Recognition & Treatment of Malignant Spinal Cord Compression Study Day

5th May 2016
Dr Bernie Foran
Consultant Clinical Oncologist & Honorary Senior Lecturer
Weston Park Hospital
Outline of Talk

• Clinical case
• Anatomy of the spinal cord
• Definition of malignant spinal cord compression (MSCC)
• Incidence
• Symptoms & signs
• Investigations
• Treatments
• Outcomes
• NICE guidance
Clinical Case

56 year old man with history of HTN & OA

Presents to GP with 1 month history of back pain unresponsive to paracetamol

Pain beginning to wake him at night
More pain with lying down
Shooting pains down right leg
Examination

Obs - normal (SHEW score 0)
CVS, Resp, GI, GU exams - normal

Back exam

- **Inspection:** normal
- **Palpation:** pain in L1 region
- **ROM:** normal
- Moderate pain in right leg with straight leg raise
Lumbar Spine x-ray

Age related degeneration

Working diagnosis
Sciatica
Back strain

Treatment recommended
NSAIDS
Few days of bed rest
4 weeks later

Pain does not resolve
Various forms of pain control tried & fail
Wakes up, difficulty supporting his weight
  – subjective leg muscle weakness
Wife calls 999
Taken to local A&E
In A&E

Objective leg weakness on physical exam
A very keen medical student performs a rectal exam and discovers a large nodular prostate
PSA: 45.0
MRI Spine.....
Anatomy of the spine

- Vertebral body
- Spinal nerve
- Pedicle
- Spinal cord
- Spinous process
Different spinal cord levels supply nerves for different regions of the body.
What is malignant spinal cord compression?

Occurs when cancer cells grow in/near to spine & press on the spinal cord & nerves

Results in swelling & reduction in the blood supply to the spinal cord & nerve roots

Symptoms are caused by the increasing pressure (compression) on the spinal cord & nerves
Method of spread

85% from vertebral body or pedicle

10% through intervertebral foramina (from paravertebral nodes or mass)

4% intramedullary spread

1% direct spread to epidural space (low)
<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoracic spine</td>
<td>60%</td>
</tr>
<tr>
<td>Lumbosacral spine</td>
<td>30%</td>
</tr>
<tr>
<td>Cervical spine</td>
<td>10%</td>
</tr>
</tbody>
</table>
What types of cancer cause it?

Most commonly seen in

- Breast
- Lung
- Prostate
- Myeloma
- Lymphoma

- 3-5% of patients with cancer overall
- Approx 200 cases per annum in North Trent
What are the signs & symptoms of MSCC?
### First Symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>95%</td>
</tr>
<tr>
<td>Weakness</td>
<td>5%</td>
</tr>
<tr>
<td>Ataxia</td>
<td>1%</td>
</tr>
<tr>
<td>Sensory loss</td>
<td>1%</td>
</tr>
</tbody>
</table>

**RED FLAGS…..**
First Red Flag: Pain

Usually first symptom
  – 80-90% of the time

Usually precedes other neurologic symptoms by 7 weeks
  – Increases in intensity

Severe local back pain

Aggravated by lying down
  – Distension of venous plexus

Back pain

May be mild to begin with
Lasts for more than 1 - 2 weeks

Pain may feel like a 'band' around the chest or abdomen (radicular)
– Can radiate over the lower back, into the buttocks or legs
Second Red Flag: Motor

**Weakness: 60-85%**
- Tends to be symmetrical
- Severity greatest with thoracic mets

**At or above conus medularis**
- Extensors of the upper extremities

**Above the thoracic spine**
- Weakness from corticospinal dysfunction
- Affects flexors in the lower extremities

**Patients may be hyper reflexic below the lesion and have extensor plantars**

Third Red Flag: Sensory

Less common than motor findings

Still present in majority of cases

Ascending numbness and parathesias

Numbness or 'pins and needles' in toes & fingers or over the buttocks
  - Sensory level
  - Saddle anaesthesia

Feeling unsteady on feet, having difficulty with walking, or legs giving way
Fourth Red Flag: Bladder & Bowel Function

Loss is late finding

Problems passing urine
  – may include difficulty controlling bladder function
  – passing very little urine
  – passing none at all

Constipation or problems controlling bowels
Duration of symptoms before diagnosis

2-5 months median
It is an oncological emergency

Requires very prompt diagnosis & treatment to try and prevent catastrophic consequences of paralysis & incontinence
Investigations & information needed prior to Rx

1. MRI scan of the whole spine
   - Can get compression at multiple levels
2. Knowledge of cancer type & stage
3. Knowledge of patient fitness
4. Current neurological function
   - Have they lost power in their legs?
   - Can they walk?
   - Do they need a catheter?
5. Do they have pain?
Differential diagnosis

- Metastatic cancer
- Herniated disc
- Benign bony lesion
- Abscess
- Alcoholic neuropathy
- Primary tumour
- Osteoporosis
- Low potassium

Case report

3/11 cases confirmed MSCC
Treatment

Until spinal stability is confirmed patients should be managed on bed rest

BUT Wherever possible keep the patient moving
Treatment Objectives

• Pain control

• Avoidance of complications

• Preserve or improve neurological function
Treatment options include:

1. Steroids & gastric protection
2. Analgesia
3. Surgery – decompression & stabilisation of the spine
4. Radiotherapy
5. Chemotherapy e.g. lymphoma
6. Hormonal manipulation e.g. prostate Ca
WPH Reducing regimen for Spinal Cord Compression

<table>
<thead>
<tr>
<th>Day</th>
<th>Dexamethasone daily dose</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>16mg</td>
<td>16mg OM or 8mg BD (8am &amp; 12noon)</td>
</tr>
<tr>
<td>4-6</td>
<td>8mg</td>
<td>8mg OM</td>
</tr>
<tr>
<td>7-9</td>
<td>4mg</td>
<td>4mg OM</td>
</tr>
<tr>
<td>10-12</td>
<td>2mg</td>
<td>2mg OM</td>
</tr>
<tr>
<td>13</td>
<td>Discontinue</td>
<td></td>
</tr>
</tbody>
</table>

- While the patient is on steroids commence PPI (e.g. Lansoprazole) for gastric protection.
- A slower reducing regimen may be required for patients who have received previous courses of steroids.
Anticoagulation

• Cancer is a hypercoaguable state
• High burden of tumour in metastatic disease
• Value in prophylaxis against venous thromboembolism
• If patient not mobile
  – s/c low molecular weight heparin +/- compression devices
Constipation

- Factors
  - Autonomic dysfunction
  - Limited mobility
  - Opiate analgesic

- Risk of perforation
  - Masked by corticosteroids

- Bowel regimen needed
Radiotherapy

Urgent access 24/7

Dose & schedule
- Depends on neurological deficit, PS, previous treatment & cancer features

Single V fractionated treatment
- SCORAD trial
Radiotherapy
Radiotherapy

Pre operatively – no
Post operatively – routinely
Definitive – all pts unsuitable for surgery

Unless
Total paraplegia (>24hrs) & no pain
Very poor prognosis
Chemotherapy

Can be successful in chemosensitive tumours

– Hodgkin’s lymphoma
– Non-Hodgkin’s lymphoma
– Neuroblastoma
– Germ cell
– Breast cancer (hormonal manipulation)
– Prostate cancer (hormonal manipulation)
Other considerations

1. Bed rest V mobilisation
   Rehabilitation
   Braces & collars
2. Psychological issues
3. Urinary catheter
4. Bowel function
5. Nutrition
6. Discharge issues
Prognosis

Median survival with MSCC is 6 months

Ambulatory patients with radiosensitive tumours have the best prognosis
   – Likely to remain mobile


MSCC is a poor prognostic indicator in cancer patients

Need better detection rates
Number of days survival following admission with spinal cord compression

Data from WPH audit
Number of days from admission with spinal cord compression to death
Range = 2 days to 319 days
Mean = 58.6 days
Metastatic spinal cord compression

Implementing NICE guidance

2008

NICE clinical guideline 75
Key priorities for implementation

The areas identified as key priorities for implementation are:

– Service configuration & urgency of treatment
– Early detection
– Imaging
– Treatment of spinal metastases & MSCC
– Supportive care & rehabilitation
Early detection

– Inform patients with cancer who are at risk of MSCC
  • information about the symptoms of MSCC
  • what to do & who to contact if symptoms develop

– Discuss with the **MSCC coordinator** immediately
  patients with cancer who have symptoms of spinal metastases & neurological symptoms or signs suggestive of MSCC
  • view as an emergency.

– Discuss with the **MSCC coordinator** within 24 hours
  patients with cancer who have symptoms suggestive of spinal metastases
Information for patients

Be bone aware

Useful information for patients with bone secondary cancer
Surgery

• RCT comparing surgery followed by RT vs. RT alone
• Improvement in surgery + RT
  – Days remained ambulatory (126 vs. 35)
  – Percent that regained ambulation after therapy (56% vs. 19%)
  – Days remained continent (142 vs. 12)
  – Less steroid dose, less narcotics
  – Trend to increase survival

Direct decompressive surgery

- Relieves compression
- Removes tumour
- Stabilises spine

But many patients not suitable
  - Unfit
  - Tumour factors
Indications for Surgery

- Unknown primary tumour
- Relapse post RT
- Progression while on RT
- Intractable pain
- Instability of spine
- Patients with a single level of cord compression who have not been totally paraplegic for longer than 48 hours
- Prognosis >4 months
# Proforma for Metastatic Spinal Referrals

*Emergency Referral (phone call already made) / Referral for urgent opinion* Delete as appropriate

*Please complete as fully as possible and fax to: 0114 2266796*

## Patient details

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surname:</td>
<td></td>
</tr>
<tr>
<td>Forename:</td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
</tr>
<tr>
<td>D.O.B.:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Hospital:</td>
<td></td>
</tr>
<tr>
<td>Ward:</td>
<td></td>
</tr>
<tr>
<td>Direct dial number:</td>
<td></td>
</tr>
<tr>
<td>Consultant &amp;/or:</td>
<td></td>
</tr>
<tr>
<td>Contact number:</td>
<td></td>
</tr>
<tr>
<td>Date of admission:</td>
<td></td>
</tr>
<tr>
<td>Time of admission:</td>
<td></td>
</tr>
<tr>
<td>Date of referral:</td>
<td></td>
</tr>
<tr>
<td>Time of referral:</td>
<td></td>
</tr>
<tr>
<td>Telephone no:</td>
<td></td>
</tr>
</tbody>
</table>

## Referrer details

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
</table>

## Current comorbidities

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>YES / NO / NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is patient’s Oncologist aware of referral?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Is the patient anticoagulated?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Patient understanding</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Has diagnosis been discussed with the patient?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Does the patient wish to consider surgery?</td>
<td></td>
</tr>
</tbody>
</table>

## Tumour presentation

<table>
<thead>
<tr>
<th>Description</th>
<th>YES / NO / NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known primary</td>
<td></td>
</tr>
<tr>
<td>Unknown primary (investigations complete)</td>
<td></td>
</tr>
<tr>
<td>Unknown primary (Investigations incomplete)</td>
<td></td>
</tr>
<tr>
<td>Prognosis &gt;3 months</td>
<td></td>
</tr>
</tbody>
</table>

## Available Imaging

<table>
<thead>
<tr>
<th>Imaging Method</th>
<th>YES / NO / NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole spine MRI</td>
<td></td>
</tr>
<tr>
<td>(Date and time of MRI):</td>
<td></td>
</tr>
<tr>
<td>CT chest / abdomen / pelvis</td>
<td></td>
</tr>
<tr>
<td>Bone scan</td>
<td></td>
</tr>
</tbody>
</table>

**PLEASE ENSURE ALL IMAGING IS UPLOADED TO NGH PACS SYSTEM**

## Performance status (prior to onset of spinal symptoms)

<table>
<thead>
<tr>
<th>Status</th>
<th>(Tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Fully active</td>
<td></td>
</tr>
<tr>
<td>1 Fully ambulant. Restricted with strenuous activities only</td>
<td></td>
</tr>
<tr>
<td>2 Fully self caring.</td>
<td></td>
</tr>
<tr>
<td>3 Limited with self care. Resting for &gt;50% of waking hours</td>
<td></td>
</tr>
<tr>
<td>4 Completely disabled. Totally confined to bed or chair</td>
<td></td>
</tr>
</tbody>
</table>

**PLEASE COMPLETE THE NEXT PAGE**
<table>
<thead>
<tr>
<th>Patient name:</th>
<th>D.O.B.:</th>
</tr>
</thead>
</table>

### Primary Tumour Site

<table>
<thead>
<tr>
<th>Breast</th>
<th>Prostate</th>
<th>Renal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>Myeloma</td>
<td>Lymphoma</td>
</tr>
<tr>
<td>Thyroid</td>
<td>GIT</td>
<td>Urothelial</td>
</tr>
<tr>
<td>Uterine/Cx</td>
<td>Melanoma</td>
<td></td>
</tr>
<tr>
<td>Other (specify):</td>
<td>Date of diagnosis:</td>
<td></td>
</tr>
</tbody>
</table>

### Pain Symptoms

<table>
<thead>
<tr>
<th>Pain</th>
<th>Y / N</th>
<th>since (date):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level / location:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Non-specific</td>
<td>Mechanical</td>
</tr>
<tr>
<td>Pattern</td>
<td>Nocturnal</td>
<td>Diurnal</td>
</tr>
<tr>
<td>Analgesia</td>
<td>Minor</td>
<td>Major</td>
</tr>
<tr>
<td>VAS Score:</td>
<td>__ / 10</td>
<td></td>
</tr>
</tbody>
</table>

### Primary Treatment:

<table>
<thead>
<tr>
<th>Adjuvant Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) RXT to spinal met</td>
</tr>
<tr>
<td>2)</td>
</tr>
<tr>
<td>3)</td>
</tr>
</tbody>
</table>

### Current Walking Status

<table>
<thead>
<tr>
<th>Neurological Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe:</td>
</tr>
</tbody>
</table>

### Neurological Symptoms

<table>
<thead>
<tr>
<th>Normal</th>
<th>Unsteady</th>
<th>Non-ambulant</th>
</tr>
</thead>
<tbody>
<tr>
<td>since (date):</td>
<td>since (date):</td>
<td></td>
</tr>
</tbody>
</table>

### Metastases

<table>
<thead>
<tr>
<th>Extra Spinal Bone Mets</th>
<th>Y / N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visceral Mets</td>
<td>Y / N</td>
</tr>
<tr>
<td>Liver</td>
<td>Lung</td>
</tr>
<tr>
<td>Brain</td>
<td>Adrenal</td>
</tr>
<tr>
<td>Lymph nodes</td>
<td>Other</td>
</tr>
</tbody>
</table>

### Other Relevant Information:

<table>
<thead>
<tr>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary incontinence</td>
</tr>
<tr>
<td>Fecal incontinence</td>
</tr>
<tr>
<td>Anal tone</td>
</tr>
<tr>
<td>Perineal sensation</td>
</tr>
<tr>
<td>Catheter tug</td>
</tr>
</tbody>
</table>

### Sensation

<table>
<thead>
<tr>
<th>Normal</th>
<th>Reduced</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most distal dermatome with normal sensation:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Power

| Most distal myotome with normal power | |
| MRC grade of weakest muscle(s) | |

### Details of Clinician to be Responsible for Ongoing Care of the Patient Following Surgery

| Name: | Contact number: | |