Malignant Spinal Cord Compression

An Introduction to Acute Oncology
Study Day
1st October 2014

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Consultant Clinical Oncologist & Honorary Senior Lecturer
Weston Park Hospital
Outline of Talk

- Clinical case
- The 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

• Observations - normal range
• CVS, Resp, GI, GU exams - normal
• Back exam
  – Inspection: normal
  – Palpation: some pain in L1 region
  – ROM: normal
  – Some pain in right leg with straight leg raising
Lumbar Spine x-ray

Age related degeneration

Working diagnosis
Sciatica V 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 does a rectal exam and discovers a large nodular prostate
- PSA: 45.0
- MRI Spine.....
Anatomy of the spine
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 and press on the spinal cord & nerves
- Results in swelling & reduction in the blood supply to the spinal cord & nerve roots
- The 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%(Low) Direct spread to epidural space
<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
- Lymphoma
- Myeloma

- 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>
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<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
  – or passing none at all

• Constipation or problems controlling bowels

• Autonomic neuropathy presents usually as urinary retention
  – Rarely sole finding
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?**
MRI of spinal cord compression in a woman with past history of breast cancer
Differential diagnosis

- Metastatic cancer
- Herniated disc
- Benign bony lesion
- Abscess
- Alcoholic neuropathy
- Primary tumour
- Osteoporosis
- Low potassium
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
- Possible value in prophylaxis against venous thromboembolism
- If patient not mobile
  - subcutaneous low molecular weight heparin +/- compression devices
Constipation

• Factors
  – Autonomic dysfunction
  – Limited mobility
  – Opiate analgesic

• Risk of perforation
  – Masked by corticosteroids

• Bowel regimen needed
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
Radiotherapy

• Urgent access 24/7
• Dose & schedule
  – Depending on neurological deficit, PS, previous treatment and cancer features
• Single V fractionated treatment
  – SCORAD trial
Radiotherapy

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

  – Unless
    - Total paraplegia (>24hrs)
    - 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
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
Be bone aware
Useful information for patients with bone secondary cancer
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

<table>
<thead>
<tr>
<th>Patient details</th>
<th>Referrer details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surname:</td>
<td>Hospital:</td>
</tr>
<tr>
<td>Forename:</td>
<td>Ward:</td>
</tr>
<tr>
<td>Gender:</td>
<td>Direct dial number:</td>
</tr>
<tr>
<td>D.O.B.:</td>
<td>Consultant i/c:</td>
</tr>
<tr>
<td>Address:</td>
<td>Contact number:</td>
</tr>
<tr>
<td></td>
<td>Date of admission:</td>
</tr>
<tr>
<td></td>
<td>Time of admission:</td>
</tr>
<tr>
<td></td>
<td>Date of referral:</td>
</tr>
<tr>
<td>Telephone no:</td>
<td>Time of referral:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current co-morbidities</th>
<th>Is patient’s Oncologist aware of referral?</th>
<th>Y / N / NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Is the patient anticoagulated?</td>
<td>Y / N</td>
</tr>
<tr>
<td>2)</td>
<td>Patient understanding</td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td>Has diagnosis been discussed with the patient?</td>
<td>Y / N</td>
</tr>
<tr>
<td>4)</td>
<td>Does the patient wish to consider surgery?</td>
<td>Y / N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tumour presentation</th>
<th>Available Imaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known primary</td>
<td>Whole spine MRI</td>
</tr>
<tr>
<td>Unknown primary</td>
<td>(Date and time of MRI):</td>
</tr>
<tr>
<td></td>
<td>CT chest / abdo / pelvis</td>
</tr>
<tr>
<td>Prognosis &gt;3 months</td>
<td>Bone scan</td>
</tr>
</tbody>
</table>

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

PLEASE ENSURE ALL IMAGING IS UPLOADED TO NGH PACS SYSTEM

PLEASE COMPLETE THE NEXT PAGE
<table>
<thead>
<tr>
<th>Primary tumour site</th>
<th>Pain Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast Prostate Renal</td>
<td>Pain ( Y/N ) since (date):</td>
</tr>
<tr>
<td>Lung Myeloma Lymphoma</td>
<td>Level / location:</td>
</tr>
<tr>
<td>Thyroid GIT Urothelial</td>
<td>Type Non-specific Mechanical Neuralgic</td>
</tr>
<tr>
<td>Uterine/Cx Melanoma</td>
<td>Pattern Nocturnal Diurnal Constant</td>
</tr>
<tr>
<td>Other (specify):</td>
<td>Analgesia Minor Major</td>
</tr>
<tr>
<td>Date of diagnosis:</td>
<td>VAS Score: __ / 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary treatment:</th>
<th>Neurological symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Describe:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjuvant treatment</th>
<th>Current walking status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) RXT to spinal met ( Y/N )</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>Normal</td>
</tr>
<tr>
<td>3)</td>
<td>Unsteady since (date):</td>
</tr>
<tr>
<td></td>
<td>Non-ambulant since (date):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metastases</th>
<th>Continence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra spinal bone mets ( Y/N )</td>
<td></td>
</tr>
<tr>
<td>Visceral mets ( Y/N )</td>
<td>Urinary incontinence ( Y/N ) since (date):</td>
</tr>
<tr>
<td>Liver Lung</td>
<td>Faecal incontinence ( Y/N ) since (date):</td>
</tr>
<tr>
<td>Brain Adrenal</td>
<td>Anal tone Normal Reduced Absent</td>
</tr>
<tr>
<td>Lymph nodes Other</td>
<td>Perineal sensation Normal Reduced Absent</td>
</tr>
<tr>
<td></td>
<td>Catheter tug Felt Not felt N/A</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Most distal myotome with normal power</td>
</tr>
<tr>
<td></td>
<td>MRC grade of weakest muscle(s)</td>
</tr>
</tbody>
</table>

Details of clinician to be responsible for ongoing care of the patient following surgery

Name:  
Contact number: