Leeds Cancer Centre

Oncological emergencies

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Oncological emergencies

- Malignant spinal cord/cauda equina compression
- Neutropenic sepsis
- Hypercalcaemia of malignancy
- Superior vena cava obstruction
- Tumour lysis syndrome

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Single best answer question

- A 75 year old gentleman with a past medical history of hypertension was admitted to MAU with difficulty walking and low back pain. He was catheterised and analgesia was administered. On examination he had reduced power in both lower limbs. What is the next most appropriate step?
- a) Referral to Urology clinic for trial without catheter
- b) Urgent x-rays of whole spine
- c) Urgent MRI of lumbosacral spine
- d) Urgent MRI of whole spine
- e) Administer dexamethasone and arrange urgent CT of whole spine

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Malignant spinal cord/cauda equina compression

- Red flags
  - Back pain
  - PMH of cancer
  - Neurological symptoms
  - Autonomic symptoms

- Clinical signs
  - Upper versus lower motor neurone weakness
  - Sensory level
  - Urinary retention/incontinence
  - (Reduction in anal tone)

Acute spinal cord compression.
Ropper *et al*, 2017, *NEJM*

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Malignant spinal cord/cauda equina compression

- Common causes
  - Prostate cancer
  - Lung cancer
  - Breast cancer
  - Myeloma
  - Renal cancer
  - Non-Hodgkin lymphoma
- Thoracic (60%), lumbar (25%) and cervical spine (15%)
  - Multiple levels of metastases common

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Malignant spinal cord/cauda equina compression

- Key investigations
  - MRI **whole** spine (CT spine if MRI contraindicated)
  - For cancer of unknown primary/patient potentially for surgical decompression obtain urgent CT chest, abdomen and pelvis
- Steroids
  - Dexamethasone 16mg od (or 8mg bd) plus proton pump inhibitor initiated once clinical suspicion of MSCC/CE compression
  - Usually continued for 4 days then reduce by 4mg every 4 days. Once 4mg od reached, reduce to 2mg od for 4 days then stop
  - Try to avoid steroids prior to biopsy if potential new diagnosis of lymphoma
- Neck hard collar for cervical spine vertebral fracture

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Malignant spinal cord/cauda equina compression

- Best outcomes if gradual onset of symptoms and some neurological function retained prior to treatment
- Ambulatory rate better following surgical decompression than radiotherapy (Patchell *et al*, 2005, *The Lancet*)
- Patients with established paraplegia rarely regain function
- Survival often less than 6 months

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Surgical decompression

- Patient factors
  - Younger/fitter patients

- Disease factors
  - Solitary/limited sites of compression and spinal metastases
  - Limited extra spinal metastatic disease
  - Further treatment options for cancer
  - Good prognosis (greater than 6 months)
  - Neurological deficits present for <48 hours
  - Compression caused by bony fragments/collapsed vertebra

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Radiotherapy

- Majority of patients receive radiotherapy rather than surgery
- Usually palliative intent radiotherapy given as a single treatment (8 Gy single fraction)
- Day visit to Leeds Cancer Centre
- Usually well tolerated
  - Common side effects nausea, diarrhoea, odynophagia, urinary frequency, skin erythema
  - May improve back pain even in setting of paraplegia

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Single best answer question

- A 48 year old lady presented with lower back pain of several weeks duration and recent onset of bilateral leg weakness. She was treated 7 years previously for localised breast cancer with surgery, radiotherapy and tamoxifen. An MRI scan and CT chest, abdomen and pelvis showed malignant spinal cord compression with vertebral collapse at T5 with small volume bony metastatic disease elsewhere in the spine. What is the most appropriate next step?
- a) Commence dexamethasone/PPI and refer for urgent radiotherapy
- b) Commence dexamethasone/PPI and refer for urgent surgical decompression
- c) Commence dexamethasone/PPI and arrange biopsy from bone metastases to confirm if this is recurrent breast cancer or a new primary
- d) Hold off dexamethasone in case this is a new diagnosis of lymphoma and arrange biopsy from bone
- e) Commence dexamethasone/PPI and refer for urgent vertebroplasty

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Single best answer question

- A 68 year old gentleman with metastatic prostate cancer was admitted with a fever of 38.5C but otherwise felt well and other observations were unremarkable. He had received his first cycle of Docetaxel chemotherapy 10 days previously. What is the most appropriate next step?
- a) Urgent blood cultures and administration of intravenous piperacillin/tazobactam
- b) Urgent blood cultures and full blood count
- c) Take blood cultures and administer oral co-amoxiclav, given that the patient feels well and observations are stable
- d) Urgent blood cultures and administration of intravenous cefotaxime
- e) Careful clinical assessment for source of potential infection

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Neutropenic sepsis

- Fever >38 C and neutrophil count <1.0 x 10^9/L
  - May not have fever/present 'generally unwell'

- Important information
  - Type of chemotherapy received and date of last treatment
  - Any indwelling central venous catheter
  - Previous episodes of sepsis
  - Recent antibiotics
  - Previous MRSA/*Clostridium difficile* infection

Management of sepsis in neutropenic cancer patients. Kochanek *et al*, 2018. *Ann Hematol*

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Neutropenic sepsis

- Risk factors
  - Neutrophil count <0.5 x 10^9/L
  - Duration of neutropenia >7 days
  - Older age
  - Comorbidities
  - Hospital admission
  - High burden of metastatic disease
  - Indwelling central venous catheter
- Development of septic shock
  - Pneumonia
  - Elevated procalcitonin and lactate
  - Reduced bicarbonate
  - Coagulopathy
  - Low albumin
  - MASCC score <21

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Neutropenic sepsis

- Key management
  - Intravenous broad spectrum antibiotics (piperacillin/tazobactam; meropenem)
    - Consider gentamicin for patients with septic shock or acute leukaemia/stem cell transplant
  - Intravenous fluid resuscitation/other supportive measures as per ABCDE assessment
  - (Paired) blood cultures, ideally prior to antibiotics
  - ‘Golden hour’/’Door to needle time’
  - Source control

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Neutropenic sepsis

- Additional therapies
  - No evidence that neutropenic sepsis should be managed differently to other patients with sepsis in terms of
    - Intravenous fluids
    - Inotropic medication
    - Thromboprophylaxis
    - Glucose control
    - Nutrition
    - Renal replacement therapy
    - Ventilatory support
  - No strong evidence to support use of G-CSF

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Neutropenic sepsis

- Persistent fever/symptoms after 48 hours
  - Careful investigation for deep seated source of infection
  - May require broadening of antimicrobial cover for resistant gram positives/negatives, anaerobes and fungi

- Oral switch for ‘low risk patients’ at 24 hours
  - MASCC score >21
  - Age <60, mild symptoms, no COPD, solid tumour, adequately hydrated

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Single best answer question

- A 28 year old lady was receiving chemotherapy for Hodgkin lymphoma. She had a Hickman line in situ. She was admitted after the first cycle of treatment with fevers and rigors 1 hour after her Hickman line was flushed by the district nurses. Despite initial management with intravenous piperacillin/tazobactam, she deteriorated with BP 90/60 mmHg, HR 130 and RR 24. What is the most appropriate management plan?
- a) Switch antibiotics to meropenem
- b) Take paired cultures from Hickman line and peripheral vein and continue current treatment
- c) Arrange urgent Hickman line removal
- d) Add gentamicin to piperacillin/tazobactam
- e) Administer line lock antibiotics within Hickman line

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Hypercalcaemia of malignancy

- Corrected calcium >2.6 mmol/L
  - Usually symptomatic >3 mmol/L
  - Severe hypercalcaemia >3.5 mmol/L

- Presentation
  - Confusion, drowsiness
  - Nausea, vomiting, abdominal pain, constipation, anorexia
  - Polyuria, polydipsia, dehydration, renal failure
  - Fatigue, bone pain

Hypercalcaemia of malignancy. Feldenzer *et al*, 2018. *J Adv Pract Oncol*

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Hypercalcaemia of malignancy

- Causes
  - Lytic bone metastases
  - PTH related peptide producing tumours (squamous cell carcinomas of lung)
  - Hyperparathyroidism
  - Medications (vitamin D, calcium supplements, bendroflumethiazide)

- Common cancers causing lytic bone metastases
  - Lung cancer
  - Breast cancer
  - Myeloma
  - Renal cell cancer

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Hypercalcaemia of malignancy

- Key management
  - Rehydration
  - Traditional advice was for 3L NaCl in the first 24 hours
  - Risk of fluid overload in elderly patients with impaired cardiac/renal function
  - Consider starting with 0.9% NaCl at 250 ml/hour and titrate by urine output
  - Check PTH and vitamin D levels prior to administering bisphosphonate
  - Intravenous bisphosphonate following rehydration
    - Zoledronic acid (dosed as per CrCl)
    - Pamidronic acid (dosed as per CrCl)
    - Serum calcium levels may take several days to fall

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Hypercalcaemia of malignancy

- Other treatment
  - Consider denosumab if calcium refractory to bisphosphonate
  - Furosemide restricted to patients with fluid overload
  - Consider calcitonin only for severely symptomatic patients with calcium >4 mmol/L
  - Consider use of corticosteroids

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Single best answer question

- A 56 year old lady with metastatic breast cancer was treated with intravenous fluids and zoledronic acid for hypercalcaemia 3.5 mmol/L. 2 days later her calcium level remains 3.5 mmol/L. What is the most appropriate next step?
- a) Administer further dose of zoledronic acid
- b) Administer dose of denosumab
- c) Continue to monitor calcium levels
- d) Increase rate of intravenous fluid administration
- e) Discuss case with Endocrinology team

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Superior vena cava obstruction

- Presentation
  - Breathlessness, cough, chest pain
  - Arm, neck, facial swelling
  - Difficulty sleeping/lying flat
  - Stridor (laryngeal/bronchial oedema)
  - Dilated collateral veins, facial plethora, elevated JVP

- Causes
  - Lung cancer
  - Lymphoma
  - Mediastinal germ cell tumour
  - Thymoma
  - Thyroid cancer
  - Central venous catheter thrombosis

Superior vena cava stenting in the 21st century. Warner *et al*, 2012. *Postgrad Med J*

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Superior vena cava obstruction

- Key management
  - Sit patient up, supplementary oxygen as required
  - Steroids (dexamethasone 16mg daily plus PPI cover)
    - Unless new diagnosis of lymphoma suspected
  - Urgent CT thorax
  - SVC stenting
  - Highly chemosensitive tumours (avoid stent)
    - Small cell lung cancer
    - Lymphoma
    - Germ cell tumour
  - Non small cell lung cancer/other tumours
    - Radiotherapy

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Single best answer question

- A 66 year old lady was recently diagnosed with extensive stage small cell lung cancer. Before she commenced treatment, she was admitted with a short history of breathlessness, cough, arm and facial swelling. A CT scan demonstrated progressive mediastinal lymphadenopathy with superior vena cava obstruction. What is the most appropriate next step?
- a) Best supportive care in view of disease progression
- b) Urgent oncology review for consideration of radiotherapy
- c) Commence dexamethasone and arrange urgent outpatient oncology review
- d) Urgent oncology review for consideration of chemotherapy
- e) Arrange urgent SVC stenting

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Tumour lysis syndrome

- Arises due to release of intracellular contents following rapid malignant cell death
- Elevated uric acid, phosphate, potassium and reduced calcium
- More common with high burden of rapidly proliferating disease
  - Acute leukaemias
  - High grade non-Hodgkin lymphomas
  - Small cell lung cancer
  - Germ cell tumours
- Older age and renal impairment also increase risk of TLS

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Single best answer question

- A 25 year old gentleman was receiving his first cycle of chemotherapy with bleomycin, etoposide and cisplatin for a metastatic germ cell tumour. He deteriorated on the ward, becoming drowsy, less responsive and anuric. Blood tests showed creatinine 400, urea 25, potassium 6.5, calcium 1.80. What would the most appropriate treatment be?
- a) Ward level management, administer intravenous fluids and correct potassium and calcium
- b) Ward level management, administer intravenous fluids and correct potassium
- c) Administer rasburicase and intravenous fluids, correct potassium and make urgent referral to ITU team for consideration of renal replacement therapy
- d) Referral to palliative care team, commence end of life care
- e) Ward level management, administer allopurinol and intravenous fluids and correct potassium

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Questions?