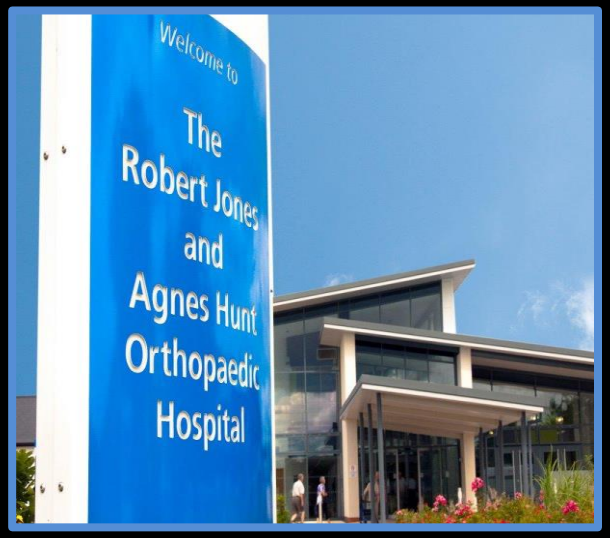


Metastatic Bone Disease

Miss Karen Shepherd

Consultant Orthopaedic and Oncological Surgeon,
Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust

Metastatic Bone Disease

- Background
- Fracture risk assessment
- Management
  - Decision making
    - Prognosis
  - Surgical options
  - Non surgical options
- Practical Advice
  - Splints/slings/traction/trough

Metastatic Bone Disease

- Common problem
- Skeletal related events
- Treatment options include surgery
- Management guided by prognosis

Prognosis

Google “MBD BOA guidelines”

http://www.boos.org.uk/wp-content/uploads/2016/03/BOOS-MBD-2016-BOA.pdf

British Orthopaedic Oncology Society

&

British Orthopaedic Association

Metastatic Bone Disease:

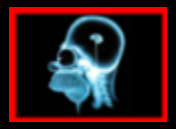
A Guide to Good Practice.

2015 Revision

11.6 Patients with a life expectancy of less than six weeks rarely gain useful benefit from major reconstructive surgery. However, an accurate prognosis cannot always be given in MBD and decisions regarding the appropriateness of surgery, or indeed any other interventions, should be discussed within the context of the multidisciplinary team and an informed patient and family.

Metastatic Bone Disease
Not one just one disease

Metastatic Bone Disease
Primary Sites



- Breast
- Prostate
- Kidney
- Lung
- Thyroid

- Myeloma
- Lymphoma

- Bladder
- Bowel
- Endometrial
- Melanoma
- Oesophagus
- Hepatocellular
- Pancreas
- Sarcoma

FRCS Question

"Please can you tell me what you think is the cause of this xray change?"

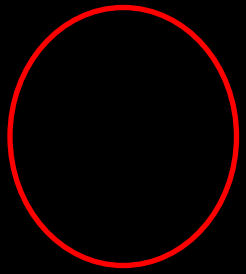
Mrs Smith
79 years

"I am concerned that this is a bone tumour. In someone of this age I expect the most likely cause is metastatic disease, followed by haematological malignancies such as lymphoma or myeloma. Finally a primary bone cancer should be considered"

Breast

Mixed

– Lytic / sclerotic

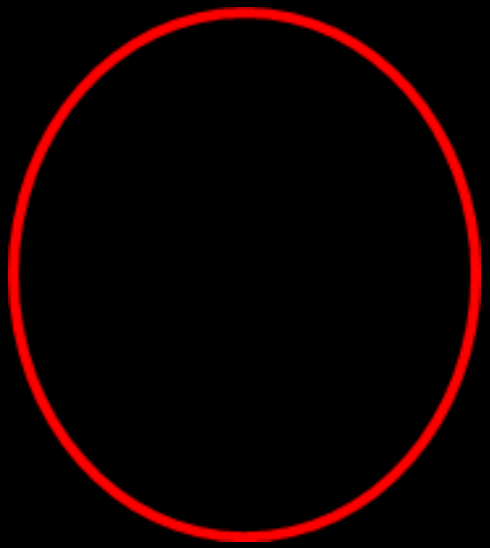


Prognostic factors for patients with skeletal metastases from carcinoma of the breast.
Bone Joint J. 2016 Feb;98-B(2):266-70
Stevenson JD, McNair M, Cribb GL, Cool WP

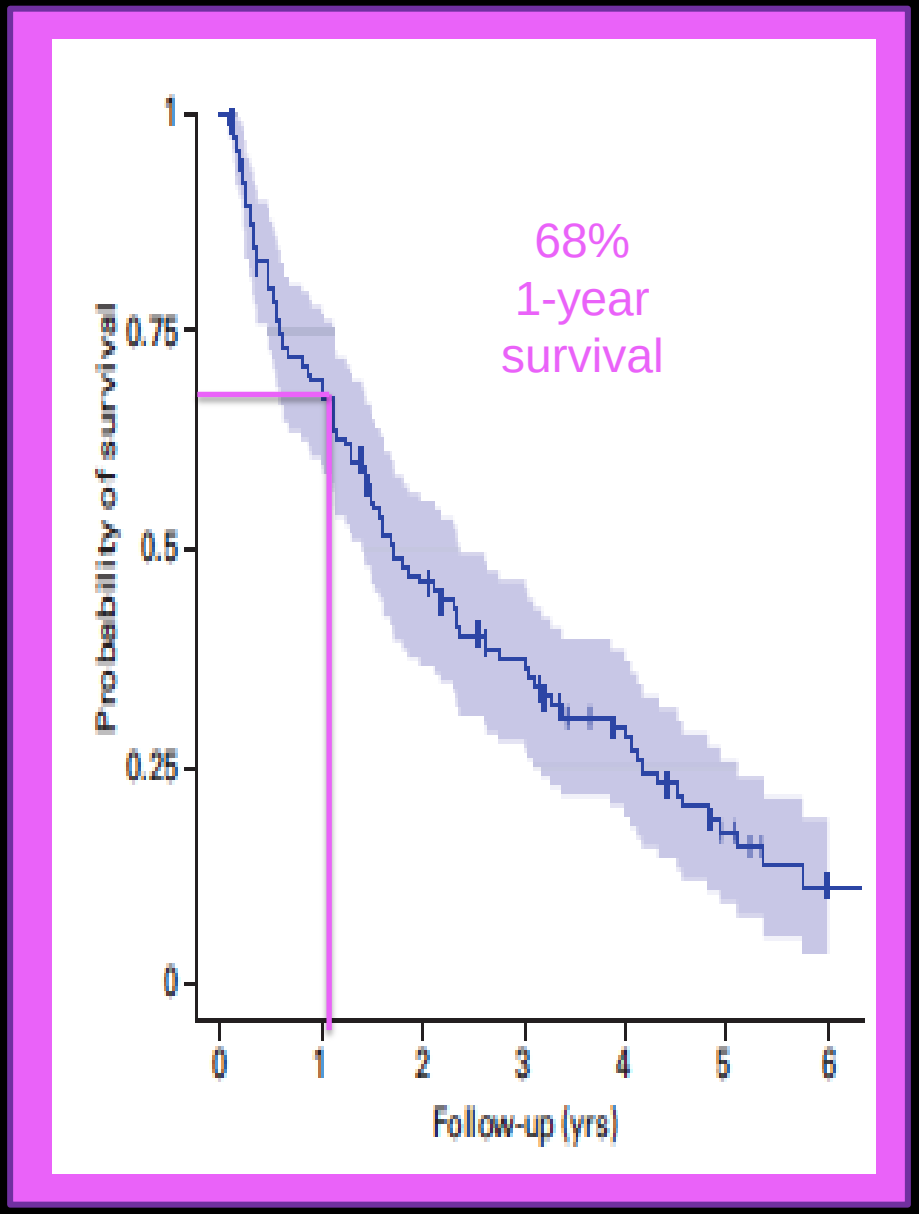
Prostate

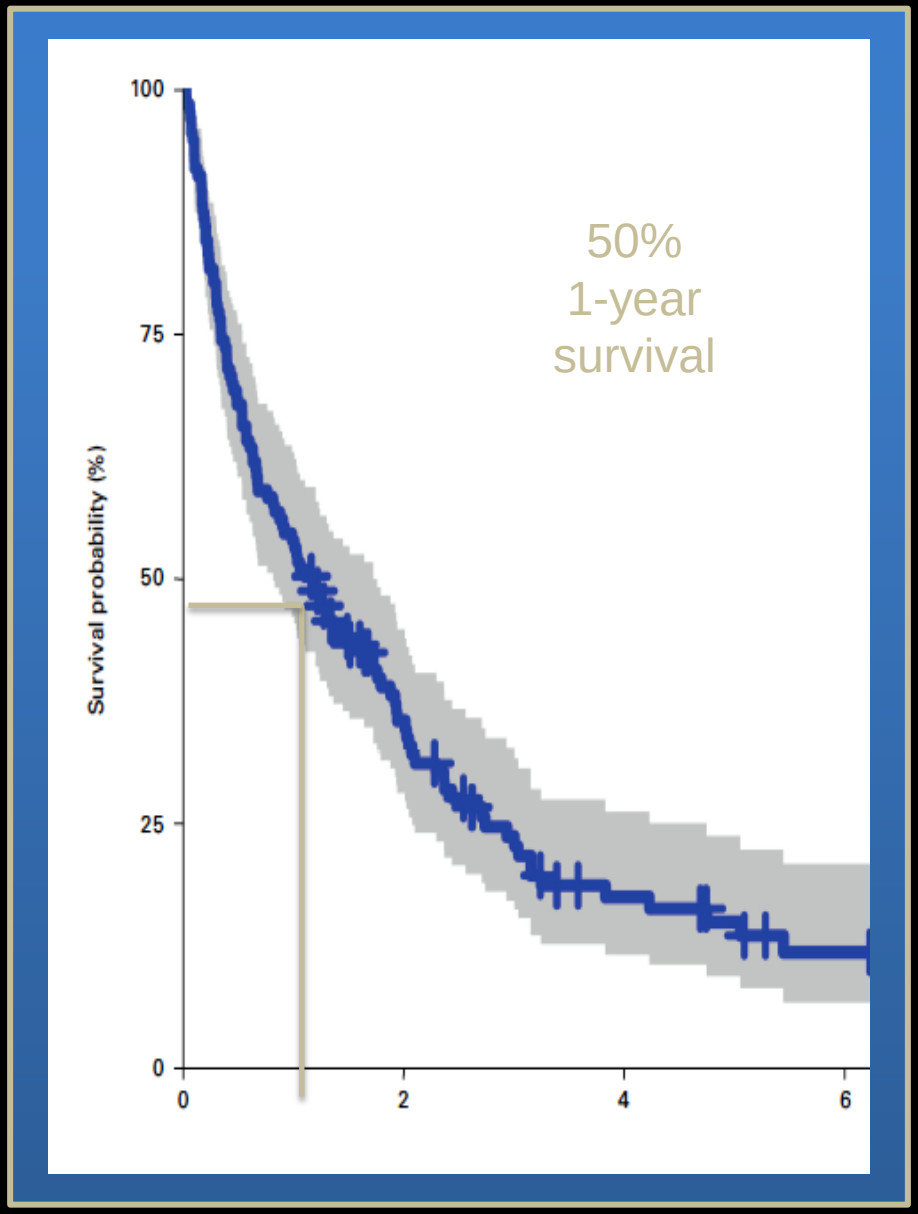
Sclerotic mostly

Lytic = bad



Prognostic indicators of outcome for patients with skeletal metastases from carcinoma of the prostate. The Bone and Joint Journal. 100-B(12):1647-1654, Dec 2018. *Shepherd KL, Cool P, Cribb G*.


68%
1-year
survival
Probability of survival
1
0.75
0.5
0.25
0
0
1
2
3
4
5
6
Follow-up (yrs)


50%
1-year
survival
Survival probability (%)
100
75
50
25
0
0
2
4
6

Metastatic Bone Disease
Poor prognostic outcome

- Low Hb and Alb
- High ALP
- High calcium

- Young
- Visceral metastases

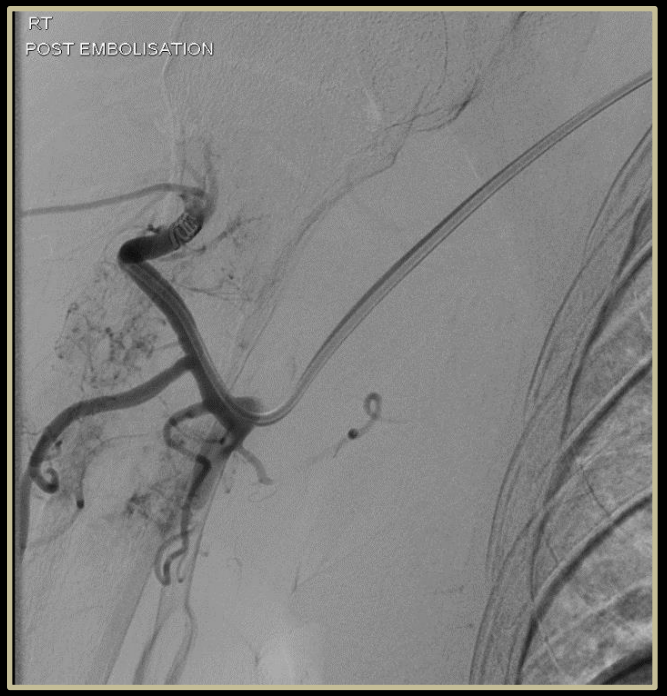
- Low Hb and Alb
- High ALP

- Relatively low PSA
- Surgical intervention

Kidney and Thyroid

- Both Lytic
- Both bleed a lot
  - Pre op embolisation
- Good prognosis if minimal disease elsewhere
- Excise solitary mets


10-CL-1841
Sep 28 2010
16:27:36
RT
(Filt 3)
(Shut)
(Peak OD)
MASK = 1


RT
POST EMBOLISATION

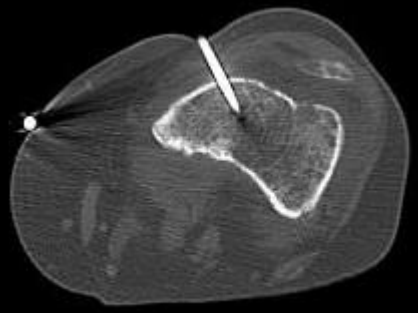
Lung

- Mixed appearance
- Aggressive
- Historically very poor prognosis
  - Recent improvements in survival with targeted therapies
  - EGFR & ALK mutations

Why biopsy?

- Solitary bone lesion on bone scan
  - To exclude a primary bone tumour
  - Other tumours
- Long disease free interval
  - May be a different primary tumour
  - May have difference receptor status
- Imaging doesn‘t fit with the diagnosis

RJAH Bone Biopsy Service



- Pre biopsy MDT discussion
- Patients all seen in clinic by consultant surgeon and have a pre op assessment
- General anaesthetic
  - Patient must be fit enough
  - Hypercalcaemia / brain mets
- Image guided percutaneous needle
  - CT (usually)
  - Fluoroscopy
- MDT biopsy discussion

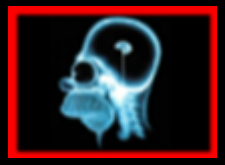
Risks of biopsy

- Mostly performed under general anaesthetic

- Fracture
- Bleeding
- Non diagnostic biopsy
  - Will need repeating
- Medical
  - CVA, MI

Fracture Risk

- Clinical assessment
  - Pain
  - Inability to weight bear
- Radiological
  - Xrays
    - Mirels score???
  - CT
    - Bone destruction
  - MRI, isotope bone scan
    - Not useful in assessing fracture risk



Fracture risk (Mirels)

- Site = pertrochanteric = 3
- Pain = unable to WB = 3
- Lesion = lytic = 3
- Size = >2/3 = 3

- Total = 12

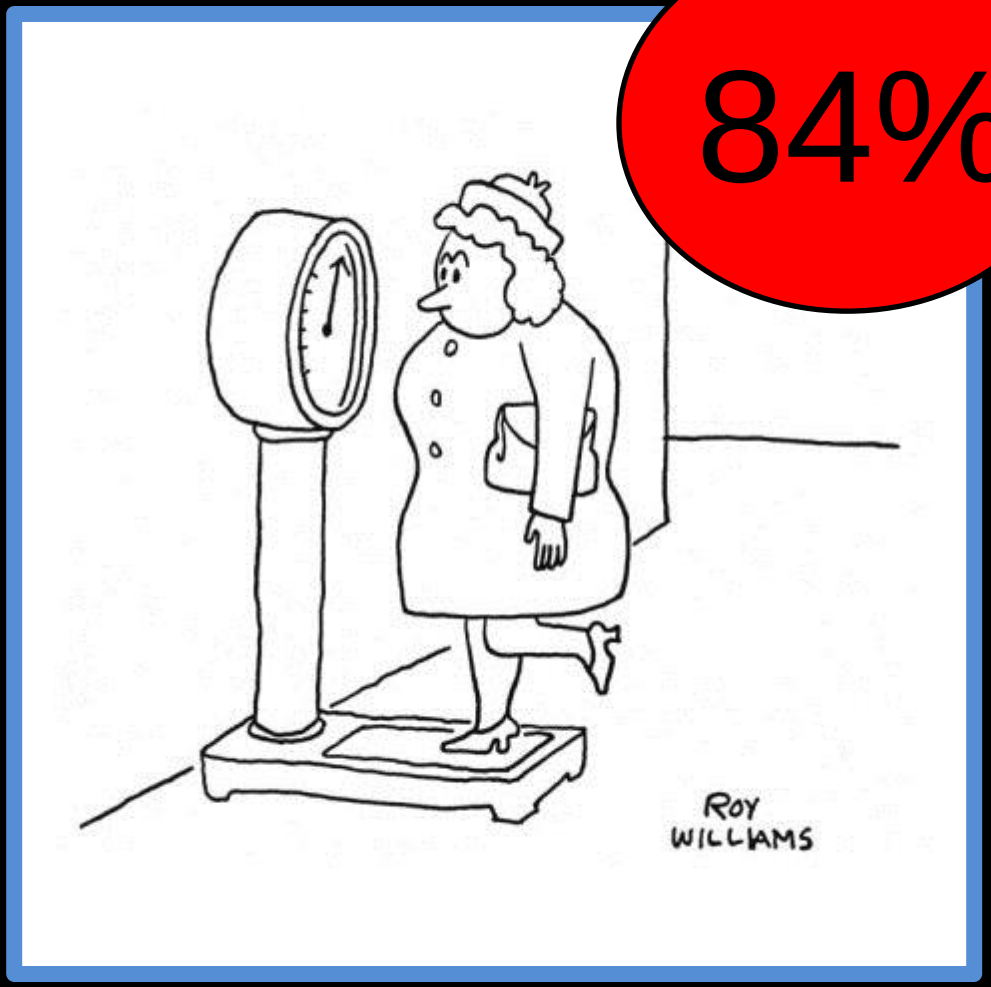
9 or greater = prophylactic fixation

MIRELS?

✗

WEIGHTS?

✓



The validity of the Mirels score for predicting impending pathological fractures of the lower limb. The Bone and Joint Journal. *100-B(8*3), Jul 2018. *Howard E, Shepherd KL, Cribb G, Cool P*.

Multidisciplinary Management

Orthopaedic

- Non operative
- Operative

Oncologic

- Radiotherapy
- Hormonal chemotherapy
- Cytotoxic chemotherapy
- Bisphosphonates/denosumab
- Targeted therapies

Management of painful bone mets / fractures

Management of painful bone mets / fractures

- Immobilisation
  - Sling
  - Crutches
  - Wheelchair
  - Splints
  - Trough
  - Traction
- Analgesia
  - Fentanyl lozenge & other strong opiates
  - Diazepam for muscle spasm
  - Nerve blocks / catheters

  - Fracture pain does settle

Surgical decision making

- Symptoms
  - Pain
  - Other
- Influenced by life expectancy
  - Tumour type
  - Other sites disease
    - Visceral
  - General condition
    - Medical comorbidities
- Patient wishes
  - Expectations

Surgery– Yes or No?

- Operative
  - Pain
    - high risk of fracture
  - Fracture
    - which is unlikley to heal
  - No other non surgical options

- Non operative
  - **No pain – despite radiological appearances**
  - Very poor life expectancy / not medically fit
  - No surgical option

Surgical Planning

- Imaging
  - MRI of the lesion and whole bone it is within
  - CT of the lesion and ideally the whole bone
  - +/- NM bone scan
  - Chest/Abdomen/Pelvis Staging CT
- Anaesthetic assessment
  - Consultant anaesthetist
  - Relevant blood tests ***and their trend***
  - +/- Echo
- Consent with family members present ideally
  - Death

Surgical Principals

- Aims
  - Improve quality of life
  - Treat pain
  - (prevent fractures)
- Implant should
  - Allow immediate weight bearing
  - Last the life-time of the patient
- Complications
  - Death
  - Infection
  - Disease progression

Surgical modalities

- Replacement
  - Solitary lesion
  - Good prognosis
  - Proximal femur
- Plate and cement fixation
  - Poorer prognosis
  - Visceral and bony metastases
- IM Nail
  - Less common
  - Diaphyseal lesions
  - Poorer prognosis

Other considerations

- Renal, thyroid, endometrial tumours
  - Very vascular
  - Pre-operative embolisation
- Serum calcium level 
  - Often elevated ??poorer prognosis
  - Must be corrected before surgery
- CT Head
  - Low threshold
  - Always with melanoma

Amputation

- Try to avoid for metastatic disease
- Only for severe pain with no other surgical option or for fungating tumours

Summary

- High risk patients
- Need careful assessment and planning
- Overall aim is to improve quality of life

Referral - Rjah.tumour@nhs.net

- History of previous cancer with bone, limb or joint pain
  - Please Xray!
- If symptoms fail to settle
  - Further imaging and or refer
- Blood tests that are useful
  - FBC, U&E, bone profile, myeloma screen, PSA

Thank you

Karen.shepherd15@nhs.net

Rjah.tumour@nhs.net