

# Causes of Bone and Joint Infections

Bone and joint infections are not common, they develop in people with local indisposition (trauma, degenerative changes, surgery,...). The treatment of these infections is difficult, requiring the cooperation of experts from several fields.

## Acute osteomyelitis

- Usually **bacterial**, rarely fungal infection
- *S. aureus*, *Streptococcus pyogenes*, streptococci, coagulase-negative staphylococci, enterococci, pseudomonads, *E. coli*, enterobacteria, anaerobic bacteria, rarely mycobacteria, fungi, actinomycetes, brucellas,...

## Hematogenous osteomyelitis

- Infection of bone as a result of embolization of microbes or infected microthrombi into intact bone (in sepsis, infectious endocarditis caused by *S. aureus*) → pre-damaged bone.

## The spread of germs from the environment *per continuitatem*

- Trauma with perforation of the skin and subcutaneous tissues, a deposit of infection around the bone.

## Diagnostics

- X-ray, blood culture to determine the cause.

## Therapy

- Conservative, long-term administration of ATB in high doses;
- unless another aetiology is known, antistaphylococcal ATB is given.

## Chronic osteomyelitis

- Consequence of trauma, deposits near infection;
- no general difficulties, but local pain and secretion from chronic fistula.

## Diagnostics

- X-ray, CT, MRI.

## Therapy

- ATBs do not penetrate necrotic bone or scar tissue, so surgery is necessary;
- find out the aetiology for the administration of ATB before the procedure: repeated microscopic and culture examination of pus from the fistula or material from the biopsy.

## Septic arthritis

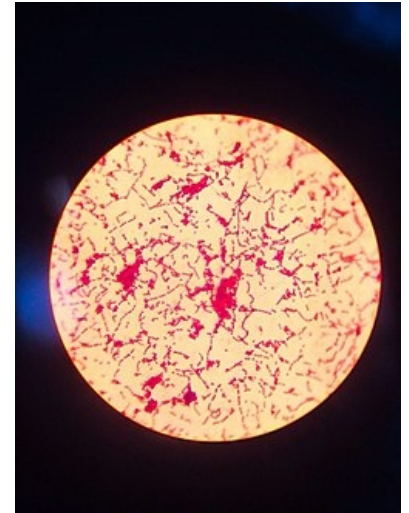
- Hematogenous spread or direct inoculation of bacteria into the joint during trauma or invasive joint surgery;
- purulent inflammation → release of hydrolytic enzymes, which causes destruction of cartilage;
- **etiological agents:** *S. aureus*, coagulase-negative staphylococci, streptococci, *Neisseriae*, enterobacteria, hemophiles, *Pseudomonas aeruginosa*, *Mycobacterium tuberculosis*, *Mycobacterium marinum*;
- **gonococcal arthritis** - in sexually active women, **enterobacteria** - in older people, **anaerobes** - after an animal bite, diabetic foot, drug addicts - *P. aeruginosa*.

## Diagnostics

- Examination of synovial fluid (joint puncture) to determine the aetiology → microscopy (Gram stain), culture, hemoculture, PCR.

## Therapy

- Drainage, administration of ATB, or surgery.



Streptococcus pyogenes

# Joint implant infections

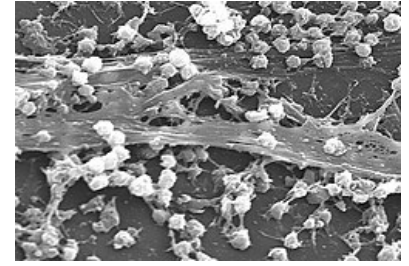
- Adhesion of bacteria to artificial material, biofilm formation;
- *S. aureus*, beta-hemolytic streptococci, enterobacteria, coagulase-negative staphylococci, skin commensals.

## Aseptic arthritis

- Viruses: HBV, HCV, parvovirus B 19, rubella virus, HIV,...
- bacterial agents: *Chlamydia trachomatis*, *Ureaplasma urealyticum*, *Treponema pallidum*, *Borrelia burgdorferi*;

## Diagnostics

- Joint puncture, synovial fluid culture - sterile collection required, agent determination serologically, PCR;
- must be distinguished from non-infectious inflammations or immunopathological inflammations.



Staphylococcus aureus

## Therapy

- Viral resolves on its own, bacterial - administration of ATB necessary;

## Links

## References

- BENEŠ, Jiří, et al. *Infectious medicine*. 1. edition. Galen, 2009. 651 pp. ISBN 978-80-7262-644-1.
- VOTAVA, Miroslav – ŠTEINER, Ivo – DUŠEK, Pavel, et al. *General medical microbiology*. 2. edition. Brno : Neptun, 2005. 0 pp. vol. 1. ISBN 80-86850-00-5.