Paget’s Disease

- Osteitis deformans is a generalised disease with thickened, enlarged & brittle bone
  - More common in Caucasians > 50 years
  - Suspected viral origins from the discovery of inclusion bodies in osteoclasts
  - Affects the pelvis and tibia most commonly.
  - Next commonest are the femur, skull and spine

- Increase overall bone turnover with increase in osteoclastic (↑ urinary hydroxyprolene excretion) and osteoblastic (↑ ALP) activity

- Phases:
  - Osteolytic (vascular)
    - Avid bone resorption, with excavations filled with vascular fibrous tissue
    - Adjacent areas have ↑ osteoblastic activity producing new woven and lamellar bone which is in turn attacked by osteoclasts
    - Alternating activity occurs on endosteal and periosteal surfaces to increase bone thickness but reduce bone strength
  - Reparative Phase
    - Osteoclastic activity abates & eroded areas filled with new lamellar bone
    - Leaving an irregular pattern of cement lines that delineate old resorption cavities and produce a mosaic/marbled appearance on microscopy
  - Burnt out phase
    - Continuing osteoblastic activity results in sclerotic, brittle bone

Clinical Features

- Usually asymptomatic and found incidentally on x-ray or due to high ALP
- But symptoms include:
  - Constant ache / bone pain
  - Deformity in the legs with bowing according to mechanical stress
    - Tibia bows anteriorly and femur anterolaterally
  - Warm skin due to local hyperaemia
  - Skull enlargement → “hat no longer fits”
  - Platybasia – flattened skull base
  - Kyphosis with “ape-like” appearance with arms and legs bent hanging forward
  - Otosclerosis can lead to deafness (compression of CNVIII-acoustic nerve)
  - May have facial palsies form CNVII compression
  - Spinal cord stenosis or nerve root compression
  - Steal syndrome – can lead to blood diversion to the skeleton resulting in cerebral impairment or spinal cord ischaemia

- X-rays:
  - Localised osteolysis
  - Flame-shaped lesion in diaphysis of bones
  - Circumscribed osteoporotic area in skull (osteoporosis circumscripta)
  - Thickening of long bones, with coarse trabeculation and sclerotic lines
  - Small stress fracures that resemble Looser’s zone from pulsating arteries that fill/heal with fibrous tissue
Ix:
- Serum ALP raised – with normal calcium and phosphate (use bone specific ALP in presence of liver disease)
- 24-hour urine collection for hydroxyprolene or pyridinoline
- Immobilisation can lead to malignant hypercalcaemia

Complications:
- Fractures – transverse in long bones, but vertical in femoral neck
  - Femoral neck fractures commonly do not heal → THR or hemiarthroplasty
- Osteoarthritis
- Nerve compression and spinal stenosis
- Sarcoma (1%)
  - Osteosarcoma in elderly almost always represents malignant transformation of Paget’s disease
  - Acute pain and swelling that is localised
  - Grave prognosis
- High output cardiac failure
- Hypercalcaemia – especially if immobilised for long periods

Treatment
- Analgesia and NSAIDs for symptoms of osteoarthritis
- Monitor serum ALP – and use as guide for increasing treatment / investigations

Indications for treatment:
- Persistent bone pain
- Repeated fracture
- Neurological complications – will not reverse deafness though
- Heart failure
- Hypercalcaemia
- Pre-operative preparation for elective orthopaedic surgery – reduces bleeding

Bisphosphonates – 1st line
- Bind to hydroxyapatite crystals – look for a 25% drop in ALP
- Can lead to prolonged remission even after discontinuation
- Oral etidronate no longer advised as not as efficacious
- Oral risedronate 30mg/day for 2 months – selective osteoclast inhibition
- Intravenous pamidronate infusions – 60mg fortnightly or 30mg weekly
- Alendronate selectively block osteoclast activity – 60mg day for 6 months

Calcitonin
- Daily s/c 50-100 MRC-units of salmon calcitonin
- Reduces osteoclast activity
- Continue until serum ALP levels reduce and stabilise
- Thereafter maintenance injections weekly, or trial withdrawal
- Human calcitonin avoids drug resistance from antibody formation

Surgery:
- Treatment of fractures – can also aim to straighten bone
- Arthroplasty vs. OA or femoral neck fracture
- Spinal decompression and local nerve decompression (e.g. carpal tunnel)
- Resection of an early detected osteosarcoma – but prognosis always bleak