Management of Brain Metastases

Jeanette Draffan
Macmillan Lung CNS
North Tees & Hartlepool NHS Trust
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Brain metastases

A common consequence of cancer progression and are the most common intracranial tumour in adults, occurring in roughly 20-40% of patients (Linskey et al, 2010)

Should always be confirmed with CT or MRI

**Incidence**

- Lung
- Breast
- Kidney
- Melanoma
- Colorectal
Lung Cancer and Brain Metastases

Brain metastases occur frequently in patients with lung cancer, especially SCLC, and have a profound effect on both quality of life and survival (NICE 2011).

It could also be said that the incidence of brain metastases is increasing due to improved survival and local control of thoracic disease.
Common Symptoms

Oedema around a metastases causes a secondary insult to the surrounding healthy brain, which may worsen cognitive function and/or motor and sensory deficits. If severe, it compromises cerebral perfusion and results in cerebral infarction.

- Vertigo
- New onset headaches
- Cognitive, personality & behavioural changes
- Nausea & Vomiting
- Memory loss

- Increased Intracranial pressure
- Parasthesia
- Visual changes
- Bells Palsy
- Ataxia
- Seizures
Prognosis

Often poor

Several large studies of whole brain radiotherapy (WBRT) identified clear prognostic groups:

• Performance Status
• Control or absence of extracranial disease
• Age
• Solitary or multiple metastases

Median survival varies from 2 – 12 months
Patient care

Diagnosis of Brain Metastases can be distressing for both the patient and family.

Urgent management is required including:

• Full clinical assessment including symptoms & PS
• Radiological assessment of Brain and Chest
• Commencement of steroids +/- anti-epileptics if seizures occur
• Discussion at Lung MDT re best treatment
• Possible discussion at Neurosurgical MDT
• Driving
• LCNS involvement
Management of brain metastases in lung cancer

• About a third of patients presenting with Brain metastases have a solitary lesion

• In patients with NSCLC and a good performance status, prolonged survival has been reported following Stereotactic Radiotherapy SRT or resection (Metastatectomy)

• Availability of specialist Oncology units providing SRT/SRS and Neurosurgical units.
Immediate Treatment

Steroids are often used immediately to reduce symptoms when patients are diagnosed with brain metastases.

They control peri-tumoral oedema, often providing symptomatic relief within hours.
Dexamethasone:

Variations in practice of the following:

• Dose ?
• Frequency ?
• Duration ?
• Patient information
• On going management
Edinburgh Cancer Centre Policy for Steroid Use in Patients with Symptomatic Brain Metastases

Histologically confirmed solid cancer outside CNS + radiological diagnosis of single or multiple CNS metastases

Symptoms related to oedema and mass effect. Start patients with seizures on an anti-convulsant e.g. carbamazepine or levetiracetam

- None
  - No requirement for steroids

- Mild
  - Dexamethasone 4 mg/day

- Moderate with evidence of midline shift >5mm
  - Dexamethasone 8 mg/day

- Severe with evidence of coning on imaging
  - Admit for iv dexamethasone/mannitol if indicated

Reduce dexamethasone dose gradually to zero (see Table 1)

- Dexamethasone 16 mg/day

Deterioration in neurological function at any time

Increase dexamethasone dose temporarily then re-start dose reduction

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Table 2 - Good Prescribing Practice for Corticosteroids

1. Document indication for the corticosteroid on the patient's card and in notes
2. Indicate length of steroid course required on card and in notes
3. Consider prophylaxis with a PPI with high doses corticosteroids. Ensure this is stopped 7 days after steroids if no ongoing GI symptoms.
4. Ensure appropriate patient information regarding corticosteroids and dose reduction regimen on discharge. Counsel if necessary.
5. Monitor all patients on high dose steroids for:
   - Diabetes (daily RM or random 2G)
   - Dyspepsia/epigastric pain
   - Mental/near delirium

Table 1

<table>
<thead>
<tr>
<th>Day</th>
<th>Mild symptoms</th>
<th>Moderate symptoms</th>
<th>Severe symptoms</th>
</tr>
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<tbody>
<tr>
<td>1-7</td>
<td>4mg</td>
<td>8mg</td>
<td>16mg</td>
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<tr>
<td>8-12</td>
<td>3mg</td>
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<td>13-17</td>
<td>2mg</td>
<td>4mg</td>
<td>8mg</td>
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<tr>
<td>18-22</td>
<td>Stop*</td>
<td>2mg</td>
<td>4mg</td>
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<tr>
<td>23-27</td>
<td>Stop*</td>
<td>1mg*</td>
<td>2mg</td>
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<tr>
<td>28-35</td>
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<td>1mg*</td>
</tr>
<tr>
<td>36+</td>
<td>Stop*</td>
<td></td>
<td>Stop*</td>
</tr>
</tbody>
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*some patients, especially those on steroids >21 days, will need 1.0mg for 7 days, then 0.5mg then 500mcg (0.5mg) and then stop. If extreme fatigue on stopping from 500mcg, then consider 2mg prednisolone then 1mg prednisolone.
Edinburgh Cancer Centre Policy for Steroid Use in Patients with Symptomatic Brain Metastases

Good Prescribing Practice for Corticosteroids

1. Document indication for the steroid on the patient’s kardex and in notes.
2. Indicate length of steroid course required on kardex and in notes.
3. Consider prophylaxis with a PPI with high doses steroids. Ensure this is stopped 7 days after steroids if no ongoing GI symptoms.
4. Ensure appropriate patient information regarding steroids and dose reduction regimen on discharge. Counsel if necessary.
5. Monitor all patients on high dose steroids for:
   • Diabetes (daily BM or random Blood Glucose) - 19% risk
   • Dyspepsia/ epigastric pain – GI Bleed - less than 1% risk
   • Mania/hypomania/psychosis – 5% risk

(>3 wk increases risk)
### Dosing of Dexamethasone

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Whole Brain Radiotherapy (WBRT)

Giving whole brain radiotherapy to patients whose lung cancer has spread to their brain provides no additional clinical benefit over steroids and best supportive care. These results are from the QUARTZ Trial

‘Dexamethasone and supportive care with or without WBRT in treating patients with NSCLC with brain metastases unsuitable for resection or stereotactic radiotherapy (QUARTZ)’

Mulvenna, P et al.
(Published online : Sept 4, 2016 . www.thelancet.com)
Stereotactic Radiosurgery (SRS)
Stereotactic Radiotherapy (SRT)

Stereotactic radiosurgery (SRS) or stereotactic radiotherapy (SRT) destroys abnormal tissues in the brain by the administration of a strong and highly focused dose of radiation.

What’s the difference?
SRS is used to mean treatment given as a single dose (Gamma Knife)
SRT as a hypofractionated treatment of not more than 5 fractions using a Linear Accelerator (LINAC)
Clinical Commissioning Policy: Stereotactic Radiosurgery / Radiotherapy for Cerebral Metastases (2013)

- Referral must be made to SRT/SRS MDT
- Where there is no local SRT/SRS services referrals must be made to the Neuro-science MDT
- All patients being considered for SRS /SRT must be discussed by the specialist MDT at the stereotactic treatment centre and must have both specialist neurosurgery and specialist oncology input
- PS – 0-1
- Extracranial cancer must be absent or controlled
- The MDT has confirmed that the patient’s life expectancy from extracranial disease is expected to be greater than 6 months
Metastatectomy

- The prognosis following a Metastatectomy depends on the primary cancer site
  - Only 1 lesion is identified
  - No extracranial or limited thoracic disease (stage 1 thoracic)
  - PS 0-1
  - Age
  - Co–morbidities
  - Referral to Neurosurgical MDT

- Follow up treatment???
Anti-cancer drugs

Given to patients who show progression of their lung cancer including solitary or multiple brain metastases

• chemotherapy

• targeted therapy

• hormonal therapy
Bibliography


Edinburgh Cancer Centre Policy for steroid use in patients with symptomatic brain metastases. (Written by Simon Kerrigan and Jenny English March 2010)
Thank you