

Microbiology - 6 - Final - Summary -

→ dead necrotic Bone

- osteomyelitis → infection in the bone associated with formation sequestra

- spectrum of osteomyelitis → 1) Extensive - in tibia + vertebral osteomyelitis
2) localized - tooth abscess.

- to make therapeutic decision about OM: "2 main classifications"

↳ ① Lee and Waldvogel system: - 1 - Acute + chronic

2 - hematogenous + contiguous 3 - with or without vascular compromise

↳ ② Cierny and Mader system: - used for long osteomyelitis

- ORGANISMS that cause OM:

① S. Aureus → Most likely pathogen, consider surgery, invasive

② other staph → associated with foreign material, Biofilm production

③ streptococci → spread rapidly

④ Enterobacteriaceae → E. coli, Klebsiella → ↑ Resistant of Ab, ^{resistant to Ab} _{2nd step}

⑤ P. Aeruginosa → ↑ Resistant to AB.

⑥ Bartonella → associated with cat scratch.

⑦ Brucella → associated with unpasteurized milk

⑧ Fungi → Mycobacterium tuberculosis. ^{Etiology → monomicrobial} ^{Etiology → mono OR poly microbial}

- Pathogenesis of OM: - Hematogenous, contiguous, traumatic.

↳ Collection of exudates → leads to ↑ medullary pressure → then go to bone
Rupture the periosteum ← cortex

↳ Rupture the periosteum = interrupted blood supply → result in necrosis

- Cierny - Mader sys → classification based on affected portion of the bone and the physiological status.

Affected portion → ~~sub~~ medullary → superficial → localized → diffuse

Note → patient with sinuses → superficial flora not represent the true pathogen
the precipitating factors "vary according to route of infection": -

① Prosthetic ~~plant~~ implant → associated with complex infection

② trauma → contaminated of the wound or surrounding tissue

pyomyositis → damaged tissue + internal bleeding → "Favorable condition for bacterial infection."

- Bacteremia → frequent cause of OM, maybe arising from Endocarditis.
↳ caused by

① prosthetic joint + S.A → can be complicated by MRSA.

② UT circulation → be the source of vertebral OM due to E. coli.

③ limited vascular supply → limit perfusion = poor healing.

④ Diabetes → impaired immunity, vascular disease, Renal failure

- MSSA → can cause OM instead of MRSA

- Pathogenesis for all pathogens → 1 - defective in blood supply + sensation

2 - ↓ oxygenated blood supply

3 - poor nutrition + immunocompromised

4 - Disease like diabetes, Diabetic Neuropathy

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Bacteria "like S.A" → cause ~~OM~~ osteomyelitis by secreting toxins which lead to destroy surrounding tissue + Affect Neutrophils Response

→ strains of S.A → survive into phagocytic vacuoles of macrophage.

- CONS → Produce biofilm to be protected from host cell → play important role in chronic OM.

- Clinical Features:-

1] Acute OM → in pediatric patients + due to ~~trauma~~ hematogenous spread

2] subacute + Chronic OM → in Adult.

3] local sign → swelling, tenderness, (erythema) → Not always

4] skin ulcer fail to heal with AB → indicate underlying osteomyelitis

Dx:- 1] Blood test → ① ESR + CRP → usually high, WCC → high ^{subacute}

② Blood culture → + in hematogenous spread + vertebral inf. ^{veg}

2] Radiology → ① X-Ray → Bone loss, sequestra, periosteal elevation

② CT + MRI → MRI are specific + sensitive

3] Biopsy → AB should be stopped (48-72) ^{Needle Aspiration} of pus collection OR Biopsy in open surgery with debridement of necrotic tissue

*Note → MRI may be contraindicated in patient with metal ware

*PCR → to detect + identify An Organism within hours

Management:- 1] in Adult → combination with debridement + AB therapy

2] surgery → debridement of infected tissue + Remove metal ware

3] AB therapy → ① 4-6 week IV therapy + addition of Effect in prosthetic material ← Rifampicin to ~~B-lactam~~

② Hyperbaric → used as adjunctive therapy

③ Negative pressure wound therapy

④ pediatric population → short duration of therapy + orally

complications:- 1] sinus tract formation 2] pathological Fracture ^{IV}

3] hematogenous spread + sepsis 4] tumor → squamous cell carcinoma the commonest

prevention → 1] mupirocin + Chlorhexidine → successful in preventing operative infections.

2] Early Dx + treatment of infection routes

3] Early surgical treatment of wound

prognosis → 1] vertebral + immuno compromised → Bad prognosis

2] tooth + Mandible → Good prognosis