October 2017 Critical Care Case of the Month

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History of Present Illness

A 42-year-old man with a history of intravenous heroin abuse and chronic hepatitis C infection presents to the emergency department (ED) with recurrent abdominal pain. The pain was dull, epigastric, and did not radiate. The pain worsened after eating, but the timing after eating that it worsened was inconsistent. He had nausea but no vomiting. His bowel movements were normal without constipation, diarrhea, or melena.

He had presented to another ED multiple times with this same pain over the past six weeks. He does not know what the work-ups revealed, but was discharged from the emergency department each time. He received supportive care including fluids and analgesics, but the pain would always recur a few hours after returning home.

He went to a third ED a few weeks ago with bilateral testicular pain after which he was discharged home with acetaminophen for pain.

Past Medical History, Family History, and Social History

His past medical history is notable for bipolar disorder. He takes no prescribed medications and does not know his family's medical history. He is a current every day smoker, has no history of heavy alcohol use, and uses intravenous heroin but no other recreational drugs.

Current Medications

Acetaminophen a few times a day for abdominal pain.

Review of Systems

He notes subjective fevers, poor appetite, and an 8 pound unintentional weight loss over the past six weeks.

Physical Exam

Vital signs are notable for hypertension to 158/91 mm Hg. Other vitals are within normal limits.

On exam, he is an ill appearing middle aged man who appears very uncomfortable. His abdomen is nondistended. He has normal bowel sounds and epigastric tenderness with a tender, smooth liver edge palpable just under the costal margin. He has decreased

sensation to light touch in his toes with no skin changes. Toes are warm with capillary refill less than two seconds.

Laboratory Evaluation

CBC reveals a leukocytosis to 23,600 cells/mcL with 80% neutrophils; eosinophils are normal. Hemoglobin and platelet counts are normal. Sodium is 128 mmol/L with a bicarbonate of 30 mmol/L and creatinine of 0.64 μ mol/L. AST 155 U/L, ALT 137 U/L, with a total bilirubin 1.1 μ mol/L. Albumin is 1.8 g/L. INR is 1.9. Urinalysis showed 1+ protein.

What additional laboratory evaluation is ***indicated at this time?***

1. Acetaminophen level
2. Hepatitis B viral (HBV) serologies
3. Lipase
4. 1 and 3
5. All of the above

Correct!
5. All of the above

Hepatitis B viral serologies, lipase, and acetaminophen level are indicated with his transaminitis, hyperbilirubinemia, and leukocytosis. His lipase was 240 U/L and his acetaminophen level was <2.0 mcg/mL, eliminating pancreatitis and acetaminophen toxicity as causes of his presentation.

His hepatitis B viral serologies showed his HBsAg positive, anti-HB core antigen positive, and anti-HB surface antibody negative.

How do you **interpret his hepatitis B serologies?**

1. Active HBV infection
2. Resolved HBV infection
3. Resolved HBV infection
4. Susceptible to hepatitis B infection
5. Vaccinated against hepatitis B

Correct!
1. Active HBV infection

The positive surface antigen and positive core antibody are indicative of active hepatitis B infection, which can be either acute or chronic.

Additional laboratory evaluation revealed a C-reactive protein of 132 mg/dL and an erythrocyte sedimentation rate (ESR) of 45 mm/hr. Antinuclear antibody was negative as were antineutrophil cytoplasmic antibodies (ANCAs).

Abdominal ultrasound revealed slightly enlarged liver with normal echotexture. CT abdomen/pelvis showed the same with normal ducts and a normal pancreas without peripancreatic inflammation.

Which of the following is on your **differential diagnosis**?

1. Eosinophilic granulomatosis with polyangiitis
2. Granulomatosis with polyangiitis
3. Microscopic polyangiitis
4. Polyarteritis nodosa
5. 1 and 3

Correct!
4. Polyarteritis nodosa

With his normal eosinophil count and negative ANCA along with his newly diagnosed hepatitis B infection, evidence of peripheral neuropathy, abdominal pain, and testicular pain, weight loss, diastolic hypertension, and elevated white blood cell count and ESR, the most likely diagnosis is polyarteritis nodosa.

Polyarteritis nodosa is a vasculitis of small and medium arteries. It is frequently associated with acute hepatitis B infection. The current hypothesis is that circulating immune complexes containing viral proteins are responsible for inciting inflammation.

Which of the following is the most **appropriate treatment course at this time?**

1. High dose glucocorticoids
2. Cyclophosphamide
3. Tenofovir
4. 1 and 3
5. All of the above

Correct!
4. 1 and 3

Given high suspicion for the diagnosis and concerns about poor wound healing, biopsy of sural nerve or kidney to confirm vasculitis was not performed. He was started on tenofovir daily and prednisolone 20mg daily (low dose given concern for precipitating mania given his of bipolar disorder for which he is not currently on therapy). While evidence is limited, most experts would agree that for his mild disease without evidence of major organ involvement, high dose glucocorticoids and antiviral therapy is appropriate for initial treatment to induce remission, though many patients do require a second immunosuppressive agent to maintain remission. He was scheduled for follow-up with rheumatology and gastroenterology. He was discharged home.

Two days later he represented to the ED with severe abdominal pain, nausea, and shortness of breath.

He was tachycardic to a heart rate of 120 beats per minute and tachypnea to 32 breaths per minute. His brain natriuretic peptide was 57,000 pg/mL and his lactate was 10 mmol/L. Portable chest x-ray is shown below (Figure 1).

Figure 1. Initial chest x-ray from second admission.

What is your **differential diagnosis**?

1. Polyarteritis nodosa associated cardiomyopathy
2. Pulmonary embolism
3. Takatsubo (stress) cardiomyopathy
4. 1 and 3
5. All of the above

Correct!
5. All of the above

The chest x-ray shows new bilateral infiltrates, attributed to cardiogenic pulmonary edema.

While all of the above are diagnostic possibilities, the most likely is polyarteritis nodosa associated cardiomyopathy, which occurs in about ten percent of patients with polyarteritis nodosa.

Transthoracic echocardiogram showed normal valvular and right heart systolic function, and an ejection fraction of 26% with no focal wall motion abnormalities.

For the cardiomyopathy and disease progression, he was started on high dose intravenous steroids (methylprednisolone 250mg q 6 hours) and plasma exchange, though the evidence surrounding plasma exchange in HBV-associated polyarteritis nodosa is limited. He rapidly improved, was extubated within two days of initiating therapy and by five days after presentation, his ejection fraction had improved to 55%.

He was ultimately discharged with a plan to continue outpatient high dose IV methylprednisolone and plasma exchange until his HBe antibody turned positive.

References

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