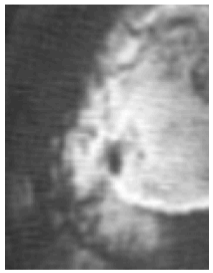
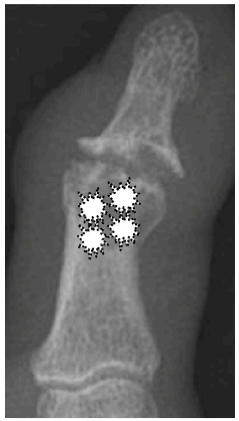
Podcast (Video Recorded Lecture Series):
Osteomyelitis for the USMLE Step One Exam





They like to use this descriptor

Bone growth/Spicules/Fragments

- Osteomyelitis, chronic (involucrumbs)
- Osteosarcoma

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Osteomyelitis, Pyogenic

- **Background**
  - Infection by hematogenous spread → long bones (kids) or vertebrae (adults), extension from contiguous site or direct implant (trauma, surgery, prosthetic joint).
  - Risk factors: Diabetics (w/ vascular insufficiency)
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- **Pathogenesis/Microbiology**
  - Staph aureus (80-90%): GPC, clusters, catalase +, coagulase +
  - Special Groups:
    - Sickle Cell: Salmonella sp: GNR, lactose (-), oxidase (-), motile (+), H_2S (+)
    - Joint prosthesis: GPC, Staph epi: catalase +, coagulase -, novobiocin (S)
    - Bites: Pasteurella multocida
  - Infection → medullary canal edema → small vessel thrombosis → bone ischemia/necrosis

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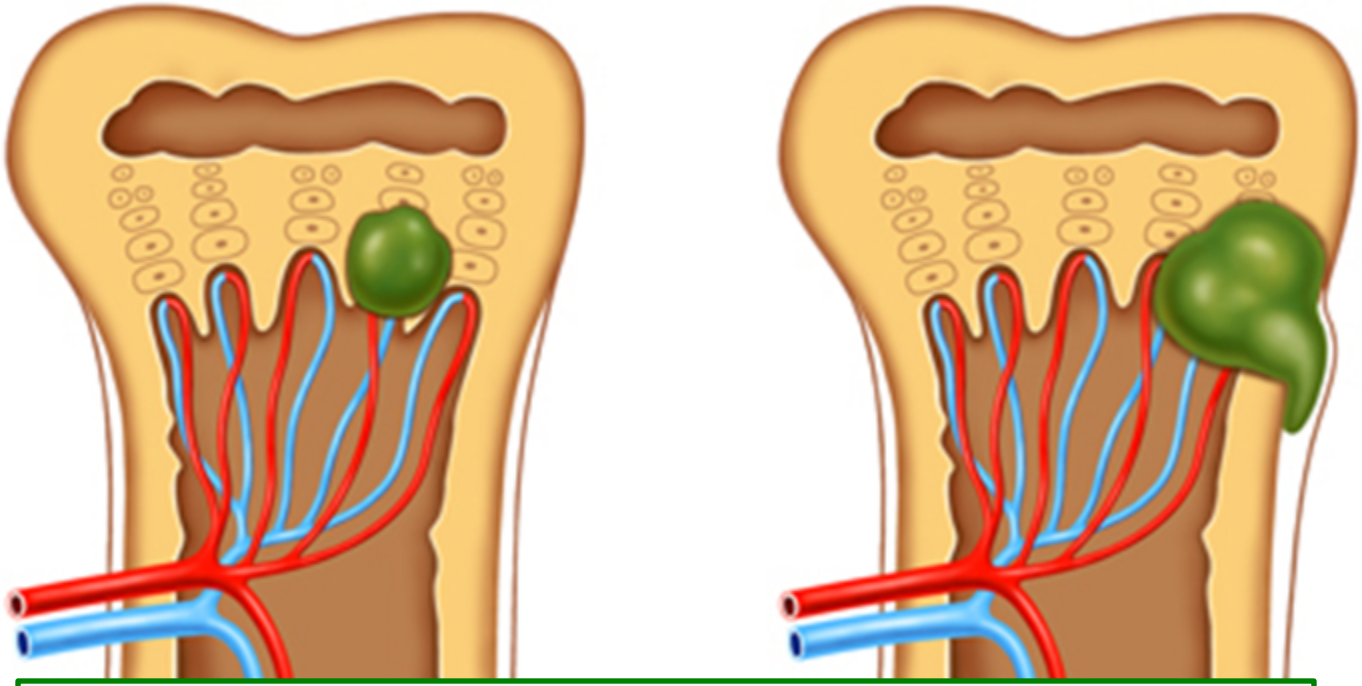
  - Infection/medullary canal edema causes small vessel thrombosis → bone ischemia/necrosis

Small vessel thrombosis is recurrent theme: necrotizing fasciitis and myonecrosis

Infection → edema → thrombosis → bone ischemia

Hematogenous spread in children:
Metaphysis → Periosteum



Spreads along sinusoidal veins → subperiosteal reaction

Growth plate prevents epiphyseal/joint space infection

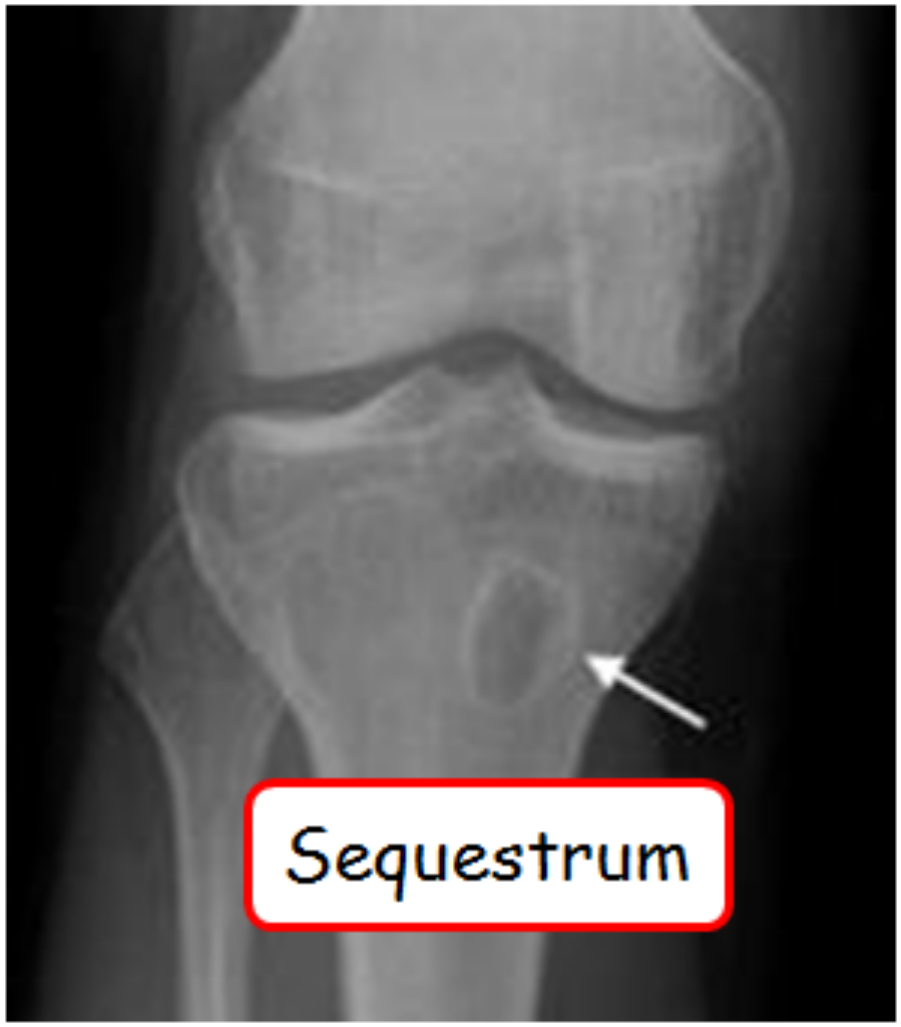
Osteomyelitis, Pyogenic

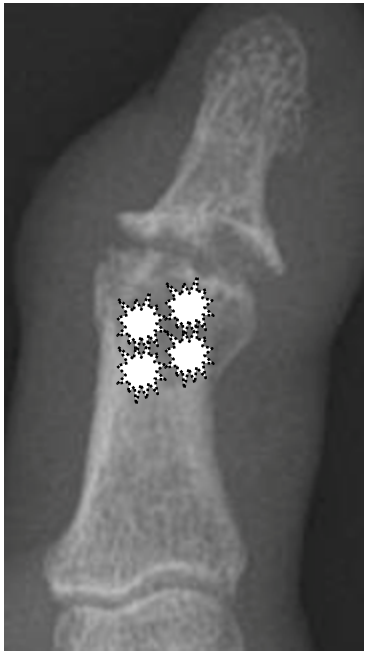
- **Pathology** (3 phases):
  1. **Acute**: bacterial proliferation, neutrophilic response with cellular necrosis.

  2. **Subacute/Chronic**: mononuclear response (osteoclast mediated bone resorption) and development of granulation tissue (fibrous response).
     - Can spread into periosteum (abscess) or create sinus tract

  3. Hallmark of **chronic** osteomyelitis :
     - Dead bone = '**Sequestrum**' (like a 'sequestered' jury)
     - Granulation tissue encases sequestrum = '**Involucrum**'
     - New bone formation is a characteristic feature forming on surviving bone fragments

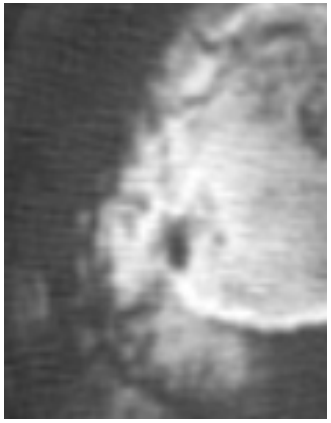
Osteomyelitis, Pyogenic

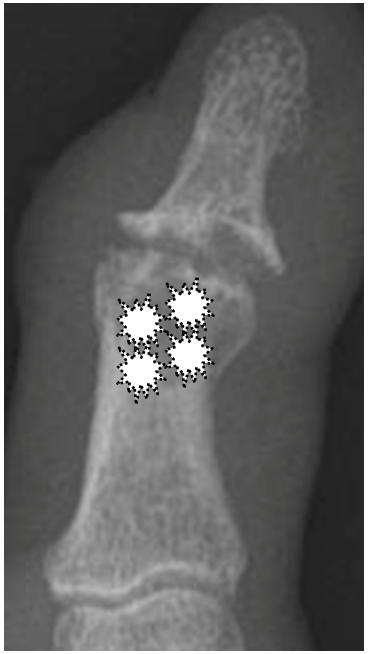




Involucrumbs
(with classic bone fragments that I didn't photoshop)

Osteomyelitis, Pyogenic





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Osteomyelitis, Pyogenic

- Clinical
  - Insidious onset with nonspecific constitutional symptoms
  - Inflammatory signs possible: swelling, redness, warmth.

'Passive ROM w/o pain' – distinguish from septic joint

- Diagnostics
  - Cultures: negative 50% of time
  - Lab: ACD, ↑ ESR, ↑ WBC
  - Radiograph (CT/MRI): Lytic focus surrounded by bony sclerosis; new bone formation (spicules)
  - Bone Scan: especially if s/p TJR

- Therapeutics
  - Antibiotics and surgical drainage

- Special Notes
  - 'They' like to keep their ducks in a neat row…it will either be osteo or septic joint; unlikely to see an osteo question with joint involvement.

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They almost always give you a pretty clean osteomyelitis description and you need to deal with the microbiology.

Other derivatives…

Kid has fever and malaise. Started limping. (+) fever. PE: passive ROM without pain; no joint effusion.
Bone scan will show increased uptake in which area?

A. Long bone
B. Flat bone

Kid has fever and malaise. Started limping. (+) fever. PE: passive ROM without pain; no joint effusion.
Bone scan will show increased uptake in which area?

A. Epiphysis
B. Diaphysis
C. Metaphysis

Kid has fever and malaise. Started limping. (+) fever. PE: passive ROM without pain; no joint effusion.
Bone scan shows increased uptake in metaphysis.
What organism is most likely?

A. Staph aureus
B. Staph epidermidis
C. Salmonella typhi
D. Strep pyogenes
E. Clostridium perfringens

Kid has fever and malaise. Started limping. (+) fever. PE: passive ROM without pain; no joint effusion. Data: peripheral blood smear reveals Howell-Jolly bodies. Bone scan shows increased uptake in metaphysis.
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  - Insidious onset with nonspecific constitutional symptoms.
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Rx: Anti-staphyloccal, Vanco (TJR), Quinolone (SCD)

Question will be about bug and bone derivatives

- Therapeutics
  - Antibiotics and surgical drainage

- Special Notes
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