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CVs
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A RARE CASE OF SUPERINFECTION OF HEMOPERITONEUM FOLLOWING INGUINAL HERNIA REPAIR

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Bleeding complications following inguinal hernia repair is rare, but secondary infections of these hemoperitoneum are even more rare and the mechanism has not been fully elucidated.

A 35-year-old woman, 11 days post laparoscopic left inguinal hernia repair, was brought in for sudden onset LLQ abdominal pain. The pain started suddenly, was excruciating at onset, constant, sharp and without radiation. Vitals showed Temp 36.9, HR 157, RR 20, and BP 111/71. WBC of 15.4, Hgb of 10.1, Platelets of 187, MCV of 103, C02 of 15, and LA of 5.9. CT Abdomen and Pelvis showed mixed density left lower quadrant mass measuring 16.7cm x 9.7 cm x 21.4 cm with adjacent contrast extravasation in LLQ with left proximal inferior epigastric artery being the likely source. Repeat blood work showed that the Hgb had dropped to 7.2 and our patient was emergently taken for angiogram. The inferior epigastric artery was gel-foamed and coil-embolized w/o any residual contrast extravasation. Repeat blood work showed that the Hgb remained stable at 7.3 Despite aggressive resuscitation with fluids and PRBC, her HR remained elevated into the 140s-150s. After being in the hospital for < 8 hours, patient became bradycardic and had PEA arrest. She was intubated, and ROSC was achieved after 50 minutes. 16 hours after she initially presented to the ED, blood cultures showed GPC in clusters in 3 of 4 blood culture bottles. She was started on vancomycin but continued to decompensate with worsening metabolic and respiratory acidosis, LA >12, hypotension requiring 4 pressers. The patient subsequently had another PEA arrest and passed, less than 24 hours after coming to the hospital.

This case was an important review, as super infection of hemoperitoneum is a very rare complication. The diagnosis of infected hemoperitoneum is difficult as the elevated leukocytosis could have been reactive secondary to the bleed. High clinical suspicion is critical to prompt diagnosis and initiation of antibiotic therapy.
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A Second Episode of Non-Traumatic Rhabdomyolysis in the Setting of Viral Illness
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Non-traumatic rhabdomyolysis is a potentially life-threatening syndrome characterized by electrolyte derangements and acute kidney injury with a multitude of etiologies, ranging from adverse medication effect to endocrinopathies.

A 33-year-old man with one prior episode of rhabdomyolysis requiring dialysis presented with generalized malaise, fevers, and myalgias. Five days prior to his presentation, he began to have fevers and chills, a nonproductive cough, myalgias, fatigue, and malaise, concerning for a viral illness. Most of his symptoms improved in subsequent days, but his generalized body aches progressively worsened. He denied any recent falls or trauma as well as any recent strenuous exercise or heavy lifting. No medications or recreational drug use. Past medical history was notable rhabdomyolysis one year prior to presentation. During that hospitalization, his rhabdomyolysis was attributed to the influenza B virus, and he had required hemodialysis in the setting of acute renal failure. Family history was without known rhabdomyolysis, genetic diseases, or muscle issues. Physical examination was notable for tenderness to palpation of his proximal legs bilaterally though his strength was full in the upper and lower extremities proximally and distally. His creatine kinase level on presentation was 98,405 U/L and peaked at 107,195 U/L prior to downtrending. The remainder of his electrolyte profile was normal, and he was started on intravenous fluids. Further workup demonstrated a negative anti-nuclear antibody and a thyroid stimulating hormone within the normal range. Due to his repeat episode of rhabdomyolysis, the acute renal failure requiring dialysis with the first episode, and both episodes occurring in the setting of presumed viral illness, the genetics team was consulted. There was concern for a muscular glycogen storage disease or a fatty acid oxidation disorder, and an acylcarnitine profile, carnitine plasma amino acids, and urine organic acids were sent with plan for further workup in the outpatient genetics clinic.

Repeat episodes of non-traumatic rhabdomyolysis in an otherwise young and healthy individual, especially in the setting of a viral illness, should warrant further investigation to elucidate other underlying etiologies with consideration of a genetic predisposition.
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THE CREATININE CLUE: EXAGGERATED CREATININE INCREASE AS A SIGN OF RENAL ARTERY STENOSIS. Davis, I, MD, O’Malley, K, MD. The University of Maryland School of Medicine and VA Medical Center, Baltimore, MD.

Fibromuscular dysplasia (FMD) is a rare cause of secondary hypertension. A nonatherosclerotic and noninflammatory vascular disease, it typically involves medium sized arteries. Complications include arterial stenosis, aneurysm, dissection and, rarely, complete occlusion. The clinical presentation varies depending on the vascular distribution involved. Most commonly, the renal artery is affected resulting in secondary hypertension.

A 63-year-old Caucasian woman without prior history of hypertension presented to the emergency department with headache, abdominal pain, nausea and vomiting. Blood pressure at presentation was 236/106 mmHg and physical exam revealed a loud (4/6) holosystolic murmur with radiation to the abdomen. During admission she was noted to have labile, difficult to control blood pressures requiring frequent break-through therapy with oral hydralazine and intravenous labetalol. Laboratory evaluation revealed normal electrolytes, normal renal function and thyroid function with computed tomography imaging showing normal appearing adrenal glands. Lisinopril was titrated to a dose of 40 mg daily. Subsequently, the patient had an exaggerated increase in creatinine which prompted consideration of renal artery stenosis as the likely etiology for secondary hypertension. Lisinopril was held and doxazosin initiated. Computed tomography angiography of the abdomen revealed bilateral beading of the renal arteries suggestive of fibromuscular dysplasia. The cardiac murmur was evaluated with a transesophageal echocardiogram which demonstrated a dynamic left ventricular outflow tract (LVOT) obstruction. At time of discharge she was normotensive and asymptomatic on doxazosin and metoprolol. Outpatient follow-up was arranged with fibromuscular dysplasia specialty clinic, vascular surgery and with endocrinology to complete neuroendocrine tumor evaluation.

This case highlights several points: 1) the importance of considering secondary causes for difficult-to-control, drug-resistant hypertension 2) the clinical “clue” of exaggerated creatinine elevation in the setting of Angiotensin Converting Enzyme Inhibitors (ACE-I) suggests the presence of renal artery stenosis and 3) As an area for future research – are patients with FMD at increased risk for developing LVOT obstructions via upregulation of the Renin-Angiotensin-Aldosterone system?

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**ABSTRACT FORM:** Must be at least 10-point font. A sharp typeface will help reproduction. Be sure to single-space and **STAY WITHIN THE BORDERS!**
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The Most Dangerous Animal is a Wounded One

Background:
Mycobacteria tuberculosis (TB) is estimated to infect 1.7 billion people worldwide (25% of population). Primary TB can present in a variety of ways, with only 1/3 having pulmonary symptoms. Early diagnosis of reactivation TB remains challenging, as symptoms have an insidious onset and are nonspecific in nature: cough, fatigue, weight loss. Treatment of reactivation TB is challenging due to duration, complexity of the regimen and the potential for toxicity. We present a case of drug-sensitive TB that required multiple different regimens due to hepatotoxicity.

Case Presentation:
A 55 year old man presented with generalized weakness, weight loss, poor appetite, night sweats. There was no cough or fever. He was diagnosed and treated for TB in India 15 years ago, prior to immigrating to U.S. He still takes occasional trips to India, last one being three years ago. CT chest showed apical cavitory lesions and 2 out of 2 sputum samples were positive for acid-fast bacilli. Cultures eventually grew pan-sensitive M. TB.

The patient developed hepatotoxicity on RIPE therapy (rifampin, isoniazid, pyrazinamide, ethambutol) so it was replaced with ethambutol, moxifloxacin and linezolid. Rifampin and then isoniazid were reintroduced after liver tests normalized. After one month, however, LFT’s progressively increased, accompanied by lactic acidosis. The lactic acidosis resolved a week after linezolid was stopped. Patient also switched to liver-sparing regimen of ethambutol, moxifloxacin, amikacin, meropenem, and amoxicillin clavulanate. After resolution of hepatitis, rifabutin was added to regimen instead of rifampin. After LFT’s remained stable for about a week, isoniazid replaced meropenem and amoxicillin clavulanate. Despite a month of this regimen and 2 months total, AFB smear remained positive, and patient remains in treatment on a regimen of ethambutol, rifabutin, isoniazid, moxifloxacin, amikacin.

Discussion:
Treatment of TB requires at least 6 month of multiple agents. RIPE therapy is first line and most well studied, but has potential hepatotoxicity. Second line treatments are less effective and well-studied, but are crucial in cases of intolerance to RIPE and resistance. Because of the duration and side effects of treatment, clinicians must closely monitor LFTs to prevent potential fatal side effects.
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UNUSUAL CASE OF HEMOLYSIS IN A PATIENT WITH VITAMIN B12 DEFICIENCY
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Vitamin B12 deficiency is a common disorder; however, has the potential for severe complications. Hemolytic anemia secondary to vitamin B12 deficiency is a rare presentation. Hemolysis is observed in about 1.5% of patients with low vitamin B12 level. We describe a patient with vitamin B12 deficiency who presented with hemolytic and megaloblastic anemia.

A 61-year-old Hispanic man with no significant past medical history presented to us with worsening non-radiating abdominal pain for two months in the epigastric area. Examination revealed mild pallor, and tenderness to palpation in the epigastric region. Laboratory analysis showed WBC 2.8, Hgb:6.9, platelets 106, MCV: 107.8, RDW: 21.5. Peripheral smear showed macrocytes, microcytes, helmet cells, achistocytes, tear cells, and basophilic stippling. Upon further lab investigation, reticulocyte count 1.6, vitamin B12 <60, folate 23.3, homocysteine level 18, methylmalonic acid (MMA) level 5.44, intrinsic factor antibody positive, haptoglobin <8, LDH 3,570, bilirubin 1.7, direct bilirubin 0.5, indirect bilirubin 1.3, iron 259, iron saturation 90. Direct Coombs test and fecal occult blood test were negative. CT abdomen revealed mild hepatic steatosis, no bowel wall thickening or fat stranding, and no acute intra-abdominal pathology.

The mechanism of hemolysis in the setting of B12 deficiency is not well understood. Intramedullary destruction of red blood cells has been attributed to elevated homocysteine level that leads to both intravascular and intramedullary hemolysis. Pre-oxidant attributes of homocysteine could further lead to endothelial damage and subsequent microangiopathy. Management of pernicious anemia with hemolysis as described in our patient is different from patients presenting with autoimmune hemolytic anemia (AIHA) with a positive direct Coombs test. Our patient’s low serum vitamin B12 and high MMA level with positive anti-intrinsic factor demonstrated that he had Vitamin B12 deficiency due to pernicious anemia.

It is important to consider vitamin B12 deficiency in the differential diagnosis of hemolytic anemia with macrocytosis for timely diagnosis and therapeutic intervention.

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UNEXPECTED HEPATORENAL INSUFFICIENCY IN A PATIENT WITH COLCHICINE ABUSE EXACERBATED BY DRUG INTERACTIONS
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Introduction: Colchicine is widely prescribed in the management of gout; however, colchicine use is limited by narrow therapeutic window and hepatic metabolism via CYP3A4 and P-glycoprotein. Toxicity management is largely supportive as colchicine has a large volume of distribution and is not dialyzable; early detection and prompt supportive therapy is therefore imperative. We report a case of colchicine toxicity secondary to unintentional overdose enhanced by drug interaction.

Case: A 70-year-old male with a history of heart failure with reduced ejection fraction, hypertension, chronic kidney disease (CKD) stage III, chronic hepatitis C, and gout presented with a one-day history of palpitations and dyspnea. Vital signs were notable for tachycardia of 128 and physical examination for bilateral diffuse crackles and bilateral lower extremity edema. Electrocardiogram revealed atrial fibrillation with rapid ventricular rate, and chest radiograph showed mild pulmonary congestion. Diltiazem bolus was given without improvement, followed by amiodarone infusion which successfully normalized his heart rate. Thirty-six hours post-infusion, the patient developed abrupt elevations in aspartate aminotransferase (1023 from 100 U/L), alanine aminotransferase (261 from 18 U/L), serum creatinine (peak of 3.17 from 1.33 mg/dL), and serum potassium (5.9 from 4.1 mmol/L). Further investigation revealed that the patient was unintentionally consuming excessive doses of colchicine, up to 3.6 mg/day over two weeks. The patient was promptly started on aggressive hydration and amiodarone was discontinued. By the fourth hospital day, the patient's renal and hepatic function improved and later returned to baseline.

Discussion: There are three stages of colchicine toxicity: the first manifests as gastrointestinal upset (2-12 hours), the second presents as multi-organ failure involving bone marrow, kidneys, and liver (8-72 hours), and the third is marked by recovery (7-10 days). Our patient presented with nausea and diarrhea several hours after administration of amiodarone and diltiazem, which are moderate CYP3A4 inhibitors that increase concentrations of colchicine. This was followed by hepatic and renal dysfunction within 36 hours, with initial recovery seen on day four. Despite a relatively low dose of colchicine ingestion, our patient developed acute toxicity likely due to the combination of pre-existing CKD, untreated hepatitis C, and administration of CYP3A4 inhibitors. It is therefore essential that physicians be aware of colchicine toxicity as a differential in acute multi-organ failure in the setting of polypharmacy, be vigilant towards drug interactions, and exercise caution in prescribing colchicine to patients with hepatic and renal impairment.
A Case Report: Segmental Arterial Mediolysis

Introduction: Segmental arterial mediolysis (SAM) is an uncommon, non-atherosclerotic, non-inflammatory vasculopathy characterized by disruption of the arterial medial layer leading to abnormal vessel stenosis and aneurysm, leaving patients vulnerable to dissection, ischemia and hemorrhage. Presenting signs and symptoms can range from vague abdominal pain to hypotension from acute hemorrhage. Fewer than one hundred cases have been reported, but one third of patients present with massive bleeding.

Case Description: A 74-year-old woman presented with severe, bilateral upper quadrant abdominal pain. She reported decades of intermittent abdominal pain. The patient was in mild distress, tachycardic, hypertensive and diaphoretic. Her physical examination was significant for tenderness to palpation in the epigastrium and right lower quadrant of her abdomen. Labs revealed a mild leukocytosis and elevation of ESR and CRP. A CT scan of the abdomen and pelvis showed alternating stenoses and aneurysms (beaded appearance) throughout the celiac, superior mesenteric, inferior mesenteric, bilateral renal arteries and their branches. Multiple wedge-shaped splenic infarcts and segmental thickening of gastrointestinal walls suggestive of ischemia were also noted. A CT of the head and neck showed similar beading of the internal carotid and vertebral arteries. The patient’s symptoms resolved with conservative medical management and blood pressure control. Follow up imaging four months after discharge showed complete resolution of the vascular beaded appearance.

Discussion: This case details the presentation, diagnosis, and management of a patient with SAM, a very rare but often lethal disease. The widespread findings on imaging combined with a negative laboratory work up led to either SAM or fibromuscular dysplasia as the most likely etiology. Both diseases are non-atherosclerotic, non-inflammatory vasculopathies of medium-sized arteries. While the latter is more commonly associated with renal artery stenosis, the former targets visceral mesenteric arteries. There are injurious and reparative phases of SAM that sometimes lead to improvement and even spontaneous resolution. The radiologic improvement after discharge supported the diagnosis of SAM, but definitive diagnosis requires histopathology from biopsy. The key step is distinguishing SAM from more common inflammatory vasculitides, as immunosuppressants that treat an inflammatory vasculitis can worsen this vasculopathy. SAM should be included on the differential of unexplained abdominal pain, infarct or hemorrhage.

Program Director’s Name: Sanjay Desai MD

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NOT EATING CAN EAT YOUR LIVER
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Starvation Induced Hepatitis is a rare condition seen in 23-50% of anorexia nervosa patients. Autophagy is thought to be the pathology of this disease entity however further studies are needed for a better understanding. It is not associated with underlying liver pathology and full recovery is expected after refeeding.

A 40-year-old Caucasian woman with history of Hashimoto’s thyroiditis and thyroid cancer status post thyroidectomy and radioactive iodine therapy, chronic kidney disease, and acne, on tetracycline since 2007, was evaluated for elevated liver enzymes. She was asymptomatic and had stable vital signs. Her weight was noted to be 37.4kgs with a body mass index (BMI) of 15.8. Physical examination was unremarkable and blood work showed alanine transaminase of 37 IU/L(normal 0-19 IU/L), normal aspartate aminotransferase, alkaline phosphatase of 179 IU/L(normal 35-105 IU/L), gamma glutamyl transferase of 51 U/L(normal 9-48 U/L), normal total bilirubin, albumin and thyroid function tests. Other diagnostic work up for hepatitis, celiac disease, Wilson’s disease and autoimmune hepatitis panel were negative. MRI and MRCP were normal. Her medications were levothyroxine 88mcg and tetracycline 500mg daily. Due to the negative workup and low BMI, starvation induced hepatitis was considered. Tetracycline was discontinued given concern for drug induced anorexia and liver injury. She was followed monthly and her liver enzymes normalized within a month with simultaneous increase in BMI to 16.5. Her last follow up was 3 months after discontinuation of medication and liver enzymes continued to be normal with BMI increased to 19.

Diagnosing starvation induced hepatitis requires high clinical suspicion and supporting laboratory data with abnormal electrolytes and elevated liver enzymes. Imaging studies show normal liver and liver biopsy is not recommended. Treatment includes refeeding and close monitoring; liver enzymes normalize with rising BMI which typically takes 20 to 40 days. Patients being treated require close monitoring as refeeding hepatitis is a complication of the treatment. Our case was interesting as her anorexia was thought to be induced by tetracycline which is a known but rare side effect.
PROGRESSION OF ELECTROCARDIOGRAM FINDINGS IN HYPERKALEMIA. Chan S, MD. The University of Maryland School of Medicine and VA Medical Center, Baltimore, MD.

Hyperkalemia is a commonly observed clinical entity in hospital medicine. Frequently, the elevation is mild and incidentally noted on laboratory data. Other times, due to the pivotal role of potassium in myocardial action potentials, changes in cardiac conduction can be seen. The most commonly taught and often earliest electrocardiogram (ECG) finding in mild hyperkalemia is the presence of peaked T-waves, representing a repolarization abnormality. As the severity of hyperkalemia increases, atrial, nodal, and ventricular conduction abnormalities can present.

A 70 year-old veteran with history of end-stage renal disease status post kidney transplant and heart failure with preserved ejection fraction presents to the Emergency Department with cough, congestion, and shortness of breath in the setting of several missed furosemide doses. On review of systems, he also complained of worsened bilateral leg tingling. Labs were drawn and an ECG was obtained. His ECG revealed peaked T-waves in V2 and V3 with a 1st degree atrioventricular block. Shortly thereafter, a repeat ECG was performed. At this time, the ECG had progressed to a junctional bradycardia, the QRS had widened to 150 milliseconds, and a new left-bundle branch morphology was seen. Calcium gluconate and potassium-lowering therapies were administered. Laboratory results eventually revealed a potassium level of 7.7. As potassium normalized with therapy, the patient’s ECG returned to his normal baseline, with resolution of conduction abnormalities and peaked T waves.

Here is presented a clinical case in which a patient at risk of hyperkalemia presents with peaked T-waves. His ECG rapidly progressed with various cardiac conduction abnormalities, including widening of the QRS complex and bradyarrhythmia. With treatment of his metabolic derangements, his ECG changes quickly resolved. In cases where new conduction abnormalities present on ECG, membrane-stabilizing agents and potassium-lowering therapy should be considered even before laboratory values result. If untreated, these conduction abnormalities can worsen and ultimately lead to cardiac arrest.
A Case of Klebsiella pneumoniae Liver Abscess

Introduction: The incidence of Klebsiella pneumoniae liver abscess is increasing in the US. It has higher incidence in Asian and Latin American populations. Klebsiella pneumoniae is estimated to account for 30 – 40% of pyogenic liver abscesses (PLA) and around 52% occur in diabetic patients. Serotypes K1 and K2 are common isolates in Klebsiella liver abscesses. Patients usually do not have any predisposing hepatobiliary or gastrointestinal disease.

Case: A 53-year-old female with diabetes mellitus presented complaining of intermittent high-grade fevers between 38.9 and 40°C for one week. Associated symptoms included rigors, headache and diaphoresis. She had been seen in the emergency department 5 days earlier for similar complaints and was discharged after an unremarkable work up and transient clinical improvement. She denied diarrhea, abdominal pain, nausea, vomiting, ingestion of possibly contaminated food or water, recent travel and/or or sick contacts. On physical examination the only positive findings were fever (39.4°C) and tachycardia.

Discussion:
Patients might not have right upper quadrant pain.
The characteristic imaging finding for early diagnosis
Antibiotics and percutaneous drainage are the main treatment modalities.
Metastatic infections like meningitis or endophthalmitis should be actively sought for.
The mucoid nature of these abscesses can make drainage difficult.
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### RARE CONSECUTIVE ST-ELEVATION MYOCARDIAL INFARCTION IN AORTIC VALVE ENDOCARDITIS

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#### Introduction

ST-Elevation Myocardial Infarction (STEMI) is a rare and potentially fatal complication of infective endocarditis. We report the first case of consecutive large STEMI in a young woman with a history of intravenous drug use (IVDU) with MRSA bacteremia, aortic valve endocarditis, cardiogenic and septic shock.

#### Case Presentation

A 31-year old woman with a history of IVDU presented to the ED with four days of weakness, dyspnea, and pleuritic chest pain associated with cough, fevers, and arthralgia. On exam, she appeared ill, was tachypneic, and tachycardic. Wound and blood cultures were obtained, and broad-spectrum antibiotics were started, but unfortunately, she left against medical advice. She returned two days later with symptom progression. Echocardiography demonstrated anteroseptal hypokinesis and left aortic coronary cusp vegetation. Initial EKG confirmed anterolateral STEMI. Her course was complicated by persistent fever and progressive hypotension, requiring vasopressor support in addition to broad-spectrum antibiotics. Follow up EKG showed new inferior STEMI. Shock progressed, and respiratory status declined. Despite maximal support, she was persistently hypotensive and developed cardiac arrest. Resuscitative efforts were unsuccessful, and the patient succumbed to her illness.

#### Discussion

STEMI caused by embolization of aortic valve vegetations are rare, and often such patients are not candidates for interventions such as fibrinolytic therapy, percutaneous coronary intervention, or valve replacement due to potentially severe complications. Current modalities of treatment for this are also very limited, and guidelines for managing STEMI in this setting are lacking.

#### Conclusion

This cornerstone case illustrates the potential severity and spectrum of complications caused by infective endocarditis. We call for a standardized approach in the management of such patients.

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**ABSTRACT FORM:** Must be at least 10-point font. A sharp typeface will help reproduction. Be sure to single-space and **STAY WITHIN THE BORDERS!**
A Case of Opiate Overdose—Induced Bilateral Globus Pallidus Hypodensities

Introduction: Non-contrast CT of the head is a commonly used imaging modality in the Emergency Department to evaluate for head injury and intracranial hemorrhage. However, it may be helpful in patients with altered mental status, as illustrated in our case.

Case Presentation: A 29-year-old male without significant past medical history was brought by EMS with altered mental status. Diagnosis of opiate overdose was presumed, as patient improved with naloxone administration. However, the patient remained hypoxic, with 80% oxygen saturation on non-rebreather mask. There was subsequent improvement with placement on BIPAP. The urine toxicology was positive for opiates and cocaine. A chest x-ray showed diffuse patchy opacities suggestive of flash pulmonary edema. CT head was positive for hypodensities of bilateral globus pallidi. Given that bilateral globus pallidi hypodensities and non-cardiogenic pulmonary edema can be seen in carbon monoxide poisoning victims, a carboxyhemoglobin level was acquired. The result was 2.5%, which is the upper limit of normal. Patient was then continued on BIPAP with interval improvement of his mentation that occurred over approximately 10 hours.

Upon further obtainment of history, patient reported that his apartment had just resumed his heating system, which had not been used for the past year. However, the patient also admitted to smoking approximately 1/2 pack of cigarettes a day for the past 15+ years. With a relatively normal carboxyhemoglobin level for a cigarette smoker and a lack of other clinical findings of carbon monoxide poisoning, besides altered mentation, the imaging findings suggested recent anoxic-hypoxic injury, perhaps from opiate overdose.

Due to patient's insistence on leaving the hospital, we were unable to perform follow-up imaging and further delineation of lesions with MRI. We did perform follow-up imaging with CT that showed stability of the hypodensities seen in bilateral globus pallidi.

Discussion: While hypodensities of globus pallidi are not specific for carbon monoxide poisoning, it is a CT imaging finding that can help provoke further clinical investigation. Our case demonstrates that said lesions can also be seen in patients affected by opiate overdose or other toxic encephalopathies that result in anoxic-hypoxic injury to the brain. As always, clinical correlations is prudent.
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EMPHASIZING THE VISUAL ANALYSIS OF CARDIAC DEVICES ON CHEST X-RAY
Joseph Klaus, MD; Andreea Bente, Rafi Raza, MD
MedStar Harbor Hospital, Baltimore, MD

Introduction. Pacemakers and implantable cardioverter defibrillators (ICD’s) are frequently encountered in today’s clinical practice, and these devices are seen on routine imaging. As such, it is essential for the general practitioner to recognize proper lead placement via radiographs so that they can notice lead or generator dislodgement.

Case Presentation. A 69-year-old woman presented with two days of melena and was found to be hypotensive in the ER. Past medical history included dilated cardiomyopathy, paroxysmal atrial fibrillation, coronary artery disease, hypertension, prosthetic mitral valve replacement, and dual chamber pacemaker for sick sinus syndrome. The patient was diagnosed with an upper GI bleed and admitted for hemodynamic resuscitation and endoscopic evaluation. Chest x-ray showed prosthetic mitral valve and dual chamber pacemaker with proper lead placement. Transjugular liver biopsy was performed, but the right ventricular pacemaker lead dislodged during the procedure and went unnoticed. The patient developed hypotension and was transferred to the ICU for pressor support. Another chest x-ray performed, but the displacement of the lead was not recognized again. Cardiac monitoring showed changes suggestive of pacemaker malfunction and a pacemaker was interrogated which confirmed lead malfunction. The patient was transferred to another center for lead correction and only at that time official radiologist interpretation of x-ray noted the lead dislodgement.

Discussion. This case highlights a significant opportunity for improving routine care of patients with cardiac devices especially during or after vascular procedures such as transjugular hepatic biopsy. If the procedure requires access via the same veins, close attention should be made to post-procedure films and confirming lead placement via chest x-ray.

Conclusion. Any patient with implanted cardiac devices or wires can be displaced during procedures requiring manipulation of wires. Further, it is essential to look for and be able to recognize proper lead placement for the devices on a chest film.
The Bite that will Make your Head Explode

Introduction: West Nile virus (WNV) infection has a wide range of presentations. Although it can involve the central nervous system, to our knowledge this is the first case of WNV meningitis presenting with Cushing reflex.

Case: A 43-year-old female presented with headache, fever of 39.4°C and a rash for one week. The rash involved the arms and trunk. The headache was described as left sided, constant, pounding, and 10/10 in severity with concomitant neck pain, nausea and vomiting. Review of systems was positive for diarrhea and urinary symptoms. Physical examination was remarkable for frontal and maxillary sinus tenderness, neck rigidity and positive Kernig sign. Laboratory tests at presentation showed WBC count 19000 cells/mm² with neutrophilic predominance. Computed tomography (CT) of head was unremarkable. Lumbar puncture (LP) showed WBC count of 134 cells/mm² with mononuclear predominance. Antibiotic and antiviral agents to cover for bacterial and viral meningitis were initiated. Gram stain, culture and viral serologies came back negative, antibiotics were discontinued. The day after, the patient developed worsening headache, blurry vision, photophobia, elevated blood pressure (up to 200/95 mmHg) and bradycardia (45bpm). Repeat head CT ruled out cerebral edema. On repeat LP she had high opening pressure (22 cmH₂O). IgM and IgG WNV antibodies came back positive. Removal of CSF and symptomatic management resulted in symptoms improvement.

Discussion: WNV infections can have a wide range of presentations from asymptomatic disease to neuroinvasive disease (meningitis, encephalitis and flaccid paralysis). The incidence of WNV infection in Maryland is 0.5 to 0.9/100,000 people. WNV meningitis usually presents with fever and signs of meningeal irritation. Cushing reflex may be secondary to increased intracranial pressure (ICP) or it might be the response to brainstem ischemia to maintain cerebral perfusion pressure. Increased ICP in meningitis is multifactorial in origin (cytotoxic and vasogenic edema, obstructed CSF flow) and indicates severe disease with higher mortality. Few case reports have been published about the association between Cushing reflex and meningitis, most of these had a bacterial cause. Indications for viral antibody testing include an unexplained febrile illness, meningitis/encephalitis or flaccid paralysis during mosquito season.

Conclusions: This case showcases the rare finding of Cushing reflex in WNV meningitis. This case is also the second reported case of WNV meningitis in Maryland in 2018. High index of suspicion and careful history taking are very helpful to get to the diagnosis.

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SHOCK AS AN INITIAL PRESENTATION OF PEMPHIGUS VULGARIS. Fishman, L, MD. The University of Maryland School of Medicine and VA Medical Center, Baltimore, MD.

Pemphigus Vulgaris is a rare dermatologic condition that involves IgG autoantibodies to desmogleins. Typical age of onset is between 40-60 years of age with clinical symptoms classically including cutaneous and mucosal (often oral) erosions. Although most physicians have heard of this rare condition, the clinical severity in which this disease initially presents is unfamiliar and should not be missed.

A 69 year-old man with history of hypertension and psoriasis presented to his primary care doctor with 3 weeks of progressive odynophagia, weight loss, and fatigue. The patient was found to be hypotensive to 71/43 mm Hg with multiple blistering cutaneous and oral lesions and was sent to the emergency department. He was started on intravenous fluids and broad-spectrum antibiotics then admitted to the Intensive Care Unit (ICU). In the ICU, antifungal and antiviral medications were added to patient’s treatment regimen. The etiology of skin lesions was unknown and work up for infection and an immunocompromised state were initiated. Urinalysis, chest x-ray, and blood cultures were negative for signs of infection. Human immunodeficiency virus rapid screen and 4th generation tests were negative, Hepatitis C/Herpes simplex/varicella/cytomegalovirus were negative and the CD4 count was normal. The patient did not have a known malignancy or diabetes and he not on any immunosuppressive medications. Computed Tomography of the chest, abdomen and pelvis was obtained to look for possible malignancy and was largely unremarkable. Otorhinolaryngology performed a laryngoscopy which was negative for malignancy. Gastroenterology performed an upper and lower endoscopy which were negative for masses with biopsies negative for malignancy. Dermatology was eventually consulted and based on the patient’s constellation of symptoms, it was suspected that this was an initial presentation of pemphigus vulgaris. The patient was immediately started on Prednisone and new lesion formation ceased. Existing lesions began to heal and the patient clinically stabilized. He was also started on Rituxumab infusions and discharged to a subacute rehabilitation facility for wound care.

Pemphigus Vulgaris is rarely seen in the realm of internal medicine and is often confined to textbooks. Although it is a primary dermatological condition, it is essential that all physicians can quickly recognize its clinical presentation and initiate appropriate treatment.
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LAW ENFORCEMENT AND IMMIGRANT HEALTH
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BACKGROUND- US immigration policies and enforcement can make immigrants fearful of accessing healthcare. Although current immigration policies restrict enforcement in "sensitive locations" including health care facilities, there are reports of enforcement actions in such settings. It is unclear if healthcare professionals know how to respond to immigration enforcement at their facilities.

PURPOSE FOR STUDY- To evaluate the experience of health professionals with workplace immigration enforcement, their knowledge and training regarding relevant policies, and their recommendations for their institutions to address law enforcement at their facilities.

METHODS- A cross-sectional survey of providers via the member portal of the Society for General Internal Medicine was conducted. Providers were encouraged to forward the survey to other healthcare professionals. Forty-two completed the survey. Descriptive statistics and Fisher's exact tests were used for data analysis.

RESULTS- Most survey respondents were attending physicians (69%), worked at academic medical centers (91%), in outpatient settings (83%), and in the Northeast (40%). Many (83%) were not aware of workplace immigration-related law enforcement policies and few (5%) received training related to immigration law enforcement. Nearly 1 in 5 reported immigration enforcement activities in or near their workplace, but no staff members involved had received training beforehand. Awareness of enforcement activity differed significantly by practice setting, with 57% of inpatient and 11% of outpatient providers reporting enforcement activity at or near their workplace (p <0.05). Survey responses about policy awareness or training did not vary significantly by region, job description, practice setting or patient language. Only 24% of respondents considered their facility prepared to respond to immigration enforcement. The most commonly cited reasons included lack of training (36%), lack of known policies (36%), and deference to immigration law enforcement (10%). Most respondents recommended staff training (70%) and/or policy development (57%).

CONCLUSIONS- Surveyed clinicians were largely unaware of workplace policies and few received training regarding responses to immigration enforcement. Most felt their facility would not be prepared to respond. Institutions should develop appropriate policies and procedures, educate and train staff, and engage with stakeholders to coordinate appropriate and ethical response to immigration enforcement in clinical settings.

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PARENCHYMAL LUNG DISEASE IN IMMUNOCOMPETENT PATIENTS: DON'T FORGET ABOUT HOT TUB LUNG
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Hot tub lung (HTL) is a rare, but important diagnosis to consider in immunocompetent patients with acute to subacute presentations of parenchymal lung disease. HTL is thought to result from inhalation of water aerosols containing non-tuberculous mycobacterial (NTM) species; causing a hypersensitivity response. Diagnosis has historically required positive bronchoalveolar fluid, lung histopathology and/or environmental studies to confirm the presence of non-tuberculous Mycobacterium.

A previously healthy 59-year-old male presented with dyspnea, palpitations, and dry cough for three months. His chest x-ray was concerning for pneumonia. He received amoxicillin/clavulanate for 7 days and LAMA/steroid inhaler without improvement. Chest CT showed small non-calcified pulmonary nodules and a small pericardial effusion. He later developed chest tightness; chills; fever and presented to the hospital with hypoxia with notable inspiratory crackles. He had no peripheral eosinophilia or hematuria and procalcitonin; HIV; Beta-D-glucan and respiratory viral panel were negative. A repeat CT scan showed interval development of patchy bilateral interstitial infiltrates in a non-specific pattern with evidence of tree-in-bud appearance. He was started on ceftriaxone, azithromycin and albuletur nebulizer and began to improve. Further history revealed daily use of a hot tub for 10 years and lamotrigine use for seizures. Bronchoalveolar lavage was inconclusive and cultures were negative. Right lower lobe lung and lymph node biopsy were all negative. Two weeks after bronchoscopy, he remained symptomatic despite complete cessation of hot tub usage, and was started on empiric oral prednisone, with plans for repeat imaging and clinical monitoring for improvement over the next several weeks.

HTL is an important diagnosis to consider in otherwise healthy patients presenting with acute or subacute parenchymal lung disease. Targeted questioning about all environmental exposures remains crucial. Treatment for HTL includes removal of the exposure plus systemic steroids which is often reported as more successful when compared to anti-NTM agents alone, supporting the theory HTL may represent a hypersensitivity reaction rather than a true infection.
CASTLEMAN DISEASE, A RARE CAUSE OF PALPABLE LYMPH NODES
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Introduction: Castleman disease (CD) is a rare lymphoproliferative disorder. First described in the 1950s, CD has been divided into 3 sub-types – unicentric, HHV associated multicentric and idiopathic multicentric. With only 7000 new annual cases and varying presentations, early diagnosis is essential for treatment initiation and improving patient outcomes. Below we present a case of unicentric CD.

Case: A 44-year-old female with history of pseudotumor cerebri, positive ANA, positive anti-ds DNA, hypothyroidism and polynuropathy was found to have palpable right axillary lymph nodes measuring 3.0 x 2.4 x 1.0 cm on ultrasound. She underwent excisional biopsy demonstrating Castleman Disease. Positron emission tomography scan revealed no significant uptake in other lymph nodes establishing the unicentric disease subtype. POEMS disease (polyneuropathy, organomegaly, endocrinopathy, monoclonal protein, and skin changes) was entertained given the history of polynuropathy however there was no evidence of monoclonal spike, or immunoglobulin abnormality. HIV test and latency associated nuclear antigen 1 (LANA 1) to identify HHV-8 associated Castleman was negative. Patient also did not fit the criteria for "TAFRO-idiopathic multicentric Castleman's disease."

Discussion: Unicentric Castleman Disease remains a challenging diagnosis given the extensive subtype workup. CD presents most commonly as an incidental finding on physical examination, most commonly in the chest/neck region. Once a diagnosis is established, complete resection, if possible is curative in this subtype. The exact etiology of CD is unknown, but theories correlate with somatic mutations in the monoclonal cell population. A timely follow up and regular imaging are warranted due to increased risk in subsequent lymphoma. In conclusion, given its rarity and recent establishment of and ICD10 code, identifying worldwide epidemiology, pathophysiology and prognostic information is warranted.
AN UNUSUAL CAUSE OF VENTRICULAR BIGEMINY: TAKOTSUBO CARDIOMYOPATHY
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Takotsubo cardiomyopathy is a form of stress-induced cardiomyopathy characterized by transient systolic dysfunction provoked by stress. Transient left ventricular apical ballooning is the most common variant occurring in 80%, and mid-cavitory variant occurs in 15% of cases.

A 59-year-old postmenopausal woman with no known medical problems presented with severe crushing pressure-like central chest pain when shoveling snow for 2 hours. Physical examination revealed irregular rhythm and tachycardio. Lab testing showed elevated cardiac troponins at 1.5 ng/mL, normal NT-ProBNP, and mildly elevated serum lipids. Initial EKG showed ventricular bigeminy. Echo showed sigmoid interventricular septum, mildly hypokinetin basal to the mid-septum and a normal ejection fraction. Cardiac catheterization performed within 24 hours of the presentation showed left ventricular mid-cavitary segment akinesis, basal and apical hyperdynamic and normal left heart pressures. This suggested mid-cavitary Takotsubo's cardiomyopathy dysfunction. The EKG returned to normal sinus rhythm after treatment. Repeat ECHO after 4-6 weeks showed normalization of left ventricular function and no wall motion abnormalities.

Stress cardiomyopathy occurs in approximately 2% of patients presenting with troponin-positive acute coronary syndromes and should be suspected in any postmenopausal women who present with chest pain or dyspnea with EKG changes regardless of elevated troponin. Although both atrial and ventricular arrhythmias from catecholamine excess are common, we are the first to report ventricular bigeminy in association with mid-cavitary Takotsubo cardiomyopathy and resolution of EKG changes with treatment.
IS A QUICK DIAGNOSIS OF TB ALWAYS ACCURATE?
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In the most recent global tuberculosis (TB) report, the World Health Organization (WHO) estimated that 10 million people developed TB in 2017. Around 4 million people with TB are missed annually by the health system globally. Mycobacterial culture is considered gold standard but can take 2-6 weeks to yield a result. Recently, the WHO endorsed a nucleic acid amplification test (NAAT), GeneXpert, as a rapid means to diagnose TB, with results available in as early as 2 hours. Diagnostic accuracy of GeneXpert for pulmonary TB is high, with a recent study of 170 patients showing sensitivity and specificity of 86.8% and 93.1%, respectively. Despite this, there can still be false negatives with potentially poor outcomes.

A 65-year-old man with diabetes and active tobacco use presented for pre-employment physical. His vital signs were stable with non-labored respiration. Lungs were clear to auscultation and percussion, with no crackles or wheezing. T-SPOT® TB testing came back positive. A chest X-ray showed bilateral opacities in the upper lung lobes and CT Chest showed several scattered irregular nodules in both lungs, predominantly in the upper lobes. Three induced sputum samples for acid-fast bacilli (AFB) were smear-negative and two sputum samples were negative by the NAAT GeneXpert. Three weeks later, sputum cultures grew Mycobacterium tuberculosis and standard anti-tuberculosis therapy was started. The isolate was later found to be isoniazid resistant and his medications were appropriately adjusted.

High sensitivity TB diagnostic tools currently available include symptom screening (up to 93%), interferon gamma release assays (69-83%) and GeneXpert (89%). However, few patients lack the classic presentation of TB and can have false negative AFB and GeneXpert results, with reliance on cultures delaying diagnosis and treatment. Moreover, timely drug susceptibility reports are crucial to prevent spread of drug resistant TB. A recent study showed that whole-genome sequencing can now characterize susceptible first-line anti-tuberculosis drug profiles sufficiently and accurately for clinical use, thereby providing a new genotypic technology to provide quick sensitivity results. This case demonstrates the continuous challenge to rapidly diagnose pulmonary tuberculosis despite high sensitivity and specificity testing, as well as the need for timely attainment of the drug susceptibility report to adequately treat and prevent spread of TB.
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**A CASE OF POLYPHARMACY AND MOVEMENT DISORDER**

Case: A 59-year-old woman with a history of CAD, CVA, depression and chronic pain presented in clinic with unusual movements of the face, neck and arms which was thought to be due to previous strokes. She denied any arthralgias, rashes or hallucinations and there was no family history of movement disorders. Her home medications were aspirin, clopidogrel, atorvastatin, carvedilol, lisinopril, nifedipine, metoprolol, metformin, pantoprazole, nortriptyline, oxybutynin, trazodone, promethazine and cyclobenzaprine. Examination was notable for appearing older than her stated age, left-sided hemiparesis and neck tenderness. Her head was tilted on one side. She alternately displayed either a lip-smacking movement or an open mouth with her tongue protruding to one side. She kept both arms bent at the elbows and her fingers demonstrated a pill-rolling motion. Liver enzymes, serum copper, TSH, CRP and ESR were normal. Brain CT showed evidence of prior MCA and lacunar infarcts.

On subsequent visits, we gradually discontinued trazodone, cyclobenzaprine, oxybutynin and nortriptyline after assessing appropriateness and efficacy of each medication. Promethazine use was also discouraged unless necessary. After a year of desprescribing and regular patient education, she not only had improved medication adherence but she also had resolution of her unusual movements.

**Discussion/Conclusion:** Drug-induced movement disorders include dyskinesia, akathisia and Parkinsonism. Cervical and mandibular dystonia are usual manifestations of acute dyskinesia while facial and lingual dyskinesia such as protruding and twisting movements of the tongue, puckering or smacking of the lips and chewing movements are present in 75% of patients with tardive dyskinesia. The temporal relationship between onset of symptoms distinguish acute versus tardive (or late onset) dyskinesia.

Known to be an effect of chronic dopamine blockade, dyskinesia especially TD is usually linked with antipsychotics. However, other classes of drugs including anticholinergics, antidepressants and anticonvulsants are also associated. It is postulated that TD occurs due to an imbalance of dopamine in relation to acetylcholine, serotonin and GABA. As such, the risk of drug-induced movement disorders increases with polypharmacy. With an observed increase in the incidence of polypharmacy across all adult age groups, providers need to be cognizant of patients who come in with 5 or more drugs, regardless of age.
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The Bug that Caused a Disarray of the Heart

Introduction: Lyme carditis, a rare complication of Lyme disease (LD), is caused by the spirochete Borrelia burgdorferi. It accounts for approximately 1% of all cases of reported LD. We describe a case of Lyme carditis presenting with third degree atrioventricular (AV) block in a patient without a typical history of erythema migrans.

Case: A previously healthy 35-year-old Hispanic male presented for evaluation of syncope. He worked outdoors maintaining cell antennas where he had been exposed to multiple ticks about six weeks before presentation. He complained of fatigue, subjective fever, and arthralgia. There appeared to be no history of a bull’s eye rash. On physical examination vital signs were within normal limits except for bradycardia. He had an erythematous, 1x1 cm papule on the dorsal aspect of his right hand but no other rashes. Laboratory studies including troponin levels were unremarkable. EKG demonstrated a third-degree AV block, right bundle branch block, and T-wave inversions in inferolateral leads. Echocardiogram showed mild mitral regurgitation. He was admitted to the telemetry unit, a temporary transvenous pacemaker was placed, and he was empirically treated for Lyme carditis with ceftriaxone pending serological testing. IgM and IgG anti-Lyme antibodies came back positive. He improved significantly with resolution of his high grade heart block. He was discharged on oral doxycycline to complete a 28-day course of antibiotics. At follow up he was doing well.

Discussion: LD has a high incidence in the mid-Atlantic, northeast, and upper Midwest of the United States. Maryland has an average annual rate of 20.1 cases per 100,000 persons. In low incidence states the rate is 10.8 and in high incidence states 69.1. LD presents with fever, fatigue, lymphadenopathy, arthralgia, myalgia, and erythema migrans following exposure to the deer tick Ixodes scapularis. Due to early identification and treatment, complications such as carditis are not commonly seen any longer. Cardiac manifestations usually occur within 1-2 months from the time of exposure. Several barriers such as poor health literacy, language, lack of medical insurance and access to primary care services plus the absence of the typical rash probably contributed to the delay in diagnosis in this case. Diagnosis is typically made with a history of tick bite, AV block on EKG, and positive serologies (ELISA and Western blot). Treatment is aimed at preventing the progression of symptoms and limiting complications. This is achieved with antibiotics and sometimes a temporary pacemaker is needed.

Conclusion: Lyme carditis should be considered as the cause of AV block in a previously healthy individual with a history of tick exposure to avoid the inadvertent placement of a permanent pacemaker.

Indicate your participation in research process (4 sentences or less):
I reviewed existing literature, drafted the abstract, and was involved in patient care. Other co-authors were involved in patient care, and/or review of the abstract.

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**MYASTHENIA GRAVIS, A RARE SIDE EFFECT OF ATEZOLIZUMAB**

Yavar Farzanfar, MD; Louis Saade, MD; MedStar Health Internal Medicine, Baltimore, Maryland

Atezolizumab is a programmed death-ligand 1 blocking antibody being evaluated for treatment of multiple malignancies. Although considered safer than chemotherapy, rare and severe immune related adverse events (irAEs) such as pneumonitis and colitis have been reported. Herein, we report a case of Atezolizumab-induced myasthenia gravis resulting in patient demise.

A 72-year-old female with stage IIIB right ovarian cancer, status post hysterectomy and bilateral salpingo-oophorectomy, on Carboplatin, Paclitaxel and Bevacizumab, was enrolled in a clinical trial with the addition of Atezolizumab. Three months after therapy, she presented with bilateral upper and lower proximal muscle weakness and ptosis, found to have positive acetylcholine receptor antibodies that confirmed myasthenia gravis diagnosis.

Atezolizumab was discontinued and the patient was started on pyridostigmine and prednisone, but there was no clinical improvement. Our patient’s symptoms progressed to the extent that it involved her oropharyngeal muscles resulting in dysphagia and dysarthria after which intravenous immunoglobulin was added to her treatment regimen. The patient continued to deteriorate, developing acute abdomen due to colonic perforation requiring laparotomy with no meaningful recovery. Eventually, hospice services were initiated and the patient expired 2 weeks later.

Our patient developed irAE in the form of Myasthenia Gravis as a side effect of the Immune Checkpoint Inhibitor Atezolizumab. Her reaction was severe and persistent, and was irreversible despite discontinuing Atezolizumab, and providing the ultimate treatment measures for Myasthenia Gravis.

Immune Checkpoint Inhibitors such as Atezolizumab can induce immune-related adverse events that could be severe, fatal, and potentially irreversible. It is critical for physicians to have a healthy respect for these rare but significant events as these medications begin to be more commonly used. More data and research will be needed to determine the safety profile of this class and the appropriate treatment of their immune related adverse events (irAEs).

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**ABSTRACT FORM:** Must be at least 10-point font. A sharp typeface will help reproduction. Be sure to single-space and **STAY WITHIN THE BORDERS!**
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Aspirin efficacy in primary prevention: A meta-analysis of randomized controlled trials

Introduction: The role of aspirin in primary prevention remains controversial. We have conducted a meta-analysis of all randomized controlled trials (RCTs) to evaluate the role of aspirin in primary prevention.

Methods: Literature search in Pubmed, MEDLINE, and Cochrane Library for related RCTs. All-cause mortality was the primary endpoint. Secondary endpoints were major adverse cardiovascular events (MACE), myocardial infarction (MI), cardiovascular mortality, cerebrovascular events, and bleeding events. We used a random effects model to report the risk ratios (RRs) with 95% confidence intervals (CIs).

Results: This analysis included 17 RCTs (164,862 patients; 83,509 received aspirin and 81,344 received placebo). This study did not demonstrate significant reduction in all-cause mortality for patients treated with aspirin when compared with placebo (RR 0.97; 95%CI 0.93-1.01; P=0.13). Sensitivity analysis by excluding healthy elderly (≥65) showed significant reductions of all-cause mortality in the aspirin-treated patients (RR 0.94; 95%CI 0.90-0.99; P=0.01). There were no significant differences between both groups in term of cardiovascular mortality and cerebrovascular events (P>0.05). However, aspirin-treated patients significantly reduced MACE and MI (RR 0.89; 95%CI 0.85-0.93; P<0.001 and RR 0.88; 95%CI 0.78-0.98; P=0.02, respectively), respectively. On the contrary, aspirin was associated with significantly higher incidence of bleeding, including major and intracranial bleeding (P<0.001).

Conclusions: Aspirin use in primary prevention has led to lower incidence of MACE and MI without significantly affecting cerebrovascular events. In contrast, aspirin was associated with higher bleeding risk. The decision regarding aspirin for primary prevention should be thoroughly discussed with patients regarding the risk of cardiovascular disease and bleeding risk.

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