osteomyletitis:

1- it is Inflammation of bone/marrow due to infection
2- Part of systemic infection
3- can be caused by any organism
4- divides into pyogenic and TB osteomyelitis

pyogenic osteomyelitis:

- caused by bacteria: 1- staph.aureus(most of the time)&E.coli
  2- klebsiella and pseudomonas are associated with UTI and IV drug abuse
- Mechanism of spread: 1- Hematogenous spread(in children)
  2- Extension from contiguous site (in adult ex.diabetic foot)
  3-Direct implantation after compound or orthopedic procedure
- pyogenic osteomyelitis in : 1- Neonates is caused by ; Haemophilus influenzae & Group B strept.
  2- Sicklers is caused by : Salmonella.
  3- Long bones is caused by : metaphysis & epiphysis in adults; in children: epiphysis or metaphysis (not both).

1- Sequestrum: is the necrotic bone that is embedded in the pus/infected granulation tissue.
2- Involucrum: is the new bone laid down by the periosteum that surrounds the sequestra.
3- Cloaca: is the opening in the involuerum through which pus & sequestra make their way out.

in acute phase : PUS & NEUTROPHIL
in chronic phase :LYMPHOCYTES AND PLASMA CELLS

MYCOBACTERIAL OSTEOMYELITIS:

- main causes of it : 1-immigaration
  2- immunocompromised patiens with pulmonary or extra pulmonary TB.
- mechanism of spread : 1- hematogenous.
  2- direct spread.
- Clinically: maybe subtle and chronic course.
- Pathology: necrotizing (caseating) granulomas.
- TB SPNDYLITIS (POTT DISEASE):
  - 1- Destructive spine TB.
  - 2- Difficult to treat.
  - 3- May lead to neurologic deficit, scoliosis, kyphosis.

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clinical observations of osteomyelitis:

1- Hematogenous OM: fever, malaise, chills, leukocytosis, throbbing pain locally.

2- Infants: subtle.

3- Adults: local pain.

DX(diagnosis):

1- high index of suspicion.

2- X-ray maybe normal in early phases.

Tx(treatment):

1- admission.

2-IV antibiotics.

3- surgical drainage of pus.

CHRONIC OSTEOMYELITIS:

1- 5-25% of Acute OM persists as chronic OM.

2- Very bad debilitating disease.

Causes:

1- Delay in diagnosis.

2- Extensive necrosis.

3- Inadequate therapy (A. biotics or surgery).

4- Weakened host immunity.

COMPLICATIONS:

1- Pathologics.

2- Secondary amyloidosis.

3- Endocarditis.

4- Sepsis.

5- SQ. cell Ca of draining sinus.

6- Sarcoma of bone.

BONE TUMORS FEATURES:
1- Primary bone tumors are rare.
2- benign tumor are much more than malignant.
3- tumor in adult tend to be more malignant.
4- TX: survival and maintaing function.
5- DX: differ depends on age &location.

bone tumors:

- OSTEOID OSTEOMA (benign):
  1- < 2 cm & found in Young men.
  2- mainly in Femur & tibia.
  3- Severe nocturnal pain (PGE2) relieved by aspirin & NSAIDS
  4- TX: radiofrequency ablation or surgery

- OSTEOBLASTOMA (benign):
  1- > 2 cm.
  2- mainly in Posterior vertebrae.
  3- no rim of bone reaction.
  4- Pain unresponsive to aspirin.
  5- TX: curetting.

- OSTEOSARCOMA (malignant):
  1- the most common primary malignant tumor of bone.
  2-mostly found in adolscents, also found in older people(secondary osteosarcoma).
  3- appears more in male than female.
  4- infects metaphysis of long bones (distal femur & proximal tibia).

  - features:
    1- progressive pain.
    2- large destructive and infiltrative lesions with Codman triangle.
    3- Hematogenous spread to lungs.

  - causes:
    mutations in : 1- RB gene. 2- TP53 gene.
    3- CDKN2A (p16 & p14). 3- MDM2 & CDK2.

TX: 1- Multimodality approach (MDTeam).
2- 5 year survival reaches 60-70%.
3- mets is a bad prognostic factor.

EWING SARCOMA: 1- Small blue cell tumor (PNET).
2- 2nd most common sarcoma of bone.
3- < 20 years, infects diaphysis.
4- translocation mutation in t(11;22)(q24;q12),which leads to fusion of the EWSR1 gene with the FLI1 gene.
5- TX: neoadjuvant CT followed by surgery.

cartlige tumors:

cartliage tumors features: Osteochondroma (benign): 1- solitary.
2- part of multiple hereditary exostoses (MHE): EXT1, EXT2 gene mutations.
3- rare transformation to chondrosarcoma.

CHONDROMA (ENCHONDROMA): features: 1- Benign hyaline cartilage tumors in bones with endochondral origin.
2- medullary enchondroma or cortical chondroma.
3- Solitary metaphyseal lesions; 20-50 years.
4- Multiple enchondromas: A- Ollier disease.
B- Maffucci syndrome: multiple enchondromas + skin hemangiomatosis.
5- mutations in IDH1 & IDH2 gene.

CHONDROSARCOMA: features: 1- Malignant tumors.
2- 50% incidence of osteosarcoma.
3- 40-50 years of age; found in males more than females.
4- mainly in shoulder, pelvis, ribs.

mutations in genes: 1- EXT. 2- IDH1. 3- IDH2. 4- COL2A1. 5- CDKN2A.

Px: depends on grade (grade 1 excellent px).

TX: surgical and chemotherapy.