



2022 Abstract Competition  
September 27 & 29, 2022 via Zoom

## **Student Abstracts**

### **Categories accepted:**

Basic Research  
Clinical Research  
Clinical Vignette  
Quality Improvement/Patient Safety  
High Value Cost- Conscious Care

## **Abstract 1**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Amyotrophic Lateral Sclerosis presenting as acute atypical respiratory failure

### **Abstract Text**

#### Introduction

Amyotrophic Lateral Sclerosis (ALS) is a rapidly progressive neurodegenerative disease that affects both upper motor neurons and lower motor neurons with an inevitably fatal course. The most common presentation for ALS involves complaints in the distribution of spinal nerves or bulbar nerves. The most common cause of death in ALS is due to diaphragmatic paralysis and ultimately respiratory failure. Albeit rare, this case highlights the importance of maintaining respiratory onset ALS when creating the differential diagnosis of a patient with respiratory complaints.

#### Case Description

A 68-year-old woman with a history of restrictive lung disease, bronchiectasis, panlobular emphysema, chronic respiratory failure with hypoxia, and stage IV breast cancer status post right mastectomy and radiation therapy reported to the ED after referral from outpatient pulmonology clinic. She reported increasing shortness of breath over the past year requiring increasing use of her average volume assured pressure support machine (AVAPs) up to 20 hours per day. At this time neurology was consulted for further workup for a possible neuromuscular cause.

History in the ED elicited an increasing feeling of generalized weakness over the last two months and weight loss over the last two years. The patient's neurological history is otherwise negative, denying any vision changes, motor changes, sensory changes, headaches, hearing changes, numbness, or tingling. During physical exam, fasciculations were noted in all four extremities with brisk bicep and bilateral knee reflexes. Her physical exam was otherwise unremarkable. A trial without AVAPs was performed, and the patient quickly desaturated to <90% SpO<sub>2</sub> in under one minute.

Workup included computed tomography of the head, spine, chest, abdomen and pelvis. Magnetic resonance imaging was deferred as she could not tolerate this without AVAPS. Imaging results were negative. A neuromuscular disease specialist was consulted for electromyography testing which showed widespread denervation with chronic reinnervation changes in her cervical, thoracic, and lumbar regions, spared sensory responses, diffusely small or absent motor compound motor action potential amplitudes, and axonal range slowing of compound motor action potential velocities. Complex repetitive discharges were also noted in multiple muscle groups, indicating chronicity. Given these findings a diagnosis of ALS was made.

#### Discussion

Respiratory onset ALS accounts for approximately 3% of all cases, and carries a poorer prognosis. One of the most fatal sequela of ALS is the effect on the diaphragm. Respiratory insufficiency in ALS is an established prognostic indicator, and respiratory involvement usually

presents late in the disease course. This case helps highlight the importance of maintaining a wide differential in the setting of reduced respiratory function as early intervention can help improve quality of life and outcomes.

**Media Link**

## **Abstract 2**

**Category Submitting for:** Quality Improvement

**Abstract Title** Employing a quality improvement database to observe the gaps in care at a student run free clinic

### **Abstract Text**

Introduction: The Student Health Alliance Reaching Indigent Needy Groups (SHARING) clinics are student run free clinics (SRFCs) at the University of Nebraska Medical Center (UNMC) that serve low income, uninsured adults in Omaha, Nebraska. Like many other SRFCs, they face multiple barriers to providing high quality care. Database: To address this, the SHARING Quality Improvement (QI) Database was created. QI has many definitions, but, overall, it is a method of analyzing clinic performance and the changes made to improve the clinic. Before this database, there was no way of continuously tracking clinic metrics over time, so previous QI projects required timely data abstraction that often only evaluated retrospective outcomes with limited real-time data to track clinical outcomes as changes were implemented thereby limiting our ability to implement further changes to improve patient health. A review of SRFC literature reveals the lack of a model or guide on how to assess quality of care in SRFCs and track patient data over time, a gap this study seeks to fill. Our database consists of a patient list of electronic medical records (EMR) that were compiled in the charting system, Epic. The patient data is exported into an Excel document each month and clinic metrics are analyzed, thus providing a real-time dashboard of quality metrics for the clinic. This database will be utilized to inform decisions regarding the reform of clinic processes. This database model can be used at other SRFCs to monitor quality of care provided at their clinics and implement QI measures accordingly.

**Media Link**

## **Abstract 3**

**Category Submitting for:** Clinical Vignette

**Abstract Title** An Unexpected Case of Ascites

### **Abstract Text**

Case:

A 46-year-old previously healthy male underwent an elective umbilical herniorrhaphy in March 2021 and was found to have ascites. A diagnostic laparoscopy was performed revealing a grossly

abnormal liver. Biopsies showed cirrhosis with moderate steatosis, patchy steatohepatitis, and hepatocellular iron deposition. Lab studies returned with ferritin: 1254 µg/L, iron saturation: 93%, INR: 1.9, AST: 63 U/L, ALT: 32 U/L, platelets: 63,000. Further workup revealed ANA positivity at a dilution of 1:640, anti-mitochondrial antibody positivity at 33 units, anti-smooth muscle (F-actin) antibody weakly positive at 21 units and alpha-1-antitrypsin (AAT) activity low at 61 mg/dL. Special stains were then performed on the original biopsies revealing AAT globules. Genetic studies confirmed H63D homozygous status for hemochromatosis and compound heterozygote status Pi\*SZ for Alpha-1-antitrypsin deficiency (AATD). Upon follow up with GI, the patient denied any family or personal history of liver disease. He endorsed a 5-year history of drinking 6-8oz of vodka daily and denied any history of recreational drug use. One-year after diagnosis, he was hospitalized with E. coli bacteremia due to spontaneous bacterial peritonitis. After successful treatment of this infection, orthotopic liver transplant was performed given worsened MELD-Na score.

#### Discussion:

The most common causes of cirrhosis in the United States are alcoholic liver disease and non-alcoholic fatty liver disease (NAFLD).<sup>1</sup> There are a number genetic and autoimmune causes of cirrhosis that are much rarer, like hereditary hemochromatosis (HFE), alpha-1-antitrypsin deficiency, Wilson disease, primary biliary cirrhosis, and primary sclerosing cholangitis.

HFE is the most prevalent autosomal recessive condition in descendants of northern European people.<sup>2</sup> The risk of cirrhosis is increased when serum ferritin is higher than 1,000 ng/mL. The two most common variants are a missense mutation (C282Y) and a substitution mutation (H63D).<sup>3</sup> The risk of developing iron overload in the setting of H63D mutation is unclear though there is evidence to suggest that alcohol acts as a potentiator in these patients towards the development of liver disease.<sup>4</sup>

AATD is an underdiagnosed disease. The less severe genotype, Pi\*SZ, retains approximately 60% of normal serum activity, and individuals with this mutation rarely develop liver disease.<sup>5</sup> However, with predisposing liver conditions such as HFE mutation, the risk of cirrhosis is increased.

#### Conclusion:

In the current patient, the cause of cirrhosis is likely multi-factorial as he had co-existent AATD and hemochromatosis in addition to autoimmune hepatitis, non-alcoholic fatty liver, and recent heavy alcohol use. Decompensated cirrhosis is not always caused by a single, unifying diagnosis. Some risk factors may potentiate others. Due to the significant costs of liver transplant, a thorough evaluation is warranted in all cases to best steward resources, avoid premature closure or attribution bias, and guide post-transplant care.

#### Media Link

#### Abstract 4

**Category Submitting for:** Quality Improvement

**Abstract Title** Magis Women's Clinic: Social Determinants of Health Affecting Women's Health Care in Omaha, NE

**Abstract Text**

Magis Clinic consists of acute care, psychiatry, and women's clinics that are student-run and free to patients. Free health clinics are extremely important, and serve a population of patients who face many health disparities and access to care. Unfortunately, there is limited research in how clinics address social determinants of health and understand patient needs. With higher than national average STD rates in Douglas County and few free women's clinics in Omaha, Magis Women's Clinic (MWC) strives to provide high quality, comprehensive women's health care. This quality improvement project further seeks to understand the MWC patient population by assessing patient demographics, healthcare experiences, and social determinants of health.

Any English speaking patient, aged 18-89 years, attending MWC has the opportunity to take the voluntary, confidential, anonymous IRB-approved survey. The 20 question survey is adapted from AAFP Pre-Visit Questionnaire, AAFP Social Needs Questionnaire, and CAHPS Adult Commercial Survey 5.1. Demographic and summary statistics are calculated using SPSS to further understand the barriers to healthcare of under resourced women in the Omaha community.

Over eight months, biweekly MWC saw 49 patients. While 23 patients elected to participate in the survey, four participants were eliminated due to incomplete data (N=19). Most of the female patients seen in clinic were between 25-54 years old (84.2%, N=16) and identified as white (47.4%, N=9). Approximately, 94.8% (N=18) of the participants had some college or a high school degree. Only 47.4% (N=9) claimed to have a primary care physician (PCP), although 89.5% (N=17) had Medicare or Medicaid. Common conditions seen in clinic included depression, smoking, and high blood pressure. About 73.6% (N=14) of patients claimed that having no transportation was a barrier to receiving health care with other challenges including clinic being too far away and inconvenient appointment times. Main reasons for visiting MWC included acute care concerns (N=12) along with prescription refills, STD testing, wellness checks, and breast exams. Patients most frequently indicated that they would be interested in STD testing and education. To note, 72.2% of participants indicated on the AAFP Social Needs Questionnaire that they would like to receive more information on available services and resources.

Despite offering a wide range of women's services (pap smear, mammogram, STD testing/education, etc.), the majority of patients coming to MWC present with acute care concerns. Although majority have insurance, many do not follow with a PCP regularly due to barriers to healthcare, most notably a lack of transportation to access the otherwise available healthcare. This research exemplifies the need for further research and allocation of resources to addressing social determinants of health, particularly in the context of women's health care services in Omaha. Our clinic continues to make improvements and expand services to best serve our patients.

**Media Link**

## **Abstract 5**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Gout as a Cellulitis Mimicker

### **Abstract Text**

#### Case

A 55-year-old man presented after a ground level fall due to one-day history of left lower extremity pain. He was hypertensive and afebrile, with left lower extremity edema and erythema over the anterolateral portion of the left foot. The left lower extremity was exquisitely painful to light touch, worst in the ankle and knee. He resisted passive movement of the ankle and knee joints and declined to ambulate due to pain. White blood cell count (WBC) was 14.2, ESR was 35, CRP was 5.7, and uric acid was 8.1. X-rays of the left lower extremity were notable for diffuse soft tissue swelling, moderate left knee joint effusion, and no acute fractures. Treatment with cefazolin was initiated for suspected cellulitis of the left lower extremity. On repeat exam hours later, erythema appeared less evident on the left foot and the patient stated that pain was becoming more severe in the left knee. Arthrocentesis of the left knee produced 10 mL of straw-colored fluid. Analysis of fluid revealed 31,640 WBCs with a differential of 89% neutrophils and monosodium urate crystals. Gram stain of synovial fluid revealed no bacteria and culture yielded no growth. A prednisone burst was administered for gouty arthritis, within 12 hours the pain had substantially improved, and the patient was able to ambulate. Antibiotics were discontinued due to low suspicion for infection.

#### Discussion

Gout is a crystalline arthropathy that is frequently encountered by general internists in both outpatient and inpatient settings. Gout is typically encountered in flares of sudden onset inflammation, generally occurring in a single joint of the lower extremities. Symptoms include pain, redness, warmth, and swelling in the affected joint. Elevations in WBC, CRP, and ESR are common but not specific.

Cellulitis can present similarly to crystalline arthropathies, occurring in a focal location with many of the same signs and symptoms. Important distinguishing features of cellulitis can include systemic symptoms such as fever and chills, presence of purulence, and local color changes. However, these distinguishing features are often not present, making diagnosis challenging.

Diagnosis of gout is made via synovial fluid analysis, with characteristic negatively birefringent, needle shaped crystals of monosodium urate confirming the diagnosis. In cases in which infection is suspected, arthrocentesis should be deferred until after infection is ruled out to prevent seeding the joint space.

Acute gout flares and cellulitis are both common causes of pain, erythema, warmth and swelling presenting in both inpatient and outpatient settings. Differentiating between these two entities is essential as the treatment strategies are different and the correct diagnosis can rapidly improve patient debility and limit use of unnecessary antibiotics.

## Media Link

### Abstract 6

**Category Submitting for:** Clinical Vignette

**Abstract Title** Aortic dissection in a patient with giant cell arteritis

#### Abstract Text

##### Introduction

Aortic dissection is a potentially devastating condition, arising from aortic wall damage, that may be associated with large-vessel vasculitis such as giant cell arteritis (GCA), the most common non-infectious inflammatory cause. We present a case of aortic dissection suspected to be primarily due to GCA vasculitis.

##### Case

An 81-year-old woman, with a past medical history of atrial fibrillation, biopsy-proven membranous nephropathy, hypertension, and a recorded history of GCA, presented to the ED after non-contrast CT abdomen/pelvis demonstrated an abdominal aortic dissection. She reported decreased appetite and malaise for three weeks; she did not experience chest pain or abdominal pain. Following admission, a repeat CT scan with contrast confirmed a Stanford B aortic dissection with extension to the renal artery ostia (no extension into the renal arteries) as well as a small saccular outpouching to the right of the infrarenal abdominal aorta. There was adjacent retroperitoneal fat stranding and periarterial fat stranding with apparent caliber narrowing in the distal subclavian/brachial arteries bilaterally. Her blood pressures and heart rate were strictly controlled using a  $\beta$ -blocker (esmolol initially followed by sotalol or metoprolol), calcium channel blocker (amlodipine), and digoxin. Since the patient did not have other active symptoms associated with GCA, such as temporal tenderness or jaw claudication, rheumatology felt that a temporal biopsy has a low yield on confirming the diagnosis and started the patient on empiric high-dose prednisone. The aortic dissection remained stable without expansion. She was discharged in fair condition to follow-up with cardiology, rheumatology, vascular surgery, and nephrology.

##### Discussion

This case emphasizes the importance of keeping inflammatory vasculitis in consideration for etiologies of new-onset aortic dissection in addition to atherosclerotic disease. A significant portion of patients with GCA have concurrent aortitis at time of diagnosis or during an acute flare, so guidelines encourage screening for manifestations of aortic damage (e.g., aortic dissection and/or aortic aneurysm). Adequate and timely treatment of the GCA as well as the aortic dissection provides optimal mortality benefit and reduces morbidity from both diseases.

## Media Link

## **Abstract 7**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Histoplasmosis Pericarditis with Pericardial Effusion

### **Abstract Text**

#### Introduction

Histoplasmosis is a common fungal infection caused by the dimorphic fungus, *Histoplasma capsulatum*. People living in the Ohio and Mississippi River Valleys are most commonly infected by histoplasma. Although most people with histoplasmosis are asymptomatic, some people acquire more severe infections especially if they are immunocompromised (1). A few potential complications of histoplasmosis include granulomatous mediastinitis, fibrosing mediastinitis, and pericarditis with or without a pericardial effusion (2).

#### Case Description

A 28 year old female with a past medical history of chronic anemia presented to the ED with sharp epigastric pain that was worse with movement and deep inspiration. Her vitals were stable. Labs including CMP, CBC, b-hCG, and lipase were unremarkable aside from a low hemoglobin level of 9.7. CT of the abdomen showed a moderate sized pericardial effusion, gallbladder wall thickening, and a right adnexal ovarian hemorrhagic cyst. Right upper quadrant ultrasound also showed gallbladder wall thickening with trace pericholecystic fluid. Sonographic murphy's sign was negative. After the patient was given a ketorolac injection, she felt better. She was sent home from the ED with ibuprofen and colchicine for her pericardial effusion.

Three days later, the patient returned to the ED with increased epigastric pain that now radiated into her chest and neck. Echocardiogram revealed a large pericardial effusion, a dilated inferior vena cava, and mild right ventricular diastolic collapse indicative of impending cardiac tamponade. A pericardiocentesis successfully removed 600 ccs of exudative, lymphocyte predominant serous fluid and repeat echocardiogram showed only a trace pericardial effusion. The patient's symptoms significantly improved after the pericardiocentesis and she was discharged home on a 2 week course of aspirin and a 3 month course of colchicine.

Two weeks later, the patient returned to the ED with intermittent chest pain worse with deep inspiration and throat discomfort unaffected by swallowing. Echocardiogram showed no pericardial effusion, but CT angiogram showed an abnormal mass within the superior mediastinum concerning for malignancy. An endoscopic ultrasound-guided fine needle aspiration biopsy of the mass revealed fragments of necrotizing granulomas and no malignant cells. GMS stain showed fungal forms consistent with Histoplasmosis and AFB stain was negative. The patient was discharged home, and she was started on a 3 month course of itraconazole after her outpatient follow up appointment with Infectious Disease.



## Discussion

The patient in our case portrays the importance of chest imaging when evaluating patients with a pericardial effusion with an unknown etiology. Although this patient had an echocardiogram and pericardiocentesis, she never had any imaging of the chest performed until she came back to the ED for the third time with chest discomfort and underwent a CTA followed by biopsy. Although this patient was immunocompetent, she developed significant complications from histoplasmosis.

## Media Link

## Abstract 8

**Category Submitting for:** Clinical Vignette

**Abstract Title** Left Ventricular Non-Compaction Induced Heart Failure in a Patient with Congenital Hydrocephalus

### Abstract Text

#### Case

A 40-year-old male presented with complaints of heart palpitations and shortness of breath. He described two weeks of intermittent heart palpitations associated with epigastric pain radiating to his anterior chest and an unintentional weight gain of 10-15 pounds over the past month. Past medical history was remarkable for congenital hydrocephalus status-post placement of a ventriculoperitoneal shunt 22 years prior. In the emergency department, labs were notable for an elevated troponin of 176.4 ng/ml and brain natriuretic peptide of 5759 pg/ml. CT angiogram of the abdomen and pelvis with and without contrast showed moderate cardiomegaly with evidence of right heart strain. Electrocardiogram was remarkable for right axis deviation and a left bundle branch block. Echocardiogram revealed an ejection fraction of 16% with severe left ventricular global hypokinesis and eccentric hypertrophy resulting in diastolic dysfunction and increased left atrial volume. To further discern the cause of his heart failure, a cardiac catheterization was subsequently done but was unremarkable. Cardiac MRI was notable for prominent non-compaction of the myocardium at the anterolateral, lateral, and inferolateral left ventricle.

## Discussion

Left ventricular non-compaction (LVNC) is a rare type of cardiomyopathy resulting from ineffective embryogenesis. The consequence is disruption in compaction during early development of the left ventricular myocardium and increased number of endomyocardial trabeculations. Non-compaction is thought to result from a genetic mutation in 30-50% of cases and has been reported as part of certain congenital syndromes [1,2]. In the adult population, the prevalence has been reported to be 0.01% - 0.3% [3]. The phenotype ranges from a benign variant to a severe cardiomyopathy with reduced ejection fraction, as in the patient case reported above.

Given the only irregularity identified on workup was LVNC, it is likely that this abnormality was the inciting cause of his heart failure. This case is especially remarkable given that the patient was born with congenital hydrocephalus and subsequently treated with a ventriculoperitoneal shunt. Previously, a case of reversible LVNC was reported during progressive hydrocephalus in the pediatric population [4]. It has been postulated that the catecholamine surge triggered by the stress of progressive hydrocephalus on the brain parenchyma resulted in LVNC, a pathophysiology similar to that of Takotsubo cardiomyopathy. However, it is unknown whether the cause of LVNC was related to our patient's hydrocephalus given that his shunt was patent and

placed years prior to his presentation. Nonetheless, there may be a more complex relationship not yet discerned between LVNC and hydrocephalus. This nonclassical presentation of LVNC illustrates a rare cause of heart failure that may be related to hydrocephalus. Recognition of LVNC and further elucidating its association with hydrocephalus is crucial for identifying risk factors of LVNC and preventing its progression to heart failure.

## **Media Link**

### **Abstract 9**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Invasive Aspergillus Sinusitis Masquerading as Temporal Arteritis

#### **Abstract Text**

Invasive Aspergillosis is a very serious infection that typically affects immunocompromised hosts. Early identification and aggressive treatment are imperative for a potentially good outcome.

A 78-year-old-female with a past medical history significant for COVID-19 pneumonia one month prior to presentation, Myelofibrosis on Ruxolitinib, and Deep Vein Thrombosis/Pulmonary Embolism on Apixaban presented to an outside hospital with headaches and left sided visual loss. Temporal Arteritis was the working diagnosis at the time and the patient was started on high dose prednisone. During her inpatient stay, a temporal artery biopsy was inconclusive. The patient was discharged home, yet in the subsequent weeks, despite being on high-dose steroids, the patient's headaches continued to worsen. She also developed impairment in the extraocular movements of her left eye, without any improvement in her vision, which prompted her to come to the ER. An MRI of the brain was done which showed dural thickenings with contrast enhancement along the length of the optic nerves bilaterally (left greater than right) along with contrast enhancement along the floor of the anterior fossa (left greater than right) and the anterior mesial aspect of the floor of the left middle fossa. ENT was consulted and debridement of the affected sinuses was done. A biopsy obtained revealed Aspergillus species. The patient was initiated on Voriconazole and her prednisone and Ruxolitinib were discontinued. Due to the severity of her illness and the invasive procedures that would be required to treat her illness, palliative care was consulted and after a prolonged goals of care discussion, the patient decided to pursue supportive care only. The patient was discharged home on Voriconazole along with her Ruxolitinib and within one month, the patient passed away.

This case illustrates the importance of maintaining a broad differential diagnosis, especially in symptomatic immunocompromised patients. It is also important to consider the various causes of immunocompromised state, as well as the fact that multiple minor factors can culminate to put a patient at risk for opportunistic infections. For example, this patient had Myelofibrosis, history of recent COVID-19 infection, Ruxolitinib use, and high-dose steroids. When treating patients with complex medical history, we must keep in mind their complete medical history along with prior and current medication use to evaluate immune status. In those with multiple risk factors, as this patient, we have to have a high index of suspicion for infections, especially because these patients are more prone to atypical presentations. Rare and serious conditions will have

overlapping symptomatology and a thorough history and physical examination are the cornerstones of prompt diagnosis and treatment.

#### **Media Link**

#### **Abstract 10**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Khat-Induced Psychotic Disorder

#### **Abstract Text**

##### Introduction

Khat is a leafy green plant whose leaves are commonly chewed to achieve stimulant effects among people native to Eastern Africa (2). Khat has been widely consumed in these countries over many centuries for recreational and social purposes (4). The primary psychoactive component is cathinone, a monoamine alkaloid similar to amphetamine (3). Cathinone is an internationally controlled substance per WHO recommendation and a DEA Schedule 1 controlled substance (1). Despite these classifications, khat remains legal and popular across Eastern Africa. Chronic khat use has been linked to an increased risk of psychosis (2-5).

##### Case Presentation

A 56-year-old Somali man with a history of khat use since adolescence presented to the ED with paranoid delusions of neighbors using “black magic” and directing magnets at his head. Patient also described delusions of a shop keeper hiring men to murder him. Past medical history was remarkable for PTSD, visual/auditory hallucinations, stroke, essential hypertension, TBI, and 25-day coma following motor vehicle collision in 1995. He denied any homicidal or suicidal ideation. He claimed smoking one pack of cigarettes per day. He also reported drinking a few alcoholic beverages per week and consumed a couple drinks prior to ED arrival. He endorsed regular khat use over 40 years but denied additional drug use.

On chart review, patient was admitted one month ago for a headache similar in nature to prior stroke. Imaging and labs were all unremarkable. He described visual and auditory hallucinations at that time, which were inconsistent with stroke and more concerning for an underlying psychiatric condition. Our psychiatry team’s interview revealed his consistent khat use since adolescence. Review of the literature suggested his extent of chronic khat consumption has been linked to similar psychotic symptoms. Interview also revealed multiple stressors and traumas. Psychiatry recommended psychotherapy and khat cessation, instead of prescribing antipsychotics.

During ED visit, blood pressure was elevated at 195/104 and other vitals were within normal limits. Haloperidol 5 mg was given for acute psychosis and clonidine 0.2 mg to control hypertension. No labs or imaging studies were ordered. Patient was ultimately stabilized and discharged 2.5 hours after ED arrival with diagnoses of paranoid delusion, stimulant use disorder, and hypertension (unspecified).

## Discussion

According to DSM-5, substance-induced psychotic disorder is diagnosed when the involved substance can produce psychosis, and the associated psychotic symptoms started within 1 month of a substance intoxication or withdrawal from the substance. (5) Our patient fit this diagnosis given his paranoid delusions, history of current and chronic khat use, history of hallucinations, and unremarkable recent stroke workup.

## Conclusion

This case demonstrates that long term khat use can increase susceptibility to psychosis, especially in the setting of PTSD and other comorbid psychiatric conditions.

\*References sent to Casey Fehringer\*

## Media Link

## Abstract 11

**Category Submitting for:** Clinical Vignette

**Abstract Title** Osteoporotic Fracture Secondary to Low Testosterone in a Young Male

### Abstract Text

#### Introduction:

Osteoporosis is a condition in which bone mass is reduced and more prone to fractures (1). Although more common in post-menopausal women, osteoporosis frequently affects elderly men due to declining levels of sex hormones such as estrogen and testosterone (1,5,6). Even though estrogen offers the most protection against bone resorption, testosterone plays a significant role as well (3). Aging, chronic glucocorticoid use, certain medications, alcohol abuse, and a host of genetic conditions can also contribute to osteoporosis (1,4).

#### Case Description:

A 31-year-old male with a past medical history of major depressive disorder, generalized anxiety disorder, and alcohol use disorder presented to the ED with leg pain after sustaining a ground-level fall at home. On admission, his vitals were stable, and labs were unremarkable. His left lower leg was swollen and visibly deformed with extreme tenderness to palpation. The patient's home medications included bupropion, sertraline, and trazodone. He was also taking multiple over-the-counter supplements but denied using steroids or hormones. X-ray revealed a closed fracture of the left tibia and fibula, which was repaired via open reduction and internal fixation by orthopedic surgery. Testosterone levels were ordered due to the patient's young age and concern for osteopenia. He was discharged on vitamin D and calcium carbonate. After discharge, testosterone levels were found to be remarkably low, with a total testosterone of 87 ng/dl (normal 264-916 ng/dl) and a free testosterone of 6.6 pg/ml (normal 8.7-25.1 pg/ml).

#### Discussion:

A fracture after a ground-level fall in an otherwise healthy, young male should prompt further investigation. Because androgens act on osteoblasts and osteocytes to prevent excessive bone resorption, it is reasonable to order a testosterone level to rule out hypogonadism-induced osteoporosis in such a patient (2,7,8). If testosterone is low, LH and FSH can be measured to determine the cause. High LH and FSH indicate that the testes themselves are not producing testosterone. This is known as primary hypogonadism. If LH and FSH are low to normal, then a secondary cause is likely (5). In this case, a thorough assessment of the patient's medications, including over-the-counter supplements, should then be conducted to look for a possible offending agent.

#### Conclusion:

Testosterone levels should be evaluated in young, otherwise healthy males who sustain a low-impact fracture. Early detection of low androgens and intervention will help prevent future osteoporotic injuries.

#### Media Link

## Abstract 12

### Category Submitting for: Research

**Abstract Title** Immunotherapy Improves Overall Survival in Gastrointestinal Cancer Patients with Liver Metastases Who Did Not Undergo Primary Re

#### Abstract Text

**Background:** In total, gastrointestinal cancers equate to nearly 25% of all new cancer diagnoses and 33% of the cancer mortality rate. The presence of liver metastases is correlated with a significantly worse prognosis in all cancers. The objective of this study is to evaluate the association of immunotherapy with overall survival and prognostic factors that affect overall survival for gastrointestinal cancer with liver metastasis who did not receive definitive surgery of the primary tumor.

**Method:** Patients with liver metastasis from primary gastrointestinal cancers who did not receive definitive surgery of the primary tumor, diagnosed between 2004 and 2016, from the National Cancer Database, were identified. Kaplan-Meier curve was plotted for overall survival and the log-rank test was used for comparison. Cox proportional hazard analysis was used to observe the overall survival difference between immunotherapy, immunotherapy plus chemotherapy, and immunotherapy plus radiotherapy, and their counterparts without immunotherapy. The multivariable logistic regression analysis took into account age, sex, education, race (white, black, other), insurance status, hospital type, place of living (rural vs urban), Charlson/Deyo score, chemotherapy, radiotherapy, immunotherapy, histology, primary cancer, and year of diagnosis.

**Results:** The study included 42,097 patients with metastatic disease to the liver from GI primary cancers and who did not receive definitive surgery of the primary tumor. In total, 5987 (14.2%) of these patients received immunotherapy (table 1). In the multivariate analysis, recipients of immunotherapy, younger age, 'other' race, rectal primary cancer, and lower education had a

significantly improved OS (table 4). Patients treated with immunotherapy had significantly better overall survival (OS) than no immunotherapy (HR: 0.749,  $p < 0.001$ ). Subset analyses revealed that chemotherapy and immunotherapy were associated with a significantly improved OS (HR: 0.768, 95% CI,  $p < 0.001$ ) compared to chemotherapy alone. Radiotherapy to the primary site plus chemotherapy and immunotherapy was also associated with a significantly improved OS (HR: 0.796, 95% CI,  $p < 0.001$ ) compared to just radiotherapy and chemotherapy to the primary site. Lastly, chemotherapy with radiotherapy (to any sites other than the liver) plus immunotherapy was associated with a significantly improved OS (HR: 0.771, 95% CI,  $p < 0.001$ ) compared to its counterpart without immunotherapy. Interestingly, liver-directed radiotherapy plus chemotherapy and immunotherapy was not associated with improved OS compared to its counterpart without immunotherapy (HR: 1.038, 95% CI,  $P = 0.85$ ).

**Conclusion:** In this study, immunotherapy plus chemotherapy and radiotherapy (excluding liver-directed); and chemioimmunotherapy showed a significant increase in overall survival for this patient population compared to their counterparts without immunotherapy. These results can help guide the addition of immunotherapy in treatment regimens for this patient population and encourage further research in immunotherapy combined regimens for advanced GI cancers.

#### **Media Link**

#### **Abstract 13**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Where did all the bile go?

#### **Abstract Text**

Obstructive jaundice usually presents with the textbook symptoms of Courvoisier sign: an enlarged, nontender gallbladder with painless jaundice. However, when the biliary tract anatomy has been surgically altered, the reliability of typical physical exam findings seen in common biliary conditions may sway providers farther down the list of differential diagnoses away from the patient's accurate underlying problem.

An 80-year-old male with a past medical history of Stage IV pancreatic adenocarcinoma and cholecystostomy tube was admitted for concern for biliary tract infection due to distresses of increased drainage and fluid color change from his cholecystostomy tube in addition to new-onset pale, chalky stools. On exam, the patient was found to be afebrile, hemodynamically stable, but fatigued and pale-appearing. A complete metabolic panel (including total bilirubin) and complete blood count were within normal limits; the only exception was a slightly elevated alkaline phosphatase. He was prophylactically started on Zosyn. Computed tomography (CT) abdomen with contrast was obtained showing appropriate cholecystostomy tube placement without signs of infection. However, there was noted to be an interval increase in the known pancreatic head mass. Infectious disease was consulted and recommended stopping antibiotics. Surgery indicated no acute surgical intervention at that time. Upon further discussion, the interval size increase in

the pancreatic head mass was thought to be causing a partial obstruction of the common bile duct distal to the cholecystostomy drain causing the retrograde buildup of bile leading to the increased drain output correlating with the simultaneous change to pale, chalky stools. After three days in the hospital, the patient was discharged with follow-up endoscopic retrograde cholangiopancreatography (ERCP), which established a partial obstruction of the common bile duct. The obstructed common bile duct was stented during the procedure. Following stent placement, the patient reported feeling well with decreased drain output back to baseline.

This case illustrates the potential of patient care being hindered due to the influence of anchoring bias, the lack of a good differential diagnosis, and improper body fluid culturing. Although having a patient with an abnormal presentation of obstructive jaundice is rare, it is important to think about how the patient's comorbid conditions may be influencing the presentation of the primary problem as seen in this case. Recognizing and combating similar scenarios in future clinical practice can help reduce hospitalizations, financial burdens, and unwarranted medical interventions for future patients.

#### **Media Link**

#### **Abstract 14**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Avoiding the Righting Reflex: Respecting Patient Autonomy in the Medically Complex Patient

#### **Abstract Text**

A 40s-aged female presented for “erratic behavior,” reportedly running into traffic earlier. Her history included an appendectomy years ago for carcinoid tumor, numerous complex medical conditions, and chronic pain diagnoses. Her mother, feeling the patient was a self-danger, placed a Board of Mental Health (BOMH). A recent 5-HIAA and a nuclear medicine scan were normal, CBC and CMP unremarkable, and drug screen only positive for cannabinoids. She incidentally had uncontrolled hypertension. Neurology and psychiatry were consulted.

On interview, the patient was linear, goal-directed, and oriented; however, besides hypertension management, she couldn't identify a reason for admission. She stated she had been enjoying the weather before authorities accosted her and that her mother spitefully filed the BOMH due cannabis use, self-administered for pain control. The patient recounted an accurate medical history consistent with records. She firmly denied thoughts of harm to self or others and endorsed no audiovisual hallucinations. Midway into the interview, however, she exhibited some abnormal thought processes: She attributed her neck pain to a recent Babinski foot-jerk that displaced her ACL repair's screws, allowing them to travel through her bone marrow to her upper nape, causing inflammation. She requested upper and lower extremity sampling for cortisol blood draws, reporting that a spinal dissection had split her blood circulation into two independent pools. A collateral call revealed that there were no past mental health diagnoses, but the patient had developed progressively more eccentric and persistent delusions for years. She, however, was

independent and largely functional at home. Offering the patient MRI imaging for mental status work-up, she declined, citing concerns about magnetic interactions with the migrating screws. She declined further testing, though was amenable to low-dose olanzapine. Ultimately, given that her delusions were causing no harm to self or others, per patient wishes, the BOMH was dropped, and she discharged home.

This case is an important reminder regarding patient autonomy that is universally relevant: For internists, neurologists, psychiatrists, and countless others. There is a concept in motivational interviewing known as the “righting reflex,” the practitioner’s urge to identify a problem and solve it for the patient, versus allowing the patient to come to their own objectives and goals in conversation. With a history of progressive delusions and altered mental status, neuroimaging and more extensive testing is appropriate, and was desired by both the medical team and family. However, the patient did not identify her beliefs as a problem and only desired hypertension management; moreover, her beliefs were not an active harm to herself or others. Thus, despite the desire to “right” the patient, coercive testing would only unnecessarily damage the patient’s future trust in medicine, and furthermore, fail to respect the patient’s right to autonomy.

### **Media Link**

### **Abstract 15**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Cardiac Arrest in the Setting of Congenital Long-QT Syndrome

### **Abstract Text**

#### Introduction

Long-QT Syndrome (LQTS) is a heart condition characterized by an extended time between the beginning of the Q wave and end of the T wave, usually greater than 480ms. Causes may be either congenital or acquired and are usually preceded by a triggering event such as emotional or physical stress. Symptomatic patients may present with palpitations, syncope, seizures or cardiac arrest.(1) Unmanaged symptomatic LQTS often leads to torsades de pointes and sudden cardiac death.(2) The Schwartz score is used to diagnose LQTS.(3,4) Congenital LQTS is rare and is associated with genetic mutations causing ion channel dysfunction.(5,6) Phenotypic variation is seen with differences in arrhythmic triggers, electrocardiogram (EKG) patterns, and response to therapy.(7) Acquired LQTS can be caused by many drug classes including antiarrhythmics, antibiotics, and psychotropics.(8)

#### Case Description

A 40-year-old female with a past medical history of atrial and ventricular arrhythmia presented to the ED after a witnessed sudden cardiac arrest. After the patient collapsed at home, her father started CPR then EMS staff shocked her twice while en route to the hospital. The patient was started on amiodarone therapy. EKG showed sinus rhythm with premature ventricular beats, left



axis deviation, and a prolonged QTc of 490ms.

The following day the patient was extubated and weaned off sedation. Telemetry revealed no significant arrhythmia. Repeat EKG continued to show a prolonged QT interval when amiodarone was discontinued due to concerns of further QT interval prolongation. Of note, the patient's family history was significant for sudden cardiac death in her mother increasing suspicion for genetically acquired LQTS.

The patient cardiac workup including echocardiogram, cardiac MRI and coronary angiogram revealed no evidence of structural abnormalities. An implantable cardioverter defibrillator (ICD) was implanted, and the patient was discharged on metoprolol tartrate for probable LQTS and genetic testing will be done during follow up.

#### Discussion

LQTS is a condition that predisposes patients to a life-threatening ventricular arrhythmia. It should be a consideration in patients with new onset arrhythmias or arrest and clinicians should be cognizant of predisposing drugs. Genetic testing can be considered in patients who are suspected to have congenital LQTS to guide treatment.(9) In general, symptomatic LQTS can be managed with beta blockers. Propranolol and Nadolol have been shown to be more effective than Metoprolol. Patients with explained syncope, ventricular arrhythmia or survived cardiac arrest should be treated with an ICD.(4,10)

#### Media Link

### Abstract 16

**Category Submitting for:** Clinical Vignette

**Abstract Title** *Listeria Monocytogenes* Septicemia in the Setting of an Ulcerative Colitis Flare

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#### Abstract Text

##### Introduction:

Ulcerative colitis (UC) is an inflammatory bowel disease characterized by inflammation of the intestinal mucosa. The exact cause of the disease is unknown, but is theorized to be due to an autoimmune inflammatory response to colonic bacteria. Treatment of UC involves immunosuppressive agents, putting patients at risk for opportunistic infections like *Listeria (L.) monocytogenes*. *L. monocytogenes* is a gram-positive anaerobic bacteria associated with food-borne infections in the United States; uncommonly associated with a systemic infection known as listeriosis.

##### Case Presentation:

A 51-year-old male trucker presented to the emergency department (ED) at the Veterans Affairs Medical Center with a three-day history of intense abdominal pain and bloody diarrhea. At the time he was managing his UC with vedolizumab and taking 35 mg prednisone. Previous medication trials in the past included mesalamine, adalimumab, and infliximab. CT in the ED showed findings consistent with an acute UC flare. Blood cultures and a BioFire FilmArray GI Panel (BioFire Diagnostics, Salt Lake City, Utah) were collected, and the patient was admitted to the hospital floor for management.

On the second day of admission, 1/1 blood culture returned positive for *L. monocytogenes*. Given the clinical appearance of the patient and the infrequency of *L. monocytogenes* as a blood-borne pathogen, the managing team had low suspicion for bacteremia. Repeat blood cultures were obtained. On the fourth day of admission, 2/2 of the cultures were positive for *L. monocytogenes*. The patient began receiving gentamicin and ampicillin with improvement in clinical symptoms. Prior to discharge, the patient was switched to high-dose amoxicillin (1000 mg every 8 hours) for his return home.

**Discussion:**

*L. monocytogenes*, while being one of the most common foodborne infections, rarely causes systemic infection. In immunocompetent patients, *L. monocytogenes* infection is usually localized gastroenteritis. The highest risk for severe infection includes patients who are immunosuppressed, pregnant, neonates, or elderly. UC patients can potentially be at a higher risk for listeriosis due to several factors. As with our patient, the treatment for severe UC involved immune-modulating therapies, lowering the body's ability to fight off infection. *L. monocytogenes* can also lead to increased severity of UC flare due to increased inflammation in the colonic mucosa. Severe *Listeria* infection is associated with a 20-30% mortality rate. It is possible that the *L. monocytogenes* infection triggered the UC flare in this patient and the increased inflammation allowed for the seeding of the bacteria in the bloodstream.

**Conclusion:**

This case report supports the findings that UC treatment with immune-modulating therapies can place patients at an increased risk for opportunistic infections, such as *L. monocytogenes*.

**Media Link**

**Abstract 17**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Post-Mirtazapine Fever: A Case Report

**Abstract Text**

Introduction:

Mirtazapine is an antidepressant that can act as a selective  $\alpha_2$ -adrenergic antagonist, as well as a 5-HT<sub>2</sub> and 5-HT<sub>3</sub> antagonist and an H<sub>1</sub> agonist. Mirtazapine is commonly used in cancer patients due to its abilities to increase appetite, weight gain, and improve sleep. Fever as a side effect of mirtazapine is reported <1% of the time. We present the case of a cancer patient with recurrent fever, despite repeated negative blood cultures and decreasing inflammatory markers, whose fever closely followed the administration of mirtazapine and subsided upon cessation of mirtazapine.

Case:

A 71-year-old female presented to the hospital as a transfer for altered mental status and a fever of 102.8°. Her medical history included hypertension, hyperlipidemia, cerebrovascular accident, heart failure with reduced ejection fraction, and metastatic endocrine small bowel carcinoma. Treatment at the transferring hospital was with vancomycin, flagyl, acyclovir and ceftriaxone for initial concern for meningitis. On further workup, urine cultures were positive for gram negative rods. Based on clinical presentation and urinalysis positive for infection, meningitis was determined less likely and urinary source more likely. Additional workup determined that her altered mentation and fever were due to septic shock from UTI. Antibiotics were switched to ceftriaxone. By hospital day two, the patient's fever resolved, and cultures were negative. However, for three days after this initial resolution of fever, the patient would remain afebrile throughout the day until around 8pm, at which time she would then spike a fever. This episodic fever reached up to up to 102.3°, would last less than an hour, then resolve spontaneously. Procalcitonin levels were down-trending, as well as white blood cell count. Clinical status was improving. 5-HIAA levels were within normal limits. Additional blood cultures were negative. After looking at the patient's chart, it appeared that the fever was spiked within an hour of administration of nightly medications. Nightly mirtazapine was suspected, and the medication was held. After discontinuation of mirtazapine, the patient's fever did not recur.

#### Discussion:

Fever is a rare adverse effect of mirtazapine, reported in less than 1% of patients. In this patient with resolving sepsis, infectious etiologies were first ruled out as a cause for fever. However, after multiple negative blood cultures, a normalizing white blood cell count, a decreasing procalcitonin level, and improving clinical status, another etiology for the fever was pursued. Given the transient nature of the fever and the correlation of the fever with administration of mirtazapine, mirtazapine as a cause was considered. Further review of medications revealed no additional serotonergic medications being administered. Given the patient's endocrine small-bowel carcinoma, 5-HIAA levels were drawn, and were within normal. Discontinuation of mirtazapine eliminated the recurrence of the patient's fever, and mirtazapine was determined as the cause.

#### Media Link

#### Abstract 18

**Category Submitting for:** Clinical Vignette

**Abstract Title** Hyponatremia in Craniopharyngioma Patient

#### Abstract Text

Case Section

A 78-year-old presented to the ED with two days of fatigue and right leg spasms. He also reported

two episodes of vomiting that morning. Patient denied fever, chills, headache, chest pain, or shortness of breath. Initial vitals were within normal limits and physical exam was only remarkable for pill-rolling tremor. CMP showed sodium of 120 mmol/L, serum osmolality 252 mOsm/kg, urine osmolality 528 mOsm/kg, urine sodium 87 mmol/L, free T4 1.2 ng/dL. Patient reports drinking extra water, more than half a gallon a day, "to avoid dehydration". He also denied aversion to fluids. Chart review revealed the patient has a history of craniopharyngioma. The patient has had prior surgical reduction plus targeted radiation. Serial MRIs last performed 3 years prior showed 1.0cm size and no growth. He also has known hypopituitarism and is adherent to hydrocortisone and levothyroxine.

## Discussion

Craniopharyngiomas are benign tumors but can have significant clinical impact due to their mass effect on surrounding structures. One potential consequence of these tumors is disturbance to fluid balance due to damage to the hypothalamus and pituitary gland. Osmoreceptors in the hypothalamus sense the body's plasma tonicity. In response to elevated osmolality, the hypothalamus can secrete anti-diuretic hormone (ADH) and stimulate thirst. The hypothalamus releases ADH into the posterior pituitary gland where it is stored. Both the hypothalamus and the pituitary gland can be affected by compression from the tumor or due to damage during surgery or radiation.

Our patient presented with hyponatremia and polydipsia. The hyponatremia with elevated urine sodium in the patient with adequate steroid and thyroid replacement is consistent with syndrome of inappropriate anti-diuretic hormone (SIADH), which has been seen before in cases of craniopharyngiomas. The polydipsia is thought to be due to damage to the thirst center in the lateral thalamic area.

Craniopharyngiomas developing into hyponatremia is rare. More common is diabetes insipidus causing hypernatremia. This is due to the tumor compressing the infundibular stalk which carries ADH from the hypothalamus to the posterior pituitary. Clearly, these tumors can have wide-ranged impacts on fluid status and electrolyte balance. As a result, the importance of monitoring patients' electrolytes and counseling on fluid intake is critical.

## Media Link

## Abstract 19

**Category Submitting for:** Clinical Vignette

**Abstract Title** Source Control in Sepsis: Ruling out all Possibilities

### Abstract Text

Case Description:

A 34 year-old man presented with one week of progressively worsening pleuritic chest pain and fevers. He also endorsed malaise, chills, nausea, vomiting, anorexia, shortness of breath, and

headaches. Medical history was significant for polysubstance abuse, including IV drug use, and chronic hepatitis C. The patient had been incarcerated for one year and had been living in a half-way house for the prior two weeks before presentation. He had left sided chest tenderness that radiated to the left arm on exam. Tachycardia and tachypnea were present, and the patient was shivering. An abscess of the left buttock and left shoulder pain with movement were also noted. Initial labs revealed leukocytosis, thrombocytopenia, and elevated procalcitonin. A chest CT revealed numerous cavitating pulmonary nodules, as well as splenomegaly. No valvular vegetations were present on trans-thoracic echocardiogram although mild tricuspid regurgitation was present. Blood cultures grew gram positive cocci identified as MSSA and the patient was started on IV cephazolin. A trans-esophageal echocardiogram was performed and was also normal. This was surprising considering the patient met definite Duke criteria for endocarditis. Repeat blood cultures 48 hours later grew positive again. The patient was continued on cephazolin due to clinical improvement. A third set of cultures returned negative. The patient was discharged on IV dalbavancin due to concerns about adherence to oral antibiotic and discharging with a PICC line in place. Although the patient had three possible sources of infection, including gluteal abscess, left shoulder joint, and endocarditis, further workup proved negative for all three and his sepsis was due to presumed complicated bacteremia.

#### Discussion:

Sepsis is a life-threatening diagnosis that must be suspected in all clinically ill patients, especially those with risk factors. Early administration of antibiotics is critical in reducing morbidity and mortality in these patients. Perhaps most importantly, identifying a source or a nidus of infection is essential in managing sepsis. This patient met sufficient Duke criteria, had previously used IV drugs, and had imaging findings consistent with pulmonary infarcts- making endocarditis a very likely cause of his sepsis and persistent bacteremia. Despite this, both transthoracic and transesophageal echocardiography failed to show valvular vegetation or functional cardiac abnormalities. A septic joint was also considered due to the patient's left shoulder pain although this was ruled unlikely due to lack of erythema, swelling, or warmth of the joint. The patient's gluteal abscess was managed by wound care and continued to improve throughout hospitalization. This case highlights the importance of considering all sites of infection in a patient who presents with sepsis and ruling each out with appropriate diagnostics. Sometimes a definitive source is never discovered, and patients must be managed with antibiotics targeted toward organisms identified via blood cultures.

#### Media Link

#### Abstract 20

**Category Submitting for:** Clinical Vignette

**Abstract Title** Type IV RTA in the Setting of Lisinopril and Bactrim

#### Abstract Text

A 76 year old male with a past medical history of CKDIIIa, type II diabetes melitus, hypertension, and chronic venous insufficiency presented for workup of hyperkalemia. The lower portion of his

legs had patchy, red-bronze erythema and scaling bilaterally. The patient was on Lisinopril and also had been taking bactrim for the previous six weeks for presumed bilateral lower extremity cellulitis. He was referred to the ED from his PCPs office for potassium of 6.2 and Cr increased to 2.8 from baseline of 1.7.

He was initially treated in the ED with albuterol for moderate hyperkalemia. Blood gas workup revealed pH 7.25, bicarbonate 13, pCO<sub>2</sub> 30 and anion gap 12. Urine studies revealed pH <5.5 and urine anion gap elevated at 6. On admission, repeat potassium identified hyperkalemia as severe at 7.2. He was subsequently treated with calcium gluconate, insulin, and lokelma. Bactrim and Lisinopril were held, and the patient's kidney function gradually returned to baseline.

#### Discussion:

Hyperkalemia is seen ubiquitously among internists and commonly caused by renal insufficiency. Hyperkalemia may have deadly cardiac consequences and should be managed urgently with temporizing measures including calcium gluconate, insulin and dextrose. Total body potassium may also be lowered using a potassium wasting diuretic or potassium binder. Although treatment with a beta 2 agonist promotes intracellular potassium shift, this alone is inadequate for the treatment of moderate to severe hyperkalemia, making this case an example of a near miss.

Normal potassium homeostasis is regulated primarily through excretion by the kidneys. This is maintained through the action of aldosterone, which upregulates ENaC sodium channels in the collecting duct of the nephron creating a favorable gradient for the excretion of potassium. Aldosterone also increases excretion of H<sup>+</sup> through upregulation of H<sup>+</sup> ATPases. If the action of aldosterone in the kidney is insufficient, patients can develop hyperkalemia and metabolic acidosis classified as renal tubular acidosis type IV. Although hypoaldosteronism causes decreased excretion of H<sup>+</sup> in the collecting duct, RTA type IV is characterized by urine pH <5.5 because hyperkalemia prevents ammoniagenesis. RTA type IV is also characterized by elevated urine anion gap and normal serum anion gap.

Although patients with CKD are typically able to maintain appropriate potassium homeostasis, they can develop hyperkalemia in the setting of oliguria or decreased renin production. This patient had multiple additional contributing factors. The trimethoprim component of Bactrim contributes to RTA type IV by closing ENaC channels in the collecting duct. The patient likely did not need Bactrim treatment as his rash was more consistent with stasis dermatitis. Lisinopril can contribute to RTA type IV by inhibiting production of aldosterone. This patient's presentation may have been avoided through more careful medication selection.

#### Media Link

#### Abstract 21

**Category Submitting for:** Clinical Vignette

## **Abstract Title** Multiple Myeloma Magnified

### **Abstract Text**

#### Introduction:

Multiple myeloma (MM) is a cancer of plasma cells, which accounts for up to 15% of all hematological malignancies. MM predominantly affects elderly patients as roughly 98% of cases are initially diagnosed in patients after the age of 45 (1).

#### Case Description:

78-year-old male presented with dyspnea, increased swelling, and fatigue. He presented with similar symptoms 10 days earlier and was discharged with a diagnosis of pre-renal AKI from poor intake. The week following discharge he became increasingly short of breath and gained 20 pounds. Past medical history was significant for prostate cancer being treated with radiation, hypertension, and type 2 DM. On admission, his creatinine was 2.86, NA 121, Ca 7.8. Protein 5.9 and albumin 1.8. ESR was elevated above 140. He had pitting edema in both legs. ProBNP was 4600. Troponin negative, D-dimer negative. Urine sodium was low at 8, urine protein elevated at 40. Hgb 9 and platelets 68, stable from last hospitalization. Recent Echocardiogram showed a normal EF with slightly elevated RVSP.

Given concern for urinary retention, foley was placed with no change in output. The patient was started on furosemide drip on hospital day 1 and then Bumetanide drip on day 3, with no response. Creatinine day 4 was 3.24. Patient was started on dialysis. Kappa-lambda flow cytometry showed Kappa elevated to 112.6 and Lambda elevated to 494.8. Echocardiogram was repeated and unchanged. MRI of bone marrow showed diffusely equivocal bone marrow signal, raising the possibility of diffuse pathological marrow infiltration. Simultaneously, the platelets and hemoglobin steadily dropped. A platelet antibody was positive for IgG. Immunoglobulin levels checked, all normal. SPEP showed no monoclonal protein. Serum immunofixation showed a lambda light chain band. Beta 2 microglobulin was elevated to 12.0. IR bone-marrow biopsy was done and found plasma cell neoplasm which were lambda-restricted. Morphology showed plasma cell neoplasm 15 to 20% by lambda in situ hybridization involving a high normocellular marrow. Flow cytometry was negative. These results given the clinical picture were diagnostic for multiple myeloma.

#### Discussion

MM can be an overlooked diagnosis due to its insidious onset and varied presentation. Our patient was likely misdiagnosed multiple times. When MM is in the differential the CRAB symptoms of hypercalcemia, renal insufficiency, anemia, and bone pain/fractures are the first consideration. However, in most patients it is unlikely to have all 4 components. In fact, one study reviewed 1027 MM patients and found only 13% had hypercalcemia and just 19% had a creatinine over 2.0 (2). The diagnosis requires only one of the 4 components and a biopsy with  $\geq 10\%$  clonal bone marrow plasma cells(3). Index of suspicion should be high in elderly patients with any CRAB symptoms that are otherwise unexplained.

#### **Media Link**

## **Abstract 22**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Metastatic Melanoma with Rhabdoid and Heterologous Rhabdomyoblastic Features

### **Abstract Text**

A 59-year-old Caucasian female with no past medical history presented to the clinic with fevers, chills, and a large non-healing cavitory wound on her right mid back. The wound measured approximately 9.5 x 7 cm in diameter and 3 cm in depth. Upon presentation, the patient described what started as a small “skin tag” under her right bra strap 2 months prior and grew significantly in the past month. Gross examination of the lesion revealed that the edges of the wound were red, raised, and the base of the wound was filled with gray necrotic material. The patient was referred to surgery for wound debridement and biopsy of the wound base, which revealed a high-grade malignant neoplasm. Immunohistochemically, neoplastic cells demonstrated strong diffuse staining for vimentin and focal staining for S100, Sox10, myoD1, and desmin. Lesional cells were negative for HMB-45, Melan-A, CD31, CD34, ERG, smooth muscle actin, myogenin, caldesmon, keratin 7, keratin 20, OSCAR keratin, and keratin AE1 AE3. A CT scan of the chest, abdomen, and pelvis revealed numerous bilateral lung tumors, extensive bilateral axillary and mediastinal adenopathy, and a soft tissue mass involving the left upper back superior to the site of the surgical debridement. Collectively, these findings were favored to represent a dedifferentiated metastatic melanoma with rhabdoid and heterologous rhabdomyoblastic features.

Possible treatment plans including combined ipilimumab and nivolumab immunotherapy, radiation therapy, and palliative care were discussed. It was determined that the patient was not a candidate for immunotherapy, as the 6-8 week latency period exceeded the patient's life expectancy of days to weeks. The patient elected to pursue radiation therapy and completed 3 of her 14 scheduled doses of radiation before being readmitted to the hospital for acute on chronic hypoxemic respiratory failure. After further discussion, the decision was made to transition the patient to hospice care, as continued radiation would likely not make a difference in her overall symptom burden or survival benefit.

The term rhabdoid was first used to describe several pediatric tumors thought to be a rhabdomyosarcomatous variant of Wilms tumor. Since first being described, a variety of extrarenal malignant rhabdoid tumors showing similar morphologies have been reported in soft tissue and various organs including the brain, uterus, lung, ovary, prostate, liver, and skin. Rhabdoid melanoma was initially described in 1992 and is histologically characterized by abundant eosinophilic cytoplasm, round nuclei with prominent nucleoli, and large hyaline cytoplasmic inclusions. It presents as a relatively rare, aggressive form of malignant melanoma and appears mainly as a metastatic or recurrent form. Correct recognition and diagnosis of this rare form of melanoma is important in clinical practice in order to avoid misdiagnosis and determinate the appropriate treatment.

**Media Link**



## **Abstract 23**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Mechanizing the Heart and Kidneys: VA-ECMO for hemodynamic stabilization and lipophilic dialysis in acute flecainide toxicity

### **Abstract Text**

A 33-year-old woman presented to the ED with diaphoresis, nausea, and shortness of breath with accessory muscle use after ingesting 60 tablets of 100mg flecainide acetate in an intentional overdose two hours prior. On arrival, vitals were 36.5°C, 122/79, 84, 31, and 98%. EKG showed a wide complex tachycardia, QRS of 178ms, QTc over 600ms, and Type 1 Brugada Pattern. Past medical history significant for 33% PVC burden managed with 100mg flecainide BID and 120 mg verapamil daily, as well as major depressive disorder and anxiety. Initial labs demonstrated a respiratory alkalosis with concomitant wide anion gap lactic acidosis (Venous Blood Gas 7.5/28/45/22, Anion Gap 17, Lactic Acid 2.3), leukocytosis of 12.8, Creatinine 1.12, Potassium 3.7, and Magnesium 2.2. Additional workup negative for salicylates, acetaminophen, and ethanol. She was given sodium bicarb boluses and started on a drip to maintain pH >7.5, as well as multiple doses of calcium and magnesium. At recommendation of local poison control, intralipid infusion was initiated. Literature shows evidence for intravenous lipid emulsion in the treatment of the cardio-toxic effects of local anesthetics and lipophilic medications (flecainide, calcium channel blockers, and beta blockers). Despite all these treatments, EKG showed progression to irregularly irregular prolonging QRS rhythm with ventricular rate of 36 bpm. She subsequently developed PEA arrest, receiving 60 minutes of high-quality CPR until cannulation for veno-arterial extracorporeal membrane oxygenation (VA-ECMO).

Class I antiarrhythmic drug toxicity, while rare, carries a high risk of catastrophic outcomes due to its narrow therapeutic index and rapid progression to malignant arrhythmias and shock, as soon as an hours after ingestion. Flecainide toxicity is particularly difficult to treat due to its high oral bioavailability, highly lipophilic structure, high volume of distribution, and poor ability to be dialyzed.

Patients undergoing treatment for antiarrhythmic toxicity should be evaluated for VA-ECMO early. Transcutaneous or transvenous pacing is ineffective, as it is unlikely to capture the myocardium. In addition, amiodarone should be avoided to prevent prolongation of the QT interval and inhibition of the cytochrome P450 system. This leaves VA-ECMO as the last-line treatment modality for hemodynamic instability in the setting of flecainide toxicity until the medication can be eliminated. Flecainide undergoes extensive hepatic biotransformation via cytochrome P450 CYP2D6, then its metabolites are excreted by urine. Flecainide has a long half-life up to 27 hours, so hemodynamic stabilization with a long-term option like ECMO is often necessary. ECMO circuits are highly lipophilic and the membrane lung is highly avid for lipophilic agents. While this lipophilicity is unfavorable for drug levels in most ECMO patients, it is possible that this may have bound more flecainide—increasing clearance and helping our patient make a full recovery.

**Media Link**

## Abstract 24

**Category Submitting for:** Research

**Abstract Title** BMX-001 prevents chemoradiotherapy-induced toxicity of healthy tissue in rectal cancer

### Abstract Text

Although 1 in 25 people in the US will be diagnosed with colorectal cancer in their lifetime, it has a favorable prognosis with an overall five-year survival rate of 64% due to advances in surveillance, surgical techniques, and therapy. Many rectal cancer patients will be treated using chemoradiation, a curative combination that causes both acute and chronic adverse effects to healthy tissue due to generation of reactive oxygen species (ROS), which can lead to inflammation and fibrosis. Acutely, therapy can cause rectal pain, diarrhea, and myelosuppression. Chronically, therapy can cause incontinence and sexual dysfunction. A radioprotector which selectively protects healthy tissue, not cancer cells, would minimize these side effects in patients, leading to improved quality of life and fewer post-therapy complications. BMX-001, a manganese porphyrin currently in phase II clinical trials for glioblastoma, anal cancer, and rectal cancer, can directly scavenge ROS while also enhancing endogenous antioxidants. We hypothesize that BMX-001 can scavenge ROS in surrounding tissue treated with chemoradiation to prevent side effects. Giving mitomycin-C and 5-fluorouracil-treated intestinal epithelial cells BMX-001 in vitro decreased cell death by  $40\pm 2\%$ . Irradiated murine rectal tissue had a lower average damage score when treated with BMX-001 ( $0.8\pm 0.8$ , scale of 1 to 10) compared to irradiated tissue alone ( $7.8\pm 1.6$ ). Chemoradiation significantly reduced red blood cell counts in mice, which BMX-001 treatment restored to a biologically normal range. Mouse rectal tissue treated with BMX-001 had significantly lower levels of protein nitration ( $14\pm 21.8\%$  vs  $3.5\pm 0.5\%$  positive cells per  $10,000\ \mu\text{m}^2$ ) and lipid peroxidation ( $53\pm 13\%$  vs  $4.9\pm 3.0\%$  area positive), suggesting BMX-001 treatment prevents oxidative stress in healthy rectal tissue. In a murine hind flank tumor model, HCT-116 colorectal tumors treated with BMX-001 and 5-fluorouracil were significantly smaller than tumors treated with chemoradiation alone ( $233\pm 119\ \text{mm}^3$  vs  $152\pm 73\ \text{mm}^3$ ) while HT-29 colorectal tumors treated with BMX-001 and radiation were not significantly different, suggesting BMX-001 does not interfere with chemoradiotherapeutic killing of tumor cells. We hypothesize that BMX-001 can selectively protect healthy tissue from chemoradiation injury by converting superoxide into hydrogen peroxide in the lipid membrane and the mitochondria. Healthy cells are more adaptable to sudden changes in oxidative stress compared to cancer cells, so addition of BMX-001 allows them to survive oxidative changes caused by chemoradiation therapy. BMX-001 is a translatable selective radioprotector with the potential to improve the quality of life during and after therapy in rectal cancer patients, and elucidating BMX-001's mechanism could allow for its application with other cancer treatments as well as the development of new selective radioprotectors.

**Media Link**

## Abstract 25

**Category Submitting for:** Clinical Vignette

**Abstract Title** Factitious Disorder Presenting as Hypoglycemia

**Abstract Text**

Factitious disorder is a psychiatric condition in which patients falsify, induce, and/or exaggerate symptoms in order to assume the sick role. Formerly known as Munchausen syndrome, factitious disorder imposed on self is relatively rare and estimated to occur in less than 1% of patients. A 42-year-old woman presented to the emergency department with hypoglycemia. Past medical history was significant for bariatric surgery 15 years ago. For the last 4 years, the patient has complained of symptoms of low blood sugar that was initially attributed to the bariatric surgery. She has had nausea, difficulty eating, and progressive fatigue. She reports her symptoms worsened over the last few weeks. Her blood glucose levels were found to be in the 40s and 50s with daily glucagon use. Despite treatment at the hospital with D10 at 125cc/hr, D50 pushes hourly, steroids, and octreotide, her hypoglycemia persisted and she was transferred to our hospital for endocrinology evaluation. CT abdomen and pelvis was done and found no masses and the exam appeared stable from her last CT 8 months ago. On day 3 of hospital stay, nursing staff shared concern that the patient may be surreptitiously using insulin. Patient was educated on the concerns of her medical team and her belongings searched. Two vials of insulin and multiple syringes were found, some of which were used. Chart review revealed that the patient had multiple visits with different specialties like Psychiatry, neurology, endocrinology, primary care, surgery, and gastroenterology. She was seen almost weekly in either a clinic or the emergency department. Based on this evidence, the patient was suspected to have factitious disorder. The best management for this is education on the disorder, outpatient therapy, and management of her medical and psychiatric treatments by one primary care provider. The patient has a primary care provider and a therapist. Although pharmacology is of limited use in factitious disorder, SSRI/SNRI use may be useful in decreasing impulsive behavior. The patient is already on an SNRI.

This case demonstrates the importance of considering possible psychiatric etiologies when a patient's symptoms are refractory to treatment. Although factitious disorder imposed on self is rare, it can be dangerous and necessitates an organized effort by the patient's care team to address the underlying problem.

**Media Link**

**Abstract 26**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Use of direct oral anticoagulants in superficial thrombophlebitis

**Abstract Text**

Introduction:

This abstract is focused on the use of direct oral anticoagulants (DOAC) as well as the presentation and treatment of superficial thrombophlebitis.

#### Patient Presentation:

Our patient is a 38 yo male with a pertinent PMHx of BMI between 40.0-44.9, non-alcoholic fatty liver, depressive disorder on medical therapy with paroxetine and topiramate, and hemangioblastoma (surgically resolved) of brain as a child, who initially presented to the family medicine clinic with complaints of bruising and tenderness in his right leg below his knee. He states that his son kicked him in this area about a week ago and that he has a family history of DVT in his maternal aunt. He denies any personal history of clotting, fevers, fatigue, chest pain, SOB, or any other symptoms.

#### Initial Exam and clinical course:

Initial exam revealed a suspected superficial thrombophlebitis based on tenderness and swelling in the venous system, which was diagnosed with a doppler ultrasound of the right lower extremity. Initial ultrasound of the right lower extremity showed no deep venous thrombosis, but confirmed a 10 cm superficial thrombosis distal to the knee. No evidence of thrombus in the common femoral, profunda femoral, or popliteal veins was seen. He was treated with NSAID therapy and heat.

He next presented to an emergency department that is eight hours away with palpable clotting that was extending up into his groin and measured over 15 cm at this time, but was unable to get an ultrasound during the ED course. He was started on rivaroxaban 10 mg DOAC. At this point, he was told to follow up with his PCP once home in order to continue to monitor for clinical resolution. Follow up at one week and at one month showed improvement towards resolution, and DOAC therapy was extended for a total of 45 days. At no point in his clinical course did he have symptoms of deep venous thrombosis or pulmonary embolism.

#### Assessment:

In assessment, this patient had a resolving course of superficial thrombophlebitis that initially began in his saphenous venous system that progressed prior to resolving and required a stronger therapeutic intervention prior to its resolution. His travel by car potentially exacerbated his clotting. Going through the treatment algorithm proposed showed correct management with NSAID therapy and heat as the initial therapy. As disease progressed, therapy was also correct to revert to DOAC therapy for 45 days or until resolution due to proximity to the deep venous system.

#### Teaching Points:

Risks factors for DVT

Superficial thrombophlebitis workup, treatment, and clinical course

Anticoagulant indications

#### Media Link

### Abstract 27

**Category Submitting for:** Clinical Vignette

**Abstract Title** Uremic Pericarditis with Effusion in a Patient with Chronic Kidney Disease Stage III

#### Abstract Text

##### Introduction:

The prevalence of uremic pericarditis in hemodialysis patients has decreased to <5% in recent

decades due to more widespread use of dialysis and improved dialysis techniques. Despite its rarity, uremic pericarditis and pericardial effusion are often unrecognized complications of end-stage renal disease due to the absence of signs and symptoms. Rapid recognition of uremic pericarditis is critical for successful management. Here we present a case of uremic pericarditis with effusion in a patient with chronic kidney disease (CKD) stage III not previously on hemodialysis.

#### Case Description:

A 70-year-old woman with a past medical history significant for hypertension, hyperlipidemia, diabetes mellitus, chronic lymphedema, and CKD stage III was sent to the emergency department (ED) due to generalized fatigue, fluid retention, and an acute kidney injury (AKI) discovered at an outpatient clinic. The patient reported a week-long history of reduced urinary output, weight gain, nausea, and mild dyspnea on exertion. Physical exam revealed bilateral lower extremity edema and distant heart sounds. Initial labs were notable for a sodium of 130 mmol/L, creatinine of 2.81 mg/dl, BUN of 140 mg/dl and a B-type natriuretic peptide of 1,416 pg/ml. EKG showed normal sinus rhythm and borderline low voltage criteria. Chest X-Ray demonstrated small bilateral pleural effusions greater on the left and mild enlargement of the cardiac silhouette. A CT abdomen was performed to rule out urinary obstruction or pyelonephritis and incidentally revealed a complex pericardial effusion. Subsequent echo cardiogram demonstrated a large, circumferential effusion with a dilated inferior vena cava and signs of tamponade. A pericardiocentesis was performed which removed 620 cc of bloody fluid. Analysis of the aspirate showed an exudative fluid with mononuclear cells, LDH of 2,572 u/l (serum LDH at 374 u/l), and protein of 5.2 gm/dl (serum protein at 7.3 gm/dl). The patient was started on half normal saline for likely prerenal AKI, sodium bicarbonate for metabolic acidosis, and low dose colchicine plus high dose aspirin due to suspected uremic pericarditis with effusion. Due to worsening creatinine and BUN, the patient was dialyzed three times which resulted in improved urine output and renal recovery and was subsequently discharged with cardiology and nephrology follow up.

#### Discussion:

Diagnosis and management of uremic pericarditis has numerous challenges due to the absence of characteristic signs such as pleuritic chest pain and diffuse ST elevation. Our patient also did not present with a friction rub, making suspicion of the diagnosis even more challenging. While uremic pericarditis is an infrequent complication of end-stage renal disease, clinical suspicion should remain high in the setting of increased BUN even in the absence of clinical signs and symptoms and in patients not previously on hemodialysis.

#### Media Link

#### Abstract 28

**Category Submitting for:** Clinical Vignette

**Abstract Title** Multidrug-Resistant Bronchiectasis with Acute Exacerbation

## **Abstract Text**

Learning objectives:

1. Recognize the clinical presentation of a non-cystic fibrosis bronchiectasis exacerbation
2. Identify the relationship between asthma and *Pseudomonas* with bronchiectasis
3. Understand the importance of sputum cultures in the setting of bronchiectasis with multiple prior exacerbations

Introduction:

A 48-year-old man presented for acute worsening of dyspnea and increased sputum production after awakening. He also noted wheezing and chest tightness. He was afebrile, tachypneic, and hypoxic, requiring six liters of oxygen. He had biphasic crackles, expiratory wheezing in all lung fields, and mild respiratory acidosis. There was no leukocytosis, and procalcitonin was 0.20. Chest X-ray demonstrated bibasilar bronchiectasis that was unchanged compared to prior imaging two weeks ago when hospitalized for similar complaints. At that time, he was treated as an asthma exacerbation given a history of severe-persistent asthma. However, he exhibited no improvement between hospitalizations despite being discharged on his home asthma regimen, five days of oral prednisone, and 14 days of oral levofloxacin due to known colonization with *Pseudomonas* and MSSA in the setting of non-cystic fibrosis bronchiectasis with multiple exacerbations. Several days after discharge from the prior hospitalization, sputum cultures grew levofloxacin-resistant *Pseudomonas* and MRSA.

Discussion:

The general internist frequently encounters dyspnea with wheezing, cough, and increased sputum production. Not all that wheezes is asthma, and bronchiectasis is important to keep on the differential diagnosis as it commonly coexists with asthma and is associated with an independent increase in the risk of bronchiectasis exacerbations [1]. Bronchiectasis is a chronic lung disease beginning with an inflammatory or infectious insult leading to airway dilatation and bronchial wall hypertrophy, causing airway obstruction and impaired secretion clearance. Its irreversible nature dictates treatment is targeted toward preventing exacerbations by controlling underlying infection and comorbid lung disease. This effort limits inflammatory responses that would otherwise cause disease progression.

Additionally, patients with bronchiectasis are often colonized with MRSA and *Pseudomonas*. MRSA is isolated less frequently than *Pseudomonas*, and its relation to morbidity and mortality is unclear at this time [2]. Conversely, *Pseudomonas* colonization is associated with a higher risk of morbidity and mortality in this patient population [3]. Thus, internists should have a low threshold for initiating broad-spectrum intravenous antibiotics in known *Pseudomonas* colonizers with prior exacerbations while awaiting sputum culture data given its propensity for quinolone resistance.

References:

1. Mao B, et al. Asthma and bronchiectasis exacerbation. *European Respiratory Journal*. Jun 2016, 47(6):1680-1686.
2. Metersky ML, et al. The prevalence and significance of staphylococcus aureus in patients with non-Cystic fibrosis bronchiectasis. *Ann Am Thorac Soc*. Mar 2018, 15(3):365-370.
3. Severiche-Bueno D, et al. Hot topics and current controversies in non-cystic fibrosis bronchiectasis. *Breathe*. Dec 2019, 15(4):286-295.

**Media Link**

## **Abstract 29**

**Category Submitting for:** Clinical Vignette

**Abstract Title** How Low Can Your Phos Go?

### **Abstract Text**

A 30-year-old man presents to outpatient clinic follow-up with weakness, tingling, tunnel vision, and feeling his neck give out prior to a witnessed tonic-clonic seizure. The patient has an unremarkable past medical history other than childhood seizures not on antiepileptic medication. The patient recently had a hospitalization due to severe weakness and cramping which was associated with a viral illness. This witnessed tonic-clonic seizure episode lasted about one minute without any tongue biting or incontinence, but the patient endorsed fatigue after. Exam was unremarkable including normal cardiac and neurological examinations. Complete blood count was normal. Comprehensive metabolic panel was unremarkable. Chest X-ray, right upper quadrant ultrasound, CT head, MRI of brain, and EEG of the brain all were normal.

Review of the patient's previous hospitalization one-week prior revealed severe hypophosphatemia  $< 1\text{ mg/dl}$  ( $n = 2.4\text{-}4.7\text{ mg/dl}$ ), vitamin D deficiency = 13 ( $n = 30\text{-}80\text{ ng/ml}$ ), mildly decreased ionized calcium of 1.16 ( $n = 1.18\text{-}1.30$ ), and high normal PTH of 68 ( $n = 12\text{-}88\text{ pg/ml}$ ). Additional workup during this first hospitalization showed a venous blood gas with elevated  $\text{pH} = 7.58$ , decreased  $\text{pCO}_2 = 24$ , and normal  $\text{HCO}_3^-$ . In addition, an elevated fractional excretion of phosphorus of 46.1% (normal  $< 5\%$ ) was noted. The patient's phosphorus was repleted during this hospital course but discharged without any additional supplementation. Repeat phosphorus on presentation to the emergency department revealed  $[\text{phosphorus}] < 1\text{ mg/dl}$  consistent with severe hypophosphatemia. Given this workup, the patient's witnessed seizure was most likely due to severe hypophosphatemia due to persistent renal phosphate wasting. The patient was discharged on Phos-NaK, vitamin D supplementation, and Keppra with follow-up planned with nephrology and neurology.

Learning objectives

Create a differential diagnosis for hypophosphatemia.

Understand the pathophysiology relating vitamin D, PTH, and phosphate.

Understand the pathophysiology relating respiratory alkalosis and hypophosphatemia.

Discussion: Hypophosphatemia is a relatively common clinical scenario encountered by a hospitalist and recognizing the possible etiologies is important in workup and management of this diagnosis. The etiology behind hypophosphatemia can be divided into three categories: decreased net intestinal absorption, acute intracellular shifting of phosphate, and increased urinary phosphate excretion. A thorough history allowed us to rule out causes for decreased absorption such as poor oral intake, medication side effects, and chronic diarrhea. VBG findings from the patient's first hospitalization was consistent with respiratory alkalosis secondary to hyperventilation. The intracellular rise in pH stimulates the enzyme phosphofructokinase in glycolysis which utilizes available phosphate and can facilitate hypophosphatemia. In addition, the

patients high normal PTH and vitamin D deficiency causing increased urinary phosphate wasting. The simultaneous occurrence of these physiologic fluctuations precipitated the severe hypophosphatemia in this clinical scenario.

#### **Media Link**

A new abstract was submitted for the Nebraska Chapter on Friday, September 2, 2022 - 17:18:

### **Abstract 30**

**Category Submitting for:** Clinical Vignette

**Abstract Title** A Rare Case of Immune Thrombocytopenic Purpura

#### **Abstract Text**

Immune thrombocytopenic purpura (ITP) is a condition characterized by an isolated thrombocytopenia of  $<100\text{k}/\text{ul}$ . The pathophysiology of ITP is not fully understood, but it has been linked to various etiologies like infection, systemic disease, or the use of certain medications. Clinical symptoms are usually related to bleeding and include petechiae, purpura, epistaxis, or more rarely, critical hemorrhage. Due to the array of potential etiologies and nonspecific symptoms of ITP, a thorough workup is critical.

A 34 year-old-male with a past medical history of hypertriglyceridemia and obesity presented to his primary care provider with 5 days of a petechial rash and easy bruising. The rash was present bilaterally on his lower legs and feet along with a few erythematous marks on his abdomen. The patient denied any recent injuries, illness, fatigue, weight changes, travel, medications, or known tick encounters. Lab results were only significant for a platelet count of  $3\text{k}/\text{ul}$ . The remainder of the CBC, CMP, UA, ESR, and CRP were unremarkable. The patient was advised to go to the emergency department, where the physician noted the petechiae had spread to the patient's bilateral arms. A comprehensive workup was performed. Testing for PT, INR, aPTT, fibrinogen, *Borrelia burgdorferi*, Histoplasma galactomannan antigen, HIV, and (1,3)-beta D glucan was all unremarkable, but the patient tested positive for Epstein-Barr virus (EBV) IgG and IgM. The abdominal US demonstrated mild splenomegaly of 13.5 cm. One bag of platelets was transfused, and the patient was admitted overnight. Hematology evaluated him and gave the diagnosis of ITP. They recommended a 4-day course of 40mg PO Decadron but advised against further platelet transfusion. Given the lack of current bleeding, the patient was okay to be discharged home with close outpatient follow-up. He saw hematology 5 days after discharge, and his platelet count had improved to  $109\text{k}/\text{ul}$ . One month later his platelet count was  $248\text{k}/\text{ul}$ . The patient had repeat lab work every 3 months for the next 9 months, which demonstrated a stable platelet count.

EBV is a rare cause of ITP. EBV classically presents with fever, fatigue, sore throat, and lymphadenopathy, though the patient in this case did not demonstrate any of these symptoms. This exemplifies the importance of a careful workup in those with isolated thrombocytopenia. Identifying the inciting event is crucial in prescribing the correct treatment regimen and preventing further progression of ITP.

#### **Media Link**



## **Abstract 31**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Ascites: Differentiating Between Cirrhosis and Heart Failure

### **Abstract Text**

#### Introduction

Ascites is the accumulation of fluid within the peritoneal cavity. Cirrhosis is the most common cause in the US, but ascites can also be due to other etiologies such as heart failure or malignancy. Investigation of ascites begins with a history and physical exam, progresses to imaging such as ultrasound or CT, and can be further assessed with paracentesis. Abdominal paracentesis is central to establishing the cause of ascites and in determining the presence of spontaneous bacterial peritonitis (SBP). Here, we present a case of ascites in a 37-year-old male with a history of heart failure and presumed cirrhosis. Initial imaging results pointed towards an etiology of cirrhosis and the presence of SBP; however, liver biopsy showed no evidence of cirrhosis, indicating heart failure as the culprit of the ascites.

#### Case

A 37-year-old male with a history of heart failure, presumed cirrhosis, ascites, and recurrent SBP presented with abdominal distension. In the ED, he described having shortness of breath and feeling bloated but denied chest pain and fever. On exam, he was tachycardic and tachypneic with severe abdominal distension. His labs showed a lactic acidosis of 3.7 mmol/L, proBNP of 8,420 pg/ml, creatinine of 2.01 mg/dl, and white blood cell count of 8.4 k/uL. CTA of his chest showed an enlarged pulmonary trunk with right heart enlargement. CT abdomen and pelvis demonstrated hepatic cirrhosis and large-volume ascites. A paracentesis was performed, which showed a hazy peritoneal fluid with 1,699 nucleated cells, of which 25% were neutrophils. Based on these findings, the diagnosis of SBP secondary to cirrhosis was made, and he was started on ceftriaxone. An echocardiogram was performed, which demonstrated an ejection fraction of 50-55% and a right heart pressure of 65.1 mmHg. Despite initial imaging suggesting cirrhosis, the patient had a liver biopsy performed two weeks prior, which described normal liver parenchyma with no evidence of cirrhosis, meaning that his ascites was related to right heart failure. This also meant that he did not have SBP; rather, he fell into the category of culture-negative neutrocytic ascites.

#### Discussion

The two most common causes of ascites are cirrhosis and heart failure. Despite the CT abdomen showing evidence of cirrhosis, radiographic imaging is not sensitive or specific enough to confirm the diagnosis. The gold standard for diagnosing cirrhosis is liver biopsy, which proved crucial to this patient's care and management. Distinguishing between cirrhosis and heart failure was necessary to determine the need for treatment of SBP.

#### Conclusion

In patients with medical history suggestive of multiple common causes of ascites, radiographic

imaging should be pursued for differentiation. Paracentesis should be performed for evaluation of the ascitic fluid, and liver biopsy may be needed to make the diagnosis in unclear situations.

#### **Media Link**

### **Abstract 32**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Rare Complication of Radial Artery Pseudoaneurysm After Cardiac Catheterization

#### **Abstract Text**

Introduction:

Coronary angiography is the gold standard for the assessment of atherosclerotic coronary artery disease and is therefore a commonly performed invasive procedure. It has a very low risk of morbidity or mortality, however some rare complications can occur, including myocardial infarction, cholesterol embolization, and local vascular injury. A pseudoaneurysm at the vascular access site can occur and is characterized by the development of a hematoma that is continuous with the arterial lumen, allowing blood to flow into and out of the hematoma. We present a case in which a male patient developed a pseudoaneurysm of the radial artery after coronary angiography.

Case Presentation:

A 67-year-old male with a history of coronary artery disease underwent cardiac catheterization to assess the need for cardiac bypass. The patient subsequently noticed swelling near his right wrist with increasing ecchymosis around the arterial access site. On exam, he was found to have a palpable, faintly pulsatile lump on the volar aspect of his right wrist with overlying ecchymosis. The patient did not have tenderness or obvious signs of infection. He did not have deficits in sensation or motor function. Vascular ultrasound was performed and revealed a small pseudoaneurysm coming off the radial artery at the right wrist measuring 0.5cm x 0.91cm. Vascular surgery was consulted and opted for surgical repair of the pseudoaneurysm with a bovine patch and repair was successful.

Discussion:

Pseudoaneurysm development is a known but rare complication of cardiac catheterization. A pseudoaneurysm forms due to trauma to a vessel resulting in a collection of blood outside of, but connected to, the blood vessel. As in this case, surgical repair is commonly done, especially in large, symptomatic pseudoaneurysms. However, observation with serial ultrasounds, therapeutic compression, or thrombin injections are also utilized. Although rare, this is a recognized complication of coronary angiography and patients like ours who develop swelling, pulsatile mass, ecchymosis, or other symptoms at the access site should be evaluated for a pseudoaneurysm or other vascular complication.

#### **Media Link**

## **Abstract 33**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Severe Hypertriglyceridemia Diagnosed at 33 weeks of Pregnancy

### **Abstract Text**

#### Introduction:

Severe hypertriglyceridemia rarely complicates pregnancy. Defined as triglycerides >1000 mg/dL, severe hypertriglyceridemia during pregnancy predisposes patients to developing gestational hypertension, preeclampsia, gestational diabetes mellitus, preterm delivery, and large for gestational age infants. Etiologies of severe hypertriglyceridemia in pregnancy include familial triglyceride derangements, insulin-resistant states, hypothyroidism, nephrotic syndrome, and medications. Hypertriglyceridemia is usually treated with dietary fat and carbohydrate restriction in pregnant patients.

#### Case Description:

A 31-year-old female, G2P0101, at 33 weeks, 1 day presented to the Obstetrics Emergency department for contractions after a fall that morning. Pregnancy was complicated by gestational diabetes mellitus (GDM) (treated with Metformin 500 mg QHS, which was started one week prior to admission), history of preterm delivery, and Rh-negative status. Maternal Fetal Medicine was consulted and recommended terbutaline for tocolysis, and the patient was admitted to labor and delivery to prepare for preterm delivery. Patient received two doses of 0.25 mg terbutaline intravenously instead of subcutaneously, 10x the maximum dose. After administration, the patient was asymptomatic, vitals remained stable, and EKG demonstrated normal sinus rhythm. On hospital day two, patient continued to have contractions every 10 minutes. Internal medicine was consulted for lab abnormalities including CO<sub>2</sub> of 10 mmol/L, potassium of 6.2 mmol/L, and AST of 200 u/L. Acidosis was thought to be due to the metabolism of terbutaline to glucuronic acid. Patient was given insulin drip, dextrose 50% fluids, and a bicarbonate drip, which normalized her electrolytes. Lab noted lipemic appearing blood sample and subsequent lipid panel demonstrated a total cholesterol of >600 mg/dL and triglycerides of 3,243 mg/dL. Patient denied personal or familial history of hyperlipidemia. Lipid levels four years prior were normal. Pancreatitis was suspected, but patient denied abdominal or epigastric pain and lipase was normal. Endocrinology was consulted and recommended dietary fat restriction of <10-15% of total calories and to follow with endocrinology outpatient. Lipid panel on hospital day three included total cholesterol of 439 mg/dL and triglycerides of 2,585 mg/dL. Patient delivered a healthy infant on hospital day five without any complications.

#### Discussion:

Triglyceride levels can increase during pregnancy; however, they rarely rise above 300 mg/dL. Traditional treatment of hypertriglyceridemia includes use of niacin and fibrates, however their use in pregnancy is controversial as they have not been studied extensively in pregnancy. In this case,

internal medicine and endocrinology opted to treat solely with insulin drip and diet control, which improved patient's hypertriglyceridemia and cholesterol over hospital stay. Insulin drips for GDM in pregnant women have been shown to be safe, but there are limited data on their use in patients without GDM to lower triglycerides. The etiology of the patient's hypertriglyceridemia remains unclear. The differential diagnosis includes undiagnosed familial hypertriglyceridemia or possible sequelae of excessive terbutaline administration.

**Media Link**

### **Abstract 34**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Acute Respiratory Distress Syndrome in the Setting of Legionella Pneumonia in a Young, Previously Healthy Patient

#### **Abstract Text**

Legionella pneumophila is a common cause of community acquired pneumonia. Risk factors for severe infection typically include old age, immunocompromised state, chronic lung disease, and smoking. Presented is a case of acute respiratory distress syndrome (ARDS) in a previously healthy male in the setting of legionella pneumonia.

A previously healthy 32-year-old male presented to the emergency department with a one-week history of flu-like symptoms. Further workup revealed hypotension, tachycardia, leukocytosis, and an oxygen saturation of 73%. Hypoxia worsened, and the patient required intubation. Imaging with Chest X-Ray and computed tomography of the chest showed bilateral infiltrates. The patient was admitted to the intensive care unit for ARDS and multifocal pneumonia. Bronchoscopy and bronchoalveolar lavage (BAL) were performed and initially came back negative. A repeat BAL was performed and culture grew Legionella pneumophila. Urine Legionella returned positive and the patient was started on levofloxacin which was later switched to azithromycin due to concerns for levofloxacin induced hepatotoxicity. The patient continued to improve on the course of antibiotics and dexamethasone and was extubated on 3L nasal cannula. The patient was weaned off supplemental oxygen therapy and discharged home.

Legionella pneumophila is a common cause of community acquired pneumonia. Risk factors for severe Legionella pneumonia are old age, chronic lung disease, smoking, and an immunocompromised state. Legionella pneumonia can be difficult to diagnose as it often presents with non-specific symptoms. Empiric antibiotic therapies typically lack coverage against Legionella as it is an intracellular pathogen. However, early intervention is essential to reduce mortality risk. Legionella pneumonia should be a consideration even in young patients who present with community acquired pneumonia.

**Media Link**

## **Abstract 35**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Risperidone-Induced Sexual Dysfunction

### **Abstract Text**

#### Introduction:

Sexual dysfunction is common among patients taking antipsychotic medication, particularly risperidone. Approximately two-thirds of men and women reporting sexual dysfunction after 1 year of using risperidone. It is often considered the most bothersome side effect of the medication and the most cited reason for noncompliance among patients.

#### Case Report:

Mr. W is a 55 year-old gentleman with a history of bipolar 1 disorder who presented to our inpatient psychiatric facility with 2 months of worsening sleep, agitation, depression, and irritability. He also reported decreased need for sleep, paranoia, and grandiose behaviors. During examination, the patient had rapid, pressured speech and occasional racing thoughts and distractibility. He said that he stopped taking his medications 2 months ago due to sexual dysfunction side effects including reduced libido and anejaculation. He was previously taking risperidone nightly for 1.5 years and stopped taking it after a few months of sexual dysfunction. He was compliant with his medications before these side effects and stated that the sexual side effects were his main reasons for stopping the medication.

CBC, CMP, and thyroid tests were within normal limits. A urine drug screen at the time of admission tested positive for cocaine and cannabinoids. A prolactin level was not performed since the patient was not currently experiencing sexual side effects. He was treated for a bipolar mixed episode at our facility and we ruled out cocaine use disorder and marijuana use disorder based on these findings.

After 1 week of stabilization, the decision was made to switch to lurasidone daily instead of resuming his home risperidone. His symptoms improved and he reported improved mood, sleep, and agitation prior to discharge.

#### Discussion:

Risperidone is categorized as a prolactin-stimulating antipsychotic since it blocks the D2 receptors. In this class of antipsychotics, hyperprolactinemia is a primary contributor to the adverse effects of sexual dysfunction. One study found that risperidone produced higher levels of prolactin than other atypical antipsychotics, and that this increase in serum prolactin was dose-dependent. Compared to olanzapine, the rate of sexual dysfunction is significantly higher (OR: 2.02, 95% CI 1.63-2.48). The most commonly reported sexual side effects included decreased libido (37.8%), erectile dysfunction (32.1%), and ejaculatory disorder (32.6%).

Lurasidone, on the other hand, has not been associated with treatment-related sexual dysfunction in a recent clinical trial. One case study also showed a decrease in sexual dysfunction when switching to lurasidone from risperidone. However, more research must be done to corroborate these findings and we hope this case study adds to the body of literature in the area. We chose to switch from risperidone to lurasidone based on available clinical research and the patient's prior inexperience with that particular antipsychotic.

#### **Media Link**

#### **Abstract 36**

**Category Submitting for:** Research

**Abstract Title** Socioeconomic and Health Comorbidities Associated with Advanced Stage at Diagnosis of Diffuse Large B-Cell Lymphoma

#### **Abstract Text**

**Introduction:** Diffuse large B-cell lymphoma (DLBCL) is the most common non-Hodgkin lymphoma in adults, accounting for 25% of cases. Estimated current 5-year survival of patients diagnosed with early stage DLBCL (ES-DLBCL), stage I or II, is 74%, in contrast to 57% for those diagnosed with late stage, or stage III or IV, DLBCL (LS-DLBCL). The objective of this study is to identify the socioeconomic, demographic, and comorbid health conditions associated with a late stage diagnosis.

**Methods:** The National Cancer Database was used to identify patients diagnosed with DLBCL between 2004 and 2018. 225,781 patients were analyzed, with 101,932 ES-DLBCL patients and 123,849 LS-DLBCL patients. The stage of diagnosis was analyzed by patient race, sex, insurance type, Charlson-Deyo comorbidity score, level of education, income, geographic location, facility type, facility location, and HIV status. Diagnosis groups were analyzed with each variable through cross-classification, chi square analysis, and one-way ANOVA. Multivariate binary logistic regression was used to compare the risk of LS-DLBCL diagnosis by patient characteristics.

**Results:** There was significant variability in socioeconomic, demographic, and comorbid medical conditions associated with later stage of diagnosis. Uninsured patients were more likely to be diagnosed at a late stage, with 56.9% diagnosed as LS-DLBCL compared to 51.3% of patients with private insurance, Odds Ratio (OR) 0.792 (95% Confidence Interval (CI) 0.737-0.851,  $p < 0.001$ ). Patients with one or more comorbidities (Charlson-Deyo score) were more likely to be diagnosed at late stage than patients with no comorbidities; 57.3% of patients with one comorbidity and 60.0% of patients with two or more comorbidities received a LS-DLBCL diagnosis compared to 53.3% of patients with no comorbidities, OR 1.123 (95% CI 1.087-1.160,  $p < .001$ ) and OR 1.226 (95% CI 1.177-1.278), respectively. African Americans were more likely to be diagnosed at a late stage compared to Caucasians, with 60.2% of African Americans receiving a LS-DLBCL diagnosis compared to 54.6% of Caucasians, OR 1.238 (95% CI 1.178-1.300). HIV positive patients were more like to be diagnosed at late stage, with 64.9% receiving a LS-DLBCL

diagnosis compared to 54.3% of HIV negative patients, OR 0.325 (95% CI 1.244-1.411,  $p < .001$ ).

Conclusion: Factors associated with an increased likelihood of LS-DLBCL compared to ES-DLBCL include lack of insurance, one or more comorbidities, African American race, and HIV positive status at time of diagnosis. This data supports the need for targeted efforts to advance access to care and early diagnosis for traditionally underserved populations with DLBCL.

**Media Link**

## **Abstract 37**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Piperacillin-tazobactam induced toxic epidermal necrolysis

### **Abstract Text**

Introduction:

Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis (SJS/TEN) is a delayed type IV hypersensitivity reaction. It is an exfoliative mucocutaneous disease often caused by antibiotics or antiepileptics. Etiology of this disease is thought to be due to drug specific CD8+ cytotoxic lymphocytes. These lymphocytes exocytose perforin and granzyme B, creating channels in the cell membrane and activating caspases, which leads to apoptosis. The exact pathophysiological mechanisms are still speculative, but it is thought to be due to the interaction/binding of drug-associated antigens with MHC type I or cellular peptide that induces the formation of an immunogenic compound.

Case Description:

A 74-year-old female with a past medical history of hypertension, hyperlipidemia, and obesity was initially admitted for nausea, abdominal pain, severe sepsis secondary to CAUTI, and pyelonephritis with metabolic encephalopathy. She started Zosyn at this time. Four days later, she developed a maculopapular rash on her stomach that spread diffusely and progressed to blisters involving the face, bilateral upper and lower extremities, and back covering >30% of her body. Zosyn was discontinued at this time and Meropenem was initiated for pyelonephritis treatment. Therabond treatment was initiated along with fluids and electrolyte replacement. There were no further issues during the hospitalization. She completed pyelonephritis treatment with meropenem, and later Levaquin. Her skin lesions continued to heal with conservative management. After two weeks, she was deemed suitable to discharge to an assisted living facility with daily Aquaphor dressing changes. Atypical causes of SJS/TEN were ruled out: negative IgM for mycoplasma pneumoniae and negative ANA for potential autoimmune causes. Biopsies of the rash were taken and showed lymphocytic interface dermatitis and necrotic/degenerative keratinocytes, as well as epidermal blistering and sloughing. These findings, along with the patient's history, were consistent with SJS/TEN.

Discussion:

Major drug classes implicated in SJS/TEN are antibiotics and antiepileptics. Among antibiotics, SJS/TEN is most commonly reported with aminopenicillins, sulfonamides and quinolones.

Piperacillin-tazobactam induced linear IgA bullous dermatosis (LABD) has been reported to present as SJS/TEN overlap, but on biopsy, LABD appears as a regenerating subepidermal bullous process compared to the degenerative nature of SJS/TEN. Severe hypersensitivity reactions are reported less frequently with carboxypenicillins and ureidopenicillins (piperacillin); however, SJS/TEN and erythema multiforme have been reported with ticarcillin (a carboxypenicillin) treatment. Aminopenicillins and ureidopenicillins share a similar biochemical structure: both have a positively charged amino group and ureidopenicillins have a carboxylic acid variable side chain. It is plausible that there is enough overlap in the properties of these classes of antibiotics to cause similar hypersensitivity reactions.

#### **Media Link**

#### **Abstract 38**

**Category Submitting for:** Clinical Vignette

**Abstract Title** The Potential of Shorter Antibiotic Course in Uncomplicated Gram-Negative Bacteremia

#### **Abstract Text**

A 66-year old male with a suprapubic urinary catheter presented to the ED with a fever of 102.7°F (39.3°C) and concern for a urinary tract infection. The patient was tachycardic and febrile upon arrival. He complained of diarrhea, and hematuria was noted in his catheter bag. The patient denied shortness of breath, chest pain, and vomiting. He had a respiratory rate of 18. A urine and blood culture were subsequently obtained.

Pertinent past medical history includes diabetes mellitus type 2, below the knee amputation, transurethral resection of prostate, atrial flutter, hypertension, PTSD, major depressive disorder, and opioid dependence.

Emergency room laboratory studies showed leukocytosis with a white blood cell count of 14.2 K/ul (Reference Range: 4.0-11.0) and elevated lactic acid of 2.8 mmol/L (Reference range: 0.7-2.1).

A COVID-19 test was negative. EKG showed sinus tachycardia with rate of 108, no ST elevations or depressions. A TEE showed no vegetation. CT of the head without IV contrast showed no acute intracranial hemorrhage or mass effect. Chest x-ray showed streaky opacities in both lungs, with greater opacity in the left lung with a low suspicion for pneumonia. CT of the abdomen showed no evidence of hydronephrosis, calcified nephrolithiasis, and no abnormal fluid collection.

The patient met 3/4 SIRS criteria for sepsis (temperature >38°C, Heart rate > 90 bpm, and WBC >12.0 K/ul). The patient was subsequently admitted to the hospital and started on empirical IV antibiotics of vancomycin and piperacillin-tazobactam. The patient showed signs of clinical improvement within 48 hours after administration of antibiotics.

On hospital admission day 3, urine and blood cultures subsequently grew *Serratia marcescens*,



an anaerobic gram-negative bacteria. At this time, piperacillin-tazobactam was discontinued and IV cefepime was added.

After stabilization of vitals, IV cefepime was discontinued and oral levofloxacin was initiated, as *S. marcescens* showed susceptibility to fluoroquinolones. The patient was discharged home for the remainder of the 10 day oral antibiotic course.

Previous standard empiric antibiotic course for uncomplicated gram-negative bacteremia is third- or fourth-generation cephalosporin, with narrowed antibiotic choice based on susceptibility for a 14 day course. However, there is a growing body of clinical evidence that shows shorter courses are noninferior to the longer conventional course for uncomplicated gram-negative bloodstream infection. A recent study indicated a 7-day course of antibiotics is comparable to a 14-day course. Our patient was considered uncomplicated because he was immunocompetent, had a urinary source (indwelling catheter), and became clinically stable in less than 72 hours. Following this evidence, this patient received the shorter 10 day antibiotic course. We present this case to facilitate discussion of antibiotic length and positive clinical outcome supporting a shorter antibiotic course.

#### **Media Link**

#### **Abstract 39**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Hyperglycemic Crisis: The Incidentaloma that Wasn't

#### **Abstract Text**

Hyperglycemic Crisis: The Incidentaloma that Wasn't  
Daniela Cortés Reyes, Fourth Year Medical Student, UNMC  
Nate Anderson, MD, Assistant Professor, UNMC

A 45-year-old woman with a past medical history significant for hypertension and type II diabetes mellitus, presented with a one-day history of elevated blood sugars as measured by a home glucometer. She also endorsed new abdominal swelling, diarrhea, and chest pain. Her abdomen was distended and diffusely tender, with a liver edge extending into her mid-abdomen. There were bounding pulses with prominent heart sounds. She also had temporal wasting and pitting edema bilaterally.

CT imaging showed a large hepatic conglomerate mass measuring up to 17 x 9 cm and a right adrenal mass, measuring 3 x 3 cm (63 Hounsfield units).

Of note, she was recently hospitalized three weeks prior for hypertensive emergency. Laboratory workup for secondary hypertension was pending at time of patient discharge but had since resulted. Plasma metanephrines were elevated at 3 (normal range: 0-0.49 nmol/L), while normetanephrines were normal at 0.6 (normal range: 0-0.89 nmol/L). Aldosterone renin activity

was similarly elevated at 33 (normal  $\leq 25$ ).

Unfortunately, before a plan for the diagnosis and treatment of her diabetes and abdominal masses could be executed, the patient decided to leave against medical advice. She was discharged on Lantus and her home amlodipine, lisinopril and spironolactone. We encouraged her to follow up with Diabetes and Endocrinology in the outpatient setting for pheochromocytoma and dexamethasone suppression testing.

Learning Objectives:

1. Identify the differential diagnosis for secondary hypertension.
2. Understand the pathophysiology of pheochromocytomas.
3. Outline prognostic factors of malignant pheochromocytomas.

Discussion:

The management of hypertensive emergency is a serious and commonly encountered challenge for internists. While most hypertensive emergencies occur in the setting of a prior diagnosis of hypertension and/or medication nonadherence, clinicians should suspect other causes in the right clinical context. In our patient with hepatomegaly, imaging was not typical for a primary liver source. Instead, we suspected a primary adrenal mass, though we did not confirm the diagnosis by 24-hour urine collection.

Pheochromocytomas are rare neuroendocrine tumors, which typically secrete norepinephrine, epinephrine, and rarely dopamine. These catecholamines are responsible for the classic triad of symptoms: episodic headaches, sweating, and tachycardia. It is a rare cause of secondary hypertension. Glucose intolerance and/or diabetes are also common in patients with pheochromocytomas. Diabetes control often improves following resection of these tumors, and in rare cases, patients are cured of their diabetes.

Malignant disease, defined as extension beyond the adrenal capsule or metastasis, is present in ten percent of cases. While malignant pheochromocytomas are rare, their aggressive nature should prompt timely evaluation and treatment. Internists should be proficient in identifying symptoms suggestive of secondary hypertension that may require further screening.

**Media Link**

**Abstract 40**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Recurrent Meningitis

**Abstract Text**

A 58-year-old woman with a past medical history of recurrent viral meningitis, liver cirrhosis secondary to hepatitis C resolved via interferon, and complex PTSD presented to the emergency

department in setting of four days of headaches, earaches, polyarthralgia, sinus pain, and throbbing back pain. She had gone to an urgent care two days prior and had been given a seven-day course of cough syrup and Zofran along with instructions to go to an emergency room if symptoms worsened. She began to having climbing temperatures that peaked at 100.2 Fahrenheit along with facial swelling. When speaking to her, she said the symptoms of facial pain, diffuse body aches, and congestion are what she experiences early on during episodes of viral meningitis. She denies neck stiffness, double vision, cough, diarrhea, abdominal pain, shortness of breath, chest pain, or history of bacterial meningitis. No recent burning with urination, new rashes, new genital lesions. < br /> Physical exam was negative for cardiac, respiratory, or abdominal findings. The only real positive findings were a bilateral, upper, and lower extremity polyarthralgia along with a diffuse lower back pain that she described as a soreness. Joints were not red, hot, or swollen. The back pain was diffuse, not worse with palpation and had gone on for seven years, so we deemed it not relevant in this case. Lastly, no skin lesions were found.

On presentation to the emergency department, her blood pressure was 153/101. She was alert and oriented, afebrile, and non-diaphoretic. Her CBC and CMP were both within normal limits except for a decreased platelets at 133 and protein at 6.2. Blood cultures were drawn. Lumbar puncture resulted glucose 59, protein 80.8, nucleated 322, lymphocytes 86, monocytes/macrococytes of 14, and no organisms on gram stain. PCR of the CSF was started for Herpes Simplex and Varicella Zoster. CT head showed no acute abnormality. With her presentation, she was given Ceftriaxone, Vancomycin, Ampicillin, Acyclovir, Benadryl, Ativan, and one liter of normal saline.

Twenty-four hours after admission, blood cultures remained negative, so antibiotics were halted.

Additionally, her CSF PCR came back positive for HSV-2 but negative for HSV-1 and VZV. As a result, we felt comfortable discharging her the next day with a seven-day supply of Valtrex.

Additionally, in the setting of her meningitis having a prodrome, she was given a seven-day supply of Valtrex and tramadol should another attack occur.

#### Conclusion:

This case presented a teaching moment regarding the usefulness of a diagnosis. The patient suffered from Mollaret's Meningitis, frequently associated with HSV-2. Despite no history of bacterial meningitis or any lab finding supporting it, she had been treated using antibiotics for every episode. While able to diagnose and treat effectively, evidence does not suggest that prophylaxis is viable.

#### Media Link

#### Abstract 41

**Category Submitting for:** Clinical Vignette

**Abstract Title** Preparing for the Unexpected: Recognizing a Tortuous Thoracic Aorta During Ultrasound-guided Thoracentesis

#### Abstract Text

Case Presentation: A 70 year-old male presented with one week of shortness of breath and lightheadedness. He was found to have a left-sided pleural effusion on chest x-ray. A bedside ultrasound demonstrated a large left-sided pleural effusion and a hyperechoic linear structure in the posterior left hemithorax. Application of color Doppler to the structure demonstrated pulsatile flow, which was confirmed to be the aorta with pulse wave Doppler.

The thoracentesis was successful with removal of about 1000 mL of sanguinous fluid. The patient tolerated the procedure without complication. As part of his evaluation, a computed tomography was performed and demonstrated “extensive atherosclerotic vascular disease with multifocal ectasia of the thoracic and abdominal aorta” in addition to previous imaging findings describing a tortuous aorta.

### Discussion

The thoracic aorta normally begins at the level of the T4 vertebra and courses caudally through the posterior mediastinum. The aorta is initially found to the left of the vertebral column but eventually tracks anterior to the lower thoracic vertebral bodies. The descending thoracic aorta ultimately becomes more tortuous with age. Aortic tortuosity increases with age, making the aorta potentially more vulnerable to puncture during procedures, likely due to decreasing elastin and increasing collagen in the aortic wall. In some cases, the aorta can have a similar appearance to pleural fluid or lung tissue on ultrasound. Vascular walls could potentially be mistaken for collapsed lung tissue or septations, as might be seen in complex effusions. In addition, aortic pulsatility could be mistaken for movement of atelectatic lung within an effusion (described as the “jellyfish sign”). Importantly, color and spectral Doppler imaging can help identify vasculature structures which can change the course of a patient's thoracentesis.

This case report emphasizes the importance of considering anatomic variants of the descending thoracic aorta when performing a thoracentesis. In our report, the patient's aorta was identified by ultrasound in the left posterior lung while attempting to find an insertion point for a thoracentesis. Visualization of the aorta is not normally identified in this manner. We advocate for routine use of ultrasonography and color Doppler over the intended needle entry site to avoid potentially life-threatening complications of thoracentesis procedures.

### Media Link

## Abstract 42

**Category Submitting for:** Clinical Vignette

**Abstract Title** Aortoenteric Fistula Formation Secondary to Aortic Stent Placement

### Abstract Text

#### Introduction:

Secondary fistula formation is an uncommon, but lethal complication of aortic surgical interventions. Fistula formation is hypothesized to occur due to graft friction on the abdominal wall and erosion into the gastrointestinal tract. Enteric bacteria are then able to invade the tissue, causing infection of the stent and subsequent risk for patient mortality. These can occur in up to 1.6% of patients following surgery, but necessitate rapid recognition due to high risk of patient decompensation.

#### Case Description:

A 65-year-old male presented to the emergency department with a chief complaint of rectal bleeding associated with two bloody bowel movements. He had a past medical history significant for an infrarenal aorta-superior mesenteric artery and aorta-hepatic artery dacron graft bypass, as well as a social history significant for smoking 0.25 packs per day. On physical exam, the patient was not in acute distress and was hemodynamically stable, with noted abdominal tenderness and guarding. On admission, his temperature was 100°F, leukocyte count was  $15.8 \times 10^9/L$ , and hemoglobin was 10.8 g/dL. Abdominal CT revealed aortoenteric fistula, with tracts also extending to an aortogastric fistula. The tract extending superiorly to the region of the stomach represented an occluded graft. The region of the lower graft near the aorta was suspicious for infected graft and vascular-enteric fistula. The patient was admitted for vascular surgery with placement of aortic bypass graft cuff. Exploratory laparotomy did not reveal evidence of ischemic necrosis, however significant adhesions were noted around an area of the jejunum and abdominal aorta. The patient remained intubated following initial vascular surgery and underwent an esophagogastroduodenoscopy the following day. This revealed necrotic changes of the stomach and duodenum with fistulas in both prepyloric and postpyloric areas with purulence. At this time, the patient remained intubated with temperatures ranging from 100-102.2°F, leukocytosis (WBC  $33.6 \times 10^9/L$ ) with 24% bands, and hemoglobin of 9.3 g/dL. He was placed on piperacillin/tazobactam and micafungin per infectious disease. The patient remained intubated due to continued agitation. Four days following surgery, the patient died after his family opted for compassionate extubation.

#### Discussion:

This case highlights multiple devastating consequences from aortic aneurysm bypass graft surgery and requirement for rapid recognition. This patient acquired extensive abdominal adhesions, aortoenteric fistulas, and aortogastric fistulas. These led to the infection of the graft, which quickly led to ischemic necrosis of the stomach and duodenum. The patient deteriorated quickly and died within five days of his admission for rectal bleeding.

#### Media Link

Abstract 43

**Category Submitting for:** Research

**Abstract Title** Trends in palliative care interventions in invasive ocular melanoma: An analysis of the National Cancer Database

**Abstract Text**

**Introduction:** Ocular melanoma is the most common primary intraocular malignant tumor found in adults. When not detected early, ocular melanoma may lead to loss of sight or life and has a 5-year survival rate of 15% with distant metastasis. Palliative care may be used to alleviate symptoms of advanced disease, though it does not slow the progression of the disease. For invasive stage IV ocular melanoma, palliative care is utilized to improve quality of life and reduce pain. Palliative care is provided in the form of surgery, radiation, chemotherapy, or pain management. Using the National Cancer Database (NCDB), we aim to identify trends in patients that receive different types of palliative care for invasive ocular melanoma.

**Methods:** Using the NCDB, 28,728 patients with invasive ocular melanoma between 2004 and 2018 were analyzed based on age, race, sex, ethnicity, insurance, income, geographic location, education, facility type, and Charlson-Deyo score. Demographic and socioeconomic factors of patients were analyzed comparing odds of receiving palliative care therapy. Chi square analysis, one-way ANOVA, and multivariate binary logistic regression were used to compare and analyze these patient trends in palliative care.

**Results:** There were significant ( $p \leq 0.05$ ) associations between race, Charlson-Deyo score, insurance status, and facility type with likelihood of receiving palliative care. Overall utilization of palliative care was low as only 0.3% of patients received some form. 0.7% of African Americans received palliative care compared to 0.3% of whites ( $p < 0.049$ ). Having two or more comorbidities (Charlson-Deyo Score  $\geq 2$ ) was associated with higher rates of receiving some palliative care ( $p < 0.005$ ). Patients with Medicaid, Medicare, or no insurance had higher proportions of receiving palliative care treatment than not ( $p < 0.004$ ). There was a greater likelihood of receiving palliative care for patients at community cancer programs, comprehensive community cancer program facilities, and integrated network cancer programs than academic research programs ( $p < 0.001$ ). Notably, there was no significance in reception of palliative care based on ethnicity, income, education level, age, or location in the US.

**Conclusions:** Factors associated with increased likelihood of receiving palliative care to alleviate symptoms of invasive ocular melanoma include race, Charlson-Deyo score, insurance status, and facility type. This data can be applied as palliative care utilization increases in the United States and in the treatment of invasive ocular melanoma.

**Media Link****Abstract 44**

**Category Submitting for:** Clinical Vignette

**Abstract Title** The Mysterical Venereal

**Abstract Text**

A 60-year-old man with a past medical history of untreated HIV presented to emergency department with rectal pain. He also noted several weeks of constipation. He was afebrile with a blood pressure of 180/93. His BMI is 25 kg/m<sup>2</sup>. No abdominal tenderness, distention, hepatosplenomegaly. Three 3-10 mm scabbed circular lesions were on his thoracic back, lumbar

back, and right foot. Several hypopigmented lesions were also seen around his rectum. Patient reported a single male sexual contact two months prior. He denied any other sexual contact in the last year. His WBC was 6.9, hemoglobin of 9.9 g/uL, and CD4 count of 120. A pelvic MRI showed anal wall thickening with diffuse lymphadenopathy. Abdominal CT showed several hepatic hypoechoic densities. Colonoscopy showed anal canal ulcers and inflammation around the dentate line without evidence of obstructive mass or colorectal cancer. Further evaluation showed positive chlamydia rectal via PCR, and ultimately, rectal and back lesions returned positive for monkeypox. The patient was started on TPoxx, Doxycycline, Biktarvy and subsequently discharged on isolation precautions 2 days later feeling improved.

Recognize common symptoms of Monkeypox

Identify skin manifestations that can mimic Monkeypox

Recognize proctitis as a symptom of Monkeypox

Identify which patients require treatment for Monkeypox

Discussion:

Monkeypox is an orthopoxvirus that was initially isolated in Denmark in the 1950's from laboratory monkeys from Singapore. It was first seen in humans in sub-Saharan Africa in the 1970's. At that point, all cases were in individuals living near the rainforest with monkey exposure. The 2022 outbreak was first reported in Europe in May 2022. This novel strain is the first reported with human-to-human transmission. The primary route of transmission is through direct contact with lesions or infected bodily fluids. 98% of cases have been identified in men who have sex with men, though it also can be spread via fomites, such as linens, and possibly respiratory secretions.

Typical presentation starts with a prodromal period characterized by fever, lymphadenopathy, myalgias, and fatigue. Symptoms persist for five days and are followed by skin manifestations. Lesions tend to start on the face, but often are seen on palms, soles, mucosal membranes, anus, or genitals. They progress from macules to vesicles, then pustules which eventually crust over. The polymorphic nature of lesions enables Monkeypox to mimic other rashes such as acne, syphilis, or herpes. Here we report a unique case of monkeypox presenting as rectal pain, tenesmus, and constipation. Monkeypox is treated with Tecovirimat (Tpoxx) which is a viral envelope inhibitor that works by preventing the virus from leaving the infected cell. It is reserved for individuals with severe disease or those at elevated risk of severe disease.

**Media Link**

**Abstract 45**

## **Category Submitting for:** Clinical Vignette

### **Abstract Title** Development of Gram Negative Septic Arthritis in an Immunocompetent Patient

#### **Abstract Text**

Introduction: Septic arthritis is the inflammation of one or more joints due to an infectious etiology, most commonly bacterial. The most common offending bacteria are gram positive organisms, notably *Staphylococcus aureus* and *Streptococcus*. Septic arthritis from gram negative bacilli only occurs in 14-19% of cases, and is higher risk in patients with a history of intravenous drug use or immunocompromise. Incidence of septic arthritis from gram negative bacteria producing extended-spectrum  $\beta$ -lactamases (ES $\beta$ L) is rarer still, comprising 2% of cases. Production of ES $\beta$ Ls further complicates management, limiting antibiotic treatment to the carbapenems. This case demonstrates development of ES $\beta$ L-producing *E. coli* septic arthritis in a patient following chemotherapy initiation and prolonged hospitalization.

Case Description: A 64-year-old female with a past medical history of type II diabetes, chronic kidney disease, and squamous cell carcinoma of the right lung status post thoracotomy and chemotherapy initiation presented to the emergency department with a chief complaint of hypoglycemia and a two day history of worsening abdominal pain, left hip and knee pain, and oliguria. On initial exam, the patient was afebrile and in pain with a diffusely tender and distended abdomen. She had right-sided flank tenderness and bilateral lower extremity tenderness to palpation. Nephrology was consulted for several metabolic derangements, including hyponatremia, hyperkalemia, metabolic acidosis, and acute kidney injury from dehydration. CT of the abdomen found bilateral nephrolithiasis and emphysematous pyelitis. Initial urine culture resulted mixed microbial flora, with a repeat culture positive for ES $\beta$ L-*E. coli*. She was started on meropenem. Two days after admission, she underwent bilateral ureteral stents with general improvement. Blood cultures at this point were negative.

Two weeks after admission, the patient began experiencing worsening left knee pain with decreased range of motion and difficulty ambulating. 3 view X-ray of the left knee showed soft tissue swelling with small joint effusion. The patient received a 3mL injection of Kenalog and underwent a joint arthrocentesis for culture of fluid. This revealed septic arthritis caused by ES $\beta$ L-producing *E. coli*. Susceptibility testing revealed resistance to all penicillins, cephalosporins, and aztreonam. Left knee septic arthritis drainage and washout was performed by orthopedic surgery and the patient reported significant pain improvement. She was discharged on ertapenem, with continued improvement of the left knee.

Discussion: This case illustrates the importance of maintaining a high degree of clinical suspicion for septic arthritis caused by resistant gram negative bacteria in an immunocompromised patient with history of recent hospitalization, despite negative blood cultures. Early diagnosis and initiation of broad-spectrum antibiotics is paramount in achieving optimal resolution of septic arthritis.

#### **Media Link**



## **Category Submitting for:** Clinical Vignette

**Abstract Title** Syndrome of Inappropriate Anti-diuretic Hormone as a Complication of Guillain-Barré Syndrome

### **Abstract Text**

Guillain-Barré Syndrome (GBS) is the most common cause of acute flaccid paralysis worldwide. Progressive motor weakness in patients with GBS is most often preceded by an infectious illness, such as an upper respiratory infection or gastroenteritis. Many pathogens have been implicated in the epidemiological association of GBS including but not limited to: *Campylobacter jejuni*, cytomegalovirus, *Haemophilus influenzae*, *Mycoplasma pneumoniae*, Epstein-Barr virus, hepatitis E virus, influenza A virus, and Zika virus.

A 71-year-old female presented to an outside hospital due to back pain with associated bilateral lower extremity weakness and numbness. She was diagnosed with sciatica and discharged home on oxycodone. Her lower extremity weakness and numbness continued to worsen, and she returned to the outside hospital the next day. She was found to have a sodium of 118 and was transferred to a tertiary medical center for further evaluation and management of hyponatremia. Of note, the patient had traveled to Scotland a few weeks prior to presentation. While in Scotland she was admitted to the hospital for gastroenteritis and treated with antibiotics for five days, with resolution of her symptoms.

At the tertiary medical center, the patient reported a history of chronic urinary retention as well as acute onset confusion. She was on no medications which were thought to cause her hyponatremia. Laboratory testing showed inappropriately elevated urine sodium. Hyponatremia was thought to be secondary to syndrome of inappropriate anti-diuretic hormone (SIADH). Renal ultrasound and chest X Ray showed were unremarkable. Her sodium was corrected with fluid restriction and salt tablets and remained stable.

Physical exam showed mild bilateral arm abduction weakness and severe bilateral lower extremity weakness. She showed prominent hyperreflexia in the bilateral upper extremities and areflexia in the bilateral lower extremities. She had decreased pinprick sensation, vibration sensation, and proprioception in both feet. MRI of the lumbar spine was unremarkable. MRI of the brain and cervical spine was also unremarkable.

Lumbar puncture was performed which showed an albumin/cytological dissociation consistent with GBS. The patient was started on IVIG with some improvement and was ultimately admitted to inpatient rehabilitation.

SIADH is a well-known complication of GBS; however, pathogenesis of SIADH in GBS is not completely understood. Hyponatremia seen with SIADH usually presents after the onset of weakness in GBS, but in some cases can precede weakness. In patients with severe hyponatremia with mental status changes, other symptoms such as weakness may be overlooked and a diagnosis of GBS could be delayed or missed.

### **Media Link**

## **Abstract 47**

**Category Submitting for:** Research

**Abstract Title** Utilizing a therapy preference scale to facilitate shared decision-making between cancer patients and oncologists

### **Abstract Text**

Utilizing a therapy preference scale to facilitate shared decision-making between cancer patients and oncologists

Kalika Mahato, Prajwal Dhakal, Christopher Wichman, Vijay Bhatt

**Background:** Over the past 50 years, cancer outcomes have improved with the development of targeted treatments and pharmacogenomic considerations. Clinical trials provide extensive data concerning drug toxicity, chances of survival, and the probability of remission. However, the statistics from these trials do not accurately reflect the patient experience. Data on the characteristics, and burdens of treatment that patients prioritize during decision making are not adequately collected, which hinders decision making.

Shared decision making is an approach that prioritizes the patient's preferences and ensures that both the patient and physician are part of the final decision-making process. In this study, we developed a self-reported 30-item questionnaire, the Therapy Preference Scale (TPS) to help patients contemplate and express their values and preferences regarding safety, efficacy, and other aspects of therapy. We report the responses of 100 patients and analyzed responses by dividing patients into 4 age-by-sex groups.

**Methods:** We conducted an-IRB approved survey. 100 adults with cancer completed the Therapy Preference Scale, a 30-item questionnaire, to determine their cancer treatment preferences. Patients were divided into 4 age-by-sex groups based on current age under 60 or 60 and over and sex (male under 60, male 60 and over, female under 60, and female 60 and over). Responses to questions were compared across the age-by-sex groups using the Kruskal-Wallis non-parametric ANOVA method.

**Results:** When asked about their most valued outcome, 50% of patients selected cure, 24% selected an increase in life-expectancy, 9% chose symptoms relief, and 17% did not respond. Patients from all groups valued avoidance of side effects, maintenance of cognition, and possibility of a cure, and no significant difference was found amongst groups.

Younger male patients, compared to other groups, preferred maintenance of sex life ( $p = 0.03$ ). Older patients found oral instead of intravenous treatment ( $p = 0.02$ ), shorter hospital stay ( $p = 0.03$ ), and shorter distance of treatment from home ( $p = 0.02$ ) more important than younger patients.

Conclusion: While patients from all age-by-sex groups equally valued avoidance of side effects, maintenance of cognition, and possibility of a cure, we found that older patients valued oral treatment, shorter hospital stay, and treatment distance more than younger patients.

## **Media Link**

## **Abstract 48**

**Category Submitting for:** Clinical Vignette

**Abstract Title** DRESS Not SJS

### **Abstract Text**

Introduction: Drug reaction with eosinophilia and systemic symptoms (DRESS) is a rare but serious complication with 2-10% mortality rate due to severe organ involvement. Cases typically follow use of aromatic anticonvulsants, allopurinol, minocycline, vancomycin, or sulfonamide antimicrobials. Similarities in presentation to Stevens-Johnson syndrome (SJS) make it a diagnostic challenge.

Case: 40-year-old female presented with an acute onset of diffuse rash approximately four weeks after initiation of lamotrigine for bipolar disorder. Exam showed diffuse faint pink macules and papules with areas of sparing on the trunk, upper and lower extremities, pubic area, breast and axilla, ulcerations on the hard palate, and erosions and sloughing noted circumferentially around the lips. Her face was edematous, and bulbar and palpebral conjunctivae were injected. Speculum exam to evaluate for vaginal pain was notable for cervical motion tenderness without vaginal wall lesion or erythema. Labs were notable for severe eosinophilia, and elevation in liver enzymes was noted. Serum creatinine was normal as were urinalysis, chest radiography, and viral hepatitis serology. Skin punch biopsy of the rash showed spongiotic dermatitis with interface dermatitis and prominent epidermal dyskeratosis consistent with an exanthematous drug eruption. The European Registry of Severe Cutaneous Adverse Reactions (RegiSCAR) score was 6, consistent with clinical diagnosis of DRESS syndrome. She was started on high dose intravenous corticosteroids as well as topical corticosteroids with improvement of cutaneous lesions and decline in liver enzymes over 10 days. She developed severe odynophagia due to oropharyngeal involvement and required enteral nutrition briefly to meet nutritional needs. She was discharged on oral steroid taper and advised to avoid lamotrigine. The rash had resolved at one month follow up in clinic.

Conclusion: DRESS and SJS typically occur within 2 to 6 weeks of initiating drug therapy but they have some differences in characteristics, prognosis and treatment. Eosinophilia and elevated transaminases are commonly seen in DRESS syndrome however severe mucosal involvement as noted in our patient's eyes and oropharynx are atypical. Lack of skin denuding, bulla and desquamation of acral surfaces made SJS less likely. RegiSCAR score >5 indicates a definitive diagnosis of DRESS. Recurrence of DRESS symptoms is common, even with use of a medication unrelated to the drug causing initial reaction. Understanding the presentation of DRESS is

important in order to avoid further exposure of causal drugs and prevent resulting organ damage and mortality.

#### **Media Link**

### **Abstract 49**

**Category Submitting for:** Clinical Vignette

**Abstract Title** How low can you go? Inappropriately low parathyroid hormone in the setting of hypocalcemia: A case report.

#### **Abstract Text**

Case section:

A 34-year-old man presented with a two-month history of extreme dizziness and fatigue. He also noted a one-month history of gingival bleeding, pain, and swelling, causing decreased oral intake. Past medical history was significant for regular intravenous methamphetamine use. On presentation to the emergency department, he was tachycardic, hypotensive (93/54), and had an oxygen saturation of 97% on room air. Physical exam revealed a cachectic male with temporal muscle wasting, significant gingival swelling with slow bleeding, splenomegaly, and multiple violaceous nodules on the arms, legs, and torso. Labs resulted with a leukocytosis of  $23 \times 10^3/\mu\text{L}$ , normocytic anemia of 8.7 g/dL with iron studies showing anemia of chronic disease, sodium of 118 mmol/L, magnesium 2.9 mg/dL, phosphorus 6.3 mg/dL, creatinine 1.99 mg/dL, calcium of 7.7 mg/dL, ionized calcium of 1.01 mg/dL, and albumin of 1.8 g/dL. Chest x-ray on admission showed patchy central and basilar pulmonary opacities and interstitial thickening, concerning for a combination of atelectasis and consolidation or multifocal pneumonia. Further labs revealed a CD4 count of 74 /ccm, reactive HIV-1 antibody with an HIV-1 RNA count of 8.4 million copies/mL. Vitamin D 25-OH of 15 ng/mL (ref 30-80) and an inappropriately low parathyroid hormone (PTH) of 9 pg/mL (ref 12-88).

Learning Objectives:

1. Recognize the clinical symptoms of hypocalcemia.
2. Understand the interpretation of calcium associated laboratory studies and how these results influence the differential diagnosis.

Discussion:

Investigation of hypocalcemia is an essential topic for all internists to be familiar with. Physical manifestations of hypocalcemia include tetany, Trousseau and Chvostek's signs, seizures, hypotension, papilledema, and psychiatric symptoms including anxiety and depression. When hypocalcemia is suspected, initial laboratory evaluation should include serum intact PTH with additional labs depending on the clinical scenario, potentially including serum magnesium, creatinine, phosphate, alkaline phosphatase, and vitamin D 25-OH (1). Vitamin D deficiency is the most common cause of hypocalcemia in the outpatient setting. With hypocalcemia related to Vitamin D deficiency, PTH would be elevated to stimulate increased calcium resorption (via the kidneys and bones) and vitamin D production in the kidneys (allowing increased calcium absorption in the gastrointestinal tract). In this patient, PTH was incorrectly suppressed. The

patient had no family history of hypoparathyroidism, and no history of autoimmune polyglandular syndrome, thyroid surgery, or thyroid radiation. Although genetic disorders associated with hypoparathyroidism were not tested for, it was felt that this presentation of hypocalcemia was secondary to his active HIV infection. Current hypotheses suggest that active HIV infection may directly affect the parathyroid gland or indirectly cause autoimmune destruction of the parathyroid gland (2). Initial treatment for this patient included vitamin D and calcium supplementation as well as initiation of HIV antiretroviral therapy.

#### **Media Link**

#### **Abstract 50**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Posterior Fossa Glioblastoma Multiforme – An Unusual Radiologic Appearance

#### **Abstract Text**

Introduction: Glioblastoma multiforme (GBM) is a malignant glioma of the central nervous system. It is classified as a grade IV neoplasm, and defined as aggressive, mitotically active, and predisposed to necrosis. Reported 5-year survival rates are 4-5%, with a median survival of 12.6 months. GBM most often develops in the cerebral hemispheres but can rarely develop in the cerebellum or brainstem. Magnetic resonance imaging (MRI) of the brain is an important diagnostic imaging modality for brain abnormalities, and it can be helpful in determining tumor location and extent of involvement. Classic MRI imaging features of GBM include hypointensity on T1-weighted images and heterogeneous enhancement after contrast infusion.

Case Presentation: A 74-year-old male presented to the emergency room with a six-month history of fatigue, intermittent headaches, weakness, balance issues and new onset falls. The patient was admitted to the hospital and stroke protocols were activated. An initial non-contrast CT of the head demonstrated a small hypodensity within the left cerebellum that could have represented a subacute infarct, but further imaging was needed to characterize the lesion. MRI with and without contrast of the brain demonstrated a diffusely infiltrative process throughout both cerebellar hemispheres and in the brainstem compressing the fourth ventricle, causing mild obstructive hydrocephalus and mild cerebellar tonsillar ectopia. This was deemed to be an unusual pattern for neoplasm and suggested more of a rhombencephalitis-pattern of inflammation or infection. Despite suspicion for infection, lumbar puncture was deferred due to risk of herniation. MRI spectroscopy was performed and again demonstrated findings most suggestive of rhombencephalitis, with a neoplastic process like glioma or lymphoma being less likely. During his hospital stay, the patient's headaches became worse, and he also experienced worsening dizziness and forgetfulness. A ventriculoperitoneal shunt was placed and cerebrospinal fluid (CSF) was collected for analysis at that time. CSF workup was negative for any infectious cause of the patient's symptoms and brain imaging findings. On day six of admission, the patient underwent a brain biopsy which revealed WHO grade IV glioblastoma with high-grade poorly differentiated cells, endothelial proliferation, and focal necrosis. Medical oncology and radiation

oncology were consulted for further treatment management.

Discussion: This patient had both a rare anatomic location and unique imaging features of GBM. The imaging characteristics made it challenging to clearly distinguish the findings as a neoplasm, and it was only after a negative infectious disease work-up that biopsy was performed. This case highlights an uncommon presentation of GBM and can serve as a learning opportunity for future difficult diagnoses.

#### **Media Link**

### **Abstract 51**

**Category Submitting for:** Clinical Vignette

**Abstract Title** An Interesting Presentation of Postrenal Acute Kidney Injury due to Benign Prostatic Hyperplasia

#### **Abstract Text**

Introduction: Acute Kidney Injury (AKI) is an abrupt decline in renal function which leads to rise in serum creatinine or blood urea nitrogen (BUN). There are three classifications of AKI based on underlying pathology: prerenal (decreased renal perfusion), intrinsic (damage to kidney parenchyma), or postrenal (impaired urine drainage). This case presents an interesting presentation of postrenal AKI due to benign prostatic hyperplasia (BPH).

Case: A 73 year-old man with a past medical history of depression and untreated BPH presented to the ED for a ground level fall. The patient had tripped while walking home from the grocery store. He denied weakness, lightheadedness, or syncope. He initially refused workup because he felt at his baseline, but subsequently agreed to laboratory workup after failing an ambulation trial prior to discharge from ED. Laboratory workup was significant for a BUN of 102 mg/dL, creatinine of 9.80 mg/dL, non-anion gap metabolic acidosis, normal potassium, and hyperphosphatemia of 6.5 mg/dL. Upon further questioning, he stated that he had urinary incontinence for at least 10 years and thought it was a normal part of aging. He noted that in the week prior he had to change his adult depends three times a day as opposed to his baseline of once per day. CT abdomen pelvis showed marked prostatomegaly (6cm in diameter) with sequela of chronic bladder outlet obstruction including large bladder diverticuli and multiple bladder calculi (5.4cm and 4.7cm in diameter) as well as moderate/severe bilateral hydronephrosis and hydroureter. A foley catheter was inserted to relieve the pressure, sodium bicarbonate 150 mEq in 5% dextrose was given for low bicarbonate levels, and sodium zirconium cyclosilicate was given to prevent hyperkalemia. Kidney function continued to improve in the following days. He was discharged with a foley catheter and a follow-up with urology for a robotic prostatectomy with bladder stone removal. He was subsequently admitted 1.5 months later for severe sepsis secondary to UTI and AKI secondary to outlet obstruction for which a left urethral stent and right nephrostomy tube were placed with plans for future prostatectomy and stone removal.

Discussion: Postrenal AKI is a result of any bilateral obstruction of urine flow along the urinary

tract. The most common causes of obstruction distal to the ureters is bladder outlet obstruction or neurogenic bladder. Prompt removal of the obstruction is imperative to prevent long-term sequelae of chronic obstruction which includes kidney atrophy and end-stage renal disease. The presentation of postrenal AKI ranges from asymptotic to severe uremic symptoms and electrolyte abnormalities. Interestingly, this patient had no significant uremic symptoms despite BUN > 100, creatinine of 9.8 mg/dL, and severe bilateral hydronephrosis and hydroureter which likely means his bladder outlet obstruction was present for an extended period of time.

#### **Media Link**

### **Abstract 52**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Leukostasis-Induced Respiratory Failure; Treat or Get Tricked

#### **Abstract Text**

Case: A 36 year-old female presented with one week of right calf pain and generalized body aches. She had no recent illnesses, fevers, chest pain, or dyspnea on exertion. Physical exam was notable for splenomegaly and non-pitting 1+ edema in the right lower extremity. Ultrasound of right lower extremity showed acute deep vein thrombosis of right gastrocnemius vein. CT chest was negative for pulmonary embolism (PE). She subsequently developed acute hypoxemic respiratory and pleuritic chest pain. Her white count was 490,000 and peripheral smear showed 64% blasts. Repeat CT chest was negative for PE. Transthoracic echocardiogram showed normal left ventricular function and no sign of right ventricular strain. Ultimately, a bone marrow biopsy showed hypercellular marrow consistent with acute myeloid leukemia with BCR-ABL (50% blast). Hydroxyurea and emergent therapeutic leukapheresis were initiated as well as therapeutic anticoagulation. She was transferred to the ICU for close monitoring and placed on CPAP. She received multiple leukapheresis and started on dasatinib and cytoreductive therapy with cyclophosphamide. Her respiratory symptoms resolved, and she responded well to treatment. Her white count normalized, and repeated bone marrow biopsy showed hypocellular marrow with 3% blast prior to discharge.

#### **Learning Objectives:**

1. Recognize that leukostasis is medical emergency that can quickly lead to end organ damage
  2. Recognize that pulmonary compromise in the setting of leukostasis, can present like a PE
- Discussion: Acute respiratory failure is a relatively common presentation encountered by hospitalist. Leukostasis is a medical emergency commonly seen in acute or chronic myeloid leukemia blast crisis with one week mortality rate of 20 to 40%. It remains a diagnostic challenge due to similarities in presentation to other acute respiratory processes. This case illustrates a potential complication of leukostasis, an interesting mimic of pulmonary arterial occlusion. This complication is thought to be due to plugging of microcirculation with large amounts of rigid blast cells. Local tissue hypoxemia is exacerbated by high metabolic activity of blast cells and endothelial damage from increased cytokine release. Patients with respiratory or neurologic

compromise have worse prognosis. Prompt identification and treatment can improve mortality due to this common complication in newly diagnosed acute myeloid leukemia.

## **Media Link**

## **Abstract 53**

**Category Submitting for:** Clinical Vignette

**Abstract Title** A case of hypercalcemia due to vitamin D excess.

### **Abstract Text**

Introduction: Hypercalcemia is a common clinical finding, and over 90% is caused by either malignancy or hyperparathyroidism. Comparatively speaking hypercalcemia from vitamin D supplementation is anomalous, yet still possible due to the role vitamin D plays in calcium homeostasis. This report will present a case of hypercalcemia in a patient receiving vitamin D injections in preparation for metastatic prostate cancer treatment.

Case: An 81-year-old male presents to the ED with acute on chronic respiratory failure and increasing fatigue. His family said he seemed groggy and not himself. His past medical history is significant for COPD requiring 1L nasal cannula during sleep, chronic respiratory failure, mycobacterium avium and pulmonary aspergillosis, diffuse large B cell lymphoma status post chemotherapy, atypical TB, endocarditis, Afib and PE, and CKD stage III. The patient's labs were significant for hypercalcemia (12.0 mg/dl) and AKI on top of CKD (creatinine 2.04 mg/dl). CT scans showed metastatic prostate cancer, small bilateral pleural effusions, poorly defined ground glass opacities. One day prior to admission the patient was given a vitamin D2 50,000 IU injection that he had been receiving weekly for preparation of leuprolide therapy for his metastatic prostate cancer. The patient's vitamin D (25,hydroxy) level is 118 ng/ml (ref: 30-80 ng/ml), and his hypercalcemia is presumed to be from the vitamin D injections he had been receiving weekly prior to presenting in the ED. Steroids are started PO as well as nebulized ipratropium bromide and albuterol for COPD exacerbation induced hypoxemia, and the patient is given an IVF bolus before starting maintenance. The patient recovered well and was discharged from the hospital two days later.

Discussion: Hypercalcemia has several common etiologies including hyperparathyroidism and malignancy; less commonly hypercalcemia can be caused by high vitamin D levels. High calcium levels lead to increased risk of renal stones, constipation, and even cardiac arrhythmias, and further investigation is warranted when the etiology is not initially clear. The patient in this case did have metastatic prostate cancer, however it was not a newly discovered condition and metastatic prostate cancer is not usually associated with hypercalcemia. Commonly used medications like thiazide diuretics can also cause hypercalcemia and should be reviewed, however this patient was not using any thiazides prior to his presentation. Vitamin D injection history in this case provided a high level of suspicion for vitamin D induced hypercalcemia; this prompted pulling the 25 hydroxy vitamin D level and led to the diagnosis of vitamin D induced hypercalcemia.



Conclusion: In patients with hypercalcemia not explained by one of the common causes, further history is needed to determine the etiology. Checking a vitamin D level in patients with history of vitamin D supplementation can lead to earlier diagnosis and reduction in complications.

#### **Media Link**

#### **Abstract 54**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Painful vision impairment secondary to ocular syphilis

#### **Abstract Text**

##### Introduction

Ocular syphilis is a clinical manifestation of syphilis that can involve any structure of the eye. Posterior uveitis and pan-uveitis are the most common presentations. In a recent investigation of early syphilis (ES) cases, the self-reported prevalence of neurological and/or  $\geq 1$  ocular symptom was found to be 151 among 9123 cases. Among symptomatic ES cases, 36% reported neurologic symptom(s) only, 34% reported ocular symptom(s) only, and 30% reported having both neurologic and ocular symptoms.

##### Case Presentation

A 53-year-old male with past medical history of chronic HIV infection, latent syphilis, previous incarceration, and polysubstance abuse presented with one week of left eye pain with redness, blurred vision, and increased tearing. Patient was recently evaluated in the eye clinic for these symptoms and received a call from the clinic that day explaining that he had tested positive for ocular syphilis and should go to the ED for treatment. He also reported new rashes on the lower back, hands, and genital area. Patient started taking Biktarvy two weeks prior for management of his HIV. His latent syphilis was diagnosed in January 2020 and then treated with 3 weekly doses of penicillin while in prison circa January 2021. On physical exam, left conjunctival hemorrhage was noted in addition to several crusted lesions on both flanks, right external ear, and right dorsal hand. Multiple scabbed lesions were noted on the scrotum, with tenderness. Laboratory investigations showed anemia, elevated RDW, and hypoalbuminemia. HSV 1&2 PCR and Monkey Pox were negative. A syphilis workup was significant for a reactive serum RPR titer of 1:512. Patient was started on IV penicillin G infusion (24 million units/day) with the plan of 2 weeks of therapy. Unfortunately, the patient eloped without completing the required treatment.

##### Discussion

Although neuro-ocular manifestations of syphilis are rare, with the increasing prevalence of syphilis in the United States, more frequent encounters with complications of syphilis may be expected. Per CDC guidelines, the definition of ocular syphilis is clinical symptoms or signs consistent with ocular disease in addition to syphilis of any stage. If there is clinical evidence of neurological involvement, a lumbar puncture with CSF evaluation is warranted prior to treatment. If ocular syphilis is suspected, ophthalmology should be consulted immediately. Recommended treatment regimen constitutes aqueous crystalline penicillin G 18-24 million units per day (3-4 million units IV every 4 hours or continuous infusion for 10-14 days). In case of penicillin allergy, limited data support the use of ceftriaxone 1-2 g daily (IM or IV) for 10-14 days.

## Conclusion

Ocular syphilis is a rare condition that may be associated with neurosyphilis and can present at any stage of syphilis. Prompt identification and treatment are essential in preventing decreased visual acuity and permanent vision impairment.

## Media Link

## Abstract 55

**Category Submitting for:** Clinical Vignette

MBBS

**Abstract Title** Neurologic complications after COVID-19: Guillain-Barré Syndrome

## Abstract Text

Introduction:

Guillain-Barré Syndrome (GBS) defines a group of immune-mediated polyneuropathies generally precipitated by infection with the most common etiology being *Campylobacter jejuni*. However, there have been cases reported following EBV, CMV, influenza, Zika virus, and rarely COVID-19 infections. The symptoms of GBS include ascending weakness and hyporeflexia.

Case:

A 40-year-old male with a past medical history of anxiety disorder and obesity presented to the emergency department with what began as weakness in his fingers and progressed to quadriparesis. He reported a mild COVID-19 infection four weeks prior and was unvaccinated. Physical exam was significant for decreased strength and deep tendon reflexes in all extremities. He underwent neurological and infectious workup, and CT head, CTA head and neck, and MRI brain and spine were unremarkable. Lumbar puncture had increased opening pressure (30 cmH<sub>2</sub>O), but CSF analysis was unremarkable. Syphilis screen was positive. Neurosyphilis was ruled out because of inconsistent neurological findings and lack of pupillary involvement. Patient was started on IV penicillin and completed a 14-day course for treatment of presumed latent syphilis. He was also started on doxycycline as empiric treatment for tick borne paralysis which was discontinued after Lyme serology came back negative. Neurology concluded that the likely diagnosis was a functional neurological disorder due to unremarkable initial workup and patient's report of recent stressful life events.

However, patient complained of cough, dyspnea, and had increasing oxygen requirements. On day six of admission, patient underwent elective intubation to protect the airway and due to concern of hypoxic respiratory failure. Lumbar puncture was repeated, and CSF analysis showed albuminocytologic dissociation (protein 69 mg/dl, nucleated cell count 1 /ul) which was consistent with GBS. Patient received a five-day course of IVIG. With minimal improvement, he was subsequently started on plasmapheresis and completed five sessions. After treatment, patient showed significant improvement in muscle strength, return of deep tendon reflexes, and increased

respiratory effort. Patient was extubated, sent to a rehabilitation facility on day 26 of admission, and expected to make a full recovery.

#### Discussion:

Although generally presenting as an ascending weakness that starts in the lower extremities, atypical presentations with weakness starting in upper extremities should not rule out a diagnosis of GBS. More than 16% of patients present with an atypical variant. In addition, albuminocytologic dissociation only occurs in 50-66% of patients who present within the first week of symptoms. Early recognition and treatment of GBS is crucial to prevent development of respiratory failure or long-term sequelae such as permanent motor impairment.

#### Conclusion:

GBS should be considered in all patients presenting with extremity weakness and hyporeflexia who were recently infected with COVID-19 regardless of an atypical presentation or negative CSF analysis.

#### Media Link

### Abstract 56

**Category Submitting for:** Clinical Vignette

**Abstract Title** The rare inflammatory syndromes of HHV-8: A case of rapid multiorgan failure in a newly diagnosed HIV patient

#### Abstract Text

**Introduction:** Human Herpesvirus 8 (HHV-8) is common in individuals infected with Human Immunodeficiency Virus (HIV) and has been associated with complications such as Multicentric Castleman's Disease (MCD) and Kaposi-virus Inflammatory Cytokine Syndrome (KICS). Though rare, these conditions are characterized by an aggressive systemic inflammatory response and carry a high mortality. We present a case of rapidly progressive multiorgan failure in a patient newly diagnosed with HIV and high HHV-8 viremia.

**Case Description:** A 34-year-old male with history of intravenous methamphetamine use presented with two months of weight loss, fatigue, and gingival bleeding. Physical exam showed violaceous nodular skin lesions and marked cachexia. Initial laboratory evaluation revealed anemia, thrombocytopenia, severe metabolic derangements including hyponatremia, hypoalbuminemia, and acute kidney injury. CT imaging revealed atypical left upper lobe consolidation, scattered nodules, and ground glass opacities in lungs, pronounced splenomegaly and diffuse multifocal lymphadenopathy. He was found to be newly positive for HIV with a high viral load and a low CD4 count of 74. He started antiretroviral therapy. Additional labs revealed high HHV-8 viral load at 2.1 million copies / mL and elevated interleukin-6 level at 79.5 pg/mL (reference range <2 pg/mL). Shave biopsy of skin lesion was diagnostic of Kaposi sarcoma. An excisional lymph node biopsy showed Kaposi sarcoma involvement of lymphoid tissue, non-

specific polytypic plasmacytosis, as well as Epstein-Barr Virus positive cells without features of lymphoma. Systemic chemotherapy was considered for high-risk disseminated Kaposi sarcoma, but unfortunately, he developed progressive renal, respiratory, and liver failure and passed away less than 4 weeks after admission.

Discussion: Identifying the etiology of rapidly progressive multiorgan failure in a patient with HIV and uncontrolled inflammatory response can be challenging and often urgent due to rapid progression and high mortality rate. While a definitive diagnosis was not identified, this patient's high HHV-8 viremia, widespread KS, and elevated inflammatory cytokine IL-6, all support an HHV-8 driven immune activation syndrome such as KCIS. The lack of clear pathologic evidence of MCD makes this diagnosis less likely, though it could not be definitively ruled out. While KS-Immune Reconstitution Inflammatory Syndrome may also be considered, the timing is not classic and no evidence of immune response to ART was obtained. The presence of EBV positive lymphocytes also raises the possibility of a similar inflammatory condition known as Hemophagocytic Lymphohistiocytosis and while less likely, it could not be ruled out. This case highlights the complexity of differentiating uncommon and overlapping inflammatory syndromes that may complicate advanced HIV. As these conditions can progress quickly, it is important for clinicians to maintain a high degree of suspicion in HIV patients with HHV-8 viremia experiencing a high inflammatory response. With early recognition and treatment initiation we can aim to decrease mortality in these patients.

**Media Link**

## **Abstract 57**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Hypercalcemia in Diffuse Large B-cell Lymphoma

### **Abstract Text**

Introduction: Hypercalcemia often presents in paraneoplastic processes and typically indicates metastatic disease. However, hypercalcemia is not commonly seen in lymphoma. We present a case of a patient presenting with hypercalcemia secondary to diffuse large B-cell lymphoma.

Case: A 78-year-old male came to the emergency department after a visit to his primary care physician showed abnormal labs with a calcium level of 14.6 mg/dL. He had noticed increased fatigue in the last few weeks and difficulty ambulating. His family noticed in the last few months that he had been sleeping more, having increased bouts of confusion, and unintentional weight loss. His vital signs were stable on arrival. During admission, his laboratory work-up was significant for a calcium of 14.6 mg/dL, ionized calcium of 1.64 mmol/L, PTH of 12.4 pg/mL, and 1,25-dihydroxyvitamin D of 116 pg/mL. PTH-related peptide (PTHrP) and multiple myeloma work-up were negative. A CT scan of the head was negative. His EKG was unremarkable, and his chest X-ray was normal. A CT of the abdomen showed a right-sided 15.7 cm retroperitoneal mass with enlarged right supraclavicular and para-aortic lymph nodes. A lymph node biopsy confirmed a diagnosis of a diffuse large B-cell lymphoma with a germinal center subtype. Flow cytometry

analysis of the retroperitoneal tissue was consistent for a CD-10 positive B-cell lymphoproliferative disorder. His bone marrow biopsy showed no evidence of malignancy. A port was placed, and he was started on systemic chemotherapy.

**Discussion:** Hypercalcemia is uncommon in lymphoma. The exact etiology is unclear, but there are several potential pathways that have been suggested. One pathway is that lymphoma produces PTHrP, a protein that mimics the activity of endogenously released parathyroid hormone from the parathyroid gland. Another explanation is that lymphoma increases the activity of 1 $\alpha$ -hydroxylase, an enzyme which converts 25-hydroxyvitamin D to the active form of 1,25-dihydroxyvitamin D. In our case, PTHrP was negative, and the patient had increased levels of 1,25-dihydroxyvitamin D, indicating an increase in 1 $\alpha$ -hydroxylase activity as the likely cause of his hypercalcemia.

**Conclusion:** Although hypercalcemia is common in malignant processes, it is a rare occurrence in lymphoma. Several potential mechanisms for the development of hypercalcemia in lymphoma have been described. The exact underlying mechanism is unclear and is a potential area for future research.

**Media Link**

## **Abstract 58**

**Category Submitting for:** Clinical Vignette

**Abstract Title** When to Worry About Panicking Patients

### **Abstract Text**

A 23-year-old previously healthy man presented with 5 months of progressive anxiety-induced "panic attacks." The panic attacks occurred daily, with each episode lasting 20 minutes to 4 hours. He described rapidly decreased fields of vision, palpitations, tremulousness, diaphoresis, and loss of consciousness followed by urinary incontinence. There was a sense of foreboding and guilt that accompanied many of the described episodes. He noted an increase in psychosocial stressors in the months preceding the anxiety attacks' onset as his parents were undergoing a divorce.

Upon encountering the patient, he appeared worried but was not in acute distress. His heart had regular rate and rhythm, his lungs were clear to auscultation bilaterally, and he was alert and oriented. His troponin was 0.26. Electrocardiogram initially showed normal sinus rhythm with 87 beats per minute for both atrial and ventricular rates. Echocardiogram showed a left ventricular ejection fraction of 55-60% with a mildly dilated right ventricle and normal systolic and diastolic function. A CT chest showed no signs of pulmonary embolism or aortic dissection. Psychiatric evaluation revealed a four-year history of audiovisual hallucinations and obsessive-compulsive behaviors with social anxiety since childhood.

Later in the day, the patient went into supraventricular tachycardia which required increasing doses of adenosine and cardioversion that were interspersed with apneic episodes and loss of

consciousness requiring painful stimuli to arouse. While in supraventricular tachycardia, the patient was diaphoretic, tachypneic, panicked, and anxious. Following successful cardioversion, no subsequent cardiac events or panic attacks occurred while the patient was still inpatient. A potential pre-excitation syndrome was thought to be the root cause of this patient's supraventricular tachycardia. However, no additional testing has been possible as the patient was lost to follow-up.

#### Discussion:

Panic attacks and tachyarrhythmias can present similarly with elements of sympathetic arousal such as palpitations, diaphoresis, difficulty breathing, and altered perceptions. It can be difficult to discern the distinction between the two, particularly in someone who has had long-standing psychiatric comorbidities with intermittent cardiac symptoms. Often these two disorders can exist concomitantly, or one can exacerbate the other. Thus, it is necessary to evaluate anyone who presents with panic disorder for associated cardiac etiologies via electrophysiology studies and electrocardiograms after the inciting events have concluded, especially if angina or arrhythmias are present.

Patients with underlying angina, ischemic events, or arrhythmias must have subsequent workup to prevent sudden cardiac death. The brief nature of panic attacks and some supraventricular tachycardias can make pinpointing a root cause difficult, but the mortality risks these patients face without cardiac workup require further evaluation. This patient likely has elements of both cardiac and psychiatric diagnoses that exacerbate each other and increase his risk of more harmful cardiac events later in life if left unevaluated.

#### Media Link

### Abstract 59

**Category Submitting for:** Clinical Vignette

**Abstract Title** "A Pain in the Neck": Atypical Presentation of Staph Bacteremia

#### Abstract Text

Learning Objectives:

Recognize an atypical presentation of bacteremia.

Identify the appropriate workup for sepsis.

Identify possible sources of infection in bacteremia.

Case presentation:

A 54-year-old man presented after four days of exquisitely tender left-sided neck pain and pleuritic chest pain. He attributed his neck pain to having slept in an uncomfortable position with his pet pig. Past medical history was significant for diabetes mellitus not on insulin, obstructive sleep apnea, hyperlipidemia, and cervical spondylosis. He was mildly tachycardic, but his vital signs

were otherwise normal. There was no nuchal rigidity or focal neurologic deficits. He had a small, non-purulent, non-erythematous ulcer on plantar surface of the right foot. He denies intravenous drug use and any new tattoos but did have a recent dental procedure not complicated by infection. A few years prior, he had a right total knee arthroplasty but denies pain, swelling, or erythema. Initial labs demonstrated mild leukocytosis with neutrophil predominance, mild transaminitis, blood glucose 408, erythrocyte sedimentation rate 54, procalcitonin 3.2, non-elevated troponin, normal lactate, and significantly elevated d-dimer of 2200.

Chest x-ray and CT angiogram were negative for acute findings. CT of the cervical spine was significant for degenerative changes. The next day, two blood cultures grew methicillin-sensitive *Staphylococcus aureus* (MSSA). Further workup for the source of bacteremia with an x-ray of the right foot was negative for osteomyelitis. CT of neck, transesophageal echocardiogram, urine culture, and ultrasound of abdomen were unremarkable for any source of MSSA bacteremia. MRI of head and neck illustrated peripherally enhancing complex epidural collection extending from C2 to T8, concerning for an epidural abscess.

#### Discussion:

A patient with non-specific symptoms and initial laboratory findings concerning for sepsis is a clinical scenario commonly encountered by internists. It is important to keep sepsis in the differential diagnosis even in the absence of classic signs such as hypotension and fever when other criteria are met. The initial evaluation of sepsis should include complete blood counts with differential, comprehensive metabolic panel, serum lactate, blood cultures from at least two different sites with additional cultures from suspected sources, urinalysis, and imaging targeted to suspected sources of infection.

*Staphylococcus aureus* is a leading cause of bacteremia. Mortality rates range from 20 to 40 percent with hospital readmission and treatment failure being common. *S. aureus* bacteremia is associated with potentially life-threatening complications such as endocarditis and epidural abscess. Therefore, early source control is the most critical part of management. Patients should be interviewed regarding potential portals of entry, the presence of indwelling prosthetic devices, and symptoms that may reflect metastatic infection. Once blood cultures grow *S. aureus*, bedside infectious disease consultation has been shown to improve outcomes with a significantly lower mortality rate.

#### Media Link

#### Abstract 60

**Category Submitting for:** Clinical Vignette

**Abstract Title** Leukocytoclastic Vasculitis with Systemic Involvement

#### Abstract Text

Vasculitis is the inflammation of the blood vessels caused by various irritants such as drugs, infection, or autoimmunity. Leukocytoclastic vasculitis is a typically dermal inflammation of venules and capillaries caused by neutrophils, often having acute onset and resolving spontaneously or with steroid treatment. Herein, we report a unique case of leukocytoclastic vasculitis with significant systemic impact and mortality.

A 75-year-old male presented with new onset bilateral petechia and purpura on all four extremities after a referral from a local clinic for acute kidney injury and an elevated proBNP. His past medical history was significant for right-sided heart failure, type II diabetes mellitus, and chronic kidney disease. Punch biopsy of the petechial lesions confirmed the diagnosis of leukocytoclastic vasculitis. The patient was started on a 30-day oral prednisone taper and showed initial improvement in symptoms. However, after completion, the patient's vasculitis returned, this time presenting with hematuria and altered mental status. Labs were notably negative for ANCA, ANA, anti-double-stranded DNA, rheumatoid factor, CCP, RNP, MPO, and PR-3. The patient's condition began deteriorating, and his Glasgow Coma Scale fell from 15 to 9. Head CT, MRI, and EEG all showed no abnormalities to explain the change in mentation. The patient's creatinine continued to climb, peaking at 4.39 (baseline 1.40) and he was started on dialysis. The patient's white blood cell count, which had previously been within normal limits, climbed to 18.1, his blood pressure dropped to mean arterial pressures below 65, and he began having hematochezia resulting in hemoglobin levels falling from 9.7 to 7.1. Initial treatment with Zosyn was started for presumptive infectious etiology, however, all blood cultures returned negative. A working diagnosis of systemic leukocytoclastic vasculitis impacting the renal, gastrointestinal, and central nervous systems was made. A punch biopsy of the kidney was taken, but the patient was transitioned to comfort care and passed away before the results were available.

This case articulates an outlier example of a typically benign leukocytoclastic vasculitis progressing to multisystem involvement and eventual death. The initial improvement in the patient's condition, followed by an abrupt decline after finishing his steroid regimen, may suggest a less aggressive taper approach to be beneficial in extensive or severe presentations of leukocytoclastic vasculitis, especially in patients with comorbid conditions.

## **Media Link**

### **Abstract 61**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Wolff-Parkinson-White: The Value of Low-Threshold Ordering for EKGs

### **Abstract Text**

Wolff-Parkinson-White (WPW) syndrome is a rare congenital disorder of the cardiac electric conduction system. WPW is rare and can present with a range of clinical presentations. Here we present a case of a 19-year-old male who presented to the emergency department for evaluation



of dizziness, “a sensation of spinning”, palpitations, and nausea that had been present for two days. The patient indicated that he experienced near-syncope on exertion approximately 1 hour prior to presentation. Vital signs were stable and physical exam was unremarkable. Past medical history, family history, and initial lab workup were noncontributory and substance use history was significant for nicotine vaporizer use. Routine electrocardiogram (EKG) displayed the pathognomonic delta wave, widened QRS, and shortened PR interval seen in WPW. Cardiology was consulted and recommended admission for complete cardiac workup. During the hospital observation, an echocardiogram revealed no structural abnormalities and cardiac laboratory workup was unrevealing. In addition, no pathologic tachycardia was detected on continuous telemetry. The patient was discharged the following day with a Holter monitor and was referred for follow up with electrophysiology. He was encouraged to discontinue the use of both nicotine and caffeine as well as exertional activities during the intervening period. Follow-up evaluation two weeks later revealed persistent pre-excitation with demonstration of heart rates between 44 and 148 bpm. The patient endorsed no resolution of symptoms during this period. Stress testing revealed aberrant pathway signaling at higher rates than the SA-AV pathway with no evidence of cardiac ischemia. Given the risk of lethal arrhythmia, informed consent was obtained for ablation of the abnormal conduction pathway. Two months after initial presentation, the patient underwent catheter ablation with complete resolution of WPW waveforms on post-operative EKG. Complications post-procedure included easily inducible supraventricular tachycardia (SVT), for which the patient was discharged home on anti-arrhythmic medications. At two-week follow-up, the patient endorsed resolution of symptoms and no recurrent episodes of suspected SVT. This case demonstrates the value of high clinical suspicion for congenital and acquired cardiac disorders in younger patients with non-specific symptoms of pre-syncope and palpitations. Despite the rarity of WPW, the diagnostic utility of its characteristic EKG is indisputable and illustrates the value of understanding EKG characteristics throughout clinical practice. A low threshold for ordering EKGs should be maintained given its low cost, ease of access, and diagnostic reliability. When implemented appropriately, these screening considerations may contribute to reduced adverse sequelae in undetected cardiopulmonary abnormalities.

#### **Media Link**

#### **Abstract 62**

**Category Submitting for:** Clinical Vignette

**Additional Authors (please list, if any)** Abubakar Tauseef, Akshat Sood, Joseph Thirumalareddy

**Advisor you are working with (please list, if any)**

**Abstract Title** A Rare Cause of Hemophagocytic Lymphohistiocytosis Revealed: Herpes Simplex

1

#### **Abstract Text**

Introduction:

Hemophagocytic lympho-histiocytosis (HLH) is a rare hyperinflammatory syndrome caused by severe immune dysfunction. In adults, secondary HLH usually occurs secondary to Epstein-Barr virus (EBV). Herpes simplex 1 (HSV-1) is an extremely rare cause of HLH. Here we present a rare case of disseminated HSV-1 induced HLH.

#### Case:

A 73-year-old gentleman with a past medical history of hypertension, hyperlipidemia, diabetes mellitus type II, and hypothyroidism presented to the emergency room with complaints of altered mental status, weakness, and fevers status post corneal transplant 2 weeks ago. Day prior to admission, he was seen in urgent care clinic for a suspected UTI and was initially prescribed Bactrim for a total of five days. In the emergency department, the patient was febrile and tachycardic. Initial workup confirmed lactic acidosis with lactate up to 2.3, serum creatinine of 1.69, sodium of 126 and AST and ALT elevated up to 527 and 427. Urine analysis confirmed large amount of blood without bacteria. CT head, chest and abdomen were unremarkable. Sepsis protocol was initiated, and patient was started on IV fluids as per sepsis protocol and broad-spectrum antibiotics including vancomycin as per pharmacy and Rocephin 2 grams BID for the concerns of sepsis secondary to meningitis. Lumbar puncture was planned which came back positive for HSV-1. The patient was started on IV acyclovir. An MRI was performed but was negative for temporal lobe enhancement. Therefore, a primary HSV-1 infection that seeded the CNS causing HSV encephalitis was suspected. The patient's ferritin level was > 20,000. Due to concern for HLH, an H score was calculated. The patient's H score was 216 (indicating a 93-96% probability of HLH syndrome). Patient was evaluated by hematology/oncology and patient was started on treatment of HLH with 1 dose of etoposide and 5 doses of dexamethasone with a drastic improvement in inflammatory markers. The patient's liver enzymes continued to trend up, liver biopsy was performed which confirmed the diagnosis of herpetic necrotizing hepatitis with evidence of Kupffer cell erythrophagocytosis and positive for HSV-1, thus confirming HLH.

#### Discussion:

HLH is a rare and potentially life-threatening disorder. Due to extreme immune activation, patients experience fevers, cell lineage abnormalities, hepatosplenomegaly, and elevated ferritin levels. HLH can be divided into primary and secondary causes. Primary HLH is caused by a genetic defect that is very rare in adults. Secondary HLH which accounts for most cases in adults is caused by infection, malignancy, immune checkpoint inhibitors, or autoimmune diseases. Infection is the most common cause of secondary HLH with EBV being the most common etiology. HSV-1 is an extremely rare cause of HLH. Due to its severe nature, it's imperative to diagnose and treat HLH immediately and identify the underlying cause.

#### Media Link

#### Abstract 63

**Category Submitting for:** Clinical Vignette

**Abstract Title** Use of two anticoagulant agents in the setting of recurrent unprovoked VTE/PE and extensive medication allergies

## **Abstract Text**

### Case Section

A 38 year-old woman presented with a recurrent episode of diabetic ketoacidosis due to alleged insulin pump failure, though there was some suspicion that this may have been a suicide attempt. The patient has an extensive medical and psychiatric history including poorly controlled type 1 diabetes mellitus. Her course was complicated by a long history of multiple venous thromboembolisms, pulmonary embolisms, and embolic strokes requiring several past hospitalizations, making inpatient deep venous thrombosis prophylaxis all the more imperative. Past management with multiple anticoagulant agents had failed when used as monotherapy. Goal INR was 2-3. She is allergic to lovenox and fondaparinux. Prior extensive testing for known clotting disorders has been negative, including flow cytometry, factor II mutations, JAK2 V617, lupus anticoagulant, antithrombin III, anticardiolipin, beta 2 glycoprotein, and Factor V leiden. Given single agent failure at therapeutic ranges, recurrent thrombosis, and allergies, the patient was started on coumadin and xarelto as an outpatient, a regimen on which she has been clot-free for four years. She continues to follow up with a hematologist as an outpatient. Hematology was consulted for management as an inpatient with recommendations to continue both agents with close monitoring of coagulation studies.

### Discussion

The coagulation cascade is a multistep process which results in blood clotting, usually in response to tissue trauma. In the setting of unprovoked thrombosis without identifiable cause even after extensive testing, clot prevention becomes the mainstay of medical management. Coumadin competitively inhibits vitamin K epoxide reductase complex 1. This enzyme activates vitamin K, a cofactor required for the hepatic synthesis of several coagulation factors, factors II, VII, IX, and X, as well as coagulation regulatory factors protein C and protein S. Xarelto is an inhibitor of coagulation factor Xa. In the absence of a known clotting disorder, drug mechanisms targeting multiple factors of the coagulation cascade seem to work well for this patient, as she has gone years without a clinically significant thromboembolism and has suffered no side effects by way of harmful bleeding. Deep venous thrombosis prophylaxis is a consideration in the treatment of virtually every hospitalized patient due to the increased risks for clotting incurred by the patient's limited mobility during hospitalization. The decision to continue her dual agent anticoagulation regimen inpatient required weighing of the risks of bleeding in a patient already unstable due to another medical condition against the benefit of preventing thromboembolism in a patient who is already susceptible. This led to a valuable and fascinating discussion on our service and an opportunity for close collaboration with the hematology service.

### **Media Link**

## **Abstract 64**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Emboli from an Uncommon Source

### **Abstract Text**

A 14-year-old female presented with left foot pain, numbness, and pallor. She was jumping on a trampoline when she suddenly experienced pain in her left foot and noticed that the foot was pale. She had no past medical history of thrombotic events, no family history of clotting disorders, stroke, or cardiac rhythm abnormalities, and was not taking any medications. CT angiography showed a non-occlusive thrombus in the left common femoral artery and thrombotic occlusion of the left popliteal and tibial arteries. A transthoracic ECHO revealed a mobile left atrial mass of approximately 1.5 cm by 2 cm that appeared to originate in the left atrial appendage and extended to the mitral valve annulus. The mass was suspicious for myxoma; therefore, the patient was determined to be at significant risk for embolization, stroke, and cardiac decompensation. She was monitored closely and remained stable overnight. The next morning, she underwent a cardiac MRI, which confirmed a mass in the left atrium. The decision was made to remove the left atrial mass the same day. The mass was carefully excised during open-heart surgery. It was approximately 2 cm by 2 cm, tan-colored, villous, and gelatinous in consistency, which is consistent with a cardiac myxoma. The patient was transferred to the critical care unit in stable condition and was discharged home four days later.

### **Discussion:**

This case represents a unique presentation of cardiac myxoma. Myxomas are the most common primary cardiac tumor in adults, and they are most often seen in females from twenty to sixty years old (1). They may present with cardiovascular, constitutional, or embolic symptoms, such as cardiac murmurs, shortness of breath, fatigue, and stroke, with embolization seen in up to half of the patients with cardiac myxomas (1). Furthermore, myxomas are typically found in the left atrium, attached to the septum, near the fossa ovalis (2). It is extremely rare for myxomas to be attached to the left atrial appendage (2).

Our patient was an adolescent female whose only symptoms were lower extremity pain, pallor, and numbness, and whose myxoma originated from the left atrial appendage. Masses in the left atrial appendage are typically blood clots, thus they are usually considered thrombi until proven otherwise (2). Consequently, a myxoma in this location could be misdiagnosed as a blood clot. Therefore, it is important to keep the possibility of cardiac myxoma in mind for all patients with embolic events and masses within the left atrial appendage.

### **References:**

1. Wang Z, Chen S, Zhu M, et al. Risk prediction for emboli and recurrence of primary cardiac myxomas after resection. *J Cardiothorac Surg*. 2016;11(1):1-8. doi:10.1186/s13019-016-0420-4
2. Malik L, Borgohain S, Gupta A, Grover V, Gupta VK. Left atrial appendage myxoma masquerading as left atrial appendage thrombus. *Asian Cardiovasc Thorac Ann*. 2013;21(2):205-207. doi:10.1177/0218492312450019

### **Media Link**

## **Abstract 65**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Oliguria in the setting of Aortic Mural Thrombus

### **Abstract Text**

Renal infarction (RI) is a rare and often misdiagnosed consequence of arterial thromboembolism, and it can present a diagnostic dilemma due to the nonspecific pattern of kidney injury and low incidence in the population. Due to the irreversible damage that accompanies prolonged tissue ischemia, the danger that RI can pose to patient well-being must be understood. Cardio-embolism secondary to atrial fibrillation is the most common cause of RI. However, we report a case of RI secondary to thoracic aortic mural thrombus (TAMT), an uncommon cause of arterial thromboembolism.

A 47-year-old female presented to the emergency department with two days of sub-sternal chest pain and a blood pressure of greater than 200/100 mmHg. The patient's past medical history included non-ST-elevation myocardial infarction requiring percutaneous coronary intervention, chronic kidney disease stage 3b, and resistant hypertension. Workup included a negative troponin and elevated D-dimer. The patient underwent CT angiogram of the chest for pulmonary embolism evaluation. The scan did not demonstrate pulmonary embolism but did show a segmental area of mural thrombus involving the descending thoracic aorta causing a luminal narrowing of 70% of the vessel diameter and a type B aortic dissection. Her blood pressure was titrated to goal with nitroprusside and esmolol infusion and she was gradually transitioned to oral agents. Her hospital course was complicated by oliguric acute kidney injury thought to be due to pre-renal azotemia given her relative hypotension. She became hypervolemic despite aggressive diuresis with a furosemide drip and required ultrafiltration for volume removal over three days. On hospital day 5, the patient had progressively worsened abdominal pain and a CT abdomen/pelvis with contrast was performed showing evidence of bilateral renal infarcts. The infarcts were thought to be due to showering from her mural thrombus and she was subsequently started on heparin to prevent further embolic events. She was eventually transitioned to apixaban. On hospital day 10, patient volume status, urine output, and blood pressure stabilized, and she was discharged home on apixaban with plans for at least six months of oral anticoagulation.

This case demonstrates the importance of rapid recognition and management of an aortic mural thrombus particularly in a patient with a high risk of thromboembolism. In such a setting, renal infarction should be included in the differential diagnosis of acute kidney injury. 82.4% of TAMT are diagnosed after an embolic event, with the most common sites of peripheral embolism being the lower extremity and visceral organs [1]. Fortunately, our patient's kidney function recovered, and she was able to discontinue renal replacement therapy.

1. Meyermann K, Trani J, Caputo FJ, Lombardi JV. Descending thoracic aortic mural thrombus

presentation and treatment strategies. Journal of vascular surgery. 2017;66(3):931-936.  
<https://dx.doi.org/10.1016/j.jvs.2017.05.109>. doi: 10.1016/j.jvs.2017.05.109.

#### **Media Link**

#### **Abstract 66**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Paruresis Status Post Living Donor Nephrectomy

#### **Abstract Text**

A 26 year-old male presented with worsening chronic urinary retention in public situations. He has a past medical history of conduct disorder, disruptive behavior disorder, adjustment disorder, poly-substance use, ADHD, and COVID-19. He endorsed urges to void but reported an inability to initiate urination in settings such as concerts and sporting events. He reported frustration and distress due to this retention. He denied any symptoms at home or at work. He endorsed mild urinary retention in the past, but it worsened after a living donor left nephrectomy for transplant to his mom on November 2021. Urinary output was adequate status post nephrectomy and computer tomography imaging showed no structural or obstructive abnormalities in the remaining kidney or ureter. Recovery was complicated due to an allergic reaction to his stitching and required irrigation and debridement, but no subsequent voiding problems or structural damage were confirmed by CT imaging. The patient was afebrile and his recent white blood count, blood urea nitrogen, and glomerular filtration rate were within normal limits. His creatinine after surgery was 1.74 mg/dL and his recent creatinine was 1.45 mg/dL. The patient was referred to urology and psychiatry for further workup.

Urinary retention is a common problem encountered by general internists, and paruresis is often left undiagnosed and untreated. Paruresis is defined as the inability to urinate in public situations which cannot be explained by structural abnormalities. It can lead to a significant disruption in life in which patients avoid leaving their homes, avoid traveling and social activities, and resign from their careers. Paruresis is frequently comorbid with other psychiatric conditions. Anxiety precipitated by failed attempts at voiding in public can cause a feedback loop that causes further anxiety, inability to void, and adoption of avoidance strategies. Anxiety leads to the stimulation of the sympathetic nervous symptom which closes the urinary sphincter and leads to the inability to void. Living donor nephrectomies have been shown to precipitate psychiatric distress like anxiety and depression in the donor. This is most common in situations in which the donor feared losing a loved one or in which they were determined to improve the health of a loved one. The patient reported he knew he wanted to donate to his mom once she developed chronic kidney disease because he wanted to improve her health as her son. It is important to consider the psychiatric impact of donor surgery on patients and possible sequela that can result. Screening should specifically focus on at-risk populations such as those with close relationships with the transplant recipient. Patients with paruresis should get further work up with urology and psychiatry for

possible treatment such as cognitive behavioral therapy, self-catheterization, and scheduled voiding.

#### **Media Link**

#### **Abstract 67**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Cannabinoid hyperemesis syndrome: A Case Report

#### **Abstract Text**

Cannabinoid hyperemesis syndrome (CHS) is characterized by its presentation in chronic cannabis users with episodic nausea, antiemetic-refractory vomiting and abdominal pain that resolves only with hot water baths. The clinical picture of CHS resembles that of acute abdomen, often prompting ED clinicians to order several diagnostic assessments which can complicate elucidating the proper differential diagnosis. A 19-year-old female presented to the ED with acute onset of nausea, vomiting and diffuse, nonradiating abdominal pain without known aggravating factors and alleviated only with taking hot showers. In the two months prior to admission, she was seen in the ED on four different occasions for similar symptoms for which reglan, ativan, haloperidol, benadryl, decadron, tylenol were prescribed (in no specific order, in various regimens), providing only partial symptomatic improvement. Labs and imaging obtained on previous admissions were non-revealing and on all four previous admissions, the patient left Against Medical Advice (AMA) before further work-up could be completed.

Upon interview, the patient revealed daily marijuana usage since the age of 13 years, with sporadic intervals of cessation but for no period longer than 2-weeks at a time. The patient reported occasional cocaine use but denied use of other drugs.

Physical examination revealed the patient to be in mild distress. The patient had a nondistended abdomen with moderate epigastric tenderness. The patient had abnormal leukocyte count, sodium, potassium and BUN/Cr, suggesting acute AKI secondary to continued emesis.

The patient was admitted to the floor where she was evaluated by the internal medicine and critical care departments, undergoing further diagnostic exams. A computed tomography scan of the abdomen and pelvis and plain film radiograph of the chest found no evidence of acute intra-abdominal, intra-pelvic disease or cardiopulmonary processes that could be contributing to the patient's presenting complaints.

Due to the clinical history (episodic vomiting, presentation after prolonged, excessive cannabis use and relief of symptoms with hot baths), and in the absence of major findings in the diagnostic imaging and exams performed, a working diagnosis of CHS was made. The patient was given intravenous normal saline and symptomatic management. She continued taking frequent hot showers throughout her hospital stay. Her laboratory abnormalities (creatinine down to 1.15 from

2.88 on admission) and symptoms improved on the second day of hospitalization, when the patient left the hospital AMA. Prior to leaving, psychoeducation, explaining the risks of continued consumption of cannabis and cannabinoid products and its relation with clinical symptoms, was performed.

Six new episodes were reported in one month following the admission described above. A review of the medical records reveals the patient developed a spontaneous pneumomediastinum, likely secondary to CHS, 3-weeks after discharge.

#### **Media Link**

#### **Abstract 68**

**Category Submitting for:** Clinical Vignette

**Abstract Title** An Unusual Presentation of Spontaneous Bacterial Peritonitis in a Patient with Cardiogenic Ascites

#### **Abstract Text**

Ascites is characterized by an abnormal collection of fluid in the peritoneal cavity (greater than 25mL), often with subsequent abdominal distension. This condition is most commonly caused by liver cirrhosis, but cardiogenic ascites from heart failure has also been reported to contribute about 5% of cases. Spontaneous bacterial peritonitis (SBP), an infection of ascitic fluid in the absence of a surgically treatable source, is a common complication of ascites that is frequently associated with hepatic cirrhosis. Here we present a case of SBP in a patient with cardiogenic ascites.

The patient is a 37 year old male with right-sided heart failure secondary to bronchopulmonary dysplasia with no history of liver disease. The patient was found to have dyspnea and anasarca and was subsequently admitted for heart failure exacerbation. CT of the abdomen showed large volume ascites and hepatomegaly. While being diuresed, 5L of ascitic fluid was removed via paracentesis. Analysis revealed a serum albumin-ascites gradient (SAAG) of 0.7, protein 4.5, absolute neutrophil count (ANC) 948, and negative culture. The patient was then started on ceftriaxone for SBP. Three days later, an additional 4.5L was removed via paracentesis due to worsening ascites. Analysis at that time showed SAAG 0.6, protein 4.2, and ANC 4808; no cultures were reported. Antibiotics were escalated to piperacillin-tazobactam due to worsening ANC. A third paracentesis was performed three days later after reaccumulation of ascites (3.2L) and to assess therapeutic response. Peritoneal fluid analysis revealed SAAG 0.8, protein 3.7, ANC 2931, and negative culture. At this point, the infectious disease team was consulted, recommending discontinuation of antibiotics and close monitoring since the patient was afebrile and asymptomatic. The patient was discharged six days later as he was afebrile and without leukocytosis.

Classic SBP presents with  $\geq 250$  polymorphonuclear neutrophils and a positive culture, but analysis of ascitic fluid can suggest culture-negative SBP (as in the case with our patient). The



pathophysiology of SBP is thought to be related to bacterial translocation to the blood which occurs in the setting of impaired immunity. In particular, there can be deficiencies in complement protein and decreased neutrophil function, which is reflected by the low ascites protein. However, SBP is extremely rare in cardiogenic ascites, with only eight prior cases reported. A possible explanation for SBP in this population is that congestive hepatopathy has similar effects on the liver as primary hepatic disease. However, the elevated protein levels suggest that there is an adequate immune response to combat this change. Perhaps this was the reason for the patient's elevated ANC despite negative cultures. Future studies could focus on the role of antibiotics and prophylaxis in these patients.

#### **Media Link**

#### **Abstract 69**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Sepsis following urinary calculi lithotripsy in a patient with neurogenic bladder

#### **Abstract Text**

Case: A 44-year-old man presented with 12 hours of fever and right flank pain. He also endorsed chills, dyspnea, nausea, and abdominal pain. A past motor vehicle accident had left him paralyzed below the umbilicus and reliant on regular straight catheterization due to neurogenic bladder. One month preceding his current presentation he was admitted for pyelonephritis secondary to an obstructing right sided ureteral calculus. This was treated with antibiotics and ureteral stenting. Urine cultures at that admission had grown proteus mirabilis. Just a day prior to his current illness he had undergone ureteroscopy with laser lithotripsy of the ureteral stone and stent replacement. On exam, he was febrile to 39.7°C and tachycardic at 132 BPM. No focal abdominal tenderness was identified. Examination of flanks and back were limited by body habitus and paraplegic status. Lungs were clear to auscultation. He had multiple chronic pressure wounds on his feet, none of which appeared infected. Labs showed lactic acidosis, leukocytosis, and a urinalysis with positive nitrites, leukocyte esterase, pyuria, and hematuria. We hypothesized the patient was experiencing another complicated UTI precipitated by his recent urologic procedure. Despite initial fluid resuscitation and ceftriaxone administration, he rapidly decompensated with increasing tachycardia, new hypotension, rigors, and decreasing responsiveness. Antibiotics were broadened to cefepime and vancomycin, and further to meropenem upon transfer to the ICU. He stabilized on this regimen and with additional fluids. Urine and blood cultures both grew pan-susceptible pseudomonas aeruginosa. He was transitioned to oral levofloxacin and made a good recovery.

#### **Discussion**

Patients with spinal cord injury commonly experience bladder dysfunction leading to urinary complications such as recurrent UTI's, renal calculi, hydronephrosis, and vesicoureteral reflux. Such complications may result in admissions requiring co-management by general internists and urology teams. Paraplegic patients are at higher risk of urinary stone development due to

recurrent UTI's with urease-producing organisms, urinary stasis with incomplete emptying, and immobilization hypercalcemia. Obstructive ureteral stones may require invasive urologic procedures including ureteroscopy with extraction or lithotripsy. Despite use of prophylactic antibiotics, such procedures carry risk of infectious complications. Fragmentation of infected stones, coupled with intraoperative microtrauma to the urinary tract, or prolonged indwelling stents, can result in bacteremia and sepsis. Our case portrays life-threatening sequelae of urologic complications commonly experienced by patients living with spinal cord injury. Hospitalists should recognize both neurogenic bladder and recent urologic procedures as risk factors for urosepsis and have a high suspicion for urinary source in patients with such history who present with systemic inflammatory response syndrome. Pseudomonal coverage should be strongly considered in patients not responding to initial antibiotics. Urine and blood cultures can guide definitive antibiotic selection and future empiric coverage if infections recur.

#### **Media Link**

#### **Abstract 70**

**Category Submitting for:** Clinical Vignette

**Abstract Title** The Covered Up Cause

#### **Abstract Text**

A 64-year-old woman presented with increasing dyspnea over the past three months. She had been able to walk five miles but could now only go one block without gasping for air. She had profound exhaustion and a productive cough with a 30-pound weight loss over six months. Her past medical history was only pertinent for kyphosis and Hodgkin's lymphoma status post chemoradiation in 1990 with no follow-up. Her vitals were heart rate 116, respirations 20, temperature 36.6C and 96% O2. Her social history included pertinent negatives of no jail time, smoking, radium exposure, or recent travel. She appeared pale, non-diaphoretic but in acute distress. There were diffusely diminished breath sounds throughout left lung fields. Initial chest x-ray showed a complete left tension effusion and a chest CT showed complete atelectasis of left lung. She denied any trauma, falls, or heart failure. An initial thoracentesis by interventional radiology removed 1.5 liter s of pleural fluid with a protein of 5.8, LDH of 249, glucose of 82, and pH of 7.5. Not long after the thoracentesis, the patient noticed a further increase in cough and shortness of breath. A repeat chest x-ray showed the effusion reaccumulating. A second thoracentesis was completed with similar results, but pH was 7.37. The next day, cytology from the first thoracentesis resulted with lung adenocarcinoma cells. A PET CT showed a 3.8 cm mass in the anterior left lower lobe. Due to a small thoracentesis sample, the patient underwent bronchoscopy with transbronchial biopsy that also yielded lung adenocarcinoma.

#### **Discussion**

Pleural effusions can be seen in a variety of conditions that internists encounter. Not often is a

pleural effusion going to cause a complete whiteout on x-ray, but when it does the differential changes. The possible causes include trauma, thoracic duct outlet obstruction or chylothorax, hepatic hydrothorax, parapneumonic effusion, tuberculosis, autoimmune disease, or malignancy. If the patient is not in need of urgent care, then a thoracentesis is the next step in both management and diagnosis. Not only are the typical labs ordered, but complete effusions also require amylase, cholesterol, gram and acid-fast stain plus respective culture, cytology, and more. Since cytology is only 78% sensitive for lung adenocarcinoma and only 15% of patients develop malignant effusions, further biopsies are needed to confirm.

Our patient presented with typical signs and symptoms of a pleural effusion. Due to her chemoradiation exposure, the first differential was topped by thoracic duct outlet obstruction. This was the case until the effusion reaccumulated. With fatigue, weight loss, deaccumulation and history of Hodgkin's Lymphoma, a second malignancy was added to the list. Once her cytology came back with lung adenocarcinoma, we were confident with her diagnosis but confirmed with a PET CT and transbronchial biopsy.

#### **Media Link**

#### **Abstract 71**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Durvalumab-Induced Encephalitis: A Rare Inflammatory Adverse Event

#### **Abstract Text**

Title: Durvalumab-Induced Encephalitis: A Rare Inflammatory Adverse Event

#### **Introduction:**

Immune checkpoint inhibitor (ICI) therapy has revolutionized the treatment of many malignancies. However, rare immunological adverse effects have been reported in the literature. Here, we report on the clinical case of a 70-year-old female with squamous cell carcinoma of the lung ultimately diagnosed with autoimmune encephalitis secondary to the ICI durvalumab. Encephalitis occurs in <1% of patients receiving ICI therapy. Among specific ICIs, encephalitis in durvalumab is considered to be particularly uncommon.

#### **Case presentation:**

A 70-year-old female with a past medical history significant for non-resectable stage III squamous cell carcinoma of the left lung status post a course of carboplatin/Taxol and currently treated with durvalumab presented to the emergency department with abdominal pain, weakness, and altered mental status. On physical examination, she exhibited waxing and waning mentation orientated to person alone and a constant headache. Initial routine blood and urine studies were unremarkable. Due to concern for stroke, an MRI was obtained and showed bilateral acute punctate basal ganglia infarcts as well as a 6 mm left middle cerebral artery trifurcation aneurysm; these findings were deemed unlikely to be responsible for her altered mentation and the patient began

appropriate treatment for her strokes. Electroencephalogram demonstrated diffuse generalized slowing with evidence of moderate diffuse encephalopathy. A cerebrospinal fluid (CSF) analysis showed 17 red blood cells/ul, 53 nucleated cells /ul with 94% lymphocytes, protein of 115 mg/dl, and glucose of 63 mg/dl. CSF analysis was negative for culture growth, malignant cells, West Nile Virus, syphilis, and cryptococcus. Both a CSF meningitis/encephalitis multiplex PCR and an autoimmune encephalopathy panel were negative.

After the patient's mentation did not improve with antibiotics, durvalumab-induced encephalitis was considered. A five-day course of intravenous methylprednisolone 1000 mg daily was initiated by neurology. After steroid initiation, the patient experienced rapid improvement in her mental status. Her response resulted in a presumptive diagnosis of steroid-responsive autoimmune encephalitis secondary to durvalumab. Notably, diagnostic angiography did demonstrate thrombosis of the aforementioned aneurysm with sentinel bleeding, suggesting a possible component of chemical meningitis to the case. Ultimately, the patient was discharged after 17 days in the hospital with plans to hold durvalumab and follow up with neurosurgery and neurology with regard to her aneurysm and strokes, respectively.

#### Discussion:

Durvalumab is a G1 kappa monoclonal antibody that inhibits PD-1 and CD80. It is indicated for non-resectable stage III non-small cell lung cancer and extensive stage small cell lung cancer. Encephalitis secondary to durvalumab is an exceedingly rare adverse event. In the present case, metabolic, toxic, and infectious etiologies were ruled out and durvalumab-induced encephalitis was suspected. This case is meant to increase clinician awareness of ICI-related encephalitis, as prompt treatment can result in rapid improvement.

#### Media Link

## Abstract 72

**Category Submitting for:** Research

**Abstract Title** Patterns of Palliative Care Utilization in Patients with Signet Ring Cell Carcinoma: An Analysis of the National Cancer Database

#### Abstract Text

##### Background

Signet ring cell carcinoma (SRCC) is a rare subtype of adenocarcinoma in which excess cytoplasmic mucin is produced by malignant cells, resulting in displacement of nuclei. Given the late presentation and poor prognosis of SRCC, patients may benefit from palliative care (PC) utilization.

##### Methods

The National Cancer Database (2004-2019) was used to identify patients diagnosed with signet

ring cell carcinoma (ICD-O-3 histology code 8490/3) of the colon (N = 15251), esophagus (N = 4786), and stomach (N = 37361). Differences in PC utilization were determined using Pearson's chi-squared test with post-hoc Bonferroni adjustment. PC is defined as treatment (e.g., surgery, radiation, systemic therapy, and/or pain management) that is performed to provide symptom relief. Survival was evaluated using descriptive statistics, Kaplan-Meier curves, log-rank tests, and Cox proportional hazards modeling.

## Results

With the exception of colonic SRCC (48.4% male), the cohort of the other two primary sites contained more male participants (85.6% esophagus, 52.6% stomach) than female, and most were treated at academic/research facilities (42.7% and 38.9%, respectively). Amongst those with colonic and gastric SRCC, men were more likely to receive PC than women. Pearson's chi-squared analysis showed that for all primary sites, patients treated at academic/research facilities were more likely to receive PC. Specifically, these patients were more likely to reside in the West South Central states. The majority of patients had Medicare (49.9% colon, 50.5% esophagus, 43.8% stomach), followed by private insurance (37.4%, 34.3%, 36.6%, respectively). Patients with private insurance were more likely to receive systemic therapy for symptom control if they had colonic SRCC, but less likely to receive any form of PC if they had esophageal or gastric SRCC. Meanwhile, those with Medicare were less likely to receive any PC for both colonic and esophageal SRCC. The average Charlson-Deyo score was 0.43 for colonic and esophageal SRCC, and 0.41 for gastric SRCC. Across all three primary sites, those receiving palliative radiotherapy (7.048 months for colon, 8.307 esophagus, 9.828 stomach) had worse survival outcomes compared to those who did not receive PC (56.358, 35.953, and 45.036, respectively). After adjusting for all other variables, Cox proportional hazards ratios remained significant for esophageal SRCC (Exp(B) = 1.826).

## Conclusion

Even within the same pathologic process, PC is utilized to different extents based on primary site. Furthermore, despite research demonstrating the benefits of PC integration with oncology, it remains underutilized by patients treated in non-academic facilities, especially in the Pacific region, and those without private insurance. Future studies should evaluate how PC can be better incorporated into this patient population in order to improve patient care and quality of life.

## Media Link

### Abstract 73

**Category Submitting for:** Clinical Vignette

**Abstract Title** An Atypical Presentation of Atypical Pneumonia

### Abstract Text

A 61 year-old man drove himself to the hospital after receiving a DUI the night before, despite reporting that he has never consumed alcohol in his life. He began having balance problems and

chest pain three days prior. The chest pain was sharp, right sided, not better with rest or worse with exertion, and subsided on its own the following day. He had no cardiac history and denied similar episodes. The balance problems had not occurred in the past. He described them as an off-balance, light-headed feeling with no vertigo. He had one fall without losing consciousness and did hit his head. He also described fevers, chills, and diarrhea starting three days prior. There was no associated shortness of breath. Past history was notable for HIV and he was taking anti-retroviral therapy – records revealed normal CD4 counts and low viral load one-year prior, but he admitted that he occasionally misses doses. He denied sexual activity for over 20 years. Crackles were heard in his left lower lobe. He was found to be acutely off balance when asked to walk across the exam room, but with otherwise normal neurologic exam. He was fully oriented. Labs showed hyponatremia to 130 mmol/L, transaminitis, and acute kidney injury. Head CT was unremarkable. Chest x-ray revealed a left sided infiltrate, and he was found to have a positive urine legionella antigen.

*Legionella pneumophila* is a gram-negative rod that is classically associated with nosocomial infections and outbreaks among those exposed to contaminated aerosols. It causes two distinct clinical syndromes, Legionnaire's disease and Pontiac fever. While the latter is a self-limited flu-like illness, the former is more severe and causes the classic pneumonia with associated diarrhea and hyponatremia. Neurological symptoms are common and can range from confusion and agitation to stupor. Respiratory symptoms may mimic typical community-acquired pneumonia in which there is fever, cough, and shortness of breath. Gastrointestinal distress and lab findings of hyponatremia and transaminitis can hint at Legionnaire's disease. Community-acquired pneumonia that is not responding to beta-lactam therapy can be another clue, as legionellosis is treated with fluoroquinolones or macrolides.

Community-acquired pneumonia is one of the most common problems encountered by internists. Identifying uncommon presentations of common problems is important. In this case, mild balance difficulties were the only apparent initial complaints. It was not until further questioning when associated symptoms of chills, chest pain, and diarrhea were elicited. Neurological symptoms such as altered mental status and confusion are seen in severe community-acquired pneumonia, but a chief complaint of balance difficulties is not as frequently encountered. In the case of this patient, his symptoms persisted even as his AKI and hyponatremia corrected, but he showed marked improvement on day three of treatment with azithromycin.

**Media Link**

**Abstract 74**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Calciphylaxis and the importance of a broad differential diagnosis

**Abstract Text**

Calciphylaxis is a rare, systemic condition that causes reduced blood flow via calcification, fibrosis, and occasional thrombus formation. It is typically associated with end-stage renal disease (ESRD) patients. Other risk factors include hyperphosphatemia, vitamin D supplementation, warfarin use, female sex, and dialysis use. The pathogenesis is poorly understood but thought to be related to the plasma calcium x phosphate product being elevated. Elevated iron and iron deposition have also been implicated. This condition can mimic many others during its early phases of progression and clinical suspicion needs to remain high in patients who would be at risk.

A 65-year-old female patient with a history of multiple myeloma, CKD on vitamin D supplementation, and DVT on warfarin presented to the ED with erythema, induration, and pain in her right lower leg. The presentation was thought to represent cellulitis versus deeper infection. The patient was started on empiric antibiotics and CT imaging was done on the leg. CT imaging showed no acute abnormalities and had no evidence of mass. US showed no evidence of DVT. CBC showed anemia unchanged from priors. CMP was slightly changed from priors, with a GFR of 13 fitting CKD V. 1 of 2 blood culture bottles grew coag-negative staph. Over the next 4 days, nephrology and ID agreed the presentation was likely due to cellulitis, and antibiotics were continued - though the patient had no improvement and the leg began to worsen with areas of erythema gradually darkening in a branching pattern. On day 5 of her hospital stay, after inspection by a new team member that this may represent calciphylaxis. Her calcium and phosphate were within normal ranges, though on the upper limit of normal. Thus, this was thought to be unlikely, but within reasonable suspicion, and evaluation was recommended after discharge. Biopsy was done the next day by dermatology based on this recommendation and found to be consistent with histological findings of calciphylaxis. Her PTH was found to be over 450 pg/mL. She was started on sodium thiosulfate within a matter of days and cinacalcet. Her symptoms did not progress much further and she has been improving without the need for wound care involvement to this date.

This case demonstrates the importance of a broad differential diagnosis and considering all of a patient's medications and contributing risk factors on the generation of this during an initial evaluation. It also shows the power of anchoring bias to miss classic presentations.

#### **Media Link**

#### **Abstract 75**

**Category Submitting for:** Clinical Vignette

**Abstract Title** Jejunal Diverticulitis: A Case Report

#### **Abstract Text**

Case:

A 76-year-old male presented with 4-5 days of dizziness, weakness, and bloody stools. The patient had a history of lower GI bleed of unknown source requiring ICU admission and blood transfusion, as well as chronic kidney disease, diabetes mellitus type 2, colonic diverticulosis,

dementia, and coronary artery disease. On arrival, the patient endorsed constipation, decreased appetite, chills, abdominal pain rated 3/10, and low back pain. He denied nausea, vomiting, and fevers. Bowel sounds were present, and tenderness was elicited upon palpation of the epigastrium and left lower quadrant with no rebound tenderness or guarding. The patient was afebrile but was tachycardic and hypertensive. Laboratory findings were notable for lactic acid 2.4, glucose 272, creatinine 1.37, bicarbonate 20.0 with anion gap 8, alkaline phosphatase 171, and total bilirubin 2.0. No leukocytosis was present, and hemoglobin was stable. CRP was later found to be elevated at 207. All remaining labs were within normal limits. Non-contrast CT of the abdomen and pelvis was performed. Findings were relevant for acute diverticulitis of the jejunum with marked distention and inflammation measuring 4 cm in the epigastric region with no perforation or abscess. Colonic diverticulosis was also present. Jejunal diverticulitis was diagnosed, and gastroenterology was consulted. The patient was started on IV fluids and antibiotics with a clear liquid diet. Abdominal pain with tensing and constipation were present early in the hospital course. Abdominal X-ray showed air fluid levels with moderate gastric distention but no pneumoperitoneum. Diet was advanced as tolerated and IV antibiotics were de-escalated to oral administration. With the exception of elevated liver enzymes, the remainder of the hospital course was uneventful. The patient was discharged with subsequent outpatient gastroenterology follow up.

#### Discussion:

Diverticulitis most commonly affects older individuals and usually occurs in the sigmoid colon and thus presents with left lower quadrant pain and bloody stool. Rarely, however, diverticulitis can occur in portions of the small intestine. Of the sections of the small intestine, the duodenum is the most affected by diverticula. Jejunoileal segments are implicated less often and are associated with increased risk of complications such as diverticulitis (1). The presentation of small bowel diverticulitis varies but can include findings similar to this patient including abdominal pain and elevated CRP (2). Because of this, along with the rarity of small bowel diverticulitis, the diagnosis can be a difficult one to make. Providers should keep this diagnosis in mind when treating a patient presenting with abdominal pain.

#### References:

1. Akhrass R, Yaffe MB, Fischer C, et al. Small-bowel diverticulosis: perceptions and reality. J Am Coll Surg 1997; 184:383.
2. Transue DL, Hanna TN, Shekhani H, et al. Small bowel diverticulitis: an imaging review of an uncommon entity. Emerg Radiol 2017; 24:195.

#### Media Link

#### Abstract 76

**Category Submitting for:** Clinical Vignette

**Abstract Title** What is causing the Hypercalcemia?



## Abstract Text

Hypercalcemia is a relatively common electrolyte abnormality. There are a variety of infectious, inflammatory, and neoplastic causes of hypercalcemia that must be considered to ensure appropriate diagnosis and treatment.

A 50-year-old African American female presented to the emergency department (ED) due to extreme fatigue. The patient had a pertinent medical history of systemic lupus erythematosus treated with hydroxychloroquine and mycophenolate, chronic kidney disease, and hypertension. For the past two weeks, the patient endorsed having a decreased appetite, weakness, myalgias, and chest pain. Of note, the patient presented a few days prior with similar symptoms and was diagnosed with gastroenteritis. At that time, she was found to have hypercalcemia, but no further work-up was pursued. She was discharged with recommendations for oral hydration. Upon admission, the patient was hemodynamically stable, but had an ionized calcium of 1.61, a 25-hydroxy vitamin D of 35, and a 1,25-dihydroxy vitamin D of 130. On physical exam, the patient was lethargic, but had full strength in her upper and lower extremities. A chest x-ray was obtained that showed an enlarging right lung nodule, and a CT scan demonstrated satellite lesions. There was concern for either a primary neoplasm of the lung, specifically, squamous cell carcinoma or a granulomatous disease such as sarcoidosis or a fungal infection. For further work-up, a parathyroid hormone-related peptide was collected along with a urine and serum histoplasma antigen. The patient's parathyroid hormone-related peptide was low leading to decreased suspicion of cancer. Her urine histoplasma antigen was negative, but her serum histoplasma antigen was positive. This led to an increased suspicion for a granulomatous disease with the most likely cause being primary pulmonary histoplasmosis. To stabilize the patient, she received IV fluids and pamidronate with rapid improvement in both her hypercalcemia and clinical symptoms. Additionally, the infectious disease team was consulted and recommended conservative management with a repeat CT scan in 3 months to ensure clearance of the infection. This case illustrates the need for a broad differential diagnosis and a thorough work-up for hypercalcemia. Additionally, it illustrates the unique treatment considerations for patients with autoimmune diseases. Treatment with itraconazole only needs to be initiated if the patient begins receiving steroids or additional immunosuppressants such as cyclophosphamide. This is of particular importance in this patient when sarcoidosis was of concern due to the increased risk in African American women and patients with autoimmune diseases. If the patient had received steroids for sarcoidosis, she would likely have developed disseminated histoplasmosis and significant medical complications. Keeping a broad differential diagnosis of patient's electrolyte abnormalities will ensure patients receive the appropriate diagnostic work-up, treatment, and follow-up.

## Media Link

## Abstract 77

**Category Submitting for:** Clinical Vignette

**Abstract Title** Sudden Paraplegia in the Setting of Panic Attack and COVID-19: A Case Report

## **Abstract Text**

### **Introduction:**

Conversion disorder is a disease state characterized by neurological dysfunction without associated pathophysiology to cause the symptoms. The diagnosis of conversion disorder is a two-part process. The first is to determine a neurological deficit, with a lack in either motor or sensory function. The second step is determining that the neurological deficit is “incompatible” with any neurological disease. With most patients, there is an association with a recent stressor for the patient, which precipitates the neurological deficit. Due to the rarity of conversion disorder and the difficulty of retroactively establishing a cause, there is limited data to establish a cause-and-effect relationship with conversion disorder.

### **Case Presentation:**

A 63-year-old homeless male with a history of mental illness presented with acute chest pain, palpitations, and shortness of breath. He had two previous admissions for chest pain, one being a pulmonary embolism and the other a panic attack. Upon arrival, he experienced sudden numbness and weakness in his legs. The exam was significant for loss of sensation to pinprick and pressure below the umbilicus with flaccid paralysis of bilateral lower extremities with hyperreflexia, however he could slightly move his left toes. Neurological exam showed no clonus, normal left Babinski, no Babinski elicited on the right, and no loss of bowel or bladder. Strength and sensation were normal above the umbilicus. Blood work was negative except for an elevated D-dimer. Spinal MRIs showed mild to moderate central stenosis with mild cervical cord compression and multilevel neural foraminal cervical spine stenosis without any acute process. Continued workup with CTA showed no acute aortic pathology, spinal infarct, or other acute abnormality. On the second day of his admission, he recovered sensation and function in an ascending pattern over the course of 30 minutes, regaining full function. Throughout his stay, the patient's COVID-19 diagnosis was mild and he required no additional treatment.

### **Discussion:**

While most presentations of conversion disorders are nonepileptic seizures, weakness is a common presenting symptom. Our patient was older than the normal age of presentation (10-35 years old). Our case highlights the complexities of conversion disorder diagnosis. While a homeless patient with an extensive psychiatric history tracks with DSM-5 diagnostic standards, the patient's recent PE and COVID-19 complicated his workup. Exams can vary between providers, complicating this patient's presentation. Our patient recovered quickly, helping clue us in on a functional disorder, but extensive imaging can be difficult to avoid without clearly contraindicating physical exam findings.

### **Conclusions:**

Conversion disorder is a challenging diagnosis, requiring an extensive workup to rule out any potential causes of neurological dysfunction. This case report shows how homelessness, recent medical issues, and inconsistent physical exam findings contribute to increased workup for this patient population.

### **Media Link**

## **Abstract 78**

**Category Submitting for:** Clinical Vignette

**Abstract Title** A case of rapid correction of severe hyponatremia in a patient with primary polydipsia

### **Abstract Text**

Case presentation: A 48 year-old woman presented with three days of fatigue, nausea without vomiting, and dizziness. Her medical history was significant for schizoaffective disorder, bipolar type and essential hypertension. Her psychiatric symptoms were well-controlled on a stable antipsychotic regimen. Laboratory evaluation on presentation revealed a serum sodium of 111 mEq/L and a measured osmolality of 232 mOsm/kg. Serum electrolytes were otherwise normal. A random urine sodium was 16 mEq/L and urine osmolality was 65 mOsm/kg. She was normotensive and euvolemic on physical exam. Upon further questioning, she revealed that she was previously adherent to a fluid restriction of 2 liters per day but, one month ago, increased her water intake to at least 4 liters per day. During the four days prior to presentation, she drank 4 liters of soda per day in addition to this water intake.

A fluid restriction of 2 liters per day was ordered and she was given a 1 liter bolus of intravenous normal saline, after which her sodium began to rapidly correct. Her sodium increased to 122 mEq/L within 5 hours, prompting administration of a 1 liter bolus of dextrose 5% in water (D5W) and a temporary removal of her fluid restriction. Despite these measures, her sodium continued to increase, peaking at 132 mEq/L within 16 hours. Subcutaneous desmopressin and serial D5W boluses were given as needed to reverse the correction to a sodium of 120 mEq/L, at which point a fluid restriction of 2 liters per day was reinitiated. In the subsequent 4 days, her sodium increased at a rate of 4-6 mEq/L per day with fluid restriction alone. Serial neurologic exams were normal and she was discharged on hospital day 6 with a normal sodium of 136 mEq/L.

Discussion: Patients with primary polydipsia develop euvolemic hyponatremia due to water intake that exceeds the rate of excretion. Due to physiologic suppression of ADH in these patients, serum sodium will autocorrect with fluid restriction alone, though often at unpredictable rates. General internists should be aware of the risk factors for rapid correction and the tools at their disposal when sodium correction exceeds the goal rate of 4-6 mEq/L per day. Patients with severe hyponatremia (sodium <120 mEq/L) are at especially high risk of osmotic demyelination syndrome, in which rapid cellular water loss induces demyelination and may cause permanent neurologic dysfunction. If the sodium exceeds or is on a trajectory to exceed 8 mEq/L in 24 hours, desmopressin may be given subcutaneously every 6-8 hours to concentrating the urine. D5W may be given in addition to desmopressin and should be titrated based on serial sodium measurements. Desmopressin should be used with caution in primary polydipsia as uncontrolled oral fluid intake can acutely worsen hyponatremia.

## Media Link

## Abstract 79

**Category Submitting for:** Clinical Vignette

**Abstract Title** An unusual presentation of thrombophlebitis obliterans

### Abstract Text

A 40-year-old man presented with two weeks of progressive pain in his left testicle. He denied any overlying skin changes, fevers, chills, or urinary symptoms. He denied a history of trauma to the area. He had bilateral descended testicles without scrotal edema or erythema. The left testicle was non-tender but abnormally firm without any discrete masses. In the left testicle, a large, solid, and heterogenous mass with increased blood flow was revealed on ultrasound. The hypervascular mass was redemonstrated on CT abdomen and pelvis with contrast. There was no pelvic or inguinal lymphadenopathy. Tumor markers were obtained and within normal limits: alpha-fetoprotein was less than 1.3, LDH was 252, and hCG was less than 1. The patient subsequently underwent a left radical orchiectomy. Pathology was negative for malignancy, but it did reveal organizing hemorrhage and fibrin deposition within many vessel walls. The specimen was then reviewed by a dedicated vascular pathologist who noted fibrinoid necrosis in the medial vessel layers and transmural inflammatory infiltrate composed of lymphocytes and macrophages. On further questioning, the patient revealed that he was actively smoking marijuana and had a 25 pack-year smoking history.

Testicular pain and lesions are problems commonly encountered by the internist. A solid, firm testicular mass is cancer until proven otherwise. The differential diagnosis includes epididymitis, epididymo-orchitis, testicular torsion, hydrocele, varicocele, or a scrotal hernia. Diagnostic work-up includes scrotal ultrasound, CT scan, and serum tumor markers. Radical inguinal orchiectomy provides histological confirmation and initial treatment.

Our patient was appropriately worked up for his testicular lesion, but pathology ruled out malignancy and instead revealed inflammatory vasculopathy. Given his tobacco and marijuana use, he was ultimately diagnosed with thrombophlebitis obliterans. Also known as Buerger disease, thrombophlebitis obliterans is a rare, non-atherosclerotic vasculitis that typically affects small and medium-sized vessels of the distal extremities. Smoking is believed to be integral to the pathogenesis, as thrombophlebitis obliterans primarily affects young male smokers. Involvement of the male reproductive system is extremely rare. Radical orchiectomy remains obligatory as thrombophlebitis obliterans is indistinguishable from neoplasm on diagnostic evaluation. Complete cessation of cannabis and tobacco products is the most effective treatment. This case underscores the importance of a complete history and consideration of the whole clinical picture. Establishing a definitive diagnosis is crucial to proper counseling of patients given that without cannabis and tobacco cessation, the disease will likely progress with increasing morbidity.

## Media Link

## **Abstract 80**

**Category Submitting for:** Clinical Vignette

**Abstract Title** What Might Be Heyde'ing Behind Those GI Bleeds

### **Abstract Text**

A 66-year-old man presented for recurrent admissions due to melena and hematemesis. The patient also notes a 6-month history of worsening exertional dyspnea and lightheadedness without syncope. He has a pertinent past medical history of coronary artery disease status post drug-eluting stent in left circumflex on dual antiplatelet therapy, gastric and duodenal ulcers receiving quadruple therapy for *Helicobacter pylori*, duodenal arteriovenous malformations clipped on discovery, hypertension, bilateral carotid artery stenosis, aortic stenosis, and 50-pack-year smoking history. He had a four of six systolic murmur extending to the carotids with bruits present; the abdomen was soft, non-distended, and without tenderness or organomegaly. Hemoglobin was 6.3 g/dL, and the patient received a unit of blood on admission. Colonoscopy and video capsule endoscopy unrevealing for masses or additional arteriovenous malformations. A transthoracic echocardiogram revealed normal ejection fraction, concentric left ventricular hypertrophy, and a severely stenotic, calcified aortic valve with restricted leaflet motion and regurgitation. We diagnosed the patient with Heyde syndrome and consulted interventional cardiology to evaluate for outpatient transcatheter aortic valve replacement. He was discharged once his hemoglobin stabilized. Unfortunately, the patient had another admission for recurrent melena and hematemesis three days later, requiring another blood transfusion. Again, the patient was stabilized, discharged, and received transcatheter aortic valve replacement outpatient a week later. Aortic stenosis and gastrointestinal bleeding are common medical conditions evaluated by general internists. However, Heyde syndrome is uncommon and potentially underdiagnosed. Heyde syndrome is a triad of aortic stenosis, gastrointestinal bleeding, and acquired von Willebrand disease. Increased shear forces across the stenotic aortic valve result in fractioning of the large von Willebrand multimers. These large multimers are necessary to maintain homeostasis and prevent bleeding within arteriovenous malformations. Arteriovenous malformations are more commonly seen in older adults and occur most frequently within the gastrointestinal system. Underdiagnosis of Heyde syndrome may lead to increased hospital admissions, morbidity, and mortality. Treatment of Heyde syndrome with surgical aortic valve replacement or transcatheter aortic valve replacement has been shown to improve the acquired von Willebrand disease and reduce the recurrence of gastrointestinal bleeding. Any patient with suspected Heyde syndrome warrants a referral for evaluation of aortic valve replacement.

### **Media Link**

## **Abstract 81**

## **Category Submitting for:** Clinical Vignette

**Abstract Title** A Case of Human Herpesvirus-6 Encephalitis in a 62-year-old Immunocompetent Male

### **Abstract Text**

Human herpesvirus 6 (HHV-6) is a common virus with an estimated seroprevalence of 72-95%. It most commonly presents in childhood as roseola, but may rarely present as encephalitis in immunocompromised adults. However, illness in immunocompetent adults is extremely rare. Clinical presentation varies, but may include fever, encephalopathy, seizures, anterograde amnesia and hyponatremia. Here, we present a case of a 62-year-old immunocompetent male found to have HHV-6 encephalitis during a prolonged hospital stay for intractable headaches and neck pain in the setting of hypertensive crisis and bilateral subacute subdural hematomas, complicated by streptococcus parasanguinis endocarditis and a new diagnosis of giant cell arteritis.

A 62-year-old male with a past medical history of hypertension, aortic valve replacement on warfarin and mitral valve stenosis presented to the ED with severe headache and neck pain which began after contracting COVID-19 2 months prior. He denied any vision changes, neurologic deficits, recent travel, or sick contacts. Laboratory analysis in the ED was remarkable for leukocytosis (15.7 k/uL), INR of 6.6, ESR of 68 mm/hr, and CRP of 43.4 mg/L. MRI brain was performed and was significant for bilateral subacute subdural hematomas. He was admitted for further management. Patient became febrile during hospital stay with positive blood cultures for streptococcus parasanguinis. TEE was performed, which showed possible mitral valve vegetation. Ceftriaxone was started. Lumbar puncture was performed on hospital day 15 due to persistent head and neck pain, with new-onset visual hallucinations. CSF studies were remarkable for lymphocytic/monocytic pleocytosis (32 nuc cells/uL) and positive men ingitis/encephalitis panel for HHV-6 confirmed by PCR (292,000 copies/mL). HHV-6 IgG levels were elevated at 3.25. HHV-6 IgM was unremarkable. Ganciclovir was started. Due to persistent temporal pain, the patient was also started on empiric prednisone due to concern for giant cell arteritis. Temporal artery biopsy findings were consistent with temporal arteritis. The patient was ultimately discharged on hospital day 36 with prednisone taper, valacyclovir, and ceftriaxone. He continues to follow up with rheumatology and headache clinic.

HHV-6 encephalitis is a rare manifestation of HHV-6 infection that typically occurs secondary to viral reactivation in immunocompromised patients and very rarely in immunocompetent patients. Mortality of untreated HHV-6 encephalitis in transplant patients is high and there is a significant risk of neurologic disability in both immunocompromised and immunocompetent patients if untreated. HHV-6 viremia in the absence of encephalitis is not typically treated; when encephalitis is present, ganciclovir or foscarnet is the treatment of choice. Early treatment of HHV-6 encephalitis in both immunocompromised and immunocompetent patients has a morbidity and mortality benefit. Prompt initiation of appropriate antiviral therapy resulted in improvement in this patients' symptoms in the context of a complicated hospital course with multiple disease processes that increased this patient's risk of adverse outcomes.

**Media Link**

