



Microbiology

Doctor 2018 | Medicine | JU

Done by

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Contributed In The Scientific Correction

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Contributed In The Grammatical Correction

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Doctor

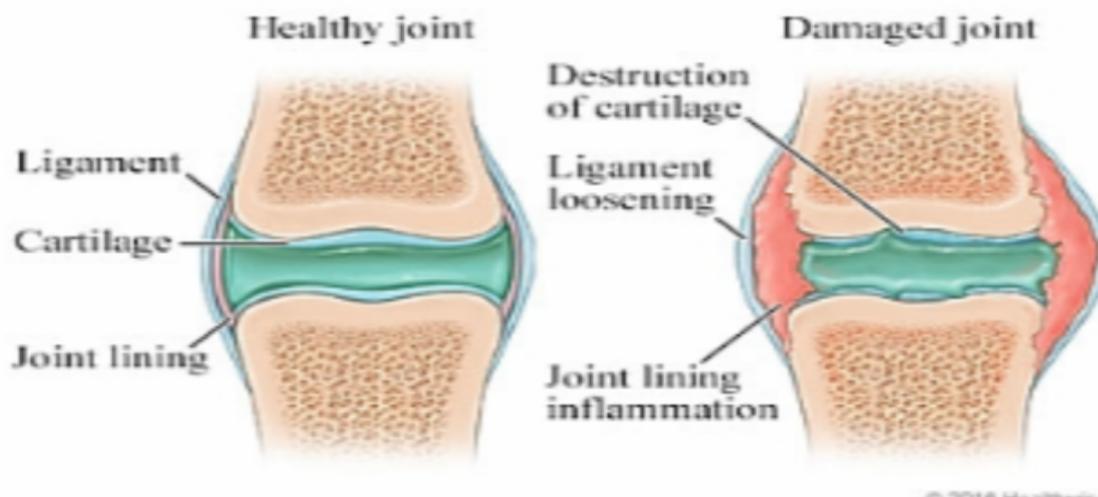
Mohammad Madadha

Septic arthritis: An inflammatory reaction of the joint space caused by an infectious agent.

It is usually caused by bacteria but may be caused by mycobacteria or fungi.

Very common and hard to treat due to use of prosthetic joints (2-10% of all prosthetic joints!)

Also common among immune compromised and elderly (45% of ppl with Septic arthritis are above 65 years and 56% are male)



Etiology: Septic arthritis can be caused by bacterial, viral or fungal infections. Bacterial infection with *Staphylococcus aureus* (staph) is the most common cause. ... Septic arthritis can develop when an infection, such as a skin infection or urinary tract infection, spreads through your bloodstream to a joint.

- Streptococci, e.g. groups A, B, C, and G streptococci, *S. pneumoniae*.
- CoNS.
- *E. coli*.
- *H. influenzae*.
- *N. gonorrhoeae*.
- *N. meningitidis*.
- *P. aeruginosa*.
- *Salmonella* spp.
- Others, e.g. *P. multocida*, *C. canimorsis*, *E. corrodens*, *S. moniliformis*, *Brucella* spp., *B. pseudomallei*, *Clostridium* spp.
- Polymicrobial infections.

Epidemiology: If patients have underlying **joint** disease, or prosthetic joints, the incidence increases

Risk factors for septic arthritis include **age** >80 years (the older you are the more likely to have it, because your ability to tolerate the seeding bacteria is less and less)

diabetes mellitus, rheumatoid arthritis, prosthetic joint, recent joint surgery, skin infection/ ulcers,
intra- articular corticosteroid infection (steroid inside the joint can introduce bacteria)
injection drug use, and alcoholism.

All of them you can reduce them because are overuse the joint or an inflammatory condition that is infecting the joint

Pathogenesis:

•Septic arthritis usually occurs after **hematogenous** seeding of pathogenic microorganisms (the most common) but may occur via direct inoculation, e.g. injection, surgery, or trauma.

contiguous spread can also be causes

Why hematogenous??

Joint after occurring the damage it will try to repair itself, the way it repairs itself is that neovascularization (new blood formation) this new blood route is the route of bacteria that use to get access into the joint.

•Healthy synovial cells have phagocytic activity and normally able to clear any seeding from outside sources.

•Any weakness to immune system (SLE, Rheumatoid arthritis..etc) increases risk (hence old age!)

•Previously damaged joints are most susceptible to infection (arthritis) •These joints show neovascularization and adhesion factors, which promote bacteremia and consequent infection.

•*S. aureus* especially, binds to articular sialoprotein, collagen, elastic and prosthetic materials via tissue adhesion factors that they possess. •Infection typically damages the cartilage (chondrocyte proteases of *S. aureus*, the inflammation in turn causes further damage to the cartilage)

•Gonococcal arthritis exhibits much less influx of WBC into the joint, which explains why it is **not as destructive** to joints as other bacteria.

#joint with arthritis is more susceptible to septic arthritis.

Clinical features

- Children and adults with acute septic arthritis usually present with **fever** (60–80%) and **monoarticular involvement** (only one joint is involved)(90%).
- The **knee is the most commonly affected joint**, followed by the hip.
- Clinical features include **pain, swelling**, and **reduced mobility** in the joint.
- Polyarticular infections occur in 10–20% of patients, especially those with rheumatoid arthritis and viral causes.
- Infections with mycobacteria or fungi usually have an insidious onset.

Diagnosis

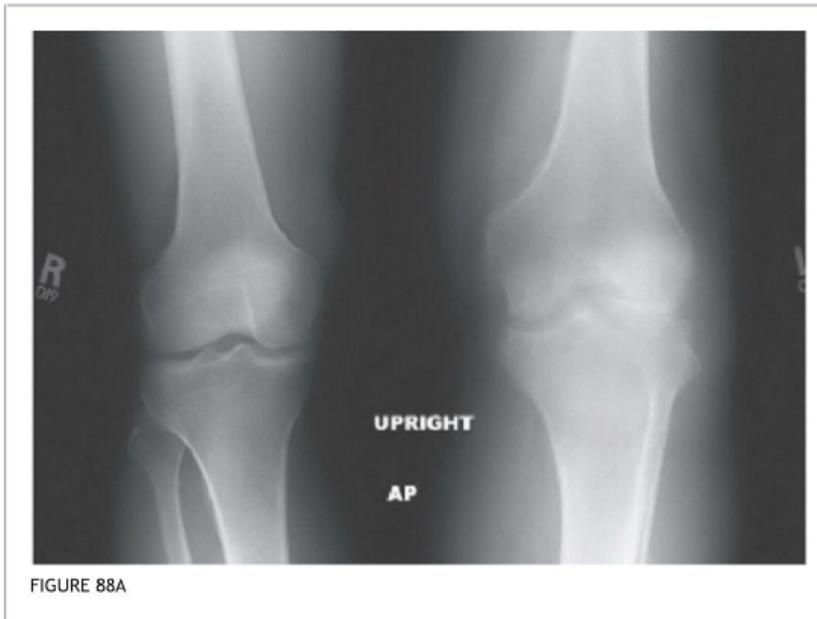
- Laboratory investigations frequently show a raised WCC and inflammatory markers.
- Joint aspiration shows purulent synovial fluid, with an elevated WCC (50 000–100 000 cells/mm³), mostly neutrophils.
- Gram stain is positive in 29–50%, and culture is positive in 80–90% of cases (synovial fluids in blood culture bottles may improve yield)
- Samples should also be sent for microscopy for crystals. BCs are positive in 75% of cases.

Imaging

- Radiographs of the affected joint may be normal at presentation.
- Typical changes are periarticular soft tissue swelling, fat pad edema, periarticular osteoporosis, loss of joint space, periosteal reactions, erosions, and loss of subchondral bone.
- Ultrasound can be used to confirm an effusion and guide aspiration.
- CT and MRI are highly sensitive for imaging early septic arthritis. CT is better for imaging bone lesions.
- MRI may not distinguish septic arthritis from inflammatory arthropathies .

CLINICAL HISTORY

43-year-old female with a history of lupus treated with steroids, presents with developing left knee pain, swelling, and fevers.



Notes about the picture:

- 1) synovial fluid cloudy in the joint space .
- 2) the subtissue is very swelling .

Management

- Drainage of the joint, either by closed aspiration or arthroscopic washout, should be performed **urgently**.
- open drainage(insert a tube and keep the tube in while keeping drainage out the fluid) may be required either when repeated drainage has failed to control the infection or for drainage of hip joints.
- Prosthetic joint infections often require removal of the prosthesis.

Antimicrobial therapy

According to the initial **Gram stain** findings.

Empirically - IV piperacillin–tazobactam ± vancomycin.

• Definitive therapy is tailored to culture and sensitivity results

- Adjunctive therapy with a short-course systemic corticosteroid treatment has been shown to be of benefit in children with haematogenous bacterial arthritis.

Useful video:

https://www.orthoatlanta.com/videos/septic-arthritis-of-the-knee#vm_A_9e1c8386

<https://www.youtube.com/watch?v=498Px-BBdOo>

Good luck 