Board Review Practice - 3

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Disclosures

- I have no financial disclosures

CASE 1

A 70-year-old woman presents with pain in her hands and wrists for 9 months. Her hands are stiff in the morning for 15 minutes. She has pain with sewing and typing. She has not noticed any joint swelling. Her vital signs are normal. Her bilateral proximal interphalangeal joints are tender to palpation and have bony enlargements. The first carpometacarpal joints are also tender and have bony squaring bilaterally. Her metacarpal squeeze test is negative. The remainder of the exam is normal.

Which of the following studies should be done to establish the diagnosis?

A) ANA

B) Uric acid

C) Radiography of the hands

D) Rheumatoid factor

E) No additional studies are needed

The correct answer is E

- This patient with first carpometacarpal joint tenderness and squaring has **osteoarthritis.**
- While symmetric and polyarticular arthritis seem to suggest rheumatoid arthritis, the joints involved are not consistent with rheumatoid arthritis, and there are no clinical indicators of joint inflammation.
- The DIP joints are almost always involved in degenerative arthritis, and rarely in RA. PIP joints can be involved in either. The MCP joints are involved almost exclusively RA.
- At the wrist, involvement of the **first carpometacarpal** joint is almost always a sign of **osteoarthritis**, while involvement of **ulnar styloid** is almost always a sign of **rheumatoid arthritis**.
- Morning stiffness less than 30 minutes indicates degenerative rather than inflammatory arthritis.
- ACR criteria for diagnosing OA of the hands:
  - Hand pain, aching, or stiffness, plus 3 of…
    - Hard tissue enlargement of two or more of 10 selected joints
    - Fewer than three swollen metacarpophalangeal joints
    - Hard tissue enlargement of two or more DIP joints
    - Deformity of two or more of 10 selected joints

Arthritis Rheum 1990;33:1601-10.

CASE 2

A 68-year-old man with a history of hypertension and gout presents for his annual exam. He was a past smoker for 20 years but quit 30 years ago. He drinks one glass of red wine daily. He exercises regularly. He has no specific complaints. He gets his influenza vaccination annually and he received his pneumococcal vaccine 3 years ago. He had a normal colonoscopy 7 years ago. He is on amlodipine and allopurinol. His vital signs are normal and his physical exam including cardiopulmonary, abdomen, prostate, and peripheral pulses are all unremarkable.

Which of the following screening tests is most appropriate for this patient based on most evidence of benefit?

A) Coronary Computed Tomography Angiography (CTA) Imaging

B) Prostate Specific Antigen

C) Thyroid Stimulating Hormone

D) Abdominal Ultrasound

E) Exercise Treadmill Test

The correct answer is D

- **USPSTF recommends that men between the ages of 65 and 75 with any current or past history of smoking undergo a one-time screening for AAA with an abdominal ultrasound.**
- Several studies have demonstrated survival benefit of screening including a population-based study of over 67,800 men aged 65 and 74 that were randomized to AAA screening with surgery for those found to have AAA >5.4cm vs. no screening that showed AAA related-mortality was reduced by an average of 42% (95% CI, 22%-58%) in the screened population compared with the non-screened population. Several studies have shown no benefit in male non-smokers and in women.
- Coronary CTA should not be used in asymptomatic individuals. CT coronary artery calcium imaging can be considered in asymptomatic individuals with borderline or intermediate increased 10-year cardiovascular disease risk to guide discussions regarding statin therapy.
- The ability of prostate cancer screening tests to prolong life is uncertain.
- There is not enough evidence to recommend routine screening for thyroid disease. However, screening high risk populations such as patients with diabetes, down syndrome, and postmenopausal women may be justified.

Lancet 2002;360(9345):1531-9.
Ann Intern Med 2005;142:203-11.
Circulation 2019; 139(25):e1082-e1143.

CASE 3

A 20-year-old woman with a history of systemic lupus erythematosus diagnosed two years earlier presents to the emergency department with fatigue and fevers to 100.5 for several days.

Home medications include metoprolol succinate 25mg daily, lisinopril 10mg daily, prednisone 15mg daily, hydroxychloroquine 200mg daily, azathioprine 50mg daily, and dapsone 100mg daily.

Initial evaluation reveals a young woman in no acute distress. Vital signs are notable for a temperature of 100.5, heart rate of 60, blood pressure 110/70, respiratory rate of 16, and an oxygen saturation of 80% on room air. Oxygen saturation increases to 88% with a non-rebreather mask. Chest X-ray and CT scan of the chest are unremarkable. CBC reveals a WBC 5.42, Hemoglobin 10 (at her baseline), Plt 273. Chemistry panel is unremarkable. Arterial blood gas shows a pH of 7.38, $PaCO_2$ 32, and PaO_2 527 on 100% oxygen via the non-rebreather mask.

CASE 3 (cont.)

The next best step in management is:

A) Endotracheal intubation and mechanical ventilation

B) Transfuse 2 units PRBCs

C) Treat with hyperbaric oxygen

D) Stop the dapsone

E) Treat with trimethoprim sulfamethoxazole and prednisone

The correct answer is D.

- This is a case of **methemoglobinemia** caused by **dapsone**.

- Methemoglobin is a form of hemoglobin that does not bind oxygen.
  - It is normally present at <1% due to the activity of anti-oxidant enzymatic pathways.

- Acquired methemoglobinemia is caused by exogenous oxidizing drugs, including trimethoprim, sulfonamides, dapsone, local anesthetics, and aniline dyes.
  - Most people are asymptomatic except for cyanosis, and possibly headache and fatigue.
  - Severe methemoglobinemia can cause shortness of breath, mental status changes, dysrhythmias, seizures, coma, and death.

- The diagnosis should be suspected in the setting of a normal PaO2 despite a low peripheral oxygen saturation.
  - Patients may or may not have cyanosis.

- Treatment: stop the offending medication.
  - Severe cases may be treated with IV methylene blue.

CASE 4

A 37-year-old woman with no significant past medical history presents to the emergency department with 2 days of days of nausea, vomiting, and abdominal pain. Her only medication is acetaminophen, which she has been taking for low back pain. She has not been taking any calcium supplements.

Labs reveal calcium 15.4, phosphate 4.9, and creatinine 1.6. Her PTH level is low, and her PTH-RP is undetectable.

All the following would be appropriate initial therapy for her hypercalcemia in the acute setting EXCEPT:

A) Hydration with intravenous normal saline

B) Zoledronate 4mg IV

C) Furosemide 40mg IV

D) Calcitonin 4 units/kg IM

The correct answer is C.

•The recommended approach for the treatment of severe hypercalcemia (calcium > 14 mg/dL) includes:

- Hydration with normal saline.
- Bisphosphonates (zoledronate or pamidronate).
- Calcitonin.

- **Loop diuretics such as furosemide (Choice C) are no longer recommended**.
  - Risks:
    - Electrolyte abnormalities.
    - Volume depletion resulting from over-diuresis.

- Loop diuretics should be considered in cases of fluid overload in order to restore euvolemia.

LeGrand SB, Leskuski D, Zama ISO. Ann Intern Med. 2008;149(4):259.

CASE 4 – Part II

CT scan of the chest, abdomen, and pelvis reveals diffuse lytic lesions in the spine, pelvis, long bones, and ribs. No other abnormalities are noted. Additional workup demonstrates a normal serum protein electrophoresis, normal serum angiotensin converting enzyme level, and a mildly elevated LDH of 450.

The most likely diagnosis is:

A) Multiple myeloma

B) Sarcoidosis

C) Metastatic breast cancer

D) Diffuse large B-cell lymphoma

E) Langerhans Cell Histiocytosis

The correct answer is C.

• All the choices listed can cause lytic bone lesions and hypercalcemia.

• **The most likely diagnosis in a 37-year-old woman with no other CT findings is metastatic breast cancer. CT of the chest may miss breast lesions.**

• The median age at diagnosis for multiple myeloma (Choice A) is 66 years, and only ~2% of patients are younger than 40 years old. Additionally, only ~ 3% of cases of myeloma are non-secretory (i.e., no M-spike on SPEP).

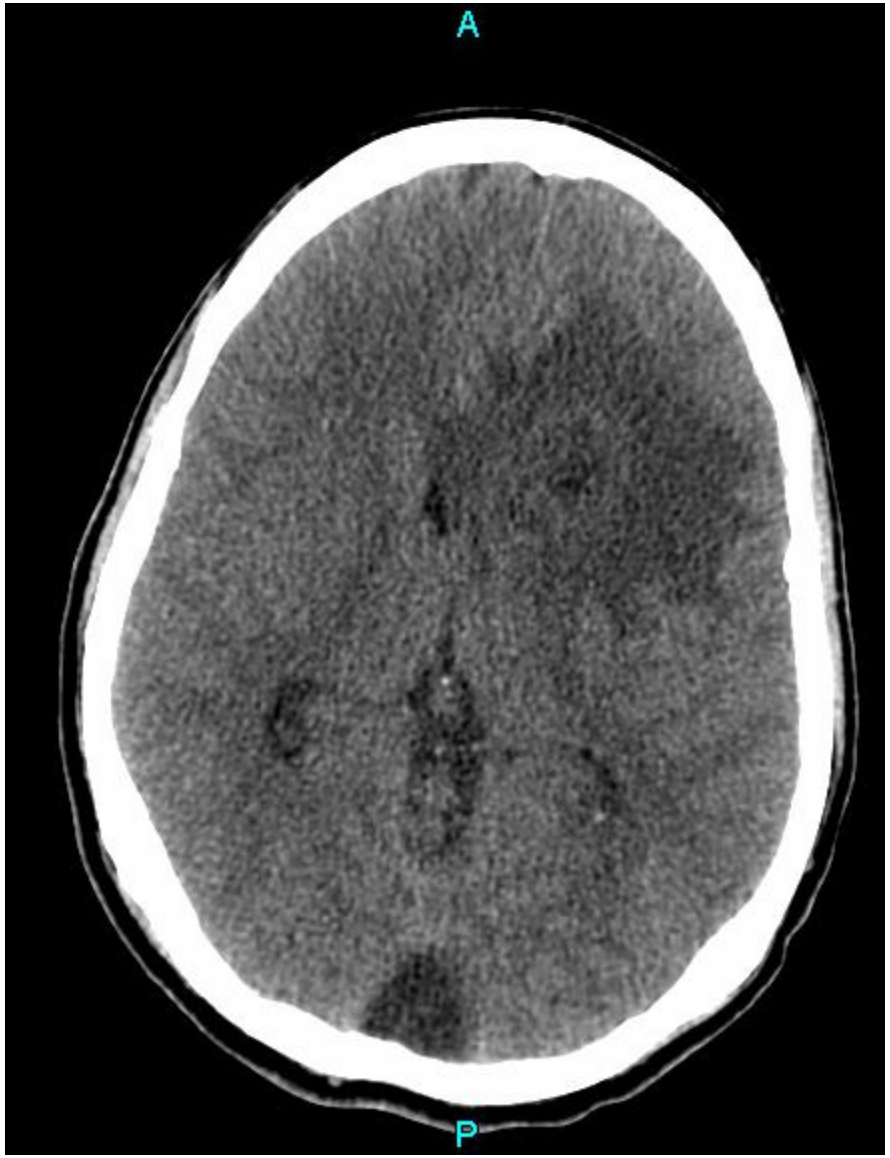
• Sarcoidosis (Choice B) of bone occurs in approximately 5% of patients with the disease, but this usually occurs in advanced disease and rarely without pulmonary manifestations.

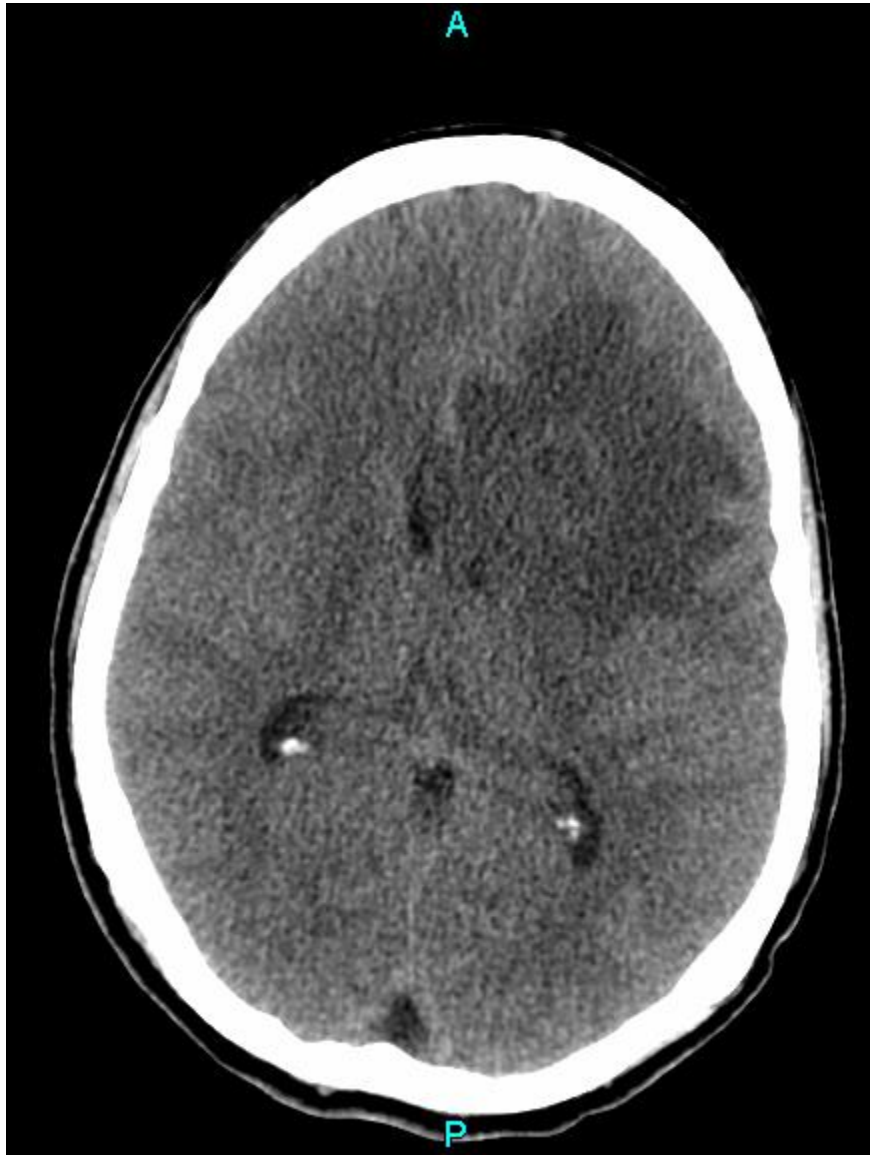
• Diffuse large B-cell lymphoma (Choice D) is a rare cause of bony lesions. The CT scan would have been expected to show lymphadenopathy as well.

• Langerhans cell histiocytosis (Choice E) is a rare disorder (2 in 1 million) that may present with bony lesions. Other presenting symptoms may include rash, diabetes insipidus, lymphadenopathy, ataxia, and memory difficulty.

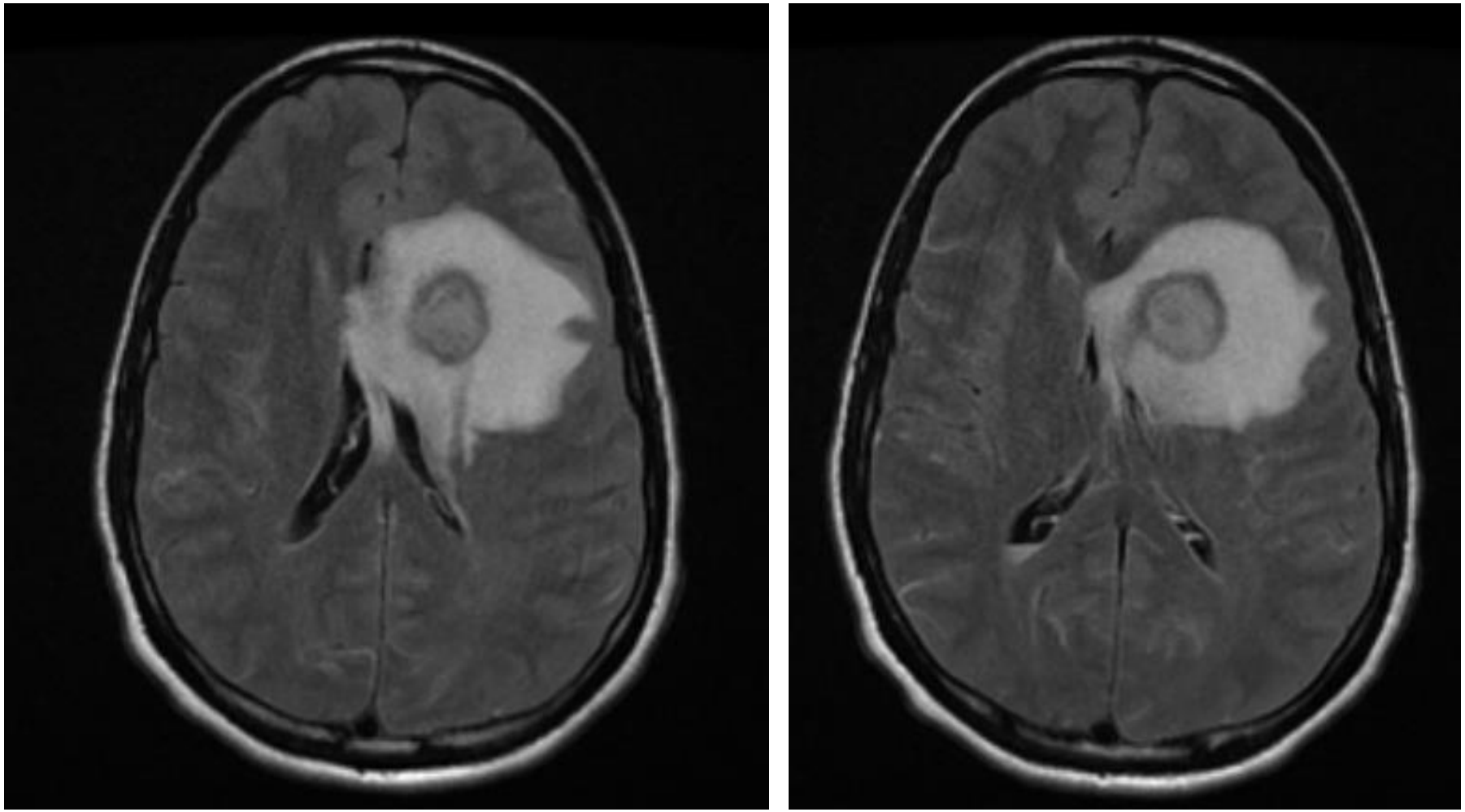
CASE 5

A 32-year-old man with no significant past medical history presents with low-grade fevers, anorexia, headache, and neck stiffness of 4 days' duration, which started shortly after a dental procedure. The night prior to presentation he had one episode of emesis and a worsening posterior headache. This morning, his wife noticed that he seemed "not quite himself" and was "walking into walls," prompting her to bring him into the Emergency Department. In the ED, he undergoes the following head imaging.





Non-Contrast Head CT



Axial T2 Flair MRI

CASE 5 (cont.)

What is the most likely diagnosis and best next management choice?

A) Meningitis; Treatment with ceftazidime, vancomycin, and micafungin

B) Meningitis; Treatment with ceftriaxone, vancomycin, and ampicillin

C) Brain abscess; Treatment with ceftazidime, vancomycin, micafungin, and acyclovir

D) Ruptured brain abscess; Treatment with ceftriaxone, vancomycin, and metronidazole with neurosurgery consultation if symptoms do not improve with 24h of antibiotics

E) Ruptured brain abscess; Treatment with ceftriaxone, vancomycin, and metronidazole with emergency neurosurgery consultation

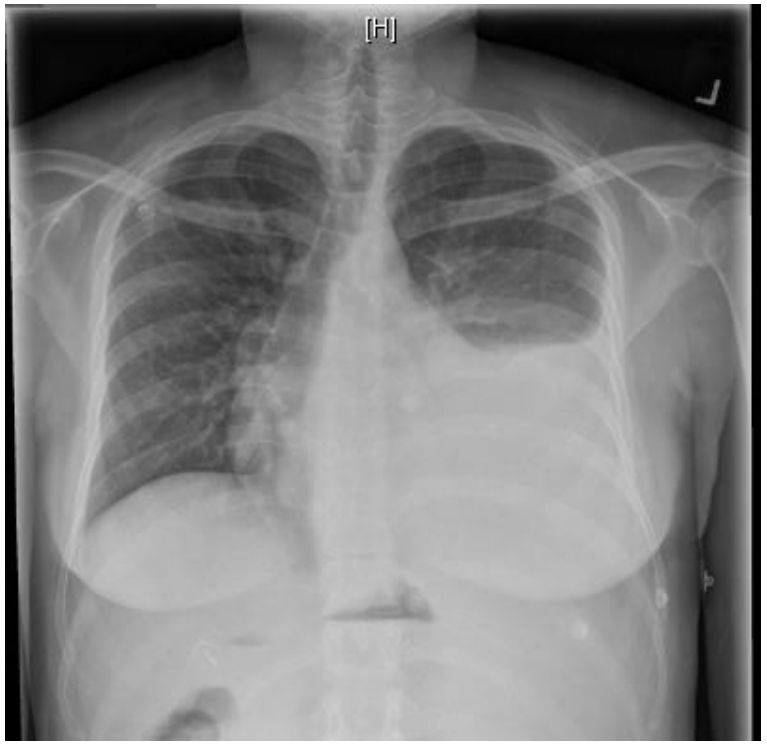
The correct answer is E.

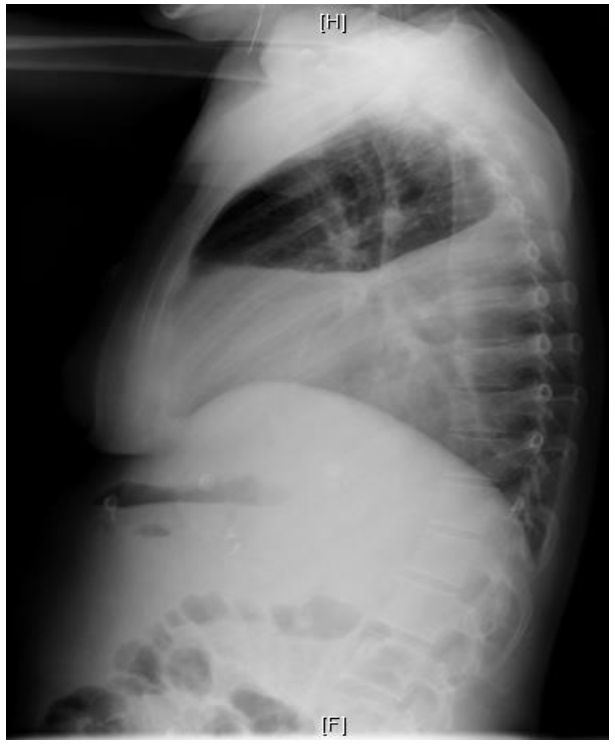
- **The patient's initial clinical syndrome of fevers, anorexia, headache, and neck stiffness is consistent with a diagnosis of meningitis.**
- An abrupt change in symptomatology and focal neurological symptoms are an indication for emergent head imaging (non-contrast head CT).
- **The head CT demonstrates a brain abscess with likely surrounding vasogenic edema.**
- The MRI demonstrates pus within the ventricle, indicating rupture of the brain abscess, a neurological emergency with a very high mortality rate
- **Emergency neurosurgical consultation and broad spectrum antibiotics are indicated in this case.**

Mathisen and Johnson, Clinical Infectious Diseases, Vol. 25, No. 4, Oct., 1997

CASE 6

A 30-year-old woman with ulcerative colitis and autoimmune hepatitis complicated by cirrhosis, ascites, and esophageal varices presents with dyspnea and left-sided back pain. Abdominal ultrasound shows minimal ascites and chest X-ray reveals the following:





CASE 6 (cont.)

Which of the following would *not* be appropriate in the evaluation and management of this pleural effusion?

A) Thoracentesis

B) Chest tube

C) Diuretics

D) TIPS (transjugular intrahepatic portosystemic shunt)

E) Evaluation for liver transplantation

The correct answer is B.

- This patient most likely has a pleural effusion due to cirrhosis and ascites.
  - Secondary to diaphragmatic defect(s), which can be microscopic.
  - 85% right-sided, 13% left-sided, and 2% bilateral.

- Thoracentesis (choice A) should be performed to assess for other possible etiologies of the pleural effusion and to rule out infection.

- Diuretics (choice C) can be used to manage the pleural effusion.

- TIPS (choice D) is used to manage refractory pleural effusions.

- Patients with hepatic hydrothorax should be evaluated for liver transplantation (choice E).

- **A chest tube (choice B) should not be placed in the setting of hepatic hydrothorax** as it can cause massive protein and electrolyte depletion, infection, renal failure, and bleeding.

Aliment Pharmacol Ther 2004; 20 :271

CASE 7

A 42-year-old man with a history of morbid obesity status-post bariatric surgery with 75-pound weight loss presents for a follow-up visit. He complains of 5 years of progressive gait instability and numbness and weakness in his distal extremities. He now has trouble holding a cup and his handwriting is deteriorating. His family history is unremarkable. He takes high vitamin supplements including B-complex and zinc.

On examination, he has an unsteady gait, Romberg sign, spasticity in the bilateral lower extremities, bilateral hyperreflexia, and Babinski sign bilaterally. There is impaired vibration and position sense in the feet. Pain and temperature sensation in the lower extremities are normal. His labs reveal leukopenia, neutropenia, normocytic anemia, high serum zinc, and low ceruloplasmin. Levels of Vitamin B12, folate, homocysteine, and methylmalonic acid are normal.

CASE 7 (cont.)

Which of the following is the most likely cause of his condition?

A) Vitamin B12 deficiency
B) Paraneoplastic polyneuropathy
C) Copper deficiency
D) Vitamin B6 toxicity
E) Lead toxicity

The correct answer is C.

- The patient has findings suggestive of progressive impairment of the corticospinal tracts and posterior columns of the spinal cord (subacute combined degeneration).
  - In a patient with history of bariatric surgery, deficiencies of either copper or Vitamin B12 should be suspected.
  - However, the Vitamin B12, methylmalonic acid, and homocysteine levels in this case are normal, which rules out Vitamin B12 deficiency (choice A).

- **Copper deficiency (choice C) affects the corticospinal tract (hyperreflexia and Babinski sign) and posterior column (impaired vibration sensation).**
  - Zinc competes with copper for intestinal absorption, and the patient is taking supplemental zinc.

- There are no signs or symptoms to suggest an underlying neoplasm (choice B).

- Vitamin B6 toxicity (choice D) causes peripheral neuropathy, but not upper motor neuron signs. Toxicity is very rare at doses less than 100mg daily.

- Adults with lead poisoning (choice E) can have many symptoms, including a peripheral neuropathy that manifests as wrist or ankle weakness; however, lead toxicity does not cause upper motor neuron signs.

Neurology 2007;68(21):1843-1850.

CASE 8

A 56-year-old woman presents with dyspnea on exertion and fatigue for 2 months. She has a history of hypertension and Stage 4 chronic kidney disease. She has no nausea, vomiting, anorexia, or chest pain. Her weight is stable, and she is adherent to a renal diet. Her medications include furosemide and lisinopril. Her health care maintenance is up-to-date, including a recent colonoscopy.

On examination, her BP is 118/62. BMI is 24. Her conjunctivae are pale. Her cardiac and lung exams are unremarkable. She has 1+ lower extremity edema. Labs reveal hemoglobin 9.6, MCV 92, eGFR 18, ferritin 190, iron 57, TIBC 257, and transferrin saturation 22%. Urinalysis reveals 1+ protein. Her stool is guaiac negative, and treatment with erythropoietin is begun. Four weeks later, her fatigue and exercise tolerance has improved, and her hemoglobin is now 12.6 with transferrin saturation 21%.

CASE 8 (cont.)

What is the most appropriate next step in the management of this patient?

A) Stop erythropoietin

B) Stop lisinopril

C) Change lisinopril to HCTZ

D) Add IV ferrous gluconate

E) Schedule EGD

The correct answer is A.

- Therapy with erythropoietin has been shown to effectively treat anemia in patients with CKD and may reduce fatigue and the need for blood transfusions.

- Normalizing hemoglobin levels with erythropoiesis stimulating agents in patients with anemia due to CKD is associated with increased risk of death, non-fatal MI, stroke, CHF and thrombosis.
  - **The FDA recommends that erythropoietin should not be used once hemoglobin is higher than 12.**
  - The rate of hemoglobin increase should not exceed 1g/dL over 2 weeks.
  - Therefore, treatment with the erythropoiesis stimulating agent should be stopped (choice A).

- Iron saturation of >20% is adequate. IV iron (choice D) is not necessary. Oral iron may be beneficial, as increased red cell production over time may deplete iron stores in the future.

- ACE inhibitors can slow the progression of chronic kidney disease, particularly those associated with proteinuria, and should therefore not be stopped (choices B and C).

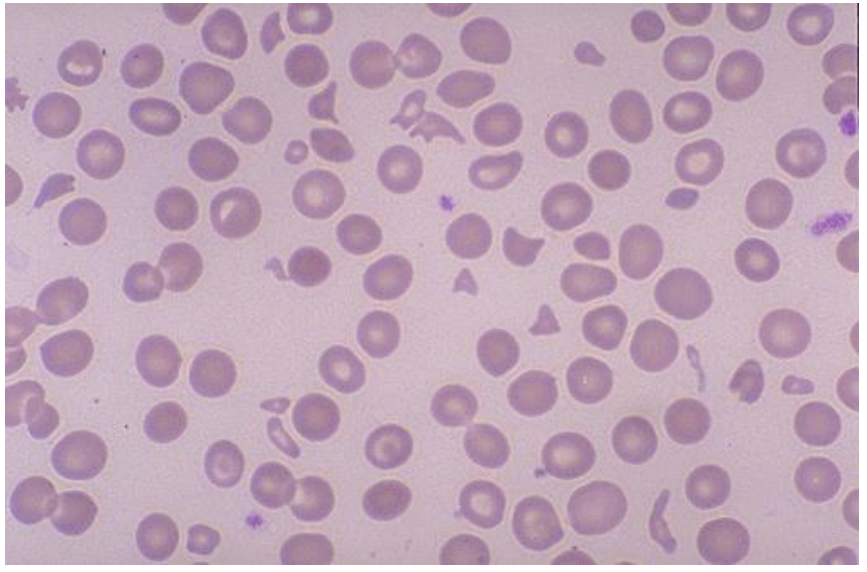
Lancet 2007;369(9559):381–388.

CASE 9

A 44-year-old man is brought to the emergency department after brief loss of consciousness at work lasting for approximately 30 seconds. He has had a 5-day history of dyspnea on exertion and chest pain. On the morning of presentation, he had difficulty walking to work because of shortness of breath and worsening chest pain.

On presentation, his ECG demonstrates 1mm ST segment elevations in leads I, II, and aVL. Laboratory values are notable for a troponin-T of 0.22, normal CK and CK-MB, WBC 4.1, Hgb 7, Plt 11. The LDH is elevated at 1300, and PT and PTT are normal.

Peripheral blood smear is shown.



(Image source: library.med.utah.edu)

CASE 9 (cont.)

The most appropriate initial treatment for this condition is:

A) Platelet transfusion
B) Cardiac catheterization
C) Rituximab
D) IVIG
E) Plasma exchange

The correct answer is E.

• This is a case of thrombotic thrombocytopenic purpura (TTP), given the concurrence of macroangiopathic hemolytic anemia and thrombocytopenia without an alternative explanation.

- It is now rare to encounter all five manifestations of the classic pentad of TTP (microangiopathic hemolytic anemia, thrombocytopenia, renal failure, neurologic changes, and fevers).
- **Plasma exchange (choice E) should be initiated even if there is uncertainty about the diagnosis of TTP, since the risks of progressive TTP generally outweigh the risks of exchange.**

• Platelet transfusion (Choice A) is contraindicated in TTP, as it may lead to progressive consumption of infused platelets and production of thrombi, causing worsening neurologic symptoms and/or renal failure.

•Cardiac catheterization (Choice B) might be reasonable for this patient later in his course but is not the most appropriate initial treatment. The ischemic signs and symptoms are most likely due to microthrombi in the coronary circulation, which are treated by exchange.

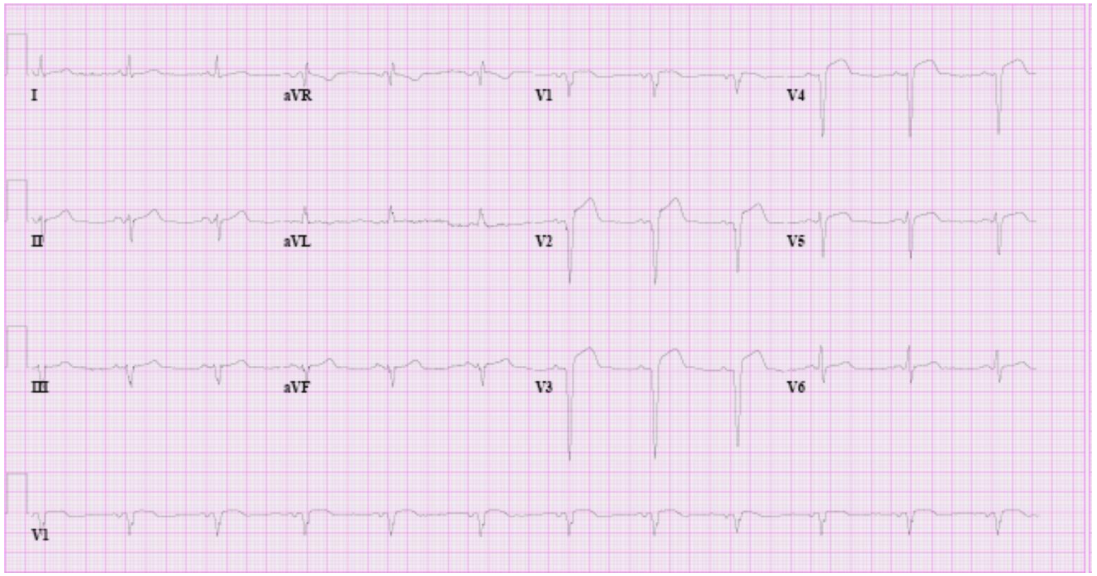
• Rituximab (Choice C) may be used in addition to plasma exchange for refractory or recurrent TTP, but at present is not indicated for up-front treatment of *de novo* TTP.

•IVIG (Choice D) may also be used as an adjunctive therapy in TTP, but not as an alternative to plasma exchange.

CASE 10

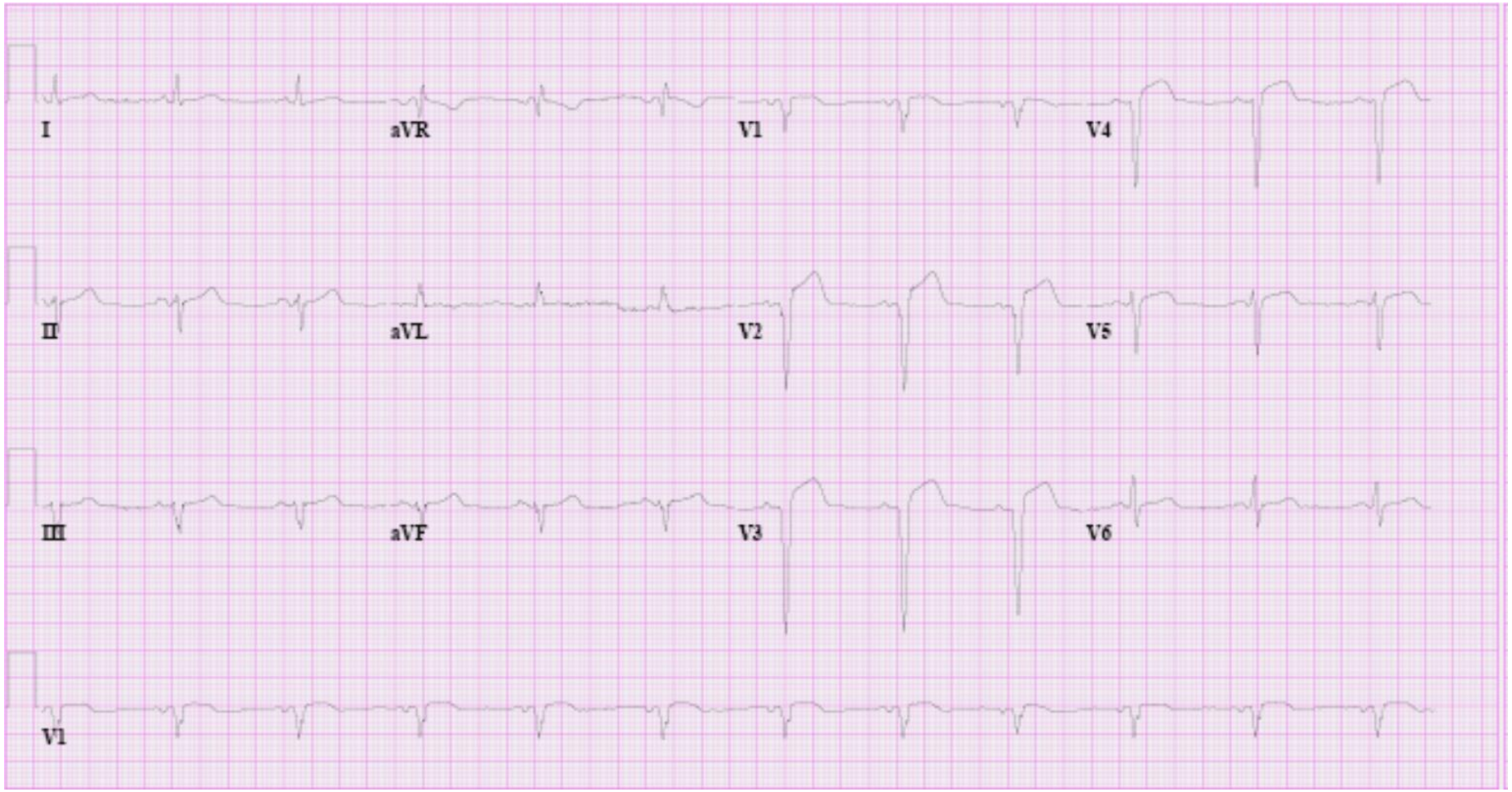
A 42-year-old man presents to the emergency department for evaluation one week after an episode of severe left-sided chest pain in the setting of cocaine use. The chest pain persisted for approximately 24 hours, and then resolved. He has not had any further chest pain, is currently chest pain free, and has no exam features of heart failure.

His ECG in the emergency department is shown below:



Cardiac biomarkers are notable for a normal CK and CK-MB, and an elevated troponin-T at 13.2.

CASE 10 (cont.)



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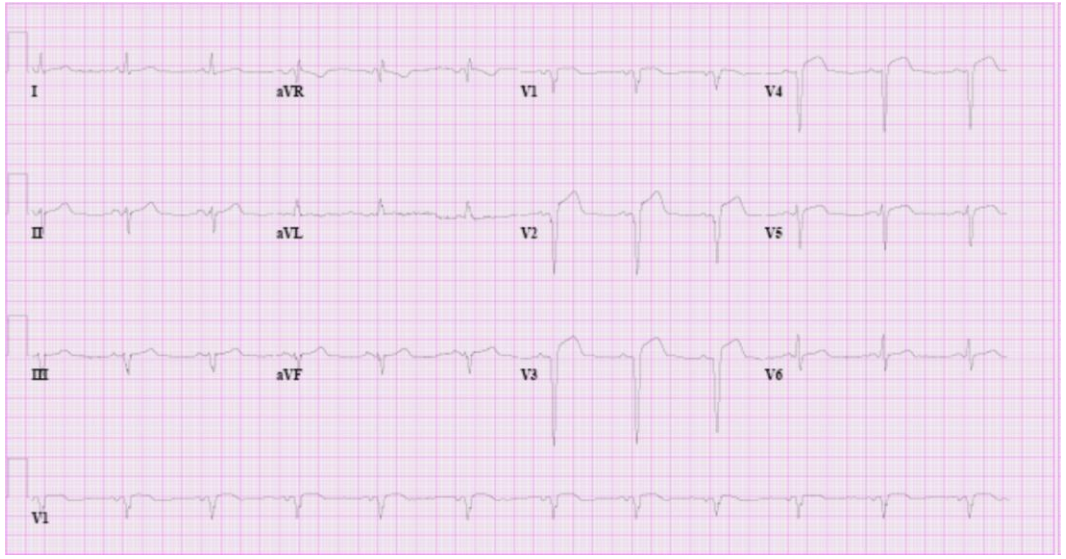

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CASE 10 (cont.)

The best next step in management is:

A) Echocardiogram
B) Anticoagulation with heparin
C) Urgent cardiac catheterization
D) Clopidogrel
E) Pharmacologic stress test

The correct answer is A.

- The clinical history of chest pain in the setting of cocaine use one week ago and his ECG suggests a missed anterior MI.
  - Following a myocardial infarction, cardiac biomarkers peak in 18-24 hours.
    - CK and CK-MB remain elevated for 48 hours, while troponins may remain elevated for 10 days.
    - The pattern of biomarkers here is consistent with a missed MI one week ago.

- The ECG demonstrates ST elevations in leads V1-V4, suggestive of an anterior ST-elevation MI. There are also Q-waves in leads V1-V4.

- The presence of anterior Q-waves plus persistent ST-elevations with a clinical story of a missed MI one week ago is suggestive of a **left ventricular aneurysm**.
  - An **echocardiogram** should be performed to look for the presence of a ventricular aneurysm and ventricular thrombus (choice A).
  - Left ventricular aneurysms are common complication of anterior MIs.
  - Left ventricular aneurysms are treated with afterload reduction and anticoagulation.

- Late, urgent catheterization of STEMI (after 24-48hrs) (Choice C) should only be done for severe heart failure, electrical or hemodynamic instability, or persistent ischemia.

CASE 11

A 28-year-old woman with no significant past medical history presents with nausea and vomiting after completing her first marathon. She was able to complete the marathon and thereafter immediately rehydrated. She took four 200mg ibuprofen tablets and was at a post-marathon party when she started to feel ill, saying unusual things to her friends such as, “I made a terrible mistake” and “I am drowning.” Her friends brought her to the emergency department. On examination, she is tired appearing and mildly confused, and has an otherwise non-focal neurological exam. Her jugular venous pressure is 6 cmH_2O

What is the best next step in the workup and management of this patient?

A) Administration of 1L intravenous normal saline

B) Oral rehydration with an electrolyte replacement sports drink

C) STAT electrolyte panel

D) Administration of hypertonic saline at a rate of 1cc/kg/hr

E) Measurement of an ibuprofen level

The correct answer is C.

- This patient likely has **symptomatic, acute hyponatremia**, likely caused by extreme loss of hypotonic fluid (sweat) from exercise and replacement of the hypotonic fluid with free water.
- **The first step in this emergency should be to obtain a STAT electrolyte panel to confirm hyponatremia and to help guide further treatment (choice C).**
- In the setting of euvolemia, rehydration with normal saline and PO hydration is inadequate to correct hyponatremia and can result in worsening hyponatremia (choices A and B).
- Empiric administration of hypertonic saline should be avoided in a clinical setting where labs can be obtained rapidly as correcting hyponatremia too quickly can lead to an osmotic demyelination syndrome or central pontine myelinolysis (choice D).
- The patient's signs and symptoms are inconsistent with ibuprofen overdose (choice E).

CASE 12

A 36-year-old woman with depression, mild asthma, and obesity presents with three weeks of a non-productive cough. She also has paroxysms of coughing and post-tussive vomiting. She denies significant wheezing. She works at a day care. She got her vaccinations as a child. Vital signs, lung exam, complete metabolic panel, and chest X-ray are unremarkable.

The best treatment at this time would be?

A) Albuterol inhaler

B) Azithromycin

C) Prednisone

D) Anti-tussive agents

E) Admission to the hospital for IV antibiotics

The correct answer is B.

- The clinical presentation suggests **pertussis**, which can be a cause of persistent cough in adults, even those who received vaccinations as child.
  - **Paroxysms of coughing** and **post-tussive vomiting** are suggestive of pertussis.
  - The clinical course of pertussis in adults is usually less severe than in children.
  - Treatment for pertussis with a **macrolide antibiotic** (i.e., **azithromycin**, choice B) is advised within 4 weeks of symptom onset in order to contain the spread of infection.

- Albuterol inhaler (choice A) and prednisone (choice C) might be used for an asthma attack but are not indicated for this patient.

- There is no clinical indication for hospitalization or IV antibiotics for this patient (choice E).

CASE 13

A 38-year-old woman with a history of diffuse cutaneous systemic sclerosis presents with lower extremity edema for one week. Her baseline blood pressures are 120-140/70-80. She is on nifedipine and omeprazole.

On examination, she is afebrile. Her HR is 98 and BP is 170/100. She has skin thickening over the face, hands, arms, chest and abdomen. There are telangiectasias on her face and palms. Her cardiac examination is notable for an S4. Her lungs are clear. She has 2+ lower extremity edema. Laboratory evaluation reveals hemoglobin 9.8, platelets 95, BUN 40, creatinine 2.4, and albumin 3.4. Urinalysis shows 2+ protein and 10 RBCs/high-powered field. A peripheral blood smear shows 2+ schistocytes.

Along with admitting the patient to the hospital, what is the most appropriate next step in management?

A) Increase the nifedipine dose

B) Begin captopril

C) Start oral labetalol

D) Begin IV methylprednisolone

E) Start oral prednisone

The correct answer is B.

- The patient has scleroderma and now has hypertension, lower extremity edema, renal failure with proteinuria, and microangiopathy consistent with **scleroderma renal crisis**.

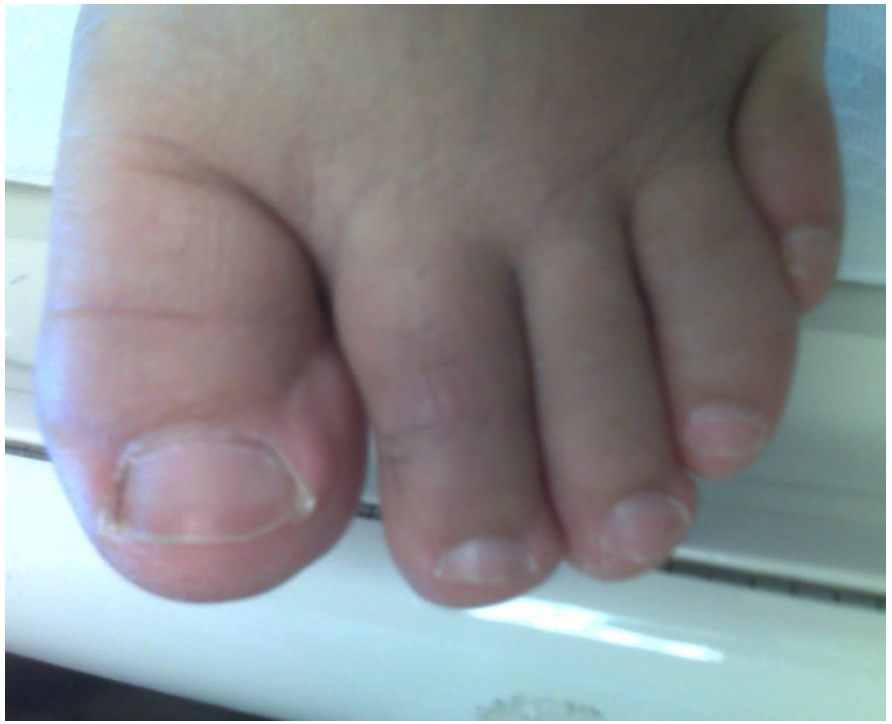
- The drug of choice for scleroderma renal crisis is an **ACE inhibitor** with rapid titration to reduce blood pressure.
  - ACE inhibitors are the most effective medication to preserve or improve renal function in scleroderma renal crisis.
  - ACE inhibitors have shown a **significant reduction in mortality** in this setting.

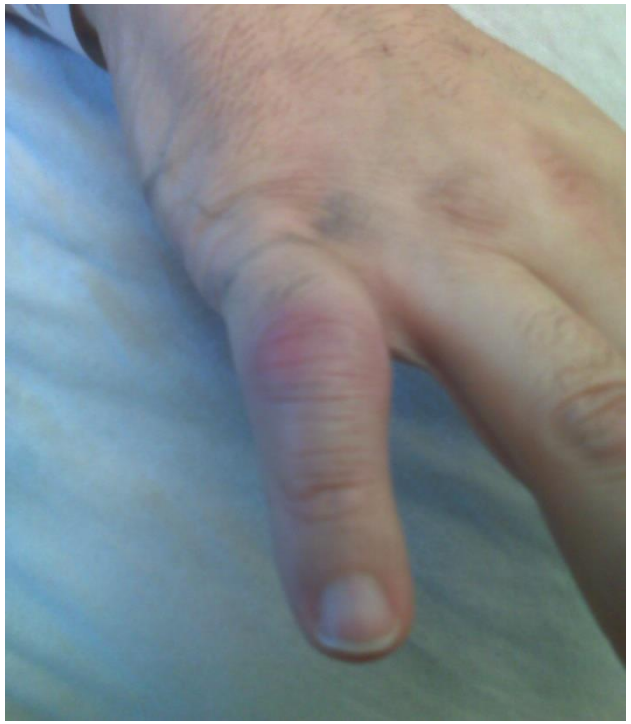
- Corticosteroids are not indicated (choices D and E) for scleroderma renal crisis.

Rheum Dis Clin North Am 2003;29:315-333.

CASE 14

A 36-year-old man presented to his primary care physician with a week-long history of severe pain in his left Achilles tendon. Over the past few days, he has also developed pain and swelling in his fingers and toes (see photographs below). He has been having difficulty walking and bearing weight. Of note, two weeks ago, he developed a week-long course of diarrhea accompanied by chills and sweats following a weekend camping trip.





CASE 14 (cont.)

The most appropriate treatment is:

A) Ceftriaxone 1g IV
B) Methylprednisolone 1000mg IV
C) Prednisone 60mg PO
D) Indomethacin 50mg PO
E) Observation

The correct answer is D.

- This is a presentation of **reactive arthritis**, which presents as an asymmetric mono/oligo-arthritis, predominantly of lower extremity joints.
    - Classically, it also presents with **enthesitis** (inflammation of the insertion of ligaments, tendons, joint capsule, or fascia to bone -- typically the Achilles tendon) and **dactylitis** ("sausage digits").
    - Extra-articular involvement may include **urethritis, conjunctivitis, uveitis, oral ulcers, and rashes**.

- Reactive arthritis may occur following **genitourinary** or **enteric** infections caused by *Chlamydia trachomatis, Yersinia, Salmonella, Shigella, Campylobacter*, and possibly *Clostridium difficile*.

- Treatment for reactive arthritis is with **NSAIDs**, such as indomethacin, for at least two weeks.

- Gonococcal arthritis (for which ceftriaxone, choice A, would be an appropriate treatment) may present with the abrupt onset of a mono- or oligo-arthritis, but typically does not cause sausage digits, and frequently presents with a rash.

- Intravenous (Choice B) or oral (Choice C) steroids may be used to treat numerous rheumatologic conditions but are not the treatment of choice for reactive arthritis.

- Observation (Choice E) is not the best choice given the severity of symptoms in this case.

CASE 15

A 39-year-old woman of Greek descent presents to the emergency department after experiencing a brief loss of consciousness while at work. Workup in the emergency department reveals a WBC 4, Hgb 6.5, Plt 207.

She notes that she had a viral syndrome one week ago, which subsequently resolved. She has no history of bleeding. She recently moved into a new house three months ago. She notes that she has had a propensity to chew ice for the past one year. She has no family history of anemia.

Additional workup reveals: MCV 55, Iron < assay, Ferritin 1, TIBC 400, ESR 8. Normal haptoglobin, LDH, B12, and folate levels.

Blood smear shows microcytic, hypochromic red blood cells of varying shapes.

Of note, CBC three years ago showed a Hgb of 9.5 with an MCV of 85.

CASE 15 (cont.)

The most likely diagnosis is:

A) Thalassemia

B) Iron deficiency anemia

C) Lead toxicity

D) Hemolysis

E) Anemia of chronic inflammation

The correct answer is B.

• This is a case of **profound iron-deficiency anemia**, as evidenced by **microcytic anemia** with very low **ferritin** level.

• Common causes of microcytic anemia include iron deficiency, thalassemia, and chronic inflammation (i.e. anemia of chronic disease). Rarer causes include copper deficiency, lead poisoning, and sideroblastic anemia.

• Iron deficiency may have an insidious onset, with typical presenting symptoms including fatigue, weakness, exercise intolerance, headache, and irritability. Additional signs and symptoms include tongue pain, dry mouth, pica/pagophagia, and restless leg syndrome.

• Thalassemia (Choice A) typically presents with very low MCVs, as in this case, but iron stores should be normal to increased. The prior MCV of 85 also makes thalassemia highly unlikely, as it is an inherited disorder.

•Lead poisoning (Choice C) may cause microcytic anemia. Basophilic stippling is often (but not always) evident on peripheral blood smear. Other manifestations include abdominal pain, joint and muscle aches, memory problems, and irritability.

• The normal haptoglobin and LDH make the diagnosis of hemolytic anemia (Choice D) less likely.

• Anemia of chronic disease (Choice E) typically presents with low iron and low TIBC, but an increased ferritin. The ESR would also be expected to be elevated.

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Board Review Practice - 3

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