbapenem or beta-lactam/beta-lactamase inhibitor
    - Clinda for antitoxin effect
    - Vanco, dapto, or linezolid if MRSA suspected
- IVIg
  - Inconclusive evidence for use in GAS infections
- Hyperbaric oxygen
  - No dedicated studies in humans, but survival benefit demonstrated in dogs

Questions???


THE HOUSEKEEPERS AT WORK WERE TALKING ABOUT ME IN SPANISH
THEY SAID I WAS CUTE