

Bone Infection

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Infection

- The micro-organisms may reach bones & joints either
- **directly** (skin wound, open # or operation) or
- **indirectly** via blood stream (from GIT, GUT, respiratory tract). Depending on type of micro-organism & body reaction, the result could be: pyogenic osteomyelitis or arthritis, chronic granulomatous reaction (TB), fungal infection or hydatid (parasite) disease.

What is Osteomyelitis?

Osteomyelitis is a term used to describe a bone infection. An infection that has migrated from nearby tissue or through the bloodstream might cause osteomyelitis.



Acute hematogenous osteomyelitis

- Is a disease of **children**, if adults are affected, their resistance should be low by disease (DM, AIDS) or drugs.
- **Trauma** may determine the site of infection by causing small hematoma or fluid collection in the bone.

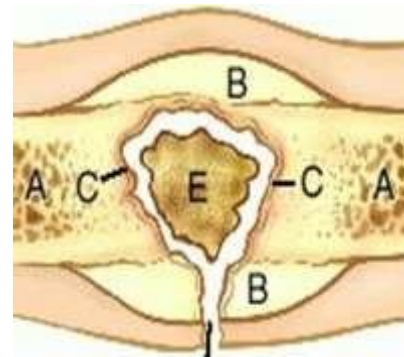
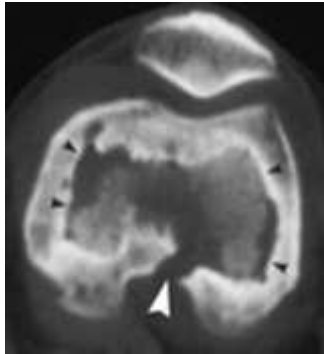
Micro-organism

- the most common are: *Staphylococcus aureus*, *Streptococcus species*, *Enterobacter species*, and *Haemophilus influenzae*. Depending on the age:
- Above 4years → 90% is G +ve: mostly *S. aureus*.
- Under 4years → 50% is G–ve mostly *H. influenzae*.
- Immune compromised patients may have unusual organism.

Site

- These may invade the blood from a skin abrasion, boil, septic tooth or urethral catheter. In **children**, they **settle** in the metaphysis (often tibia or femur), while in **adults**, in the vertebral body than in the long bones



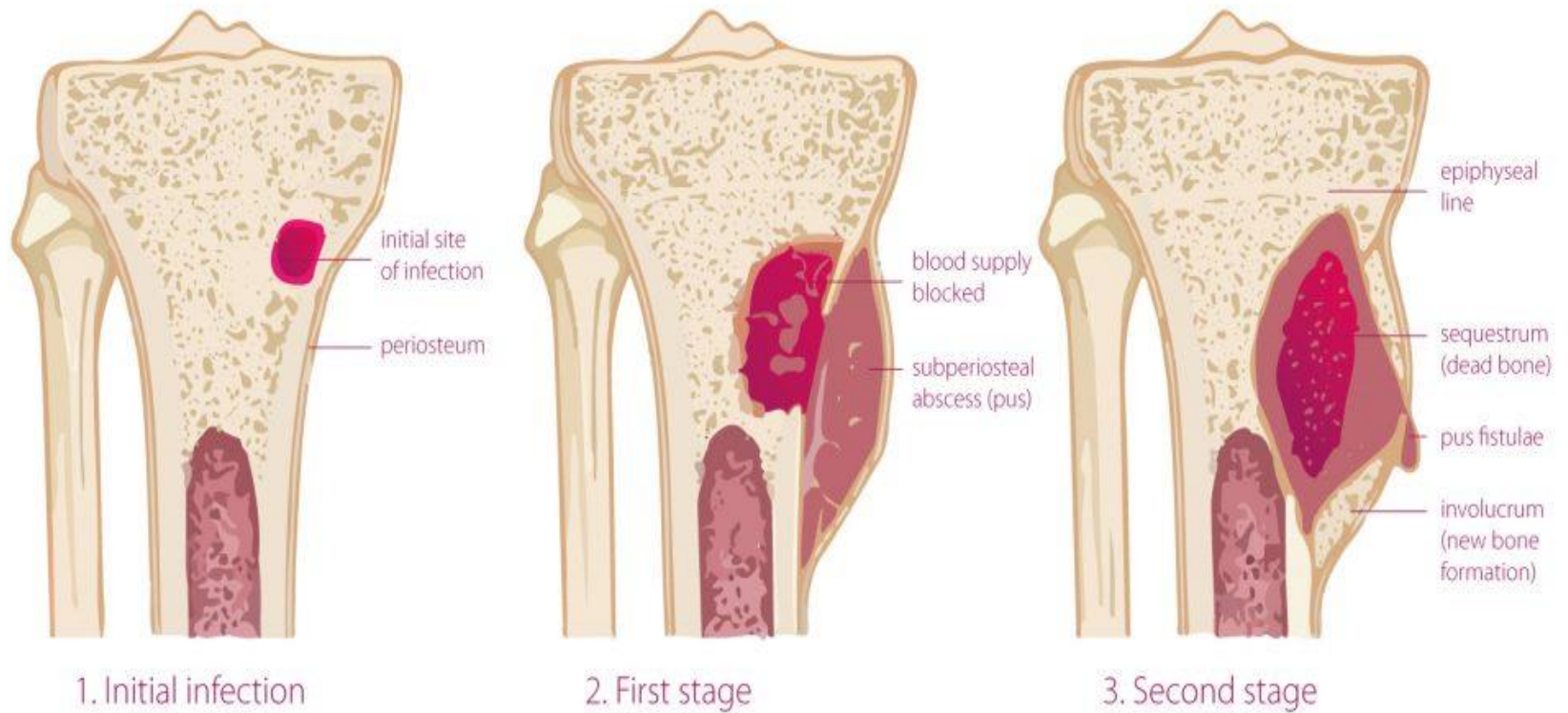


Clinical features

- **A child** in severe pain, malaise, fever, toxemia with still limb.
- **O/E:** acute finger-tip tenderness near one of the large joints; painful limitation of joint movement. **Later, when pus escapes from inside bone to soft tissue** → local redness, swelling, warmth & edema.
- **Infants:** irritability & metaphyseal tenderness with resistance to joint movements may be the whole picture.

Clinical features

- **Adults:** the common site is thoracolumbar spine: CF: mild fever with local tenderness.
- in elderly & those with immune deficiency, the systemic features are mild.

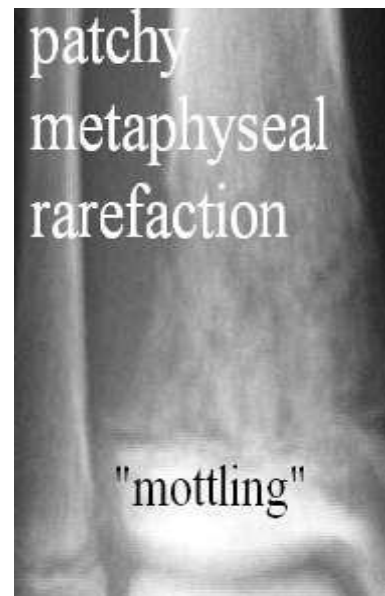
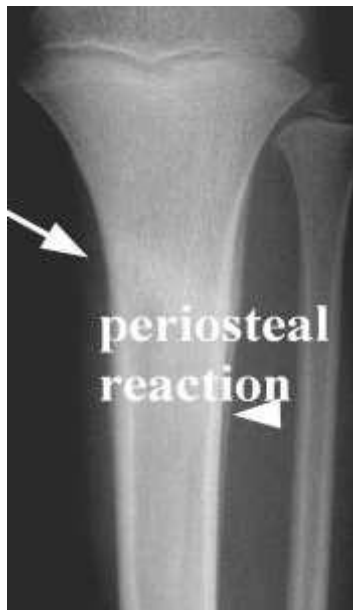


development of osteomyelitis



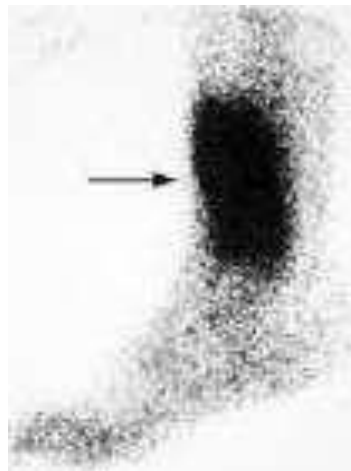
Diagnostic imaging

- **X-ray:** during first 10 days → only soft tissue swelling. After 2 weeks → faint periosteal reaction. Later → thick periosteal reaction + metaphyseal mottling. Still later → sequestrum & involucrum (chronic OM).



Diagnostic imaging

- **U/S**: may detect subperiosteal abscess.
- **Radioactive bone scan**: using ^{99m}Tc → very sensitive but less specific while $^{67}\text{Ga-citrate}$ & ^{111}Ind -labeled leucocytes are more specific.
- **MRI**: is very sensitive & can differentiate between OM & soft tissue infection.



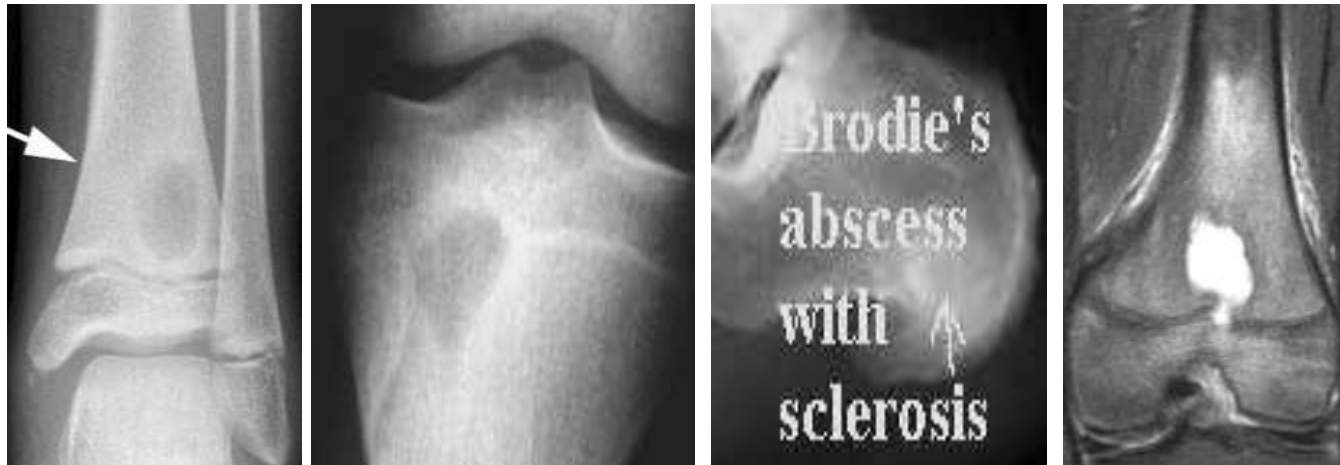
Complications

- Metastatic infection: to other organs (infants).
- Suppurative arthritis.
- Physeal damage→ bone shortening.
- Chronic OM: in neglected or immune depressed patients

Subacute haematogenous OM

- Is more mild than acute HOM possibly due to less virulent organism &/or the patient is more resistant.
- Site: distal femur, proximal/distal tibia

- Clinical features: an adolescent having pain for several weeks with slight swelling & tenderness near one of the larger joints. Temp & WBC are normal but ESR is often ↑.
- X-ray: round or oval 1-2cm cavity in metaphysis; it may be surrounded by a halo of sclerosis (**Brodie's abscess**).



Postoperative OM

Risk factors

- **Local** : open #, use of implant, multiple operation, hematoma formation, soft tissue damage & bone death.
- **General** : elderly, obese, diabetic & immune suppressed patient.

Clinical features

- superficial infection is mild; deep infection → persistent pain, fever, inflamed discharging wound, $\uparrow$ WBC&ESR;



X-ray

- Bone resorption & periosteal reaction. MRI & scan: may help.



Chronic OM X-ray

- areas of bone resorption, sclerosis & thickening with dense sequestra. **Sinogram:** see connection of sinus to bone. **Bone scan, CT & MRI.**

