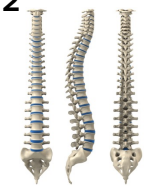
Serious Spinal Pathology 2 Metastatic Spinal Cord Compression and Stenosis / Spondylolisthesis



Miss Zoe James
Neurosurgery

1

School of Medicine
CAME Learning Technology Unit

DISCLAIMER: This session is being recorded in video/audio format by Cardiff University.

- By attending this session you are giving your implied consent to the possibility of being recorded.
- Be aware that if you ask a question or comment during the session your likeness and/or voice may appear on the final recording.
- If you do not wish for your likeness and/or voice to be recorded ask the presenter/s to either pause the recording before posing your question/comment or request your likeness and/or be removed after the session.
- This session is not a definitive statement. Mistakes may be part of the recording.
- If published, by accessing the subsequent recording you are implicitly agreeing not to copy, edit or distribute any part of the session recording without express permission from the presenter and/or the University.
- Session attendees must not make their own audio or video recordings of the session in whole or part, unless it is has been pre-approved by the University in order to support established additional requirements.
- The recording may be used by Cardiff University for the purposes of education, teaching and research for only the specified programme and cohort. To use a recording for another programme or cohort, permission must be obtained by the presenter/s first.
- If you object to any of these conditions please make it known to the presenter/s BEFORE the session commences.

2

Objectives 1

- Be familiar with the epidemiology of spinal metastases and metastatic spinal cord compression
- Identify key clinical features that would raise suspicion of metastatic spinal disease
- List the more common malignancies which metastasize to bone
- Explain the ways in which spinal metastases can cause spinal cord compression
- Recognise the difficulty in the management of some cases of metastatic spinal cord compression and be aware of sources of support (palliative care / oncology / Macmillan / support groups etc.)

3

Objectives 2

- Understand and explain the pathology and clinical features of spinal stenosis and spondylolisthesis
- Be able to differentiate spinal stenosis from vascular claudication

4

Spinal Tumours and MSCC

5

Classification

- Primary
  - Spinal Column
    - Benign – Aneurysmal Bone Cyst, Giant Cell Tumour, Haemangioma, Osteoid Osteoma, Osteoblastoma
    - Malignant – Chordoma, Osteosarcoma, Chondrosarcoma
  - Extradural
    - Schwannoma, Meningioma
  - Intradural
    - Extramedullary – Schwannoma, Neurofibroma, Meningioma
    - Intramedullary – Ependymoma, Astrocytoma, Haemangioblastoma
- Secondary – Spinal Metastases
- Haematological – Lymphoma, Plasmacytoma or Myeloma

6

Commonest Tumour in Bone?

Commonest Primary Tumour in Bone ?

Commonest Primary Bone Tumour ?

7

Red Flags

Serious and Sinister Pathology

8

Red Flags

9

= **Urgent Referral**

10

Cauda Equina Syndrome / Metastatic Spinal Cord Compression / Epidural Abscess =

11

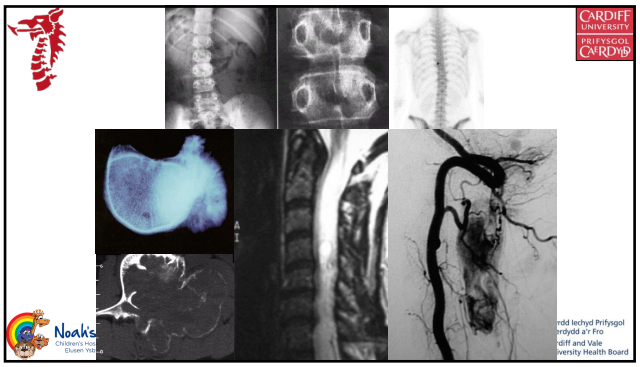
Primary Spinal Tumours

- 0.4% of all tumours
- <10% of bone tumours
- (50-70% cancer deaths have vertebral mets)

Rare – but don't miss them

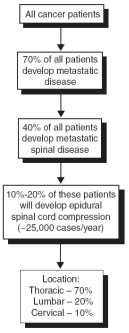
- Age
  - <21 usually benign (68%)
  - >21 usually malignant (82%)
- Site
  - Posterior column — usually benign (68%)
  - Anterior column — usually malignant (75%)

12



13

Metastatic



Mets

14

Patient Presentation

- Pain – 95% presenting feature
  - Expansion of cortex of vertebral body
  - Not relieved by rest
  - Intensifies night – venous engorgement
  - Pathological fracture / Spinal instability
  - Breast / prostate– twelve month history
- Neurological compression – 5%
  - Nerve roots or spinal cord
  - Weakness symmetrical in 60-85%
  - Bladder / bowel loss is a late feature
- Incidental finding whilst Ix primary tumour

Mets

15

Patient Presentation

- Spinal cord compression
  - Compression by bone or tumour mass after pathological fracture
  - Direct pressure from tumour extension
  - Kyphosis after vertebral collapse
  - Pressure from intradural metastasis
- Oncological Emergency

Mets

16

Mets

Site of Primary - MSCC

Primary tumour site	Typical % of MSCC presentations
Lung	
Prostate	
Breast	
Haematological (myeloma, lymphoma)	
Gastrointestinal (colorectal, oesophageal, gastric, pancreatic)	
Renal	
Other solid tumours (melanoma, sarcoma, thyroid, bladder, etc.)	
Unknown primary	

Mets

17

Mets

Site of Primary – Spinal Mets

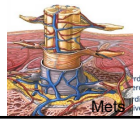
Primary tumour site	Typical % of spinal metastases
Breast	
Lung	
Prostate	
Renal	
Haematological (myeloma, lymphoma)	
Gastrointestinal	
Thyroid	
Melanoma / sarcoma / others	
Unknown primary	

Mets

18

Mets

Pathophysiology Mets



Mets

19

Mets

Evaluation

- Complete history
  - PMH, risk factors
  - Differential diagnosis
  - Nature of pain
- Physical examination
  - Primary
    - Breast, prostate, clubbing, lymph nodes, spleen
  - Neurological examination
- Investigations
  - Bloods / Urine

Mets

20

Mets

Evaluation

Mets

21

Mets

Imaging Tumours

Mets

22

Mets

NICE MSCC Guidelines

- November 2008 (updated 2023)
- Main Aim of NICE Guidelines:
- Barrie White (Nov 2008) – "This (NICE) guideline is published in recognition that patients with MSCC sometimes suffer delays and avoidable disability"
- Key Priorities:
  - Early Detection
  - Imaging
  - Treatment
  - Supportive Care and Rehabilitation
  - Patient Centred Care
  - Service Configuration and Urgency of Tx

Mets

23

Mets

Imaging

- Suspected MSCC with neurological signs and symptoms = urgent MRI of whole spine **within 24 hours**
- Suspected Spinal Mets (normal neurology) = MRI whole spine within a week of suspected diagnosis

Mets

24

NICE MSCC Guidelines

Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer: a randomised trial

Roy A Patchell, Phillip A Tibbs, William F Regine, Richard Payne, Stephen Saris, Richard J Kryscio, Mohammed Mohiuddin, Byron Young

- Surgery
- Steroids
- Radiotherapy
- Chemotherapy

25

Mets

Indications for Surgery

Mets

26

Mets

Surgical Candidate

Mets

27

Mets

Steroids

- Works by reducing oedema (cf trauma)
- 16mg Dexamethasone daily
- Load then 8mg bd
- Reduce dose over 5-7/7 post intervention
  - Neurology deteriorates – increase dose temporarily
- Monitor blood glucose
- Proton pump inhibitor (gastric cover)

28

Mets

Prognosis

Mets

- Median survival MSCC – 6 months
- Ambulatory patients with radiosensitive tumours
  - Best prognosis
  - Likely to remain mobile
- It is better to keep somebody walking than to try and make them walk again (i.e. do something before they become paralysed)

29

Mets

Complications - Surgery

- Up to 20% Infection
- Up to 5% Surgical Mortality
- Pre op radiotherapy 3x ↑ risk wound infection / breakdown
  - 32% vs 12%
- Radiotherapy then surgery
  - 50% ambulation post op
- Surgery then radiotherapy
  - 75-90% ambulation post op

Spine 1999 p1943
Spine 2001 p84
J Neurosurg 1985 p676

30

Mets

31

Definitions

- Stenosis:
  - "Narrowing of the spinal canal, nerve root canals or tunnels of the intervertebral foramina producing symptoms of claudication or radiculopathy" Arnoldi 1976
  - Central, lateral recess and foraminal types
    - Describes the area where the narrowing occurs

32

Definitions

- Spondylolisthesis:
  - "Spine slipping" - forward backward or lateral of one vertebra relative to an adjacent vertebra
  - Various types and classifications
    - Commonest in young is lytic L5/1
    - Commonest in elderly is degenerative L4/5
- Claudication:
  - Limping
  - A condition in which cramping pain in the leg is induced by exercise

33

Spinal Claudication

34

Symptoms

- Often asymptomatic at rest
- LBP with walking
- Early leg pain, paresthesia and numbness
- Increases with distance
- Sitting / crouching / leaning forwards decreases pain

35

Signs

- Vague in all forms
- Examination often normal:
  - Gait
    - Long tract signs
    - 10-15% concurrent cervical stenosis
  - Hips
    - OA often present
  - Distal pulses
    - Is it vascular claudication?

36

Signs

- Neurological Exam:
  - SLR usually N
  - Back usually non-tender +/- loss lordosis
  - Palpable bony step if SPL
  - Good flexion limited extension - symptoms - prompt relief by leaning forward
  - Stoop test – keep walking – leans
  - Possible neurological signs on exertion
  - Occ "hard" neurological signs
    - weakness, numbness, loss reflexes etc

37

- **Spinal Claudication**
- **Vascular Claudication**

38

Investigations

"And just exactly what is that expression intended to convey?"

- MRI – look at nerves
- Erect XR – look at slip
- +/- CT – bony anatomy
- +/- CT Myelogram
- +/- Duplex
- +/- NCS EMG

But remember - treat the man not the scan!

39

40

Natural Hx Stenosis

- 1/3 improve 1/3 same 1/3 worse
- 30-50% mild / mod stenosis favourable Hx

- SPORT TRIAL: at 8 years
  - 27% choosing non op and
  - 52% randomised to non op
  - **Had Op**
  - At 4 years surgery better than non op
  - At 8 years decline in benefit noted

41

Natural Hx Degen SPL

- No correlation clinical symptoms / slip progression
  - Slip progression 1/3
  - >80% disc height loss – slip unlikely to progress
- 3/4 no neuro deficits over 10 yrs – favourable Hx
- 4/5 with initial neurology do deteriorate
- SPORT TRIAL: at 4 years
  - 33% choosing non op and
  - 54% randomised to non op
  - **Had Op**
  - At 4 years surgery better than non op

42

Interventions

- Epidural Injection - ✓short term ?Long (not SPL)
- Corset - when on! (not SPL)
- Pharmacological - insuff evidence
- Physiotherapy - insuff evidence
- Manipulation - insuff evidence
- TENS / elec stim - insuff evidence
- Accu, traction - insuff evidence
- Surgery - ✓good evidence
  - op - SPL > stenosis

43

Operations

- Indications:
- Type of Operation:
  - Varies depending on pathology

44

Surgery – Stenosis / SPL

- Surgery
  - 2/3 have good medium term results
  - 25-40% not satisfied
  - 20% require further surgery
  - 10% complication

45

Pragmatic Approach

- No significant neurological problems / CES:
- Patient managing
  - Observe
  - Lifestyle modifications and exercise
- Not managing
  - Lifestyle modifications and exercise
  - Injection first (safe and low risk - ? predictive)
  - Operation

46

47

Summary

- Covered lots…
- Spinal mets and infections are serious
- Thou shalt not forget that…

48

49