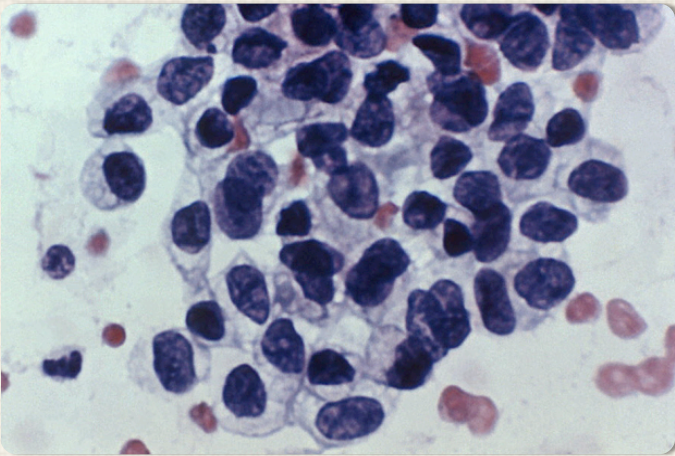


EMERGENCY MEDICINE CASES



EPISODE 33: ONCOLOGICAL EMERGENCIES
WITH DR. JOEL YAPHE AND DR. JOHN FOOTE

5 key presentations of cancer patients:

1. fever 2. shortness of breath
3. altered mental status 4. acute renal failure 5. back pain (see Episode 26)

FEVER: The majority of cancer patients with febrile neutropenia will have a bacterial infection. While the priority is to identifying and treat these infections, other complications from cancer (tumour burden and necrosis, drug and transfusion reactions, and PE) must be considered in the differential diagnosis.

Examine patients carefully, looking for subtle signs of mucositis, abscesses, skin breakdown, and line

infections. Many patients will not have an identifiable source of infection. Defer a digital rectal exam in neutropenic patients, because this may promote infection.

Investigations: Sepsis workup including 2 blood C&S, urine C&S, throat and abscess swabs as indicated, and culture all lines. IDSA guidelines do not recommend routine CXR in febrile neutropenic patients unless there are respiratory symptoms present.

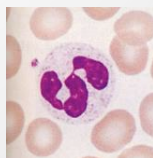
Do bloodwork early (i.e. at triage), as neutrophil levels can take significant lab time for manual cell counting. Begin treatment early, and give a steroid stress dose to any patient on chronic steroids.

IDSA guidelines (1) for cancer patients with febrile neutropenia include these key recommendations:

- Start antibiotics ASAP
- Wide spectrum coverage with pip-tazo, meropenem or imipenem
- Add vancomycin for patients with low BP, suspected line sepsis, mucositis, a history of MRSA, or recent antibiotic use
- Add an aminoglycoside in patients in septic shock or suspected/proven antibiotic resistance
- Add IV acyclovir if there are signs of a herpetic infection or encephalopathy, and consider anti-fungal coverage for patients with fever >4 days

IDSA Definition of Febrile Neutropenia

A patient who has a single oral temperature measured at >38.3 (or >38.0 for > 1 hour), with ANC <0.5, or ANC <1.0 with an expectation that counts will drop to <0.5. Risk of serious bacterial infection increases with degree and duration of the drop in neutrophils. The neutropenia typically occurs 3–14 days after chemo, and is accompanied by a weakened immune system. Thus febrile neutropenic patients who are not oncology patients seem to be less at risk for serious outcomes, as they have less weakened immune system.



Typhlitis - Appendicitis Mimic: When febrile, neutropenic cancer patients present with GI symptoms consider **necrotizing enterocolitis** (typhlitis), usually involving the ileocecal region. Neutropenia, loss of bowel integrity, and bacterial translocation leads to serious illness, which may mimic appendicitis, or present with generalized abdominal symptoms. **Investigations:** CT abdomen (rather than U/S)
Treat: IV antibiotics, an NG tube “gut rest,” a surgical & medical consult, admit.

Treating nausea and vomiting in cancer patients

Consider possible causes (gastritis, GI obstruction, medication reactions, metabolic/electrolyte disorders, etc.) and treat the underlying cause when possible. There are **two main classes of drugs** to choose from:

- 1) antiseritonergeric drugs (eg: ondansetron) work best on chemoreceptor trigger for nausea, NB: can cause QT prolongation
- 2) anti-dopaminergic medications (metoclopramide, prochlorperazine, olanzapine) work best when the nausea is secondary to opioids or slow GI transit time.

Be cautious with anti-histamine type anti-nausea drugs [eg: Dimenhydrinate (Gravol)], as they can cause significant anti-cholinergic side effects, esp. in the elderly.

Which febrile neutropenia patients are “low-risk” and could go home?

MASCC scoring index stratifies patients with mild symptoms, no hypotension or COPD, solid tumor types, no pre. fungal infection and <65yo as **low-risk patients** (2).

The American Society of Clinical Oncology also considered logistic factors to determine which patient can safely go home with outpatient management in their guidelines (3).

Our experts recommend outpatient management plans be discussed with the patient’s oncologist or oncology team for low risk patients in whom you are considering discharge.

Oral antibiotic regimens:

Amox-clav 875/125 bid plus a fluoroquinolone (i.e. cipro), with treatment for as long as neutropenia is expected to continue.

SHORTNESS OF BREATH

Shortness of breath may be due to lung tumour burden, SVC syndrome, malignant pericardial effusion, pulmonary embolism, or other complications of malignancy.

Do all cancer patients need a CT to rule out PE? No good evidence to answer this, but most cancer patients admitted for shortness of breath of unclear etiology will need PE ruled out by CT

What is SVC syndrome?

SVC obstruction (acutely or sub-acutely) either by solid tumour or SVC thrombus. Intravascular devices (pacemakers, PICC lines) are an increasingly prevalent cause of SVC syndrome.

Symptoms of SVC syndrome can be mild, such as complaints of facial swelling, arm swelling, dyspnea, cough, and facial redness. Mental status changes from raised ICP, or voice hoarseness from airway edema are rare, but are very ominous signs of severe SVC obstruction. SVC thrombi can embolize and cause PE.

Look for dilated superficial veins above the neck, which occur if the occlusion is subacute.



Pemberton’s sign for SVC syndrome is facial redness caused by elevating the arms.

Investigations: the test of choice for SVC syndrome is a CT chest with contrast, to look for SVC obstruction and collateral vessels.

Management: Sit the patient upright & provide oxygen. Steroids & diuretics may be considered, but are not likely to offer any major benefits. If the obstruction is severe, airway edema and altered LOC from cerebral edema can occur. These patients need urgent stenting and radiotherapy.

ALTERED MENTAL STATUS

The differential diagnosis for altered mental status in cancer patients includes CNS metastases, raised ICP, electrolyte disturbances such as hypercalcemia, medication side effects, and hyperviscosity syndrome. (*Don’t forget the usual, non-cancer causes of altered mental status!*)

Hypercalcemia: Up to 1/3 of patients with hypercalcemia will have a malignancy, and 1/3 of cancer patients will develop hypercalcemia.

Stones, Moans, Abdominal Moans, and Psychic Groans!

Symptoms of hypercalcemia include renal colic, bony pain, abdominal symptoms (anorexia, constipation, abdominal pain), and altered mental status.

The most common malignancies that present with hypercalcemia are multiple myeloma, lung, renal, and breast cancers. The hypercalcemia is due to a parathyroid-like hormone secreted by the tumours. Consider serum PTH to rule out primary hyperparathyroidism in first presentations of hypercalcemia.

ECG findings in hypercalcemia:

Usually the only finding is a shortened QTc (<350msec) Other causes of shortened QTc (digoxin toxicity, congenital short QT syndrome*) are few and rare.

**Congenital short QT syndrome is a rare condition that presents with syncope, palpitations or sudden death in otherwise healthy young people*

At what calcium levels should symptoms appear? Calcium above 3.0 mmol/L can cause symptoms, and levels above 3.5 mmol/L cause severe symptoms. Use corrected calcium levels for malnourished patients with low albumen, and multiple myeloma patients with high serum protein levels.

Treatment: Give boluses of IV NS to correct hypovolemia and promote urine output. Add a bisphosphonate (i.e. pamidronate or zoledronate), and consider calcitonin in severe cases. Patients with severe renal impairment or CHF may need hemodialysis. Furosemide is not recommended unless the patient has CHF/fluid overload.

Hyperviscosity syndrome:

Elevated WBCs or severe hyperproteinemia can cause high serum viscosity and micro-circulatory problems in patients with Waldenstrom's macroglobulinemia, multiple myeloma or acute leukemia. Classic Triad is mucosal bleeding (epistaxis, vaginal/rectal bleeding, hematuria), visual disturbances, and altered LOC.

A clue to the diagnosis is that often lab sample processing is delayed due to high sample viscosity, and Rouleau may be seen in blood smears.

Raised intracranial pressure in cancer patients can be caused by brain mets, hydrocephalus, bleeding, and brain abscess. A non-contrast CT should show most symptomatic mass lesions, however contrast enhancement may be needed to identify metastases.

Treating impending brain herniation: Intubate & hyperventilate to PCO₂ of 30 temporarily.

Avoid hypotension, and consider giving hypertonic 3% saline or mannitol. Give Dexamethasone IV for metastases with edema. One meta-analysis suggested hypertonic saline may be more effective than mannitol for treating elevated ICP (4), but this may not be generalizable to cancer patients. A meta-analysis of prophylactic anti-seizure meds for brain mets did not reduce the frequency of first seizures.

RENAL FAILURE

Pre-renal causes (i.e. hypovolemia) are a common cause of renal failure in cancer patients. However, pelvic masses can cause post-renal obstruction, and infiltrating tumours, amyloidosis, nephrotoxic drugs, and tumour lysis syndrome may also cause renal failure.

What is tumour lysis syndrome? Electrolyte and metabolic derangements secondary to rapid cell destruction, usually following chemotherapy for lymphoma or leukemia. These patients present with *hypercalcemia, hyperphosphatemia, hypocalcemia, and severe renal failure.*

Treatment for tumour lysis syndrome: The first treatment priority is to lower the potassium. Be cautious about giving calcium, as these patients have high phosphate! in case dialysis is needed.

Rasburicase (an enzyme that transforms uric acid into soluble allantoin) is used to manage tumour lysis syndrome

A little bit more about multiple myeloma: Multiple myeloma is a malignancy of plasma cells, which accumulate in the bone marrow and produce paraproteins.

Patients present with fatigue, weakness, weight loss, and bone pain. Anemia and renal failure are common. Rarely, bony infiltration can cause cord compression. Paraproteins can cause a **low** anion gap, pseudo-hypercalcemia (free calcium levels will be normal), and hyperviscosity syndrome.

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