**H&P – 9/23/14, 3:00 PM**

SUBJECTIVE

CHIEF COMPLAINT: “fever, low back pain, chest pain”

HISTORY OF PRESENT ILLNESS: Ms. CW is a 27-year-old female with a history of ulcerative colitis, pulmonary embolism, and recently diagnosed stage III colon cancer status post surgical resection and currently undergoing chemotherapy who is admitted to the oncology service from clinic with a 3-day history of fever, bilateral lower back pain, and chest pain. She came to clinic this morning for cycle 11 of chemotherapy but was admitted for management of her acute illness. She reports temperature up to 101.5 at home with associated sweats and chills during the day and night. She has not taken any medication because fever reliably breaks on its own. She describes a transient, migratory joint pain with fever.

She describes bilateral low back pain as initially intermittent but now constant with radiation bilaterally to the front lower lateral portions of her abdomen on both sides but not to her groin. Severity ranges from 6 to 8 out of 10. Pain worsens with activity but is partially relieved by rest and tramadol. The patient reports changing positions often to remain comfortable. She also acknowledges associated nausea, vomiting, and abdominal cramping. She has vomited four times in last 3 days; vomitus is clear.

The patient describes her chest pain as a deep, sharp discomfort in the area under her left clavicle that radiates down her upper left arm. She reports that this resembles the pain she experienced when she was found to have bilateral pulmonary emboli in 2012. The pain is unchanged with breathing or exertion. She also acknowledges associated shortness of breath on exertion.

Of note, Ms. CW was recently diagnosed with a UTI and treated with a course of Bactrim that she completed 6 days ago. Since then, she reports feeling like she has to urinate but being unable to void when she tries. She denies dysuria or increased urinary frequency. Ileostomy output has remained unchanged. Her last menstrual period was 6 weeks ago but she denies sexual activity at this time and said she was told to expect to missed periods during her chemotherapy treatment. The patient also denies chest pressure, diaphoresis, leg swelling or redness, cough, or hemoptysis.

ONCOLOGIC HISTORY: Ms. CW presented to her gastroenterologist in 2/2014 with worsening hematochezia that she had attributed to an exacerbation of her drug- refractory ulcerative colitis. She was found to be severely anemic (Hgb 4.9 compared to

10 at baseline) and this prompted colonoscopy in early 3/2014 which revealed a poorly differentiated adenocarcinoma obstructing the cecum. Previous colonoscopy in 3/2012 was significant for multiple inflammatory polyps but no pre-malignant lesions. CT scan demonstrated a cecal mass and local lymphadenopathy. The patient then underwent total proctocolectomy with negative margins and placement of end ileostomy. Pathologic analysis demonstrated tumor invasion through the muscularis propria into

the pericolonic soft tissue with involvement of 12/82 associated lymph nodes. This led to initial staging pT3N2bM0 (stage III). The patient began adjuvant chemotherapy with FOLFOX (fluorouracil, leucovorin, and oxaliplatin) and has completed 10 of 12 cycles. Initial treatment period was complicated by MSSA port infection requiring hospitalization and IV antibiotics as well as removal of initial port and replacement 3 weeks later. Chemotherapy course has been complicated by acute oxygen desaturations during treatment requiring supplemental oxygen therapy. She also reports fatigue and anorexia throughout the treatment course but no nausea or vomiting.

PAST MEDICAL HISTORY:

- Ulcerative colitis – Diagnosed by colonoscopy in 2004 and known to have pancolonic involvement. Refractory to mesalamine, 6-mercaptopurine, infliximab, and prednisone; patient was on vedolizumab phase III clinical trial at time of cancer diagnosis and colectomy in 3/2014.

- Iron-deficiency anemia – Secondary to ulcerative colitis; no history of menorrhagia.

Patient began experiencing symptoms in late 2012 and has received IV iron dextran every 2 months since then. She developed severe anemia (Hgb 4.9) in 2/2014 and

required transfusion of 2 units packed RBC’s, which in turn lead to discovery of

colon cancer by colonoscopy.

- Bilateral pulmonary emboli – Diagnosed in 12/2012 and thought to be provoked by oral contraceptives (OCP) and long car travel in the setting of risk factors of obesity

and ulcerative colitis. Treated with 3 months enoxaparin and discontinued OCP.

Testing for Factor V Leiden, anti-phospholipid syndrome, and prothrombin gene mutation were negative.

- Depression – treated and well-controlled with Zoloft, dose increased from 100 mg to

150 mg in May

PAST SURGICAL HISTORY:

- None other than the procedures described above

MEDICATIONS:

- Diphenoxylate-atropine (Lomotil) 2.5-0.025 mg 4 times/day as needed for diarrhea

- Diphenhydramine (Benedryl) 25 mg every night for sleep

- Lorazepam (Ativan) 0.5 mg every 12 hours as needed for anxiety

- Polysaccharide iron complex (Ferrex) 150 mg every day for iron deficiency

- Promethazine (Phenergan) 25 mg by mouth every 6 hours as needed for nausea

- Ondansetron (Zofran) 4 mg by mouth every 6 hours as needed for nausea

- Sertraline (Zoloft) 150 mg by mouth every day for depression / anxiety

- Tramadol (Ultram) 50 mg by mouth every 6 hours as needed for pain

- Zolpidem (Ambien) 10 mg by mouth every night for sleep

ALLERGIES: NKDA

SOCIAL HISTORY: The patient lives alone in Gainesville, FL, and is unmarried with no children. She works as a pediatric nurse at UF Health Shands Hospital. She moved to Florida from New Hampshire a few years ago to begin her new job, but most of her

family still lives in the north. She does not smoke or use tobacco. She used to drink alcohol socially but stopped in March when she received her cancer diagnosis. She has been sexually active with male partners in past but is not sexually active at this time.

FAMILY HISTORY:

- Mother – HTN, died at age 47 of lung cancer

- Father – alive, healthy

- Sister – asthma

REVIEW OF SYSTEMS: Constitutional: ***fatigue***; no weight loss

HEENT: no rhinorrhea, headaches, vision changes, sore throat, ear pain, eye pain

Cardiovascular: no palpitations

Gastrointestinal: no diarrhea, melena, hematochezia

Genitourinary: no vaginal bleeding, vaginal discharge, suprapubic pain Skin: ***pruritic rash*** (posterior distal right leg, non-erythematous) Musculoskeletal: no focal weakness

Hematologic / Lymphatic: no LAD, easy bruising or bleeding

OBJECTIVE

PHYSICAL EXAM

General: Patient is sitting upright in bed, appears uncomfortable but not in acute distress. She has pleasant affect.

Vital Signs: P 116, RR 14, BP 119/72, T 36.8, SpO2 95%, Wt 79.2 kg, BMI 31.93

HEENT: Extraocular movements intact. Pupils are equal, round, and reactive to light. There is no scleral icterus or conjunctival pallor. Nasal septum is midline. Oral mucosa is moist and pink; there is no erythema. There is no yellow discoloration of the inferior oral mucosa or underside of the tongue. Uvula is midline. No tonsillar hypertrophy. CN’s II-XII grossly intact.

Neck: Neck is supple. There is no jugular venous distention, thyromegaly, or lymphadenopathy. There are no palpable masses.

Cardiovascular: Increased rate and regular rhythm. Normal S1 and S2. There is a grade

2/6 early systolic murmur that obscures S1 heard and is best at the second intercostal space on the left and right sides. No rubs or gallops.

Respiratory: Lungs are clear to auscultation bilaterally. There are no crackles or wheezes. There is no increased respiratory effort.

Chest Wall: Port placed on upper left chest and site is clean, dry and intact. There is no erythema, discharge, or tenderness to palpation.

Abdominal: Abdomen is soft and mildly distended. There is tenderness to palpation of the right and left upper quadrants and periumbilical region. There is no rigidity, guarding, or rebound tenderness. There is no Murphy’s sign. Lower abdomen is non- tender There is bilateral CVA tenderness. There is no obvious hepatomegaly or splenomegaly but exam is limited by body habitus. There is an ileostomy bag in place in RLQ and attachment site is clean, dry, and intact. The bag contains brown stool material. There is no erythema or increased tenderness around insertion site. Rectal exam deferred.

Genitourinary: Exam deferred.

Extremities: Distal pulses are intact 2+ in bilateral upper and lower extremities. There is no swelling, erythema, or tenderness. Range of motion, muscle tone, and motor strength are intact bilaterally in upper and lower extremities.

Skin: No jaundice, rashes, or pallor. Skin is warm and well perfused with capillary refill less than 2 seconds.

LINES AND DRAINS

- Infusaport placed in upper right chest wall.

- Ileostomy bag in right lower quadrant of abdomen.

LABORATORY DATA (from clinic on the morning of admission; NOTE: values that were helpful to my assessment are in bold)

- **BMP**: Na 135, K 3.3, Cl 102, **CO2 19 \*L, BUN 13, Cr 1.39 \*H (last Cr 2 weeks ago in clinic was 1.01), eGFR 45,** Ca 8.9, Mg 1.6

- **LFT**: Total protein 7.6, albumin 3.9*,* **total bilirubin 1.5 \*H, ALP 551 \*H, AST 101 \*H, ALT 36,** Anion gap 15

- **CBC**: **WBC 10, Hgb 10, Hct 32.1, MCV 90, RDW 19 \*H,** Plt 151

o **Diff**: PMN 73.9%, Lymph 14.3%, Monos 6.1%, Eos 1.8%, Basos 0.4%

- **Urinalysis with Micro**: + protein, few RBCs and WBCs (WNL), no bilirubin, no Hgb,

no leukocyte esterase, no nitrites

MICROBIOLOGY: blood and urine cultures drawn in clinic, results are pending

ASSESSMENT AND PLAN

Ms. CW is a 27-year-old female with stage III colon adenocarcinoma status post resection and currently undergoing adjuvant chemotherapy who is admitted with likely pyelonephritis and concern for pulmonary embolism. She is currently tachycardic but afebrile and hemodynamically stable. There is laboratory evidence of acute kidney injury likely due to pre-renal azotemia. Of note, patient is at risk for chemotherapy- induced immunocompromised state.

**1. Pyelonephritis**: Patient is currently afebrile with normal WBC but these indices are less reliable indicators of infection in setting of immunocompromised state. Fever with chills, flank pain, nausea, vomiting, and cramping abdominal pain are most consistent pyelonephritis as most likely etiology of this patient’s acute presentation. However, unremarkable UA and recent treatment for UTI prompts consideration of alternative diagnoses such as nephrolithiasis, cholecystitis, pancreatitis, and liver metastases. Nephrolithiasis fits much of the symptom profile but is less likely to cause fever. Cholecystitis and pancreatitis are less likely to cause flank pain as described here but would explain other symptoms and will be considered if there is no evidence for more likely diagnoses. Colon cancer metastases to liver and periportal lymph nodes with pain due to mass effect and associated tumor fever is a possible non-infectious etiology but is less likely in the setting of active chemotherapy treatment. Pregnancy is unlikely given history of no current sexual activity but must be ruled out since patient recently missed a menstrual period.

**PLAN**: **(1)** Check urine hCG to ensure patient is not pregnant. **(2)** Proceed with

imaging work-up to evaluate for other etiologies of above symptoms beginning with RUQ / retroperitoneal ultrasound to evaluate for hydronephrosis, perinephric abscess or inflammation, nephrolithiasis, gallbladder inflammation or dilatation, peripancreatic inflammation, and metastatic disease. **(3)** In case of negative urine hCG and non- diagnostic ultrasound, proceed with non-contrast CT abdomen/pelvis for more complete evaluation. **(4)** While work-up is pending, initiate pain management with oxycodone 5 mg by mouth every 4 hours as needed. **(5)** Begin empiric treatment with cirprofloxacin IV 400 mg every 12 hours to cover for likely urinary pathogens in this patient, including *E. coli* and *P. aeruginosa.* Follow results of urine and blood cultures and monitor closely for new signs or symptoms of another infectious source.

**2. Concern for pulmonary embolism:** Symptom complex of chest pain, dyspnea on exertion, and tachycardia (current HR 116) as well as history of past PE lead to high clinical suspicion. However, previous PE was likely provoked by OCP and patient is not taking OCP at this time. Other risk factors for PE include malignancy, ulcerative colitis, and obesity. Modified Wells criteria score is 7 indicating this patient is at high risk for PE and further evaluation is necessary1,2. Alternative explanations for these symptoms, especially in the context of fever and immunocompromised state, include pneumonia

and port infection. Clear lung exam and lack of erythema, pain, or pus at port site make these less likely.

**PLAN**: **(1)** Pending results of pregnancy test and improvement of renal function after fluid challenge, proceed with CT angiogram of the chest with PE protocol. If pregnancy

test is positive or AKI is refractory to fluids, pulmonary V/Q scan is an appropriate alternative modality for this evaluation3. Of note, D-dimer level would be helpful information if clinical suspicion for PE were lower since that is the setting in which it has high negative predictive value. However, with a Wells criteria score of 7 and PE as most

likely diagnosis to explain the described symptoms, knowing the D-dimer level (whether elevated or normal) would not change management, as further imaging would still be warranted. Thus, D-dimer is not a necessary test in this case. **(2)** If evaluation is delayed or symptoms worsen, begin IV heparin drip 5000 units loading dose followed by

1000 units/hr until definitive evaluation is complete. **(3)** Consider chest X-ray to evaluate for pneumonia if PE work-up is negative and symptoms persist or worsen.

**3. AKI, likely pre-renal azotemia**: BUN 13; Cr 1.39. Last Cr was 1.01 at clinic visit 2 weeks ago. Pre-renal etiology is most likely given fever and tachycardia with lack of known intrinsic renal insult but this is made less likely by BUN/Cr ratio of ~10. Possible intra-renal cause includes Bactrim course completed 6 days ago, in which case renal injury is likely resolving. Post-renal obstruction would not affect creatinine unless bilateral, and a stone in the urethra is possible given history of pain and urinary urgency but unlikely since patient is still voiding without difficulty.

**PLAN**: Fluid challenge with normal saline, evaluate for hydronephrosis with renal ultrasound. Repeat BMP to determine if injury is transient and whether it is resolving or worsening.

**4. Colon cancer**: Stage III (pT3N2bM0) poorly differentiated adenocarcinoma diagnosed in March. Molecular pathology report is indeterminate for status of common mutations. Patient is status post surgical resection and 10 cycles of FOLFOX as adjuvant chemotherapy4. Cycle 11 is postponed and will resume pending uncomplicated

diagnosis and management of acute illness.

**PLAN**: Administer cycle 11 of FOLFOX in inpatient setting after patient is afebrile for

24 hours unless work-up described above reveals contraindication to continued chemotherapy or metastatic disease. Check CEA level if there is question or concern for metastasis on imaging. Arrange close follow-up with primary oncologist Dr. Daily. Continue management of chemotherapy-related nausea and vomiting with Zofran 4 mg every 6 hours as needed but change from PO to IV while patient continues to be symptomatic.

**5. Abnormal LFTs, concerning for primary sclerosing cholangitis (PSC)**: AST 101, ALP 551, total bilirubin 1.5. Pattern is consistent with cholestasis versus infiltrative process. AST has been mildly elevated since surgery in March but ALP has been persistently elevated and trending up since 2011. Hepatotoxic chemotherapy or psychiatric medications are likely contributors, as is NASH given the patient is obese. Additionally, an infiltrative pattern on liver panel (primarily elevated ALP) is consistent with metastatic liver disease, as previously discussed.

PSC is a cause of cholestasis (elevated ALP, bilirubin) that must be considered in this patient given her history of UC. PSC is often diagnosed by work-up of abnormal LFTs in an asymptomatic patient with UC5. Additionally, UC patients who have PSC are at a significantly increased risk for colorectal carcinoma6. This patient’s persistently

increasing ALP with elevated bilirubin would be consistent with undiagnosed PSC. If present, this process is likely not contributing to her acute presentation but the issue should be further investigated. Initial work-up would include RUQ ultrasound to look for dilation of bile duct, with MRCP and possible ERCP to follow. Eventually, a liver biopsy could be required to confirm the diagnosis. Finally, viral hepatitis is less likely given liver panel does not show a pattern consistent with hepatocellular injury, but it should be ruled out given multiple, persistent abnormal LFTs.

**PLAN**: Further characterize the RUQ with the imaging described above to rule out metastatic liver disease and initially evaluate for PSC. Order hepatitis B panel to confirm

patient is immune (Hep B surface antibody positive) and hepatitis C virus Ab. Pursue

further work-up of concern for PSC after resolution of acute illness.

**6. Anemia**: Hgb 10, MCV 90, RDW 19. MCV and most recent ferritin (70.9 on 7/8/14) within normal limits indicate that iron-deficiency anemia is well controlled with daily oral iron supplement and IV iron every 2 months. Current normocytic anemia is likely due to chemotherapy-induced toxicity.

**7. Depression / Anxiety**: Continue Zoloft 150 mg daily and Ativan 0.5 mg every 12 hours as needed.

**Fluid / Electrolytes / Nutrition / Prophylaxis**:

• Order regular diet as tolerated.

• There are no electrolyte derangements that need correction at this time.

Continue to monitor with daily BMP.

• Begin subcutaneous heparin for DVT prophylaxis if therapeutic heparin is not needed.

**Disposition**: Admitted to oncology inpatient service for further work-up of acute illness and possible chemotherapy pending results of diagnostic testing.

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