Metastatic bone disease
Introduction

- Bone = 3rd commonest site for mets
- ↑survival of metastatic Ca breast & prostate
- Carcinomas >> Sarcomas
Cancers most likely to metastasise to bone

- Breast
- Lung
- Prostate
- Thyroid
- Kidney
- Bowel
Axial skeleton preferred to appendicular

- Persistence of red bone marrow
- Ribs, pelvis & spine affected 1st
- Batson’s VVP allows cells to enter vertebral circulation without passing through lungs. Sluggish flow aids adhesion
Lesions

- **Lytic**: Osteoclastic process > osteoblastic activity
- **Sclerotic**: Results from new bone growth stimulated by tumour
Most common symptom (70%)
- Periosteal stretching
- Endosteal nerve stimulation
More common with lytic lesions e.g. Ca breast
Less common in:
- Ca lung (short life span)
- Ca prostate (osteoblastic)

Lytic mets must be > 1 cm and have destroyed 30-50% of the bone density in order to be seen by x-ray
Presentation 3 - Hypercalcaemia

- Polyuria
- Kidney stones
- CNS (confusion, stupor, weakness)
- GI (constipation)

- Can be life threatening
  - Can occur without extensive mets
  - Due to release of GF’s & cytokines that stimulate osteoclastic resorption (at distant uninvolved sites)
  - Treat with N. saline rehydration
Bone scan (precedes x-ray visualisation by 2 – 18/12)
FBC, Biochem, LFT, Coag screen, G & S)
Biopsy not necessary
Aims:
- Identify lesion to treat primary
- Differentiate from primary bone lesion

- FBC, Bone profile, U&E, LFT, Coag screen, G&S
- TFT, PSA, Tumour markers, ESR, CRP, BJP
- Bone Scan
- CXR
- CT chest & abdomen
- Biopsy lesion(s) for histology & microbiology (incl. TB)
- Normally palliative
- Solitary mets esp renal can do very well
  - Treat as a primary neoplasm
Useful for reducing bone pain and progression of tumour growth

- 90% some relief, and
- 50% receive near complete relief with 20 to 40.5 Gy of radiation

Complications:

- osteonecrosis
- stress #
- nonunion
- ↓ bone resorption therefore ↓ pain & risk of #.
- ↓ Ca^{2+} fast. But needed long-term to treat widespread osteolytic disease.
- Clodronate affects bone resorption but does not alter bone mineralization
  - In studies, clodronate found to reduce bone pain after a few months
  - Also decreased need for DXT and risk of pathological fracture was also reduced
Prophylaxis is best
Occur in up to 29% of pts with bony mets
High risk:
- > 50% loss of the cortex / shaft diameter on any view
- Avulsion of lesser trochanter is an indication of imminent hip fracture
- >2.5cm lesion
Numerical score assigned to 4 variables:
- Location of lesion
- Degree of pain
- Radiographic appearance
- Size of lesion

Weighted system.
< 7 – Safely irradiate without risk of #
> 8 – DXT prior to internal fixation
Role of the surgeon

- Prevent # through prophylactic fixation
- Stabilise or reconstruct after #
- Decompress spinal cord and nerve roots
- Confirm Diagnosis if in doubt:
  - Whenever there is the slightest doubt about the diagnosis biopsy is MANDATORY. Prophylactic nailing of a lesion that turns out to be a primary is a DISASTER
Load bearing better than load sharing
Defects can be filled with cement
After nailing, whole bone needs to be included in the radiotherapy field
Plate fixation is acceptable in the upper limb +/- cement augmentation
Fractures around the hip need careful consideration
  - Usually hemi or THR
  - Extensive destruction of the proximal femur may require endoprosthetic replacement
  - Acetabular lesions should be reconstructed
Thank you