ONCOLOGIC EMERGENCIES

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FIRST, LET’S TALK ABOUT BONE MARROW AND CELL LINES.

Nah, Let’s Not!!

THINGS YOU MAY BE CARING FOR (AT LEAST INITIALLY) IN THE OFFICE OR ED.

- Superior vena cava syndrome
- Tumor lysis syndrome
- Neutropenic fever
- Chemotherapy related nausea and vomiting
- CNS metastases
- Spine Mets.
- DVT prevention in malignancy
- Not asked to cover hematology so this will all be oncology related.
WHICH OF THE BELOW PATIENTS SHOULD NOT GET LMWH?

1. Creatinine clearance of <30ml/min
2. Age >75
3. Weight > 150kg
4. Patients with protein C deficiency

ANSWER: 1

• CrCl < 30mg/min
• Variable results in:
  • Obese > 150kg
  • Children
  • ICU patients
• Follow anti-factor Xa activity drawn 4 hours after dose given.

COMPLICATIONS OF MALIGNANCY AND IT’S TREATMENT

• Mr. McGillicuty, age 62, smokes... He presents with dyspnea, facial swelling and headache. He notes that he has had night sweats for a couple of months along with fevers, weight loss (so called “B” symptoms”).
• On questioning, he notes that the dyspnea has been worsening over weeks.
**“B” SYMPTOMS**

- Fever – Persistent temperature >38°C (>100.4°F)
- Weight loss – Unexplained loss of >10 percent of body weight over the past six months
- Sweats – The presence of drenching night sweats
- Prognostic: Why “B symptoms”? Staging is “A” or “B”.

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**EXAM SHOWS ELEVATED NECK VEINS, A RAPID HEART RATE AND LOW BLOOD PRESSURE. WHAT IS THE DIAGNOSIS? (HINT: THIS IS AN ONCOLOGY LECTURE)**

1. Isolated left heart failure
2. Slowly growing PE
3. Renal failure
4. Superior vena caval syndrome

Note venous distention

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**ANSWER: 4**

- Superior vena caval syndrome
- Why not:
  - Isolated left heart failure
  - Slowly growing PE
  - Renal failure
SUPERIOR VENA CAVA SYNDROME

- Obstruction of the Superior Vena Cava
- Generally from lung CA, lymphoma: 4% each
- Small cell carcinoma of lung: 20%
- Also
  - External compression
  - Thromboas

SVC SYNDROME

- Early findings
  - Periorbital edema
  - Facial swelling
- Progresses to
  - Neck vein distention
  - Frank facial edema
  - Cyanosis
  - Plethoric facies...
SVC SYNDROME

- Next
- Headache/papilledema
- Blurred vision
- MS changes
- Cerebral edema
- Death

Superior Vena Cava Syndrome

- Shortness of Breath/Dyspnea
- Swelling of Trunk and Arms
- Chest Pain, Cough, Hoarseness
RADIOGRAPH: PLEURAL EFFUSION, MEDIASTINAL WIDENING

84% have some changes

DIFFERENTIAL DX

• Nephrotic syndrome
• CHF
• Tamponade: Malignant pericardial effusion
• Hypovolemia
• Narrowed pulse pressure
• Pulsus paradoxus >10mm Hg
• JVD
• Diminished heart sounds
• Cardiomegaly on x-ray but no CHF
• Low voltage EKG

GENERALLY: TRY TO GET TISSUE BEFORE TREATMENT BUT...

• Emergent if:
  • Central airway obstruction,
  • Severe laryngeal edema,
  • Coma from cerebral edema (I might try to get them a bit before coma...).
OFFICE MANAGEMENT

- Elevate head (no good data)
- Glucocorticoids:
  - May be helpful in those with airway obstruction (no good data)
  - Steroid responsive tumors (e.g. lymphoma)
- Anticoagulation if thrombus related.
- Diuretics but do not dry out…may help.

DEFINITIVE CARE

- Chemo/radiation (effective Cochrane): up to 78% at two weeks.
- Stent: Best modality (Cochrane). Endovenous recanalization.
  - 95%-100% success rate (technically)
  - 90% report improvement of symptoms.

First problem solved!
SO….

- You send this patient to the oncologist for radiation and chemotherapy. After making a diagnosis of lymphoma and giving one round of chemo, she sends the patient back. The patient returns to the office after the first round of chemo….

HE IS HAVING AN AWFUL, NO GOOD, ROTTEN, HORRIBLE DAY.

• The patient complains of some mild back pain and marked decrease urine output. What urine there is looks cloudy.
WHAT DO YOU EXPECT TO SEE ON UA?

1. Renal tubular cells (e.g. acute tubular necrosis)
2. Urate crystals (e.g. urate nephropathy)
3. White cell casts (e.g. interstitial nephritis)
4. Red cell casts (e.g. glomerulonephritis)

ANSWER: 2 URATE NEPHROPATHY.

TUMOR LYSIS SYNDROME

- 1-5 days after chemotherapy
- Generally leukemia/lymphoma-6%
- Also solid tumors with effective chemo
- Oliguric or anuric
- May have flank pain if stone with obstruction.
WHICH OF THE FOLLOWING IS NOT A RISK FACTOR FOR URATE NEPHROPATHY?

1. Baseline hyperuricemia
2. Dehydration
3. Unresponsive tumor
4. Baseline renal dysfunction

ANSWER: 3

- Baseline hyperuricemia
- Dehydration
- Large tumor
- **Responsive** tumor
- Baseline renal dysfunction
METABOLIC FINDINGS

- Tissue breakdown
- Hyperurecemia
- Hyperkalemia
- Hyperphosphatemia-nephrotoxic
- Hypocalcemia

CLINICALLY SX RELATED TO UNDERLYING METABOLIC FINDINGS

- Rapid onset renal failure (urate nephropathy)
- Nausea, vomiting, diarrhea, anorexia
- Muscle cramps, weakness
- Lethargy, seizures
- CHF, Cardiac arrhythmias
- Sudden death

URINALYSIS MAY BE NORMAL OR HAVE URATE CRYSTALS

Normal because basically may have no significant urine output.
WHICH OF THE FOLLOWING IS NOT USED TO TREAT URATE NEPHROPATHY?

1. Saline
2. Hemodialysis
3. Allopurinol
4. Bicarb

ANSWER: 4. NO BICARB.

- Best treatment is prophylaxis
  - Allopurinol, Rasburicase,
  - Febuxostat (nah….) reduces uric acid but not creatinine, etc. Studies were strawman studies.
  - IV hydration before chemo:
    - DS ½ NS 2-3L/m² per day≠ guidelines (steroids will increase Na)
    - NS≠ just fine!!
• Make them pee.
  • Fluids (watch for CHF)
  • Furosemide with caution (only if urine established...)
• Alkalinize urine→ Nah…doesn’t work
• Drugs as above

• Drugs:
  • Allopurinol (pretreatment). or after
  • Rasburicase (Elitek) — A recombinant form of the enzyme urate oxidase, which oxidizes uric acid to allantoin
  • Make them pee artificially (dialysis)

UNDER YOUR EXCELLENT CARE
HIS NEPHROPATHY RESOLVES.

But…
He returns to the clinic complaining of fever (we are about 7 days out from his chemo).

On exam he looks mildly ill with vitals that are not too bad: 
38.7-105-16-110/70-96% RA

You really don’t find a source by hx and exam (no diarrhea, dysuria, cough, etc.)

You appropriately get labs along with a CXR, blood cultures, urine, urine culture

Your labs start to come back

- WBC = 0.5 (there are a few lonely blood cells working their hardest)
- Hb: 9, HCT 30, PLT 75,000

- You make a diagnosis of neutropenic fever.
WHAT IS NEUTROPENIA AND “FEVER” IN THIS SETTING?

- Fever: 38.3 (101 F) at any time
- 38.0 (100.4) over 1 hour.
- Neutropenia: absolute neutrophil
  - <1000-1500 cells
  - Severe neutropenia <500 cells
  - OR expected to drop to <500 cells within 48 hours (are they at their nadir based on their chemo regimen? Usually 12-14 days out)

EVALUATION: GOOD HISTORY AND PHYSICAL

- CBC (obviously)
- Renal function
- Liver function
- Lactate
- UA
- Stool studies if indicated
- Blood cultures including at least one from port/central line (20ml each)
- CT more sensitive than plain radiograph (thickened bowel wall, pneumonias)
DOES HE NEED TO BE HOSPITALIZED?

- Matter of some debate.
- Initial antibiotics:
  - Cefepime, meropenem, imipenem-cilastatin, or piperacillin-tazobactam.
  - If line and considering MRSA (catheter infection, skin source, pneumonia): add vancomycin. BUT not a routine agent.

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Endoscopy is safe

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Sending some neutropenic patients home is OK (but not standard of care!!)
When is it safe to stop antibiotics?

Traditionally ABX often continued until neutropenia resolved...

- 100 high risk episodes of neutropenic fever started empirically on antibiotics.
- Were able to stop antibiotics in responding patients and those with negative cultures.
- Were able to narrow spectrum of others.
- No adverse events.
- So treat as would other patients.

Third problem solved
• He returns notes increasing inability to void. But, surprisingly, it doesn’t seem so be uncomfortable to him. He also has some difficulty with ambulation. He is really in no more pain than usually. He always hurts.
• Exam: hyper-reflexia of the lower extremities. Weakness, especially of lower extremities.
• What are you thinking and how do you want to treat it?

CORD COMPRESSION

• 5-10% of all cancer patients have spine mets
• 20% of those with spine mets end up with cauda equina or other cord compression
• Treatment:
  • Dexamethasone-10mg-20mg IV
  • Surgery/radiation

CNS Edema--dexamethasone
Whole brain radiation does not improve survival (they just die from something else). Seems to worsen quality of life. Gamma knife may help. It's complicated.

**GAMMA KNIFE MAY IMPROVE SUR**

Gama knife and elec

**CASE**

- 62 year old male, history of “cancer” (I don’t know doc, they just said “cancer”). Actually, he is slurring his speech so it is more like “dunowdoc jisstcancer”.
PATIENT NOTES:

• Headache, slurred speech, blurred vision.
• He is also a bit short of breath.

YOU LOOK THROUGH THE CHART AND SEE THIS......

WHAT IS YOUR DIFFERENTIAL?.....

• Hypercalcemia
• Hyperviscosity syndrome
YOU WANT MORE INFORMATION....

MORE INFO....
- Punched out lesion

[Image of radiographic scan]

[Image of MRI scan of spine]
HYPERVISCOSITY SYNDROME

- From:
  - Waldenström's
  - Multiple myeloma
  - HCT > 60

PRESENTATION

- CNS and Neuro sx
  - Headache
  - Blurred vision
  - CVA
  - Mental status changes
  - Hearing loss
  - Cardiac: CHF
  - Heme: mucosal bleeding, easy bruising

DX

- For protein related:
  - Serum viscosity: Normal 1.6-1.9
  - Sx sx:
    - 2-4 (rare)
    - >5 more common
- For RBC related:
  - No good correlation between HCT and viscosity... Clinical dx.
HOW DO YOU WANT TO TREAT IT?

RX:

- Protein related:
- Plasma exchange
- HCT related:
  - Remove 500cc blood
  - Replace with 500cc fluid
  - Take up to 1500cc blood in 24 hours...

CASE: YEAH, IT’S THE SAME GUY...

- 62 year old male, history of “cancer” (I don’t know doc, they just said “cancer”).
PATIENT NOTES:

• This time:
  • Confusion, personality change
  • Blurred vision
  • Increased difficulty walking
  • Anorexia, non-specific abdominal discomfort
EXCEPT FOR BEING A CHIMERA, WHAT IS THE DX?

HYPERCALCEMIA

- Common: 20-30% of those with malignancy
- Breast, non-small cell lung CA
- Band keratopathy
  - Unusual
- PPT of calcium in subepithelial cornea
- Higher local pH because CO2 sublimes off
- Bones, stones, abdominal groans

CLINICALLY:

- GI: Anorexia, constipation, pancreatitis
- Renal: stones, inability to concentrate urine, diabetes insipidus, nephropathy
- Anxiety, depression, COBS
- Muscle weakness
- Gout, calcium pyrophosphate disease
THREE MECHANISMS

• Humeral
• Parathyroid like hormone
• Bone mets with osteolysis
• Osteoclast activating factor
• Multiple myeloma

TREATMENT

• Fluid: Lots, bolus
  • NS 200-300ml/h titrate to urine output of 100-150cc/h
  • Loop diuretic?? Falling out of favor
    • Furosamide 80mg-160mg q 2 hr BUT MUST BE WELL HYDRATED FIRST.
    • Electrolyte shifts: Na, K, Mg, etc.
  • Calcitonin IM Q 12h for 48h (tachyphylaxis)
  • Bisphosphonates : zolendroic acid IV

• Gallium nitrate: Likely most effective, lots of side effects
• Steroids
• Oral phosphate binders
• Dialysis
NAUSEA AND VOMITING

CHEMOTHERAPY INDUCED NAUSEA

• Acute emesis: within 6 hours of rx
• Delayed emesis: 24 hours out
• Anticipatory emesis!!
  • Prevent N and V from first use.

PREVENTION

• 5-HT3 receptor antagonists and ondansetron and palonosetron and others. Maximum ondansetron 16mg IV-QT prolongation.
• Dexamethasone: synergistic
• Neurokinin 1 inhibitors: aprepitant (CYP3A4) and others.
• Olanzapine: good add-on therapy.
CHEMOTHERAPY INDUCED NAUSEA/VOMITING

- Rule out neutropenic fever/infection
- Make sure all of the other stuff like calcium, etc. are fine.

TREATMENT REGIMENS

- Add new drugs to existing regimen!
- High dose metoclopramide + odansetron + dexamethasone
- Palonosetron → Long acting and more effective than odansetron
- Lorazepam
- Haloperidol or prochlorperazine

• Prochlorperazine, metoclopramide
• Lorazepam
FOR ANTICIPATORY NAUSEA AND VOMITING

- Cognitive behavioral therapy
- Benzodiazepines

- No good data for marijuana plus adverse effects (according to the book) including
  - Euphoria, somnolence, hallucinations: Some would call these a feature rather than a bug!

Probably tired of Oncology by Now…

REMEMBER…

- Adrenocortical insufficiency
- SIADH/Hyponatremia