Diseases of bones
1. Orthopaedic investigation and ultrasound
2. Pathological finding is indication for X-ray investigation

we evaluate:
- osification of the head of the femur
- course of the acetabulum
- position of the hip joint
Developmental dysplasia of hip

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we evaluate:
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Dysplasia of hip

Acetabulum dysplastic bilateralis luxation of the right hip
Craniosynostosis

- Is premature closure of the cranial sutures
- Involved suture is narrow or is not visible
- Expressive impresiones of the gyruses
- Turicephalia, scaphocephalia, oxycephalia, plagiocephalia
Osteogenesis imperfecta

- Congenital fragilitas ossium
- Deficient formation of bone matrix and collagen
- Repeated fractures of different date
- Bizarre deformities
- The bones are bowed, extremities short, cortex is thin
Osteopetrosis (Albers-Schonberg)

- Failure of normal resorption of calcified chonral tissue
- Osteosclerosis
- Homogenous or unhomogenous
- Pathological fractures
- Bottle-shaped metaphyses
Mucopolysacharidosis
*Gargoylismus* (Hurler’s type)

- Palm-leaf-shaped ribs
- Underdevelopment of superior half of vertebral body (upside down parrot beak shaped)
- Coxa valga
M. Calve-Maydl-Legg- Perthes

- The most frequent aseptic necrosis
- etiology is unknown
- head and neck of the femur
- 5.-10. year of age
- RTG finding comes about six weeks later than clinical finding

- affected part of the bone is:
  - shorter, unhomogeneous with foci osteosclerosis and osteoporosis,
  - later, it comes to fragmentation and deformity
Further aseptic necrosis

- Osgood-Schlatter (tuberositas of tibia)
- Blount (med. condyle -tibia vara)
- Koehler I (naviculare pedis)
- Koehler II (caput MTT II)
- Haglund (calcaneus)
- Kienbock (lunatum)
Scheuermann’s disease (juvenile vertebral epiphysitis)

- Etiology is unknown
- around puberty
- Th-L spine
  expressive kyphosis
  wedge-shaped body of the vertebra
  uneven margin of the vertebral body
  fragmentation of the apophysis
  Schmorl’s knots
Osteomyelitis

- Acute, chronic, specific, unspecific
- X-ray changes after 10 to 20 days
- soft tissue swelling
- periosteal reaction
- lytic areas (bone destruction)
- irregular sclerosis
- sequestrum
Osteomyelitis sclerotisans Garré/TBC

Garré
- unpyogenes osteosclerosis
- spindle-like widenig of diaphysis

TBC
- osteoporosis
- parallel meta-epiphysial involvement (osteolysis)
Brodie´s absces (osteomyelitis chronic)

metaphysis of the long bones
• (most frequent in femur)

• circumscribed osteolytic area with sclerotic margin

• thin periosteal lamellar reaction
Congenital syphilis (lues)

- diaphysitis
- metaphysitis (Wegener´s zone)
- periostitis

Wimberger´s sign:
- erosions
- at the medial portion of the proximal metaphysis
Rachitis (rickets) vitaminosis D

Osteomalacia (substitution of the bone with osteoid)
• unsharp margins
• tumbler-like deformity of metaphyses
• rachitic rosary on the rips

Healing:
• periostosis
• doubled zone of the provisional calcification
Scorbutus (scurvy) avitaminosis C

- Subperiosteal hematomas
- Multiple epiphyseal dysplasia
  
  *Pelkan’s sign*: sharpening margins of the metaphysis

  *Winberger’s sign*: sclerotic margin of the porotic epiphysis
Degenerative joint diseases

- Sharpening of the articular margins, osteophytes
- Narrowing of the joint space
- Subchondral sclerosis
  - Cystic rarefactions
  - Subchondral, periarticular calcification, subluxation.
Bechtěrev’s disease (spondylitis ankylosans)

1. SIS:
   - subchondral osteoporosis, subchondral erosions (sign of the rozary), ankylosis

2. Spine: (rigid)
   - expressive kyphosis
   - image of the bamboo stick
Paget’s disease (osteitis deformans)

- Enlargement of the bone
- Deformity (bone is bowed)
- Pathological fractures
- Osteosclerosis and osteoporosis
- Malignant degeneration is a serious, but infrequent complication
Cyst / nonosifying fibroma

- Cyst manifest as a clearing in the bone with an expansion effect.
- Cortex can be thin

- Fibromas occurs in metaphyses,
- Eccentrically subcortical,
- Occasionally multiloculated
Osteocartilaginous exostosis

The bone exostosis always goes from metaphysis toward diaphysis. Cartilage cup is not visible.
Osteochondroma: bone and cartilage cap
Osteoma: bone only
Enchondroma

• tumor from chondral tissue
• ( multiple chondromatosis of the bones )
• defectes in bones often with expansion effect, thin and perforated corticalis
Osteoid osteoma

- In diaphysis lower extremities
- Osteoplastic changes
- Nidus (detectable CT) - is round osteolytic lesion with small calcification
Histiocytosis from Langerhans cells

- Eosinophilic granuloma
  sharp demarcated osteolytic defect

- Hand-Schuller-Christian - map skull
Osteosarkoma: osteolytic/osteoplastic

- Osteolysis
- Hyperostosis (laminated, onion-skin appearance, spiculated), Codman’s triangle
Osteosarkoma

• Soft tissue part of the tumor - regression after appropriate therapy
Metastases
In childhood the most frequent from neuroblastoma

- Osteolytic, osteoplastic, mixed

Skull: erosion of margins of bones