Abstracts submitted by medical students and residents to the annual meeting of the Texas Chapter of the American College of Physicians in 2019

1. Diffuse large B cell lymphoma presenting as cauda equina syndrome

Abdullah Shaikh, MD; Krishna Suthar, MD; Dongming Li, MD

Introduction: Diffuse large B cell lymphoma (DLBCL) is the most common type of lymphoma and arises from a mature B cell. Patients typically present with a rapidly enlarging symptomatic mass, most often due to a nodal enlargement in the neck or abdomen. Extranodal involvement is common and "B" symptoms are seen in approximately 30% of patients. In up to 40% of cases, disease can arrive in extranodal extramedullary tissues such as the GI tract, bone, kidneys, and adrenals.

Case: A 68-year-old male with multiple sclerosis, gout, and hypertension presented with a one-year history of progressive bilateral lower extremity paresthesias that worsened to include left lower extremity foot drop and bowel and bladder incontinence concerning for cauda equina syndrome. He denied any constitutional symptoms. CT of the chest, abdomen, and pelvis was remarkable for a large left sided retroperitoneal mass associated with retroperitoneal adenopathy and mass effect on the aorta, left-sided pelvic vessels, and left pelvic ureter. Steroids were started.

Lumbar spine MRI showed an ill-defined infiltrative enhancing process at L3 that displaced the left psoas, encircled the left common iliac artery, and infiltrated into the neural foramina of L4-L5 and L5-S1 resulting in a circumferential epidural mass that severely effaced the thecal sac, causing compression of the cauda equina nerve roots. Neurosurgical biopsy of the mass revealed DLBCL. A paraspinal fluid collection was also seen, which was drained and negative for infection. CSF was negative for malignant cells.

Corresponding author: **Drew Payne**
Contact Information: Drew.payne@ttuhsc.edu
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The patient was not a surgical candidate and underwent one cycle of R-CHOP. Post-chemotherapy course was complicated by pancytopenia, neutropenic fever, and septic shock due to E. coli bacteremia. Intrathecal chemotherapy was postponed because the patient developed acute hypoxic respiratory failure due to acute pulmonary embolism, volume overload, and aspiration pneumonia. Subsequently, he developed hemodynamic instability and family withdrew care.

Autopsy revealed (1) lumbosacral mass infiltrating left iliopsoas muscle and dorsal root nerves, (2) edematous lungs with bilateral consolidation, (3) splenomegaly, and (4) right upper lobe pulmonary embolism. There was no other lymphadenopathy noted.

Discussion: B-cell lymphomas, such as DLBCL, can secondarily involve the central nervous system (CNS) especially in patients with extra-nodal disease. However, they very rarely present solely as cauda equina syndrome as in the case presented. A literature review by Mandawat, et al, reviewed nineteen published cases of B-cell lymphomas presenting as cauda equina syndrome. Five of reported cases were due to DLBCL as in our patient.

Key Point: Extranodal lymphoma should be on the differential diagnosis of a patient presenting with cauda equina syndrome of unclear etiology. Prompt biopsy and therapy is warranted in these patients.

2. Reducing unnecessary laboratory draws on internal medicine wards: a quality improvement project

Abraham Lee; Simon Pinsky; Judy A Trieu; Nicole Sheung; Lindsay K. Sonstein

Introduction: Over-utilization of laboratory testing has been criticized for contributing to rising healthcare costs to causing iatrogenic anemia in hospitalized

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patients. Frequent blood draws are a nuisance to patients and healthcare staff, and as such, hospitals across the US are aiming to reduce lab over utilization. The aim of our study was to quantify the number of blood draws per patient per day and reduce them 25% over a period of 2 months.

Methods: Patients admitted to the four general medicine floors at UTMB during June 2018 to August 2018. Reasons for lab draws were identified among a randomized sample of patients from each floor. A multipronged approach was instituted: educating house staff, changes to UTMB EMR (EPIC), implementing a phlebotomy policy, sharing specimen across lab divisions, and incentivizing lab stewardship among house staff.

Results: Twenty patients were evaluated during the pre-intervention period. At baseline, an estimated 2.7 lab draws were performed per patient, per hospital day. Acuity of care lab draws, deemed as additional draws due to expected (e.g. trending troponins) or unexpected (e.g. decompensation) were excluded, resulting in an adjusted estimated baseline of 1.7 lab draws per patient, per hospital day.

The most common reasons for labs draws include daily lab orders, consultant recommendations, and additional orders post-rounding. House staff education and phlebotomy policy (lab draws at 4 am and 4 pm) were initially implemented on a single floor, then expanded to a second in the subsequent month, and finally house-staff incentives were implemented during the third month. Post-intervention data were collected over this 3-month period. Overall draws decreased to an average of 0.97 lab draws per patient per day across four internal medicine units at UTMB, with 42.9% overall reduction.

Lab draws on the two floors with revised phlebotomy policies had an initial reduction of 0.59 lab draws per patient, per day in the first month resulting in a 65.3% reduction. The overall 3-month average for these two floors was 1.08 lab draws per patient, per day resulting in a 36.5% reduction.

Discussion: Overuse of labs has become a systematic problem amongst U.S. hospitals. After three interventions, our approach showed a 23.8% decrease in the number of labs being ordered by house staff during a 3-month follow up period. Introduction of the new phlebotomy policy showed an even greater reduction in lab being drawn. We speculate an initial rapid decline in draws was due to new education with subsequent fluctuations related to extinction of this education over time as well as fluctuations inherent to PDSA cycles. Further plans to implement the above interventions are anticipated with a focus on education re-enforcement and novel lab throughput. Institutional lab utilization will need to be intermittently re-assessed in an effort to improve the quality of care and reduce overall costs.

3. Optimizing medical management of heart failure on discharge

Aliasger A Ali, MD; Jessica I Abhulimhen, MD; Elena T Cherian, MD; Andres D Escobar Camargo, MD; Omayra J Gonzalez Pagan, MD; Thuyvan N Hoang, MD; Robin Jacob, MD; Annie K Janise, MD; Lakshmi B Konduru, MD; Sophia S Lee, MD; Saher Rabadi, MD; Maneera T Chopra

Introduction: Varied causes of heart failure readmissions have been reported. Optimal medical management is pertinent in prevention of readmissions. Our goal was identifying a knowledge gap, which if filled through intervention of resident education, may increase the rate of appropriate medications dispensed on discharge.

Methods: Our three-part study included a retrospective analysis, an intervention and prospective study. The retrospective analysis studied discharge medications of patients with heart failure with reduced EF of <40%, specifically, beta blockers, ace inhibitors/arbs and spironolactone.

Patients who were not discharged on all indicated medications without contraindications to any one of those medications were considered not optimized. Intervention consisted of an education graph sent to residents depicting medications indicated with mortality benefit for patients with reduced EF. The prospective study, done after the intervention, looked at discharge summaries and gathered the same data as the retrospective analysis.

Results: In retrospective analysis, 31 of 116 patients (26.7%) were not discharged on the indicated medications. In prospective study, 7 of 23 patients (30.4%) were not discharged on indicated medications.

Conclusion and Future Directions: Among patients discharged on non-optimal medications, only 7% were discharged on spironolactone despite no contraindications in the retrospective group, and 0% in the prospective group. Although our intervention did not significantly impact discharge medications, we still believe this discrepancy is related to a lack of knowledge of the mortality benefit of spironolactone, which can improve through continued intervention and education of all staff, including those beyond residents.

4. E-sick: concerns regarding the safety of e-cigarettes emerge with new cases of acute lung disease

Amanda El-Hag; Dhayanithi Dhayalan; Swarnalaxmi Umapathy; Roshni Ganesan; Frederick Barnum IV; David Stotts; Travis Odom; Mohan Sengodan; Ranjit Nair; Elise Johannesen; Dereje Ayo; Machaiah Madhrira; Saravanan Balamuthusamy

Introduction: E-cigarettes have become increasingly common as an alternative to cigarettes, capturing the attention of young adults. Recently a sudden rise in cases of acute lung disease strongly associated with vaping has appeared, with 530 known cases and 9 deaths. We present 3 such cases of healthy young adults with a history of vaping.

Case 1: A 29-year-old Caucasian male with a history of vaping for approximately 2 years (flavored nicotine and THC cartridges) complained of vomiting, shortness of breath, cough, fever, nausea, and diarrhea. Lab tests showed elevated D-dimer levels, elevated brain natriuretic peptide (BNP), anemia, and leukocytosis. Chest x-ray (CXR) and computed tomographic angiogram (CTA) chest showed severe, bilateral, diffuse groundglass opacifications. Infectious workup was negative. Empiric antibiotic therapy and intravenous steroid treatment was initiated. He required non-invasive positive-pressure ventilation but steadily improved, de-escalating to nasal cannula after 3 days.

Case 2: A 24-year-old Hispanic male with a history of vaping for 1 year (THC cartridges) complained of fever, vomiting, nausea, cough, headache, night sweats, and diarrhea. High resolution CT chest showed diffuse ground-glass opacities throughout with subpleural sparing. Infectious workup was negative.

Bronchoscopy with bronchoalveolar lavage (BAL)/biopsy showed focal areas of pneumocyte hyperplasia with increased neutrophils and eosinophils. Symptoms improved with empiric antibiotic therapy and supportive care.

Case 3: A 23-year-old Caucasian male with a history of smoking and vaping (THC) complained of shortness of breath, cough, anorexia, fatigue, and diarrhea. Lab tests showed leukocytosis, hyponatremia, anemia, and an elevated D-dimer. CXR and CT chest demonstrated extensive bilateral pulmonary infiltrates in middle and lower lobes. Infectious workup was negative. Bronchoscopy and BAL/biopsy showed acute lung injury with fibrin/proteinaceous material within the air spaces, focal increased areas of inflammation (consistent with chemical pneumonitis). Levaquin and Vancomycin, high flow nasal oxygen and breathing treatments were initiated and symptoms improved.

Discussion: Per the CDC, lung injury caused by vaping is classified as Severe Pulmonary Disease associated with e-Cigarette Use. Diagnostic criteria include: e-cigarette use within 90 days, radiographic evidence of pulmonary infiltrate, absent pulmonary infection, and no alternative diagnosis.

The decision to perform bronchoscopy should be done on a per-patient basis. Treatment includes respiratory support and IV corticosteroids. Empiric antibiotics cover infectious etiology, which may present with similar symptoms, and avoid delay of care. It is important to discuss both the type of recreational drug use/method as well as any history of vaping.

Little is known about the pathophysiology of vaping related lung disease and root cause analysis research is warranted. This dramatic increase in cases signals the need for investigation into regulation, manufacturing, and import of e-cigarette fluids, as this has become a national health concern.

5. Every breath you take: a case of polymyxin b-related neuromuscular blockade

Andrew Gdowski, DO, PhD; Jaison John, MD; Meghana Gadgil, MD, MPH

Introduction: Polymyxin B has the rare but devastating complication of neuromuscular blockade that can lead to respiratory compromise. Here, we present the case of a patient who declined precipitously following administration of Polymyxin B for extensively drug-resistant (XDR) infection.

Case Description: A 49-year-old man with a history of spina bifida, paraplegia, right below-knee amputation, and a chronic right trochanteric ulcer with previous multidrug-resistant (MDR) infections was admitted with a worsening wound infection. His previous wound cultures had grown MDR ESBL *Escherichia coli, Enterococcus faecalis*, MRSA, and *Staphylococcus capitis* among others.

During this admission, XDR *Actinetobacter baumannii* complex was isolated after surgical debridement from the wound that was sensitive to colistin, polymyxin B, and trimethoprim-sulfamethoxazole. Polymyxin B was started empirically due to it being the least nephrotoxic choice in the setting of the patient's acute kidney injury (creatinine of 1.7 mg/dL).

Shortly after the administration of two 750,000-unit doses of Polymyxin B, the patient reported subjective tongue swelling, shortness of breath, and difficulty thinking clearly. A physician was called to bedside and on exam, the patient's vital signs were within normal limits, his tongue was of normal size and his respirations appeared somewhat labored, although there was good air movement initially. Over the next two hours the patient deteriorated significantly as his breathing slowed markedly and he became increasingly lethargic and less responsive. A chest x-ray was unremarkable and his ABG revealed a pH of 6.79 and pCO2 of 121 mmHg. The patient was transferred to the ICU, whereupon he became apneic and required bag mask ventilation and emergent intubation. During intubation, a normal airway was observed. A review of the literature led the medical team to identify the cause of the patient's respiratory paralysis as polymyxin B neurotoxicity resulting in neuromuscular blockade that initially presented as facial paresthesia.

Polymyxin B was discontinued and he was started on meropenem, trimethoprim-sulfamethoxazole, and eravacycline given his extensive history of multidrug-resistant organisms.

Discussion: The rise of MDR and XDR organisms are leading to the increasing reliance on older antibiotics that physicians are less familiar with polymyxin B and colistin (Polymyxin E) were frequently used decades ago with use decreasing into the 2000's as newer less-toxic antibiotics were utilized. Case studies from the 1970's reported neurotoxicity in the form of paresthesia's and rarely as respiratory muscle paralysis from neuromuscular blockade with increased risk seen in renal insufficiency. Our patient's sensation of tongue numbness was the first clue and manifestation of neurotoxicity presenting as paresthesia. The patient's acute renal insufficiency may also have increased his likelihood of developing neuromuscular blockade. Recognizing potentially life-threatening toxicities of older therapeutics is critical, especially in rapidly decompensating patients.

6. Complete heart block and fever? Don't forget invasive pneumococcal sepsis

Andrew A. Paulk, MD; Julian Nguyen, DO; Sivatej Sarva, MD, PhD

Introduction: Complete heart block is a condition in which electrical impulses from the atria are unable to reach the ventricles, resulting in total dissociation between atria and ventricles, and manifests clinically as symptomatic bradycardia. It is generally caused by fibrosis of the conduction system, which is age-related or idiopathic. While infectious endocarditis is a well-known cause of AV conduction abnormalities, manifestation with complete heart block is considerably less common.

Case: A 66-year-old Caucasian female presented to the hospital via EMS after being found unresponsive at home. She remained unresponsive on arrival and was intubated. She had fever, and her electrocardiogram showed complete heart block. CXR showed

patchy interstitial infiltrates. She was resuscitated with fluids, blood cultures were sent and she was started on vancomycin and Cefepime as well as a dopamine drip. Emergent cardiology and electrophysiology consultations were obtained. Transthoracic echocardiogram (TTE) performed as a part of the work up did not show any structural abnormality. The next morning patient was awake and responsive and was extubated. Blood cultures showed Streptococcus pneumoniae.

In view of the positive blood cultures and reasonable hemodynamic status, permanent pacer was not implanted. Antibiotics and dopamine were continued.

On the fourth day of hospitalization, her clinical condition worsened with extremely wide pulse pressure and hypotension. She was reintubated and temporary transvenous pacing was started. Multiple vasopressors had to be started. She acutely developed posterior tibial artery occlusion in both legs. A repeat TTE for evaluation of infective endocarditis was negative. Though the patient was hemodynamically unstable, in view of high clinical suspicion, a transesophageal echocardiogram (TEE) was performed, which showed aortic root abscess. Cardiovascular surgery evaluated the patient and determined that the mortality risk for operating was prohibitive. The family decided to make her hospice and she passed away.

Discussion: Invasive pneumococcal disease is defined as infection confirmed by isolation of Streptococcus pneumonia from a normally sterile site. Risk factors for invasive pneumococcal disease include age (<2 or >65 years), race, male sex, alcoholism, smoking, illicit drug use, immunocompromised states, CSF leak, and cochlear implants.

Pneumococcal endocarditis can occur in morphologically and functionally normal valves with aortic valve being more frequent. Early surgery is indicated in aortic root abscess requiring debridement, reconstruction, and aortic valve replacement with prosthesis.

This case illustrates that in patients with complete heart block and Streptococcus pneumonia bacteremia, aortic root abscess needs to be considered. In these cases, a TTE may not be enough for diagnosis. Even though there may be a higher risk in performing a TEE, if performed early, it may lead to early diagnosis and early surgical consultation preventing devastating consequences as seen in our patient.

7. Active duty personnel with STEMI are deployment ineligible despite receiving standard management

Andrew S. Wilson, DO; James A. Watts, MD; Kelvin N.V Bush, MD

Background: ST elevation myocardial infarction (STEMI) is a high acuity diagnosis that requires prompt recognition and developed system responses to reduce morbidity and mortality. There is a paucity of literature describing active duty (AD) military personnel with STEMI syndromes at military treatment facilities (MTFs). This study aims to describe AD military members with STEMI diagnoses, military treatment facility management and the subsequent military dispositions observed.

Materials and Methods: We performed a single-center, retrospective review of all STEMI diagnoses at San Antonio Military Medical Center (SAMMC) from January 2008 to June 2018. Patients met inclusion for the analysis if they were active duty personnel in the United States Air Force (USAF) or United States Army (USA). All STEMI diagnoses were confirmed by board certified interventional cardiologists with coronary angiography. The 2017 American College of Cardiology (ACC) STEMI clinical performance measures were used as the standard of care metrics for our case reviews and the final disposition of patients was determined from Medical Eligibility Board (MEB) documentation.

Results: A total of 236 patients were treated for STEMI at SAMMC during the study period, eight (3.4%) of these cases met inclusion criteria of being AD status at the time of diagnosis. The average age was 46.3 + 5.5 years old, body mass index 28.5 + 3.1 kg/m^2 and 50% were of Caucasian ethnicity. Preexisting cardiovascular risk factors were present in six (75%) of the individuals with hypertension being most common (63%). Other baseline average values included low-density lipoprotein cholesterol of 110 + 39 mg/dL and calculated 10-year risk of atherosclerotic

cardiovascular disease (ASCVD) 3.9 + 1.6%. 100% of patients underwent primary percutaneous coronary intervention (PCI) within 90 minutes of presentation (average D2B time 59.3 ± 24 min). Single vessel disease was found in all eight patients of whom seven of them underwent drug eluting stent placement (average number of stents 2 + 1.5). Performance measures were met in all applicable categories including door to balloon times, discharge medical therapies, and cardiac rehabilitation enrollments for 100% of AD personnel. Reported adverse events included two stent thromboses and two vascular complications. Three of eight individuals (37.5%) were diagnosed with behavioral health disorders attributed to experiencing a STEMI. Medical retirement secondary to STEMI diagnosis occurred in 87.5% of subjects and all study personnel medically retired within 24 months (average 12.8 + 7.9 months).

Conclusions: AD personnel represent a small, but vulnerable population in MTF STEMI diagnoses. Despite receiving standard STEMI management compared to national performance measures, AD personnel were deemed deployment ineligible post STEMI diagnoses and exhibited accelerated medical retirements. These findings warrant further investigation to determine the complete epidemiology of acute coronary syndromes (ACS) in AD members given the associated morbidity. Future directions include expanding our study into a multicenter study review.

Disclaimers: The views expressed herein are those of the authors and do not reflect the official policy or position of Brooke Army Medical Center, the U.S. Army Medical Department, the U.S. Army Office of the Surgeon General, the Department of the Army and Department of Defense.

8. Achy breaky heart: a case of post-mitral valve repair chorea in an adult

Anupama M Kapadia, MD; Jaya Vasudevan, MD; Meghana Gadgil, MD, MPH

Introduction: Cardiac surgery can provoke rare neurologic sequelae. Here we present the case of an adult patient who developed choreoathetoid movement disorder, AKA 'post-pump' chorea, following mitral valve replacement (MVR).

Case Presentation: A 61 y/o woman was admitted with left-sided weakness twelve days after her third MVR. Her history included coronary artery disease, severe mitral regurgitation requiring repeat MVRs and stroke with residual right-sided weakness. Admission CT showed evolving right middle cerebral artery (MCA) territory infarction with stable occlusion of the inferior division of the right M2 segment. Within 4 hours, her left-sided weakness significantly improved and neurologists determined that her case was non-interventional given rapid improvement and non-disabling features. The cause of her stroke was determined to be due to valve thrombosis from warfarin non-adherence. Her admission exam was also notable for choreoathetoid movements of her left hand and foot, which she reported had started after her latest MVR, twelve days prior.

On day two, the patient developed transient right-sided weakness along the distribution of her previous stroke. A repeat CTA showed short segment occlusion of the left paraclinoid internal carotid artery with collateral flow and improvement in the small acute infarcts. Disruption of the basal ganglia's corpus striatum through injury or ischemia can cause chorea. However, her neuroimaging did not demonstrate basal ganglia vascular compromise and therefore could not explain her left-sided choreoathetoid movements. A transthoracic echo showed mildly dilated left atrium with a negative bubble study and no thrombus. Her medication history did not reveal any known to provoke chorea. The choreoathetoid movements gradually diminished and had fully resolved by discharge on day six.

Discussion: Common neurologic complications of cardiac surgery include encephalopathy, stroke, seizure, and peripheral nerve injury. Our patient experienced two neurologic complications of valve replacement, one most common (CVA) and one very rare (post-pump chorea). Post-pump chorea has been described most frequently in pediatric populations. The pathophysiology is hypothesized to be due to the multifactorial effects of hypothermia, extra corporeal circulation, and aortic cross-clamping in decreasing blood flow to the basal ganglia and slowing cerebral metabolism, resulting in a reversible watershed effect. The literature describes only two other adult cases: one five days after aortic valve replacement

and a second case of chorea two weeks after the repair of a thoracic aortic aneurysm. In our patient, her neuroimaging, medication history and initial acute left-sided weakness could not explain the choreoathetosis; only her recent history of MVR provided the key to the diagnosis. This case highlights that patients who undergo cardiac surgery can be at risk for subtle neurologic complications that may mimic more devastating ones like CVA. Providers should have a low threshold for neurologic assessment in patients who have recently undergone cardiac surgery.

9. New tool for the fundoscopic exam

Chelsey Bravenec, MD; Bhanu.Chaganti, MD;
Thwe Htay, MD, FACP; Patricia Nelson, MD, FACS

Background: Direct ophthalmoscopy is an essential skill taught in medical school. Studies have shown that medical students, residents, and even physicians have limited proficiency in using ocular fundus exam using an ophthalmoscope. Competency in this examination skill is crucial for learners to diagnose and make clinical decisions in regard to ophthalmological emergencies and systemic diseases with ocular manifestations.

The study utilized an inexpensive smartphone retinal imaging adapter, the Ophthalmic Docs Fundus (oDocs Fundus) to image the retina. It is a 3D printable adapter that converts any smartphone into a retinal fundus camera. It allows for direct observation of what the learner sees and on-the-spot correction of technique. The effectiveness of using a reproducible smartphone imaging for ophthalmology simulation training was measured.

Methods: Ninety-six second-year medical students completed pre and post surveys comparing proficiency, ease of use, and confidence of a direct ophthalmoscope versus the oDocs device during ophthalmoscopy simulation training. The surveys measured confidence on a 5 point Likert scale. Learners viewed pre-recorded instructional videos and live demonstration prior to using both devices, ensuring a baseline training.

Results: Pre-survey confidence in the examination of the retina and red reflex was low. Post-training showed a significant improvement. 53% of learners preferred the direct ophthalmoscope due to ease of use and view of the image. oDocs Fundus was preferred over the direct ophthalmoscope by 47% of students. It was preferred due to ease of use, view of ocular structures, image capture, and ability to educate patients. Most learners experienced at least a one-point increase in confidence afterwards. Only 7.7% of learners owned a direct ophthalmoscope.

Discussion: This study demonstrates that training with both oDocs and direct ophthalmoscope are effective in increasing learners' confidence in fundus examination. Although confidence level improved after training, examination skills would necessitate repeated practice to improve proficiency. Future learners may find confidence in using a smartphone device in the absence of a direct ophthalmoscope.

10. Blastic transformation of myelodysplastic syndrome presenting with isolated acute central nervous system involvement

Bracamonte-Baran William, MD; Rajasekar S;
Kolli S; Davis WR

Introduction: Myelodysplastic Syndrome (MDS) is characterized by abnormal proliferation of mature bone marrow-derived cells of myeloid lineage, in some cases associated with genetic abnormalities such as BCR-ABL translocation or JAK1/2 mutations.

Case description: A 75-year-old female patient was rushed to our Emergency Department due to acute confusional syndrome, without fever, falls, seizures or evident weakness. She had a 10 year-long diagnosis of MDS (BLR-ABL negative) in current treatment with Ruxolitinib 10 mg BID.

Physical examination demonstrated 3 subcutaneous mobile non-tender renitent nodules of 3–4 cm diameter in the abdominal wall and one in the forehead, without changes in overlying skin (of 3 months' evolution according to family). Spleen was enlarged, Boyd 3. Neurologic examination revealed Broca aphasia and loss of allopsychic orientation; no signs of other neurologic focalization or meningismus.

CBC/smear showed WBC 27,600/uL, Neutrophils 70% (4% bands), Hgb 8.4g/dL, Hct 27.9%, Platelets

212,000/uL and lack of blasts. Head MRI with contrast showed no parenchymal lesions or hemorrhage, mild meningeal thickening and a 1 cm occipital non-enhanced osteolytic lesion. Biochemistry revealed signs of tumor lysis syndrome, given by hyperuricemia (14.3 mg/dL), hyperphosphatemia (5.8 mg/dL) and high LDH (1,570 U/L), with preserved GFR.

Hyperhydration was initiated, but within 4 hours the patient developed further neurological deterioration given by lethargy without focalization, and ultimately a tonic-clonic seizure. Sequential CT scan showed no changes. Based on history, clinical and biochemistry findings, the possibility of acute blast transformation restricted to CNS involvement was proposed. Bone marrow biopsy demonstrated 21% myeloid blasts, and CSF cytospin showed increased cellularity with predominance of myeloid blasts, thus confirming the diagnosis. Intrathecal/systemic chemotherapy was offered, but family members legally decided on palliative care and the patient died one week later.

Discussion: This case demonstrates the possibility of acute blastic transformation in the context of a patient with BCR-ABL negative MDS under anti-JAK therapy. Subcutaneous infiltration developed subacutely without symptoms, thus suggesting a pre-existent accelerated phase of the MDS/CML. Remarkably, presence of blasts was evident in bone marrow with signs of spontaneous tumor lysis syndrome but without evidence in peripheral blood. Furthermore, the cardinal acute pathogenic process was blastic central nervous system involvement without motor neurologic focalization or imaging abnormalities. This diagnosis requires a high index of suspicion and must be considered in MDS patients with de novo neurologic manifestations.

11. What's poop got to do with it? The incidence and burden of C. diff infections following Bristol 7 protocol implementation

Bradley Kapten, MD; Kevin Saunders, DO; Yvette Achuo-Egbe, MD; Tiffany Egbe, MD; Shayne Skarda, MD

Introduction: The prevalence of *Clostridium difficile* infections (CDI) in the United States reaches nearly 500,000 patients annually. Approximately 29,000 people will die within 30 days of diagnosis with approximately 15,000 deaths resulting from complications of CDI. Health costs associated with this illness has been estimated around $4.8 billion with an average total cost around $35,000 per patient. While the clinical presentation of C. difficile is distinct, asymptomatic colonization, not requiring antibiotics, is common in adults with frequent health care contact. The Bristol criteria has been implemented in a variety of settings—including our facility—to prevent overtreatment of CDI, promote, antibiotic stewardship, and decrease costs. Our hypothesis regarding Bristol 7 Protocol implementation will not greatly affect the number of false positive assays, is too restrictive, and will increase patient morbidity by underdiagnosing CDI.

Objectives: To investigate the feasibility of implementation of the Bristol 7 protocol and measure the impact on resource utilization, patient safety, and on cost savings.

Methods: We conducted a retrospective chart review of the hospital EMR to identify all cases of diarrhea from January–December 2018. Among those cases, we specifically examined the stool studies that were initially rejected due to not meeting Bristol 7 criteria and how many patients within this subset returned within 12 weeks with a positive PCR test for *C. difficile* toxin B. Also, the incidence of CDIs was examined during this time period, compared with rates one year prior to Bristol 7 implementation.

Results: In total, 2,043 stool samples were collected. 1019 (49.6%) cases were accepted by Bristol 7 criteria for PCR testing, 675 (33%) were rejected, and the remainder were excluded. Of the 675 rejected samples, 35 (5.19%) cases returned within twelve weeks with watery diarrhea and a positive CDI result. Of the 35 returned cases, there were two deaths one from a cardiogenic etiology and the other from complications of fulminant sepsis. Of the accepted cases, 209 (22%) were positive for CDI. An estimated $1.85 million dollars was saved via implementation of Bristol 7 protocol.

Conclusion: Our pre-specified acceptable number of missed CDI cases was 10%. Bristol 7 Protocol

implementation accomplished this, resulting in half as many missed cases. Therefore, our null hypothesis was incorrect, and Bristol 7 Protocol has decreased the rate of inappropriate tests without an unacceptably high false negative rate.

Discussion: CDIs are not only a significant cause of morbidity and mortality, and incur a large financial burden on both hospitals and patients. The implementation of the Bristol 7 Protocol, has reduced the number of colonized patients treated with antibiotics, without missing a significant number of true CDI. Additionally, a significant cost savings to our system was achieved. Longer follow up is required.

12. Outside the scope: a better FIT for some patients

Jonathan Calderon, DO; Ronak Ghiya, MD; Harris Lin, MD; Kim Le, DO; Jonathan Piruchello, MS4

Introduction: Colorectal cancer is the 3rd most common cancer in American adults. It is the 2nd most common cause of cancer death and there is an estimated $14 billion in direct medical costs annually. CRCS is unique because it not only detects colon cancer but also prevents cancer from ever developing, something no other cancer screening accomplishes. Despite the benefits of colonoscopy in 2015, the national average for CRCS compliance was only 63%, below the National Colorectal Cancer Roundtable (NCCR) goal of 80%. The reason for a low rate of CRCS compliance is multifactorial including the fear of having a colonoscopy. However, patients resistant to this method of testing should be offered alternative methods of CRCS, such as fecal immunochemical test (FIT).

Objective: At the Baylor Scott & White Primary Care Clinic in Round Rock, TX, CRCS compliance in 2019 was 54% (Commercial Insurance) and 73% (Medicare Insurance). Our goal was to increase our CRCS compliance and more importantly to provide better preventative care for our patients as a whole.

Methods: We reviewed the charts of 200 randomly selected patients in October 2018 who were seen in the clinic from September 2017 to September 2018 and were non-compliant with CRCS. This helped us identify causes for why CRCS was not completed in our non-compliant population. In our review, 0% of these patients were offered FIT for CRCS. We then educated attending and resident physicians with presentations on alternative testing modalities. Starting April 2019, our team placed fecal immunochemical test (FIT) kits in clinic rooms, and providers were able to directly offer them to patients if they refused a colonoscopy for CRCS.

Results: Among noncompliant patients, chart review revealed that not many modalities for CRCS aside from colonoscopy were mentioned by health care providers. However, with the implementation of the FIT kits, patients were more inclined to undergo CRCS. After the implementation of this project, the monthly CRCS compliance in our clinic increased by 7.3%, from 11% (period of November 2018 to March 2019) to 18.3% (period April 2019 to July 2019).

Discussion/Conclusion: Despite its benfit, CRCS remains below compliance goals set by NCCR. By placing FIT kits in all of our clinic rooms, it was more convenient for patients to have CRCS. As a result, patients were more compliant with CRCS. As such, there will be continued education on the benefits and modalities of CRCS to more health care providers. We plan to implement this project at other Baylor Scott & White Primary Care Clinics in the region. We are working to create an automatic mailing enrollment program in which those patients who chose the FIT method for CRCS would be mailed FIT kits annually.

13. Mumps without the bumps (except in lipase)

Celia Pena Heredia, MD; Ethan Burns, MD; Alejandro Granillo, MD; Lilian Vargas, MD; Amna Ahmed, MD; Kai Sun, MD; Ashley Drews, MD

Introduction: Mumps is an acute infection caused by the paramyxovirus, mumps virus. Edematous pancreatitis secondary to mumps occurs in 1–8% of infected patients and usually follows a mild, self-limited course. Rarely has mumps pancreatitis been reported in the absence of the classic parotitis and orchitis.

Case: A 30-year-old male with a history of irritable bowel syndrome presented with an acute onset of

constant, intense epigastric pain radiating to his back, and associated with nausea and vomiting. He denied diarrhea, fevers, recent travel, or sick contacts, and was not taking medications. He drinks alcohol socially, but denied tobacco and illicit drug use.

His initial vital signs were within reference range. Physical examination was significant for tenderness to palpation in the epigastric region without rebound or guarding. Pertinent laboratory tests included a neutrophil predominant leukocytosis of 25.59 k/uL, hematocrit of 45.1%, blood urea nitrogen of 19 mg/dl, lipase >600 U/L, amylase of 2657 U/L, and slightly elevated aspartate aminotransferase and alanine aminotransferase at 63 U/L and 66 U/L respectively, with normal alkaline phosphatase and total bilirubin. Calcium was 10.0 mg/dL, triglycerides were 49 mg/dL, and albumin and renal function were both normal. CT of the abdomen without contrast showed inflammatory changes around the pancreas consistent with acute pancreatitis. Ultrasonography of the gallbladder did not demonstrate cholelithiasis or common bile duct dilation.

His clinical status deteriorated and further imaging suggested acute necrotizing pancreatitis. Further workup demonstrated a negative immunoglobulin-G4 antibody titer. Infectious workup was significant for a positive mumps IgG antibodies and significantly elevated mumps IgM antibodies (at 6.29 IV (reference range <=0.79 IV)). The patient did not have signs or symptoms of parotitis or orchitis. He received all recommended childhood vaccinations.

Discussion: Despite major advances in disease prevention since the introduction of the mumps vaccine, infection and complications due to mumps virus are not eradicated and serious complications can occur as this case suggests. Isolated cases of mumps pancreatitis have been serologically confirmed in the absence of parotitis in both adolescents and adults, and are typically mild, non-hemorrhagic, and non-necrotic. Rarely, acute necrotizing pancreatitis from mumps viremia in the absence of parotitis has been reported. If the etiology of necrotizing pancreatitis remains elusive, mumps virus should be considered on the differential after more common etiologies have been ruled out. Furthermore, this case raises concern for the potential of mumps infection to occur in previously vaccinated patients. Immunity to mumps wanes overtime, and providing either booster immunization or checking immunoglobulin levels in the adult population should be considered.

14. Obstructive chylous ascites in a patient with human immunodeficiency virus

Chandra M. Becka, MD, MPH&TM; Eddy Valdez, MD; Jose E Campo-Maldonado, MD, MSCI, FACP

Introduction: Chylous ascites is the accumulation of triglyceride rich fluid in the abdominal cavity secondary to obstruction or rupture of the lymphatic channels. It commonly results as a complication of abdominal surgery. Although rare, mortality ranges from 40 to 70%.[1]

Case: A 32-year-old male with a past medical history of HIV on antiretroviral therapy was admitted for two months of progressive abdominal distension and discomfort. The patient also reported a 20-pound weight loss over the last year. He denied fever, chills, night sweats, rashes, shortness of breath, cough, sputum production, hemoptysis, nausea, vomiting or recent travel. The patient was diagnosed with HIV eight months prior to admission. Despite compliance with antiretroviral medication and reduction of his initial viral load to undetectable, his CD4 remained under 20 since initiating therapy. The patient's medications included Emitricitabine/Tenofavir and Darunavir/Cobicistat for antiretroviral therapy and prophylactic medications with Dapsone and fluconazole.

On admission, vital signs were within target range. The patient appeared cachectic, cardiovascular and pulmonary examination were unremarkable, the abdomen was distended, and a fluid wave was present. The HIV viral load was undetectable, CD4 count was 20, total protein 56.6 g/dL, albumin 1.5 g/dL, ALT 14, AST 27. Other routine laboratory test results were normal. Abdominal CT revealed ascites and moderate periaortic and proximal left iliac adenopathy. Paracentesis was performed and two liters of milky white ascitic fluid was removed. Fluid analysis showed triglycerides of 642 mg/dL, consistent with chylous ascites. Culture, gram stain and nucleic acid tests of fluid were negative for bacteria, fungus, and acid fact bacilli. Biopsy

of abdominal lymph nodes showed granulomatous lymphadenopathy, which was considered the source of obstruction causing the chylous ascites.

Lymphoma, cirrhosis and autoimmune disorders were considered. However, the presence of granulomatous lymphadenopathy in the setting of low CD4 levels was highly suspicious for disseminated Mycobacterium avium complex (MAC). The patient was started on empiric therapy for disseminated MAC infection. Additionally, he was started on a non-fat diet with medium chain triglyceride supplementation. Blood cultures reported at six weeks were positive for MAC, confirming the diagnosis. Follow-up at nine months showed significant immunological recovery, overall nutritional status and symptoms.

Discussion: We report a patient presenting with obstructive chylous ascites secondary to granulomatous lymphadenopathy as a late complication of disseminated MAC infection. Chylous ascites resulting from MAC is extremely rare and has only been documented in sporadic case reports.[2–5] However, this case demonstrates the importance of including MAC in the differential diagnosis of a patient with a poorly responsive CD4 count despite successful HIV suppression with antiretroviral therapy. Empiric treatment should be initiated immediately if disseminated MAC is suspected.

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15. Non-obstructive hydrocephalus with herniation and cauda equina syndrome as initial presentations of breast cancer in a middle aged woman: a case report

Abreu C; Gomez F; Loyola D

Introduction: Leptomeningeal involvement in metastatic tumors is seen when tumoral cells infiltrate the CSF, subarachnoid space and arachnoid matter of brain and/or spinal cord.[1] CNS metastasis is usually a late manifestation of breast cancer, but it can occur in about 5% of patients with early disease.[2] In breast cancer Parenchymal metastases account for about 80% of cases of CNS involvement; whereas Leptomeningeal metastatic disease is only seen in a minority of cases, about 8% in some series.[3]

Case Presentation: We present the case of a 49-year-old woman with no history who was brought due to severe headaches, altered mental status and worsening LE weakness for 2 days prior to presentation. On exam, the patient was seen lethargic and confused. She had nuchal tenderness and BL LE weakness. She had suprapubic tenderness and a distended bladder. Lab work was unremarkable except for UA suggestive of UTI and neutrophilia with a normal WBC. Brain MRI showed crowding of the posterior fossa and foramen magnum, with thick pachymenigeal enhancement in the fourth ventricle and along the posterior fossa extending along the cerebellar folia and along the basilar cis-terns, with associated mass effect with obstructive hydrocephalus with some caudal descent of the cerebellar tonsils up to 5 mm with some associated mass effect on the brainstem. Differentials were meningitis vs metastatic disease. Neurosurgery was consulted. She was started on meningitis coverage; dexamethasone and admitted to the NSICU. LP done showed elevated ICP at 32 cmH_2O and CSF with protein of 256 and glucose of 28 and differential of 89 WBC's with 85% lymphocytes. MRI's of the spine showed metastatic spinal disease with meningeal infiltration. Patient underwent

ventriculostomy which improved her mentation. Biopsy of a vertebral lesion showed metastatic carcinoma, consistent with breast primary. Plans were initiated for treatment of her condition.

Discussion: CNS metastasis is a rare initial presentation for breast cancer. The extent of her metastasis and her presentation are somewhat atypical. There is only one case reported in the literature of breast cancer with meningeal involvement with herniation.[4] The combination of herniation and cauda equina syndrome is even rarer. Also, the highly strange findings of CSF analysis make this case a very unique presentation and a very unfortunate one of widespread breast cancer.

Conclusion: Management of patients with such severe metastatic disease at presentation is a very challenging affair for physicians as sometimes the information we receive from patients and family members does not help create an adequate picture of the situation. This case is a very good example of the importance of keeping a wide differential diagnosis for atypical presentations of conditions such as this one.

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16. Bleeding pseudoaneurysm of the superior rectal artery- a rare clinical entity

Michelle Baliss, DO; Christopher Nguyen, DO; Obada Tayyem, MD

Introduction: Severe lower gastrointestinal (GI) hemorrhage in adults is most commonly caused by colonic diverticulosis and angiodysplasia. Visceral artery pseudoaneurysms are extremely rare and usually present following a traumatic event or interventional procedure. Here, we present a unique case of massive lower GI hemorrhage caused by a spontaneous bleeding superior rectal artery pseudoaneurysm.

Case Description: A 79-year-old male presented with lower abdominal pain, dizziness, and multiple episodes of large volume hematochezia preceded by 1 week of constipation. Comorbidities included coronary artery disease without a personal or family history of GI malignancies or GI hemorrhage. Medications included aspirin and clopidogrel. Upon presentation, his vital signs were normal. He appeared pale and had tenderness to palpation in the left lower quadrant with active large volume hematochezia. He was admitted to the medical intensive care unit due to ongoing bleeding and subsequent hemodynamic instability. Laboratory data was significant for hemoglobin 8.1 g/dL from a baseline of 14 g/dL that decreased to 6.2 g/dL after recurrence of hematochezia, requiring transfusion of 4 packed RBC units. CT of the abdomen showed focal wall thickening of the distal sigmoid colon and active contrast extravasation suggestive of active hemorrhage. Due to recurrent bleeding and drop in mean arterial pressures, endoscopic evaluation was deferred. Interventional radiology performed visceral arteriography which demonstrated active extravasation associated with a pseudoaneurysm in the distal branch of the superior rectal artery. Coil embolization was successful, and the patient remained hemodynamically stable without bleeding recurrence.

Discussion: Visceral artery pseudoaneurysms are exceptionally rare with an incidence of 0.01–0.2% and tend to be incidental findings. Typical locations involve the splenic, hepatic, superior mesenteric, and celiac arteries. Aneurysms arising from the inferior mesenteric artery (IMA) account for 1% of all visceral artery aneurysms. Pseudoaneurysms of the superior rectal artery, a branch of the IMA, are seldom reported in the literature, usually occurring after trauma or procedures. This case is unique due to the non-traumatic,

non-iatrogenic nature of the pseudoaneurysm causing a massive lower GI bleed. Visceral artery aneurysms carry a high risk of rupture making them potentially fatal and necessitating treatment even if identification is incidental. CT angiography is the modality of choice for the identification of these lesions. Radiologic embolization is the preferred treatment as it allows for a minimally invasive approach with high success rates.

17. Phlegmasia cerulea dolens: a life threatening manifestation of deep venous thrombosis

Chungting J. Kou, Capt, USAF, MC; Caitlin G. Batzlaff, Capt, USAF, MC; Tyson J. Sjulin, MAJ, USA, MC

Introduction: Venous thromboembolism (VTE) is the 3rd leading vascular emergency diagnosis affecting approximately 300,000 to 600,000 Americans annually with significant morbidity and mortality.[1] Phlegmasia cerula dolens (PCD) is a rare and extreme manifestation of deep venous thrombus, which can result in gangrene, loss of limb and ultimately death.[2] The pathogenesis of PCD is related to increased hypercoagulability, stasis, and/or vascular wall injury. Malignancy is the most common risk factor identified in 20–40% of patients presenting with PCD.[4] It occurs more commonly in the 5th and 6th decades of life, with preferential involvement of the LLE.[4] Currently, there is no consensus on a superior therapeutic intervention.[7] We report a case of PCD successfully treated with catheter directed thrombolysis, stent placement and angioplasty.

Case: A 66-year-old female presented to the emergency department with three days of acute left- lower extremity (LLE) swelling, pain, cyanosis, inability to bear weight, dyspnea, and hypoxemia. She denied recent travel, hormone replacement, or history of DVT/PE. Her medical history was notable for systemic lupus erythematosus, CREST syndrome, Sjogren's, and local invasive anal squamous cell carcinoma. Doppler ultrasound revealed LLE thrombus extending from the greater saphenous vein to popliteal vein. She was admitted to medical ICU and started on unfractionated heparin drip. Vascular surgery was consulted for catheter directed thrombolysis of LLE. Initial venogram demonstrated extensive clotting of tibial, popliteal and femoral venous system with chronic occlusion of the left common iliac vein. Catheter assisted thrombolysis resulted in improvement of overall clot burden however chronic occlusion remained. The left common iliac vein occlusion was stented, followed by angioplasty with restoration of venous outflow on venogram. Subsequently she had rapid clinical improvement over 24 hours.

Discussion: PCD is a vascular emergency characterized by pain, edema, and cyanosis of the affected limb[3] due to complete occlusion of the venous drainage system (deep and superficial) leading to increased interstitial edema, further compromised capillary flow, tissue hypoxemia, ischemia and progression to gangrene.[5] High index suspicion of PCD is vital to promptly initiate diagnostic workup with ultrasound or CT venography.[5,6]

While initial treatment of PCD is achieved with administration of intravenous heparin, definitive management is less clear.[7] Limb-sparing options include endovascular revascularization (includes mechanical catheter-directed and pharmaceutical catheter-directed thrombolysis) or venous thrombectomy. If gangrene has occurred, amputation of the affected limb is indicated.[5,8] Decision to pursue an endovascular or surgical approach depends on clinical degree of acute limb ischemia (ALI). We opted for endovascular therapy because she exhibited ALI class IIA with largely intact sensation and strength of her LLE. Early recognition and rapid coordination with vascular surgery or interventional radiology is critical in preservation of limb and life in PCD.[5,6]

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18. Hepatitis c associated vasculitis: a case report

Suarez Andres; Rivas Cynthia; Bello Fatimah; Al Gburi Karrar; Gonzalez-Cano; Tomas Bravo; Vianis Gutierrez Cesar; Pean Joseph

Introduction: Hepatitis C Virus (HCV) infection is a leading cause of liver-related morbidity and mortality; its incidence in 2016 was 1.0 cases per 100,000 population, and approximately 2.4 million people are living with it in the United States. HCV has been closely associated with extrahepatic manifestations such as cryoglobulinemia, an immune complex-mediated vasculitis. Here we present a case of untreated chronic HCV infection with liver cirrhosis, new-onset vasculitis, and acute kidney injury (AKI).

Clinical Case: 56-year-old man with a history of alcohol-induced liver cirrhosis presented with a petechial rash of one-day duration. The rash started initially at the right thigh and later became widespread along both lower extremities. Associated with shortness of breath, hematuria, and soft tissue swelling. On admission, he is in mild distress, normotensive, tachycardic, and tachypneic. On exam, he presented tongue ulcers and non-palpable petechial rash at lower extremities and palate. Also, presented with bilateral JVD, decreased breath sounds, distended abdomen, and tender/mobile soft tissue swelling at the right supraclavicular/antecubital area. Initial workup showed leukocytosis, microcytic anemia, thrombocytopenia, and BUN/Creatinine 48/4.2 (baseline 0.9). A urinalysis came positive for microscopic hematuria, and nephrotic range proteinuria. A drug screen was positive for cocaine. X-Ray was compatible with mild edema with basilar consolidation.

The patient was admitted to the hospital; he was started on broad-spectrum antibiotics and given IV Lasix. A blood smear, cultures, and vasculitis workup were ordered. Smear showed no schistocytes. Rheumatologic workup showed hypocomplementemia, positive C-ANCA titer 1:20 (but negative anti-MPO and RPS3), elevated free kappa/lambda chains, positive Rheumatoid Factor, Cryoglobulins, and reactive HCV with 2380000 Iu/mL copies. The patient was evaluated by Rheumatology, who started Solumedrol 20 mg IV BID; Nephrology recommended a renal biopsy. The hospital course was complicated with new-onset GI bleeding and deterioration of the renal function. Renal biopsy was deferred due to high risk, overall prognosis, and short life expectancy, for which the patient decided to pursue comfort care.

Discussion: Cryoglobulinemia is a systemic vasculitis affecting small and medium-sized arteries and veins of multiple organ systems due to immune-complex deposition and complement activation. It has been associated with an increased risk of advanced fibrosis and cirrhosis in patients with chronic HCV infection. Manifestations include purpura, 20% of cases have renal involvement with type I membranoproliferative glomerulonephritis. Therapy involves Interferon-alpha and Ribavirin combination, Rituximab, and/or immunosuppressant for moderate to severe presentation. Our case illustrates a multifactorial vasculitis with an acute

kidney injury, most likely related to hepatitis C. Since we were unable to obtain a kidney biopsy, it is essential to keep in mind the overlap features between different types of vasculitis, and that remission induction treatment is initially with steroids.

19. Acute eosinophilic pneumonia in the setting of electronic cigarette use with cannabidiol vape oil

Daniel Rongo, MD; Moiz Salahuddin, MD; William Christopher Harding, MD; Namita Sood, MD

Abstract: Electronic cigarette use has become a common recreational activity with 20% of high-school students reported using in the past thirty days.[1] Several cases of severe lung disease associated with vaping have been recently reported. We present a case of Acute Eosinophilic Pneumonia in following the use of cannabidiol-containing vape oil.

A 23-year-old female presented with one week of fever, dyspnea and non-productive cough. Her past medical history is remarkable for myasthenia gravis. She began using electronic cigarettes with cannabidiol vape oil 4 months prior. She denied cigarette use, drug use, prior pulmonary illness, or any other exposures. She was febrile (100.6°F), pulse 143, B/P 143/77, RR 30, and Sp02 96% on room air. Physical exam demonstrated tachypnea, and fine inspiratory crackles on auscultation. Laboratory demonstrated WBC 10.6, Eosinophil count of 0.3% (318 cells/mm^3). Chest X-ray diffuse bilateral alveolar. Ceftriaxone and Azithromycin was started. Due to lack of improvement, coverage was broadened to Vancomycin and Cefepime. She worsened with increasing oxygen requirements despite 4 days of antibiotics. CT pulmonary angiogram showed extensive patchy ground-glass opacities and consolidative changes of both lungs with peribronchial distribution and air bronchograms. Bronchoscopy with bronchoalveolar lavage (BAL) was performed, showed normal airways. The BAL demonstrated 700 nucleated cell with a differential of 25% neutrophils, 22% lymphocytes and 23% eosinophils. All cultures were negative for bacterial and viral pathogens. Prednisone 40 mg daily was started and antibiotics were discontinued. She improved rapidly in regards to her symptoms, oxygen requirements and radiologically. She was discharged two days later on room air.

Acute eosinophilic pneumonia (AEP) is a rapidly progressive disease that can cause fatal respiratory failure. Clinical presentation is similar to community-acquired pneumonia with cough, fevers, and bilateral infiltrates. The diagnosis is made by increased eosinophilic count >25% in the BAL (normal <2%) with the exclusion of other causes of eosinophilia. AEP usually responds rapidly to corticosteroids within 24–48 hours and rarely relapse after stopping treatment.

The exact cause and mechanism of AEP is largely unknown. However, there are documented associations with cave exploration, woodpile moving, smokehouse cleaning, and electronic cigarette use.[2,3] The FDA requires manufacturers to submit a list of ingredients of potentially harmful substances for all nicotine-containing products. However, these laws do not transfer over to nicotine-free products. Synthetic Cannabinoid inhalation has been reported to cause AEP. The other possibility is that many CBD-containing products have been found to contain pesticides.[5] One of these pesticides can be phosgene. Phosgene has been implicated in the development of AEP.[4] We suspect this may have played a role in our patient's development of AEP. More investigation and regulation of CBD-containing products is needed to prevent severe lung disease.

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20. Quality improvement on obesity documentation and management

Ramirez D; Kamnani S1; Montes J; Shamdeen S; Osuna Z; Sraow A; Soni M; Bravo V; Huayanay I

Background: Obesity is an epidemic disease increasing worldwide. Recognition of obesity as a medical problem in primary care is essential to preventing detrimental health conditions. The aim of this quality improvement project is to analyze the trends in documentation of obesity as a medical problem in our graduate medical clinic (GME) and implement a reminder system in the health record to increase compliance with documentation.

Methods: The first part of the project was a chart analysis that included data from our GME Internal Medicine Clinic from July 1, 2018 to April 1, 2019. Inclusion criteria was charts of patients with BMI >30. New patient and chronic disease follow up charts were included. Sick visits or encounters addressing one problem were excluded. Data was gathered by six medical residents who each analyzed twenty-five patient charts. The assessment & plan or visit codes containing obesity related documentation, were plotted on a separate patient de-identified excel spreadsheet.

Results: Out of 200 charts, only 179 were included in this study. Most of the patients were females 106(59%). Across all BMI ranges, approximately 64% charts contained obesity related documentation. The largest subgroup was BMI 30–35, which consisted of 44% of charts analyzed. When obesity was documented, management options were offered in the documentation approximately 88% of the time.

Conclusions: Documentation of obesity and management is more common with increasing BMI. When obesity is documented in chart, management is more likely to be offered. Implementation of a reminder systems should help increase compliance with documentation.

21. Inferior pancreaticoduodenal artery pseudoaneurysm rupture presenting as hemosuccus pancreaticus

Dhayanithi Dhayalan; Sahityan Viswanathan; Swarnalaxmi Umapathy; Timothy Dobin; Monte Troutman; Ikponwosa Iyamu-Osagiede; Saravanan Balamuthusamy

Introduction: Hemosuccus Pancreaticus (HP) is a rare condition, defined as bleeding from the ampulla of vater via the pancreatic duct from a bleeding source in the pancreas and surrounding vasculature. Pancreaticoduodenal artery aneurysms constitute <2% of all visceral artery aneurysms. We describe a very rare case of inferior pancreaticoduodenal artery pseudoaneurysm secondary to celiac artery stenosis eroding into the CBD and bleeding through the ampulla of Vater and Santorini presenting as Hemosuccus pancreaticus.

Case report: 39 yo male with PMH of hypertension and multiple episodes of acute alcoholic pancreatitis presented with midepigastric abdominal pain radiating to the right upper quadrant, associated with nausea and non-bloody emesis. Review of systems was significant for LOA and LOW of 90lbs over the past 8 months. Prior medical records indicated multiple episodes of acute pancreatitis in the last 6 weeks that was complicated by hemorrhagic pancreatic pseudocyst and CBD stricture s/p stent placement. IR mediated coil embolization of pancreatic arcade artery pseudoaneurysm was performed. Physical exam was significant for tenderness over epigastrium and RUQ. Labs were significant for leukocytosis (26.8), normocytic anemia, transaminitis of cholestatic pattern and elevated lipase (2515). Abdominal ultrasound demonstrated dilation of the common bile duct up to 13 mm and biliary sludge. CECT abdomen/pelvis revealed a 3.5 cm mass at the pancreatic head with surrounding inflammatory changes and embolization coils around the pancreas. Provisional diagnosis of acute pancreatitis and acute cholangitis was made and patient was taken for emergent ERCP which demonstrated fresh blood in the stomach, first part of the duodenum and large blood clots obstructing the end of the biliary stent and the minor papilla in the second part of the duodenum. The biliary stent

was then retrieved and biliary sweep was performed. Patient then developed active bleeding from the CBD causing hemodynamic instability and the procedure was aborted. Interventional radiology was consulted emergently and an angiogram was performed which revealed active bleeding from pseudoaneurysm of inferior pancreaticoduodenal artery with severe celiac artery stenoses and extensive collaterals. The bleeding vessel was successfully embolized with gel foam and coil.

Discussion: HP presents with gastrointestinal bleeding, abdominal pain and hemodynamic instability. In our case, patient had an atypical presentation with non-bloody emesis, low hemoglobin with hemodynamic stability. Diagnostic imaging pointed towards acute pancreatitis and cholangitis necessitating an emergent ERCP. The blood clots at the outlet of the major and minor papillae acted as physiologic plugs and likely caused the acute cholangitis and pancreatitis. Removal of the obstructing pathology in our case was complicated by the active pseudoaneurysmal bleeding mandating emergent intervention by IR. The low incidence of pancreaticoduodenal aneurysms and the sequelae of bleeding into the CBD formed the perfect storm for HP complicated by acute cholangitis and pancreatitis.

22. IgG4 related disease as a cause of recurrent pancreatitis: a diagnostic approach beyond gallstones and alcohol

Earl J Mejia, MD; Lauren Muenchow; Adedayo Okanlawon; Henderson Lopez, MD; Laura Garcia, MD, FACP; Carlos Ramos, MD, FACP; Jose E. Campo Maldonado, MD, FACP; Henry Kwang, MD; Carlos Garza, MD; Muhammad Shamim, MD; James F. Hanley, MD, MACP

Introduction: Acute Pancreatitis is an inflammatory process of the pancreas, which typically presents as intense epigastric pain classically radiating to the back or scapula. Establishing the etiology of acute pancreatitis is imperative as the management between subtypes can vary greatly. The majority of cases are related to alcohol, gallstones, and hypertriglyceridemia. When there is recurrent pancreatitis without a common etiology, the differential expands to include anatomical variation and autoimmune disorders. We present a complex case in which IgG4 related disease seems likely.

Case Presentation: A 37-year-old woman with a two-year history of recurrent pancreatitis, past diagnosis of SLE and Sjogren's presents with complaints of severe epigastric pain, nausea, and vomiting. She denied alcohol use, history of gallstones, nor family history of pancreatitis or hypertriglyceridemia. On physical exam, the patient had extreme tenderness to palpation of the epigastric region. There was no finding of an acute flare of SLE nor Sjogren's. Pertinent laboratory values demonstrated leukocytosis of 11.6, a lipase level of 4,477 units/L, and amylase level of 390 units/L. Triglyceride level was 354 mg/dL. A urine drug screen was negative for ethanol and illicit drugs. A MRCP performed one-week prior, showed no biliary tree abnormalities or pancreatic mass. Results of IgG 4 level were elevated at 181 mg/dL (normal 2–96 mg/dL). She received supportive management and was started on a steroid taper with improvement in her symptoms. The patient was referred to rheumatology and gastroenterology for further management of her SLE and AIP.

Discussion: This case highlights the challenges of evaluating chronic pancreatitis and making the diagnoses of autoimmune pancreatitis. In this patient, a leading candidate is IgG4 related disease which is a spectrum of immune-mediated processes affecting several different organ systems including the pancreas, hepatobiliary tract, salivary glands, and cardiovascular system. AIP is a rare cause of chronic, recurrent pancreatitis. Diagnosis is largely dependent on biopsy findings of dense lymphoplasmacytic infiltrate with storiform pattern and associated fibrosis. Mayo Clinic has developed the HISORt criteria to aid in diagnosis which includes: histology, pancreatic imaging, an elevation 2× greater than the upper limit of normal for IgG4, other organ involvement, and improvement with steroid therapy. Our patient had elevated IgG4 and response to steroids, but did not have other organ involvement. Invasive biopsy was difficult to recommend at this time as the patient showed improvement with steroids. It remains unclear how this patient's diagnoses of SLE and Sjogren may be

associated with her recurrent pancreatitis. Although, without related findings it is unlikely to be the etiology. In our final analysis, we suspect IgG4 related disease as the cause of pancreatitis, which is speculation without biopsy. We believe that this is a common dilemma, making this entity a difficult diagnosis.

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23. Utilization of A1C test in patients admitted to a university-associated southern US-Mexico border hospital; does it add value?

Eddy Valdez, MD; Rafael Otero, MD; Ralph Apolinario, MD; Andres Adrianza, MD; Jiyun Lim, MS3; Angel Rendon, MS3; Christine Loftis, MS3; David A Diaz Voss Varela, MD; Francisco Avellan, MD; Laura Garcia, MD, FACP; Henry Kwang, MD

Purpose: To evaluate the utility of inpatient A1c testing and its significance in regard to medical management.

Introduction: The HbA1c test currently plays a role in both diagnosis and monitoring of diabetes as it provides valuable information on long-term glycemic control. The American Diabetes Association (ADA) established inpatient guidelines in 2018 stating that an A1c should be ordered on patients with diabetes or glucose >140 mg/dL, if not performed in the previous 3 months. We aimed to evaluate how our hospital was utilizing A1c testing and its impact on patient care.

Methods: We performed a retrospective chart review of demographic, lab and medication information of 520 patients admitted to Valley Baptist Medical Center in Harlingen, Texas between 01/2018-06/2018. We paid special attention to whether A1c ordering practices followed the ADA guidelines, baseline diabetic status and medications, and any changes in management based on A1c results.

Results: In total, we reviewed 520 patient charts with 247 (47%) without a documented history of diabetes and 273 (53%) with a known diabetic history. In the former group, 27 (5%) were found to have A1c >6.5% (new diagnosis) and in the latter group, 71 (13%) had an A1c <6.5% (overtreatment). Of patients previously diagnosed with diabetes, 119 patients were taking home insulin though only 49 had dose adjustments upon discharge. There were minimal changes in the management of oral agents. Overall, 240 (46%) A1c tests ordered did not follow established ADA guidelines with 61 cases already having a previously documented A1c in the preceding 3 months and 196 ordered in non-diabetics without blood glucose values >140 mg/dl.

Discussion: With limited effect on management, the utility of A1c as a diagnostic tool in the hospital setting has been questioned. When applied properly, the A1c test has potential to be an excellent tool for adjusting medications and facilitate a smooth transition to the outpatient setting to continue diabetic care. However as noted in our study, only a small minority of providers adjusted diabetic regiments based off their testing. Moreover, providers often rechecked A1c too early based on the half-life of a glycosylated red blood cell and also checked A1c in patients with low pretest probability of diabetes based on ADA guidelines. We observed that almost half of A1c tests ordered were not in accord to ADA guidelines, with the cost of

testing during our study period totaling $5280 based on average cost at our facility. Ordering A1c testing without indication or change in management has potential to add to the cost of care without improving quality. In efforts to promote high value care, we plan to work closely with our QAPI department in instituting system-wide efforts to improve A1c utilization through provider-education, best practice alerts, and EMR adjustments.

24. Recognition and management of Long QT syndrome to prevent Torsade de Pointes in a southern border community hospital

Francisco Avellan-Jimenez, MD; Rafael Otero, MD; Supraja Thunuguntla, MD; Dayan Ojeda, MD; Hansapani Rodrigo, PhD; Amanda Cantu, MD; Rehan Ansari, MD; Laura Guerrero, MD; Eddy Valdez, MD; Laura E. Garcia, MD; Henry Kwang MD

Introduction: Long QT Syndrome (LQTS) is associated with syncope, ventricular arrhythmias, and sudden death. Cardiac arrest due to Torsade de Pointes (TdP) via the acquired form of LQTS (aLQTS) is reported to be higher compared to congenital LQTS.

In an effort to improve patient care in our facility, we evaluated the management of patients admitted with LQTS or who developed hospital-acquired LQTS according to the 2011 AHA/ACC Scientific Statement of Prevention of Torsade de Pointes in hospital settings. The main purpose of our study was to raise awareness among hospital staff to the risk factors, potential culprit drugs, and management of LQTS.

Methods: We performed a retrospective study on patients admitted to our South Texas facility between January 2016 and July 2019 with a QTc >450 m/s for men, a QTc >470 m/s for women, and on patients who developed LQTS after admission to the hospital. We evaluated the demographics and the presence of major risk factors, including coronary artery disease (CAD), heart failure (HF), hypertension (HTN), chronic kidney disease (CKD), end stage renal disease on hemodialysis (ESRD-HD), hypothyroidism, and psychiatric disorders. We also evaluated the patient's home and in-hospital medications along with noted electrolyte derangements.

Results: In total, we reviewed 121 patients: 81 males and 40 females. The average age was 66 and majority were self-identified as Hispanic. The most common comorbidities were HTN (62.8%), CAD (45.5%), HF (45%), CKD III-V (19.8%), and psychiatric disorders (15.7%). 66.1% were admitted with abnormal QTc and 38.8% developed prolonged QT during hospitalization. Within these groups, 19% and 12.3% had critical abnormal QTc (≥500 m/s), respectively. Only 35.5% of patients had repeat EKGs ordered, 3.3% had prolonged QT charted as a problem, 5% had the risk of TdP assessed, 32.2% had their medications addressed, and 44.6% had cardiology consulted. Three patients had a cardiac arrest during their hospitalization (2.47%).

Only 43.9% had their electrolytes effectively replaced (when K <3.5, Mg <2) and 40.5% did not have a magnesium level ordered during their index admission. Medication reconciliation was done in 52.9% of cases. The most common drugs known to cause drug-induced LQTS identified in our population were SSRIs (11.6%) as a home medication and ondansetron (11.6%) used during hospitalization.

Discussion: In our population, LQTS is often overlooked. Simple interventions such as electrolyte management and adequate medication reconciliation can help prevent fatal events during and after hospitalization.

Our study demonstrates the need to increase awareness of this issue to reduce adverse events. We plan to work in conjunction with our Quality Assurance Performance Improvement department to implement institutional-wide changes, such as provider education, EMR best practice alerts, and order restrictions in an effort to promote patient safety.

25. Fibrosing mediastinitis with pulmonary hypertension, aggressive treatment and outcome at 5 years

Argueta F; Villafuerte D; Castaneda J; Peters J; Restrepo C

Introduction: Fibrosing mediastinitis (FM) is a rare disorder characterized by the invasive proliferation of

fibrous tissue within the mediastinum which may result in compression of intrathoracic structures including the pulmonary vasculature.

Case Presentation: A 24-year-old man with a diagnosis of pulmonary coccidioidomycosis who complicated by mediastinal fibrosis with significant scarring of the left upper lung and involvement of the pericardium. The fibrotic process had progressed over the subsequent 2 years resulting in complete occlusion of the left pulmonary artery (PA), stenosis of the right PA, and compression of the superior vena cava. These intrathoracic vascular occlusions resulted in severe pulmonary hypertension with right ventricular hypertrophy. His symptoms consisted of severe dyspnea on exertion (NYHA functional class III) and bilateral lower extremity edema. The patient underwent a right heart catheterization that showed total occlusion of the left PA and severe stenosis of the right PA with a gradient of 50 mmHg across the stenosed vessel. One month later, right PA stenting was attempted; however, the procedure was aborted when the patient became acutely hypoxemic and developed signs of acute cor pulmonale requiring to be placed on extracorporeal membrane oxygenation (ECMO). Ultimately, the patient underwent right PA stenting where two overlapping, self-expanding vascular stents were placed with ECMO support. The patient was discharged and placed on clopidogrel indefinitely. Five years later, a computed tomography angiography showed no filling defect in segmental or sub-segmental areas of the right PA and the transthoracic echocardiogram demonstrated improvement in the right ventricular hypertrophy. The patient continues to do well with no dyspnea on exertion or lower extremity edema and has been able to return to work.

Discussion: FM is a rare disorder characterized by proliferation of locally invasive fibrous tissue within the mediastinum, most commonly associated with *H. capsulatum*; however, this is a rare complication of pulmonary histoplasmosis occurring in less than 1% of cases.[1] It also has been associated with granulomatous diseases such as sarcoidosis, tuberculosis, fungal infections, and autoimmune disorders. PA occlusion with resultant pulmonary hypertension is the most common complication. Several treatment strategies for FM have been described including medical, surgical and non-surgical interventions. Endovascular approach with PA stenting seems to be a safe and feasible option, although this can complicate with thrombosis one to two years later and require more interventions.[2] Our patient did not show complication related to the procedure in the following 5 years. To date, no clinical trials have been conducted to show whether endovascular interventions alone or in combination with medical therapy improves survival and further investigation is warranted. To our knowledge, this is the first case describing ECMO support for endovascular stenting of PA occlusion related to FM with good outcomes at five years.

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26. A web of confusion for the indigent–10 years of ignored dysphagia

Prabhat Garg, MD; Praveen Koneru, MD;
Erik Rahimi, MD

Introduction: Chronic and progressing dysphagia should not be ignored. It is usually a sign of significant pathology. We discuss one such case. We also discuss challenges seen in our healthcare system when caring for indigent population.

Case Description: A 52-year-old Spanish speaking female with poor access to care presented with shortness of breath. Shortness of breath had been ongoing for about one month, intermittently. While shortness of breath was her chief complaint, it spontaneously resolved. However, she was found to be profoundly anemic with hemoglobin of 4.7 g/dL.

She also revealed a 10-year history of dysphagia, first with solids but progressed to thick liquids at the

time of admission. She reported having an EGD done 10 years prior to this encounter for unclear reasons. She also reported weight loss but could not quantify for us. She was presumably postmenopausal with last menstrual period one year prior to admission. She reported no other prior medical or surgical history and denied tobacco/EtOH/drug use. She worked as a house cleaner for an employer she knew for 30 years. She had been hemodynamically stable. Physical exam was significant for cachexia, poor dentition, pallor, and koilonychia. CT chest/abdomen/pelvis was benign. EGD found a proximal esophageal stricture with 3 mm lumen. Inpatient dilatation efforts opened it to 5–8 mm with some relief of dysphagia with thick liquids. Patient was discharged after blood and iron infusions. However, she was lost to follow up due to lack of insurance and high cost of care.

Conclusion: We present a case where pathology was allowed to develop to a severe degree, presumably due to poor access to care primarily due to financial constraints. Even after admission and discovery of the pathology, patient could not get proper outpatient follow up due to limited financial means. Meanwhile, we may have encountered an atypical presentation of Plummer-Vinson Syndrome, which is a rare syndrome consisting of chronic iron deficiency and dysphagia.

27. Spitting blood and casts with mud: a rare and unusual presentation of C3 glomerulonephritis

Gerardo Mederos, MD; Harsh Patel, MD; Menalee Hapuarachchi, MD; Som Aftabizadeh, DO; Prashanth Reddy, MD; Ranjit Nair, MD; Dana Ciobanu, MD; Machaiah Madhrira, MD; Saravanan Balamuthasamy MD

Introduction: C3 glomerulonephritis (C3GN) is a rare disease that falls under the umbrella of C3 glomerulopathy. It is manifested by abnormal activation of the alternate pathway resulting in complement deposition in the glomeruli. Kidney biopsy with characteristic findings of electron-dense deposits in the mesangial and capillary wall confirms the diagnosis. Until recently, C3GN presenting with primarily lung involvement had not been reported. We present a unique case of initial pulmonary manifestation C3GN.

Case Report: A 21-year-old Caucasian male with no past medical history presented to the hospital with a chief complaint of acute hemoptysis for 1 day. One week prior to admission, he visited urgent care with symptoms of cough, rhinorrhea, and congestion. He was diagnosed with acute bronchitis. He was treated with steroids, bronchodilators, and a 3-day course of Cefdinir. Per patient, symptoms initially improved after finishing the antibiotic course but the day prior to arrival, he experienced fevers, chills, night sweats, and hemoptysis.

On admission, he had an acute kidney injury with elevated creatinine of 1.73 mg/dL, anemia with Hgb of 11.9 g/dL. Urinalysis revealed proteinuria (>500 mg/dL) and hemoglobinuria. Inflammatory markers ESR and CRP were elevated, 18 and 13.1, respectively. Computed Tomography Angiography showed extensive bilateral parenchymal infiltrates with associated pleural fluid suspicious for diffuse alveolar hemorrhage. Infectious and autoimmune workup was negative. Complement levels showed normal C4 and low C3 of 51 mg/dL. Antistreptolysin O, ANCA and anti-GBM titers were within normal limits. Due to continued worsening hemoptysis, the patient was taken for a bronchoscopy. Results were consistent with diffuse alveolar hemorrhage. Renal biopsy was consistent with C3 glomerulonephritis.

On admission, he was started on steroids and broad-spectrum antibiotics. Despite steroid therapy, his respiratory status worsened, he was transferred to the ICU and intubated. Once kidney biopsy confirmed C3GN, he received several rounds of plasmapheresis and was started on mycophenolate mofetil. His renal function returned to baseline and his pulmonary symptoms subsided post-therapy.

Discussion: Pulmonary renal syndrome (PRS) is a rare condition that includes diffuse alveolar hemorrhage (DAH) and glomerulonephritis. Oftentimes, the rapid deterioration can lead to death; thus, a rapid diagnosis of the underlying disease improves survival. Commonly, PRS is associated with autoimmune etiology such as systemic vasculitis, Goodpasture's syndrome, or Systemic Erythematous Lupus. This patient, uncommonly, had PRS secondary to C3GN; even more unusual, the initial presentation of C3GN

was hemoptysis. Classic manifestations of C3GN include acute renal failure, proteinuria, and hematuria. Management of PRS depends on treating the underlying cause as therapies may differ. Most often, the treatment modalities will involve pulse dose steroids, plasmapheresis, and immunosuppressive agents (eculizumab for C3GN).

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28. A drug that gets on your nerves

Harika Medi, MD; Lily A. Romero Karam, MD; Ruby P. Shah, MD

Introduction: Hydralazine is widely used in the treatment of hypertension. Drug-induced lupus is a well-recognized complication of hydralazine; ANCA vasculitis is another is less common but potentially fatal condition associated with this medication. Hydralazine may cause autoimmunity by inducing neutrophil apoptosis by binding to myeloperoxidase, resulting in the formation of auto-antibodies; increasing expression of MPO and PR3 due to epigenic alterations; or causing acetylation abnormalities.[1–3]

Case Description: A 71 year-old Caucasian male with a history of hypertension, type-1 diabetes mellitus with neuropathy presented with 6 months of malaise, myalgias, proximal muscle weakness, shoulder and pelvic girdle stiffness, jaw pain and an unintentional 35 lbs weight loss. He denied headaches, vision abnormalities, fever, rashes, shortness of breath or joint pain. On physical exam he had normal vital signs, a non-healing tongue ulcer, pain over biceps and thighs, and limited arm elevation due to pain. Laboratory studies on admission revealed elevated sedimentation rate of 90, CRP 8.54 mg/dL (normal 0–0.5 mg/dL), normal creatinine-kinase and aldolase, ANA titer of 1:1280, negative dsDNA, anti-Smith, SS-A and SS-B antibodies. The patient was on hydralazine; it was discontinued as it was thought to be responsible for high ANA titers. Initial concern was high for polymyalgia rheumatica with giant cell arteritis and steroids were started at 1 mg/kg/day, the patient underwent temporal artery biopsy. He had drastic improvement of his symptoms after the first steroid dose, however, he later developed a left-sided foot drop. Electromyography and nerve conduction studies showed chronic, asymmetric demyelinating polyradiculoneuropathy with superimposed sensorimotor polyaxonopathy. CSF analysis showed normal protein and glucose, no pleocytosis, and normal IgG-synthetic rate. The patient was discharged on high dose steroids with close rheumatology follow up. At follow up, he had high titers of anti-nuclear cytoplasmic antibodies (ANCA) >1:640, elevated myeloperoxidase 2.1 AI (<1.0 AI) and protease-3 antibodies 1.3 AI (<1.0). Histone antibodies were also strongly positive 9.0 units (0–0.9 units). Diagnosis of hydralazine-induced ANCA vasculitis was made. He was started on rituximab and steroids were tapered. He continues to feel better and his foot drop improved after the first rituximab dose.

Discussion: The incidence of hydralazine induced vasculitis increases with dosing, affecting 5.4% of patients on 200 mg/day and 10.4% of patients on 200 mg/day for >3 years.[2] Being such a commonly used medication, it is not surprising that physicians

are encountering more cases of hydralazine-induced autoimmunity. Clinicians must have a high index of suspicion when dealing with potential drug-induced vasculitis to allow for timely diagnosis and discontinuation of the offending agent. Lastly, complications of hydralazine therapy should be taken into consideration when deciding on antihypertensive therapies for patients.

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29. A case of periorbital pyoderma gangrenosum

Abhizith Deoker, MD; Chelsey Bravenec, MD; Inayatullah Wahdatyar, DO; Tony Ghaith, MD; Zainab Alam, MS

Pyoderma gangrenosum is an ulcerative cutaneous condition of uncertain etiology. Around 50% of patients affected have systemic diseases. It is a diagnosis of exclusion. Thus, it is imperative to rule out other conditions that cause similar-appearing cutaneous ulcerations including infection, malignancy, vasculitis, collagen vascular diseases, diabetes, and trauma. In 30% of patients with pyoderma gangrenosum new ulcerations can occur after trauma or injury to the skin, in a process termed pathergy. A 59-year-old male presented in 2012 with a soft tissue infection of the right cheek for which he had an I&D and was given antibiotics. Three months later he returned with a new area of erythema and purulence of the right cheek. Pathology of this lesion was negative for neoplasia and instead showed acute over chronic inflammation with granulomas, necrosis, and scar tissue. It was negative for fungal and acid fast organisms. Over 4 years, he had 9 admissions for non-healing lesions. Cultures grew MRSA, MSSA, and Pseudomonas for which he was seen by the ID team with appropriate antibiotics given and had multiple I&Ds without resolution. Over these years, an extensive workup which was negative for AFB, Fungi, Anaerobes, Blasto, Histo, Cocci, ANCA, HIV, RPR, and TB. He did have elevated ESR and CRP. Multiple biopsies were negative for neoplasia, connective tissue disease, vasculitis, dermatitis herpetiformis, porphyria cutanea tarda, pseudoporphyria, autoimmune blistering disease and dermatomyositis. Colonoscopy was not performed; however, patient denied all GI complaints.

4 years after presentation, he was seen by a Dermatologist who suspected Pyoderma gangrenosum versus cocaine tainted with Levamisole per patient history of cocaine use. Multiple urine drug screens negative. Patient was started on Minocycline which has shown some success in treating PG 2. He met 6 out of 8 minor criteria for Pyoderma.[1] The diagnosis of PG was given, and Prednisone 20 mg was started. After 1 month of treatment, some lesions completely resolved, others improved 50%, and no development of new lesions. The patient ran out of Prednisone 8 days after missing his appointment and noticed some lesions “opening up” again thus prednisone was restarted after which all lesions healed. He was seen in 2019 with a new lesion of the left lower eyelid, which started as a papule and ulcerated to encompass the peri-orbital area. Patient developed endophthalmitis and required left eye exenteration. He was restarted on prednisone, with intent to follow up with Dermatology.

This case illustrates that although rare, pyoderma gangrenosum needs to be on a Physicians differential, especially when antibiotics are not working and the lesions are getting worse with debridement. Due to the pathergy phenomenon in pyoderma gangrenosum, ulcers get worse with debridement unless they are necrotic in which case they should be removed.

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30. Reducing repetitive inpatient phlebotomy by adjusting admission order set

Capt Jaclyn Harris; CPT Jeremy Smith; CPT Crystal Forman; Capt Sarah Schall

Introduction: Repetitive unnecessary laboratory testing is a wasteful clinical practice which threatens high value care. Excessive phlebotomy can lead to hospital acquired anemia, increased transfusions, extended length of stay, and unnecessary downstream testing and procedures. For these reasons the Society of Hospital Medicine published a Choosing Wisely initiative in 2013 which states "Don't perform repetitive CBC and chemistry testing in the face of clinical and lab stability."

Methods: We surveyed 31 Internal Medicine residents to gauge current daily lab ordering practices and physician interest in changing them. The majority of residents agreed inpatients often had more complete blood counts (CBC) and renal function panels (RFP) than needed during their admission. We aimed to decrease the number of unnecessary CBCs and RFPs obtained with a goal of 10% reduction in CBCs and RFPs obtained within a 3-month period. Therefore, we changed our Internal Medicine admission order set from a default of CBC and RFP q AM to a default of q AM x2.

Results: This is a simple adjustment in our admission order set reduced the number of CBCs and RFPs obtained per patient by 13.4% during the first 10 weeks after the intervention was executed compared to 10 weeks prior. There have been no adverse outcomes reported to date to include an increase in CBCs and RFPs ordered later in the day due to absence of data from morning lab draws. We will continue to collect data in the coming months for better assessment of outcome from this intervention.

Discussion: This intervention saved our hospital approximately $24,000 dollars within the first 10 weeks after the intervention based on Centers for Medicare and Medicaid Services 2019 clinical laboratory fee schedule. We project greater than $118,000 annual savings due to this intervention. A meta-analysis published by Eaton et al. in 2017 demonstrated significant cost savings by other institutions who implemented changes to reduce repetitive phlebotomy without increase in adverse patient outcomes measured over a 3-year period. While it is difficult to assess change in morbidity and mortality following this intervention, this effort reflects best practices as the standard of care mandates direct indication for ordering of each laboratory test for inpatient medical treatment.

Disclaimers: The views expressed herein are those of the authors and do not reflect the official policy or position of Brooke Army Medical Center, the U.S. Army Medical Department, the U.S. Army Office of the Surgeon General, the Department of the Army and Department of Defense.

31. Bariatric bradycardia

Devina Jagota, DO; Christopher B. Hearne, MD

Introduction: Asymptomatic bradycardia has been observed in patients after bariatric surgery, but it has not been well studied for cause or frequency.

Case Description: A 73-year-old male was seen at PCP clinic after he was noted to have an apical pulse rate of 41 at a pain management clinic. His heart rate was noted to be 59 at the time of encounter, and he denied any symptoms of chest pain, fatigue, and syncope. AN EKG was completed and showed sinus bradycardia. Patient was asked to walk 100 meters and he showed chronotropic competence. No other findings on physical exam. His history is significant for bariatric surgery 4 months prior to presentation, and

careful chart review revealed gradual decline in heart rate since his procedure.

Conclusion: In an investigation done at Hahnemann University Hospital, sinus bradycardia was seen in 18% out of 137 patients who underwent bariatric surgery. The development of bradycardia after bariatric surgery could be a result of decreased leptin levels leading to augmented vagal tone and parasympathetic stimulation. Further studies looking at frequency and cause could help establish bradycardia as a possible effect of bariatric surgery and avoid unnecessary extensive cardiac work-up in these patients. Long-term follow-up investigations could also help determine the persistence of the bradycardia and ascertain if it is a transient or permanent effect of the surgery.

32. Shrinking lung syndrome—a rare pulmonary manifestation in a patient with systemic lupus erythematosus

Makram J; Eshak N; Mallah H; Hamous K;
Payne JD

Introduction: Systemic lupus erythematosus (SLE) is a systemic autoimmune disease that can affect almost any organ; pulmonary involvement in SLE occurs in 50% to 70% of cases. Shrinking lung syndrome (SLS) is an extremely rare pulmonary manifestation of SLE, occurring in only 1% to 6% of cases. Fewer than 100 cases of SLS have been documented in the literature, and given the diagnostic challenge in SLS, its incidence may be underreported. We describe a patient with SLE presenting with dyspnea ultimately diagnosed with SLS.

Case Presentation: A 26-year-old woman presented to our institution with worsening shortness of breath lasting three weeks. She was diagnosed with SLE three years previously and was in remission at presentation. She was successfully tapered off steroids four weeks prior to presentation. She had no associated cough, pleuritic chest pain, orthopnea, or paroxysmal nocturnal dyspnea. Her clinical examination revealed tachycardia and moderate respiratory distress with rapid, shallow breathing, flaring of the alae nasi, accessory muscle use, and a respiratory rate of 40 breaths per minute. The other findings from her systemic examination were unremarkable. Her laboratory workup revealed only mildly decreased C3 levels (0.79 g/L); however, her immunological profile was not suggestive of any SLE activity. Arterial blood gas analysis showed pH 7.49, pCO2 was 27 mmHg, pO2 was 64 mmHg, HCO3 was 21 mEq/L, and oxygen saturation was 92% on room air. Chest computed tomography scan showed elevation of the right and left hemidiaphragms, with no evidence of parenchymal lung disease and pleural or pericardial effusion. Pulmonary function tests (PFT) revealed a restrictive pattern with vital capacity of 25%, forced expiratory volume in one second (FEV1) of 26%, and FEV1/forced vital capacity ratio of 85%.

Given the clinical manifestations, imaging findings, and PFT results, we suspected shrinking lung syndrome. Therefore, the patient began a course of oral prednisone and azathioprine and showed marked improvement in her dyspnea after 2 days of therapy. She was successfully tapered off supplemental oxygen over the next 6 days, and the patient was discharged.

Discussion: In 1965, Hoffbrand and Beck used SLS to describe an SLE patient who presented with dyspnea, had radiological evidence of raised diaphragm, and a restrictive pattern on PFT. The precise pathogenetic mechanism underlying the SLS remains poorly understood, but it is hypothesized to be due to diaphragmatic dysfunction, phrenic neuropathy, or pleural inflammation. Despite presenting with the classical triad of SLS, this patient case reaffirms the diagnostic challenge of this condition. Primary care physicians should be aware of this disease entity, despite its rarity, to institute treatment promptly to prevent additional worsening of dyspnea and pulmonary function, ultimately allowing patients the best possible outcomes.

33. Smoke synthetic weed, get cardiac arrest or pneumonia from weird organisms for free

Jordan Babcock, DO; Siva T. Sarva, MD

Background: Synthetic marijuana is becoming more attractive due to its psychoactive properties, and it is not part of the standard drug testing. The

drug was initially developed in 1965 for research purposes and became popular in the early 2000s. There are multiple synthetically designed and illicitly manufactured cannabinoids making it difficult to develop diagnostic tests.

Case: A 26-year-old female without significant past medical history was brought to the emergency department by EMS after being found unresponsive in ventricular fibrillation and cardiac arrest. The patient was intubated and cardioverted by EMS. Therapeutic hypothermia protocol was started, and she was transferred to the ICU. ABG shows a pH of 7.113. Chest X-ray showed pulmonary edema. The patient showed significant deterioration in the next few hours and required multiple vasopressors. Emergent cardiac catheterization negative for coronary artery disease. Pulmonary angiogram negative for pulmonary embolism. A left ventricular Impella device was placed to augment ventricular function. Hypothermia protocol was completed. She continued to require cardiovascular and respiratory support.

She progressed to ARDS and was managed with inhaled epoprostenol, low tidal volume (6 cc/kg IBW), and high PEEP (15 cm of H_2O). Empiric therapy with vancomycin and Cefepime was started for pneumonia. Her hemodynamic status improved over the next four days, and the Impella was discontinued. Cefepime was changed to meropenem given she did not respond to the therapy. Sputum cultures and bronchoalveolar lavage cultures initially showed gram-negative bacteria. Eventually the bronchiolar lavage sample returned positive for Pseudomonas fluorescens which was multidrug-resistant. Her antibiotics were changed to tobramycin, and her respiratory status improved. She was extubated on the 10th day of hospitalization. After extubation, the patient gave a history of recent synthetic marijuana use.

Discussion: Synthetic marijuana can cause a variety of adverse clinical effects such as tachycardia, tremor, seizures, vomiting, myocardial infarction, and transient ischemic attacks. There are a few cases reported of myocardial infarction after synthetic marijuana use. Due to the illicit nature of manufacturing without any quality controls, there is a high risk of biological contaminants like Pseudomonas and fungi.

This case illustrates that synthetic marijuana can cause cardiac arrest and requires a high index of suspicion for diagnosis in the younger population, particularly when they present to the hospital in an unresponsive state. It is imperative to give supportive care during the acute event and when patients are not responding to standard broad-spectrum antibiotics, think of uncommon infections. More resources would need to be utilized for the education of the general public and young adults in particular about the risks of smoking or vaping synthetic marijuana.

34. Immunologic outcomes in recipients of orthotopic liver transplant induced with steroids

Jordana Faruqi; Shehzad N. Merwat; Ahmed T. Chatila; Mohammad Bilal; Rupak Kulkarni; Heather L. Stevenson; Jeffrey H. Fair; Sheharyar K. Merwat; Tomasz Kozlowski; Muhammad A. Mujtaba

Introduction: Liver allografts are resistant to antibody mediated rejection (AMR) in the presence of preformed alloantibodies. In most cases donor specific antibodies (DSAs) disappear a few months after liver transplantation (LTx). There is a little knowledge on the impact of induction immunosuppression (IS) on preexisting or de novo development of DSAs in LTx.

Methods: We conducted a retrospective single center review of prospectively collected data on 50 ABO compatible LTx from 2016 to 2018. Induction regimen was solumedrol 500mg before reperfusion, 250 mg on postoperative day 1, 125 mg on day 2, and then taper to steroid free at 6 months. Maintenance IS consists of mycophenolate 1000 mg/day and tacrolimus with trough levels 6–8 ng/mL. Patients were monitored for development of DSAs. Continuous variables are reported as mean with standard deviation and analyzed using unpaired t test. For categorical variables Fisher's test was used, P of <0.05 considered significant.

Results: Patients mean age at transplantation was 36.9 years, predominantly Caucasians (78%).

Etiology of liver disease was: HCV infection 42%, Alcohol 36%. The mean follow up was 407 ± 270 days. Mean PRA was 24%, 2 patients had positive T/B cell CXM, 1 patient had positive B cell CXM due to presence of DSAs. Three patients had Class II DSAs only, 2 patients had CI & CII antibodies and 2 patients had CI antibodies at the time of LTx. 10 patients developed biopsy proven ACR within first 12 months and were treated with pulse dose steroids. One patient developed AMR 20 days post-transplant. Treatment consisted of apheresis, IVIG and Bortezomib. One-year graft & patient survival were 96%. Class I & II DSAs MFI at the time of LTx were 53195 ± 44999, & 22292 ± 27717 respectively. At last follow up, 18% of patients developed de novo DSAs [7 CII only, 3493 ± 2946 MFI, one CI 4531 MFI and CII ± 1954] MFI. Two patients with pre-existing CI & II DSAs cleared only CI antibodies. There was a significant drop in cumulative CI + CII and CI DSAs from transplant to last follow up with P = 0.05 and 0.02 respectively. In the rejection group, 4 out of 11 patients were noted to have DSAs. There was no significant difference in DSAs MFIs in patients with and without rejection, P = 0.72. There was no significant difference in AST, ALT, INR, albumin, and total bilirubin levels in patients with and without DSAs.

Conclusion: Steroid induction alone appears to be sufficient in controlling DSAs as evident by drop in pre-existing antibodies strength. LTx patients may still develop de novo or may not be able to clear CII DSAs. More prospective studies are required to determine if choice of induction therapy will have an impact on CII antibodies dynamics.

35. A sense of detachment in a patient with urothelial cell carcinoma

Joseph W. Caravella, DO; Selena Stuart, MD; Stephen McNutt, MD

Erdafitinib as of April, 2019, was the first FDA-approved fibroblast growth factor receptor (FGFR) tyrosine kinase inhibitor indicated for treatment of locally advanced or metastatic urothelial carcinoma for individuals with fibroblast growth factor receptor (FGFR) mutations. While ocular disorders such as central serous retinopathy/retinal pigment epithelial detachment (CSR/RPED) are listed as a black box warning, there are currently few reported cases.

An 82-year-old male with history of metastatic urothelial cell carcinoma involving bilateral metastases to the lungs presented to his oncologist with visual disturbances approximately two weeks after starting erdafitinib. He has a past medical history of hypertension and bladder cancer that was diagnosed 10 years ago with noninvasive disease managed by urology with repeated transurethral resection of bladder (TURBT) procedures. Pathology from his most recent cystoscopy approximately two years ago was classified as noninvasive high-grade papillary urothelial cell carcinoma. The patient was referred to oncology when he developed hemoptysis and 20–30 lb weight loss about 18 months ago, and imaging revealed bilateral pulmonary nodules worrisome for malignancy. A biopsy of a lung nodule confirmed metastatic urothelial cell carcinoma. After progression on previous checkpoint inhibitor therapy and chemotherapy, the patient had worsening hemoptysis and palliative radiation therapy was initiated. Next generation sequencing was performed and the patient was found to have a FGFR mutation. He was started on erdafitinib at 8 mg po daily.

Two weeks after initiation of erdafitinib, he presented to his oncologist noting visual disturbances with blurred vision and floaters and he was immediately referred to ophthalmology where a dilated fundus exam and retinal optical coherence tomography (OCT) was performed as per the screening protocol. OCT demonstrated that he had bilateral neurosensory retinal detachments potentially accounting for his visual disturbances. As per erdafitinib's drug pamphlet information, monthly ophthalmological exams should be done during the first four months of treatment, then every 3 months afterwards, or at any time for visual symptoms. In this instance, this was within the first two weeks of treatment at the starting dose. Despite these findings, the patient elected to remain on erdafitinib given lack of other good treatment options. After 6 weeks of treatment, CT imaging demonstrated a decrease in several pulmonary nodules, but showed postobstructive pneumonitis. His

ophthalmologic symptoms are stable and he continues on erdafitinib.

This case demonstrates the importance of being vigilant with the side effect profiles and screening regimens of medications, especially new oncological medications which are emerging rapidly. This patient's non-specific visual changes could have gone undiagnosed without proper follow up had it not been for the initiation of the screening regimen. In this case, as there are no other options for treatments, the patient will remain on erdafitinib with close ophthalmological and oncological follow up.

36. A tale not told in blood: the hidden pathophysiology of glomerulonephritis

Joshua Hernandez, DO; Paolo Zavala, MD; Grace McNutt, MD

Introduction: Rapidly Progressive Glomerulonephritis (RPGN) is a clinical syndrome that involves different etiologies. Among them, membranoproliferative glomerulonephritis (MPGN) immune complex-type has been encountered in autoimmune diseases, chronic infections, and monoclonal gammopathies. Rarely, no underlying process can be identified.

Case Description: 28-year-old Hispanic female with a past medical history of hypertension and iron deficiency anemia presented to the hospital with right upper quadrant abdominal pain, hypertension and generalized weakness. She was found to be in acute renal failure with creatinine 9.40 mg/dl, urine protein/creatinine ratio of 11 g/g. Urinalysis showed proteinuria with hematuria. She was started on emergent hemodialysis. Serologies were negative for antinuclear (ANA), anti-neutrophil cytoplasmic (ANCA), rheumatoid factor, double stranded DNA (dsDNA), and anti-glomerular basement membrane (GBM) antibodies. Additionally, the hepatitis panel, SPEP and UPEP were all found to be negative. However, despite negative serologies, the subsequent renal biopsy revealed proliferative and crescentic glomerulonephritis with membranoproliferative features, immune complex-type, and severe interstitial fibrosis involving approximately 70% of the cortical surface along with moderate tubular atrophy involving approximately 40% of the tubules. Immunofluorescence revealed diffuse mesangial and capillary wall staining with a near "full-house" presentation positive for IgA, IgG, C3, C1q, Kappa and Lambda light chains. Electron microscopy demonstrated thickened glomerular basement membrane with subepithelial and intramembranous immune complex deposits. The patient was started on a course of pulsed steroids in the hospital and transitioned to outpatient rituximab with scheduled hemodialysis.

Discussion: This patient presented with rapidly progressive glomerulonephritis (RPGN) and was found to have crescentic immune-complex mediated MPGN on biopsy with a near "full-house" immunofluorescence staining. Interestingly, an extensive work-up was negative for any immunologic or pathologic markers. This case illustrates the importance of obtaining a prompt renal biopsy when indicated and initiating prompt treatment tailored to the individual patient. In this case, rituximab and prednisone were initiated based on the patient's level of chronicity on biopsy, age, and unclear underlying diagnosis. Even when current advances in immunofluorescence and electron microscopy techniques are helping to identify new pathologic processes involved in this disease, the term idiopathic MPGN would apply to this specific scenario.

Therefore, this case further demonstrates the need for future research focused on identifying the cause, pathophysiology, and potential biomarkers for these reported "seronegative" autoimmune type glomerulopathies.

37. Concomitant pulmonary diagnoses in a dyspneic patient with a history of seronegative rheumatoid arthritis and travel across the US-Mexico border

Juan Simon Rico-Mesa, MD; Averi White, BS; Stephanie Levine, MD

Clinical Scenario: This case involves a 66-year-old Hispanic female presenting to the emergency department with dyspnea at rest. Per the patient,

her symptoms started suddenly fifteen days ago. The patient lives in Mexico but sought care at our south Texas institution. Her medical history is significant for hypothyroidism and rheumatoid arthritis (RA).

Clinical Decision Making: Upon admission, the patient was hypoxemic with an oxygen saturation of 80% despite bilevel positive airway pressure (BiPAP) and high flow nasal cannula (HFNC) at 40 L/minute. A subsequent chest x-ray (CXR) demonstrated complete opacification of the right lung along with upper lobe opacifications in the left lung. A CT chest with PE-protocol revealed diffuse bilateral opacities with numerous air bronchograms. The patient continued to desaturate despite maximal non-invasive mechanical ventilation and ultimately required intubation on the third day of hospitalization. Initial oxygenation settings were as follows: volume control-assist control (VC-AC) mode, FiO2 80%, PEEP 10, synchronous with the ventilator. The patient required a step-up to airway pressure release ventilation (APRV) mode on the fourth day of hospitalization. The initial work-up for hypoxemia ruled out pulmonary embolism and bacterial pneumonia (via negative procalcitonin). A transthoracic echocardiogram was performed and revealed normal cardiac function without signs of pulmonary hypertension. At this point in the work-up the differential diagnosis for the patient included the following: rheumatologic disease, diffuse alveolar hemorrhage, and alveolar proteinosis. A rheumatologic panel was subsequently obtained and showed negative anti-nuclear antibodies (ANA), extractable nuclear antigen (ENA), and rheumatoid factor (RF); however, the panel revealed positive antineutrophil cytoplasmic antibodies (ANCA) directed to proteinase 3 (PR-3). These findings supported an ultimate diagnosis of granulomatosis with polyangiitis (GPA), formerly called Wegner's granulomatosis, presenting with diffuse alveolar hemorrhage. High-dose methylprednisolone was initiated as immunosuppressive treatment prior to bronchoscopy with bronchoalveolar lavage (BAL). Bronchoscopy findings were consistent with diffuse alveolar hemorrhage, likely secondary to PR-3 positive ANCA vasculitis. Whilst awaiting the BAL results, rituximab was initiated per rheumatology recommendations and the patient experienced symptomatic improvement. After two days, the BAL results returned positive for aspergillus galactomannan, consistent with pulmonary aspergillosis. Voriconazole was added to the patient's treatment regimen and the patient was extubated. The patient was discharged on prednisone after completing the rituximab course.

Conclusion: Diffuse alveolar hemorrhage is associated with granulomatosis with polyangiitis; however, it is rarely associated with rheumatoid arthritis, particularly in seronegative disease, as in the patient presented. Early recognition is critical because adequate immunosuppressive treatment must be initiated as soon as possible. This case illustrates a complex diagnosis encompassing two rheumatological diseases (GPA and RA), presenting with concomitant pulmonary aspergillosis and diffuse alveolar hemorrhage secondary to GPA, presenting a challenge in diagnosis and management for the clinician.

38. Acute respiratory distress syndrome from *Pneumocystis jiroveci* pneumonia in a patient with ectopic ACTH-dependent Cushing's syndrome

Kanza Muzaffar, MD; Anna Buteau, MD;
Steven Taylor, MD

A 70-year-old woman was admitted to our institution with signs and symptoms of Cushing syndrome that had rapidly progressed over two months. A diagnosis of ACTH-dependent Cushing's syndrome was confirmed by 24-hour urine free cortisol quantification (9,878 mcg/24 hours, normal 3.5-45 mcg/24 hours), serum cortisol (93.3 mcg/dL, normal 3.7-19.4 mcg/dL) and serum ACTH (513.6 pg/mL, normal 6-50 pg/mL). Ketoconazole was promptly initiated to inhibit adrenal steroidogenesis and within five days serum cortisol dropped to 15.5 mcg/dL. After MRI of the brain showed no evidence of pituitary adenoma and inferior petrosal sinus sampling confirmed an ectopic focus of ACTH hypersecretion, localizing imaging studies showed a probable secretory neuroendocrine tumor in the right upper lung lobe.

As planning was undertaken for curative right upper lobe wedge resection, the patient developed new onset hypotension, hypoglycemia, hypothermia and lethargy. An infectious workup was initiated and the patient was started on broad spectrum antibiotics. Serum cortisol continued to be normal, with levels ranging from 7.7 mcg/dL to 16.5 mcg/dL. While adrenal insufficiency was unlikely, the dose of ketoconazole was decreased to ensure endogenous cortisol was not suppressed. Serial chest radiography subsequently showed new and worsening bilateral lung infiltrates with hypoxemia progressively worsening to severe ARDS requiring intubation. Bronchoalveolar lavage confirmed a positive direct fluorescence antibody (DFA), consistent with Pneumocystis Jiroveci pneumonia.

Therapeutic trimethoprim-sulfamethoxazole was started, ketoconazole was stopped, and the patient was started on hydrocortisone as indicated for Pneumocystis Jiroveci pneumonia. The patient continued to oxygenate poorly with ARDS Net protocol ventilator management including prone positioning, and ultimately passed away.

This case illustrates the potential for severe life-threatening infectious complications in patients with hypercortisolism, and specifically the possibility that latent opportunistic infections present due to chronic immunosuppression can become life threatening when the hypercortisolism is treated. This presents the query, of which limited data is currently available, of whether these patients should receive prophylaxis for Pneumocystis Jiroveci pneumonia. Although case series have been reported with opportunistic infections in patients with ectopic ACTH-dependent Cushing's syndrome, it is worthwhile to remark that patients with Cushing's syndrome have a blunted ability to localize infection and are not routinely given prophylaxis as are patients with more common causes for immune suppression. Waiting for clinical biomarkers and radiographic evidence of infection often delays therapy and leads to poor outcomes. In the absence of ideal curative surgery, it is imperative to medically manage hypercortisolism, actively surveil for infectious complications, and strongly consider initiating prophylaxis to opportunistic infections such as *Pneumocystis jiroveci.*

39. Renal actinomycosis, unusual presentation without significant risk factors

Karrar AL Gburi, MD; Hussein Aljobori, MD; Andres Suarez, MD; Chelsea Chang, MD

Actinomyces is a rare disease, subacute to chronic infection caused by filamentous, gram positive, non-acid fast, anaerobic- to microaerophilic bacteria. Abdominal actinomycosis accounts for 10–20% of cases. We report renal actinomyces which is even rarer. Only around 25 cases were reported since 1990.

The patient is 48-years old woman with a history of type 2 diabetes presented with generalized body weakness and abdominal pain for three weeks. Upon evaluation, she was found to be in severe sepsis and has anemia with Hb 3.4 gm/dl. Abdominal CT scan was showing left renal subcapsular hematoma measuring 16 cm $\times$ 10 cm with perirenal fat stranding. After resuscitation, the patient underwent exploratory laparotomy with left radical nephrectomy, due to suspicion of neoplasm versus abscess. Biopsy showed organizing abscess cavity with sulfur granules and gram-positive filamentous bacteria consistent with renal actinomycosis and was negative for malignancy. The patient was started on IV penicillin G to be continued for 6 weeks followed by 6 months of oral Amoxicillin.

The most common site for actinomycosis are cervicofacial, thoracic and to a lesser degree abdominal. Abdominal/pelvic actinomycosis usually affects appendix, and gastrointestinal tract with presentation similar to inflammatory bowel diseases. Risk factors include intrauterine devices, history of abdominal surgeries, perforated viscus or ingestion of foreign bodies. For renal actinomycosis, routes of infection are either direct transmission from other infected organs or hematogenous spread. In our case, we could not find other sources of actinomyces infection, and the only risk factor in our patient was diabetes mellitus.

The treatment for renal actinomycosis is usually medical, with penicillin G if the diagnosis was made early on. In some cases, due to resemblance with renal neoplasm, surgical intervention is unavoidable,

especially with big renal masses and necrosis. Renal Actinomycosis should be considered in the differential diagnosis of renal masses especially in patients with risk factors.

40. Allopurinol can leave a scar: the importance of HLA B58:01 testing

Keshav Poddar, MD; Leslie Cler, MD, FACP

Introduction: Gout affects 1% of the United States population annually, representing about 3 million cases per year. 16 million prescriptions for allopurinol are written annually, and it has been associated with a severe, life threatening side effect of Severe Cutaneous Adverse Reaction (SCAR), which may be underappreciated by internists and rheumatologists. In general, Type A adverse drug reactions account for 85% of drug side effects. These are dose dependent and related to the primary effect of a drug, an example being hypotension after taking an increased dose of blood pressure medication. Type B adverse drug reactions account for 15% of drug side effects. These are less predictable and typically involve hypersensitivity in unpredictable drug doses. Allopurinol is commonly implicated in Type B reactions–especially cutaneous. Stevens-Johnson syndrome, toxic epidermal necrolysis, and DRESS (Drug Rash with Eosinophilia and Skin Symptoms) syndrome have all been associated with allopurinol.

Case Description: A 61-year-old Han Chinese male presented with 4–5 weeks of failure to thrive, hiccups, malaise, and fevers up to 101.5 degrees Fahrenheit at home. The patient had been admitted one week prior due to similar symptoms. His primary care physician recently (within 3 months) started gabapentin and chlorpromazine for hiccups, and allopurinol for gout. Drug fever was suspected, and the patient was asked to discontinue gabapentin, allopurinol and chlorpromazine. An abbreviated infectious workup for eosinophilia was negative for *Herpes simplex* virus, Strongyloides, and *Mycoplasma pneumoniae,* and he was discharged.

On repeat admission he admitted to occasional use of allopurinol since his discharge home. Blood pressure was 90/50 mmHg, temperature was 100.5 degrees Fahrenheit, and heart rate was 100 beats/minute. Physical examination showed facial plethora, dry mucous membranes, and a diffuse morbiliform rash covering 70 percent of his body. Laboratory data was notable for white blood cell count of 20,000 per microliter, with 6,200 eosinophils per microliter, and 31% eosinophils. Peripheral blood smear confirmed eosinophilia. A skin biopsy showed combined spongiotic and perivascular dermatitis with eosinophils and neutrophils, all of which was consistent with SCAR. His symptoms quickly improved with oral prednisone. HLA B58:01 allele was positive, which is associated with allopurinol hypersensitivity.

Conclusion: The patient was warned to avoid the use of allopurinol in the future. HLA B58:01 allele testing in the Han Chinese population is routine in East Asian countries prior to treatment with allopurinol. Despite recommendations by the American College of Rheumatology, testing is often overlooked.

41. Hepatostellular: Von Meyenburg complexes in patient with pancreatic adenocarcinoma

Kevin K. Yu, MD, MS; Wasay A. Mohajir, MD; Layth H. Alzubaidy, MD; Robert A. Spencer, MPH; Preethi M. Reddy, MD

Introduction: Von Meyenburg Complexes (VMC) are rare clinicopathologic entities. They are comprised of benign biliary hamartomas that are often found incidentally on abdominal imaging. This case features a patient who was diagnosed with pancreatic adenocarcinoma who was incidentally found to have multiple lesions in the liver that was eventually diagnosed as VMC, which dictated his therapeutic and clinical course.

Clinical Presentation: A 59-year-old man with hypertension and hyperlipidemia presented with a 3-week history of postprandial right upper quadrant (RUQ) abdominal pain, non-bloody vomiting, and a 20-pound weight loss. He described the pain as sharp, crampy, and becoming progressively pronounced. He denied sick contacts, fever, diarrhea, pale stool, skin discoloration, or hematuria.

On admission he was found to have elevated AST, ALT, and alkaline phosphatase. A hepatitis panel was negative. MRCP of the abdomen revealed a mass in the pancreatic head with associated mild narrowing of various portions of the biliary tree. CA19-9 was elevated. A subsequent biopsy via EUS confirmed the mass to be well-differentiated adenocarcinoma. Incidentally, the MRI also found multiple hepatic lesions of varying size that had imaging patterns consistent with VMC.

The pancreatic mass was amenable to surgical resection as it spared the superior mesenteric vein (SMV), the celiac axis, and the superior mesenteric artery (SMA). However, due to the concern that the presumed VMC in the liver could be metastatic lesions or a combination of VMC with superimposed metastatic lesions, the lesions were ultimately biopsied and confirmed to be benign biliary hamartomas.

Discussion: VMC are benign biliary hamartomas that are thought to arise from embryonic bile duct remnants that failed to involute. Small, disorganized clusters of dilated cystic bile ducts, VMC may be mistaken for metastases to the liver in a patient on imaging. In this case, the decision had to be made whether to treat this patient surgically or with only chemoradiation. Resectability of pancreatic adenocarcinoma is dependent on factors such as presence of distant metastases, attachment to other organs, arterial or venous involvement, or metastasis to lymph nodes.

VMC have characteristic imaging findings. The lesions are hypointense on T1 and hyperintense on T2. The diagnosis can often be made based on imaging findings alone. However, in the case presented, a biopsy of the lesions was pursued to confirm the diagnosis given possible alteration of therapeutic approaches if the patient's primary adenocarcinoma of the pancreas had metastasized to the liver.

Conclusion: Treatment of malignancies depend on the staging of the disease and VMC can often be mistaken for metastases. Recognizing imaging findings with confirmation of the diagnosis allowed the patient to undergo curative resection of the malignancy. The patient is currently doing well and in remission.

42. Mediastinal germ cell tumor with hemophagocytic lymphohistiocytosis (HLH)

Kiran Ghimire; Onyedika Umenaeto; M Nawar Hakim; Sumit Gaur

A previously healthy 20-year-old male presented with a 1-month history of intermittent chest pain, productive cough, weight loss and fever. On exam, pulse rate was 130/min, blood pressure BP 164/80. Liver and spleen were palpable. Chest X ray showed a large mediastinal mass. CT scan of the chest showed an enhancing $10 \times 10 \times 12$ cm. Laboratory tests showed WBC 3240 (ANC 2140), Hemoglobin 8.7 gm/dl and platelets 43000/mcl, AFP 2070 ng/ml, hCG 187.92 mIU/ml. Biopsy of the mediastinal mass revealed a mixed germ cell tumor (85% yolk sac, 10% seminoma and 5% embryonal). Testicular ultrasound and CT of abdomen/pelvis did not show any other site of disease. A bone marrow biopsy was obtained to evaluate anemia and thrombocytopenia. This showed normal cellularity with increase in foamy macrophages showing hemophagocytosis of red blood cells and platelets. Further analysis for HLH showed high triglyceride (301 mg/dl), elevated soluble Interlukin-2 receptor (sIL2R) levels (15,798 pg/ml), elevated ferritin (3380 ng/ml). A next generation sequencing panel to evaluate for mutations in 26 genes associated with inherited HLH revealed no mutations or copy-number variants, establishing a diagnosis of malignancy associated HLH.

Patient commenced systemic therapy with bleomycin, etoposide and cisplatin. Dexamethasone was administered to control HLH. After 2 cycles, AFP decreased to 139 ng/ml and HCG became undetectable. However, he continued to have complications related to cytopenias and eventually expired while awaiting a stem cell transplant.

Although germ cell tumors are considered curable with cisplatin based regimens, a minority (<1%) of patients with primary mediastinal germ cell tumors present with an associated hematological syndrome,

including HLH. These patients have a universally poor outcome despite therapy.

HLH is a life-threatening syndrome of excessive immune activation. The signs/symptoms of HLH are due to impaired cytotoxic function of NK cells, impaired downregulation of activated macrophages and lymphocytes and overproductions of inflammatory cytokines, chiefly Interferon-gamma. Acquired HLH is seen in the setting of malignancy, infection or auto-immune disorders. HLH can be diagnosed by demonstration of either familial HLH gene mutations or by fulfilling 5 out of 8 diagnostic criteria: fever, splenomegaly, cytopenia, hypertriglyceridemia/hypofibrinogenemia, pathological demonstration of hemophagocytosis, impaired NK cell activity, ferritin >500 ng/ml and elevated sIL2R (>2400 U/ml).

The causal link between mediastinal germ cell tumors and HLH has not been well studied. We performed a comprehensive next generation sequencing of 26 genes implicated in familial HLH and found no mutations. A better understanding of the pathogenesis of the syndrome may lead to better treatment outcomes for these patients.

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43. When heuristics fail; unraveling a convoluted case of seemingly unrelated symptoms

Kristin Stoll, DO; M. Christina Cuartas;
Jack Badawy, MD

Introduction: Clinical decisions are multifaceted processes requiring amalgamation of data to quickly arrive at a differential to guide management. Behavioral decision science reveals that physicians apply heuristic cognitive processes; mental shortcuts allowing for simplification of assumptions and pattern recognition. The representativeness heuristic, first defined by Kahneman and Tversky in 1972, is the process of making judgements regarding pathology by comparing it to a typical case of a specific diagnosis. This heuristic fails when there is an atypical presentation, particularly when the pathology is rare and the symptoms ambiguous.

Case: A 61-year-old female with history notable for Crohn's disease in remission after two bowel resections presents with dysphagia associated with a 16 kg weight loss over six weeks. She denies prior urological history, including cystitis. Review of symptoms is positive for chronic diarrhea which stopped 3 days prior to admission and new onset dysuria and polyuria. She is afebrile and remains hemodynamically stable throughout admission.

Initial laboratory studies demonstrate leukocytosis (16.9 $\times$ 109/L), anemia (hemoglobin 6.7 g/L) and an elevated CRP (190 mg/L). Urinalysis is concerning for cystitis and empiric antibiotic therapy is initiated. Upper endoscopy and colonoscopy are without gross abnormalities. On day two, the patient remains hospitalized without a diagnosis unifying her indolent symptoms. The medical team continues to gather data and broaden the differential.

Given severe constipation, a plain film of the abdomen is obtained. It reveals a large radiopaque stone, which leads to a computed tomography of the abdomen/pelvis demonstrating a 12 mm stone in the right proximal ureter. An 8.7 cm perinephric abscess is visualized with replacement of the renal tissue by low density areas surrounded by an enhanced ring, classically termed a bear print sign. It is pathognomonic for xanthogranulomatous pyelonephritis (XGP).

While the imaging findings in this patient are representative, paradoxically, the diagnosis mystifies the team. XGP is an uncommon variant of chronic pyelonephritis. It preferentially affects immunocompromised middle-aged women with recurrent cystitis, flank pain, fever and sepsis. This pathology is never considered in the increasingly broad differentials being considered.

Discussion: Consistent with type I reasoning, clinicians rely on the representativeness heuristic for rapid judgements when first encountering a patient. Here, the team relied on this heuristic for an initial differential for the indolent constellation of presenting symptoms. When the application of this heuristic failed, the team went back to the beginning to find a diagnosis satisfying the clinical picture. While the representativeness heuristic is important in practice, it should not be relied upon at the expense of an accurate diagnosis. When Type I reasoning fails, it is imperative to then apply Type II reasoning. Type II thinking is more deliberate, forward thinking and asks the question where did the hypothesis fail?

Disclaimers: The views expressed herein are those of the authors and do not reflect the official policy or position of Brooke Army Medical Center, the U.S. Army Medical Department, the U.S. Army Office of the Surgeon General, the Department of the Army and Department of Defense.

44. Coronary artery dissection in multiparous postpartum patient

Kuroush Nezafati, MD; Hetendra Makanbhai, MD; Leigh Hunter, MD, FACP

Introduction: Evaluation of chest pain should be performed diligently, even in patients without typical risk factors or demographics. Spontaneous coronary artery dissection (SCAD) is an important and rare etiology of chest pain, especially in young women with a history of recent emotional or physical stressors such as peripartum or postpartum time frames. A case of SCAD will be presented along with discussion of severity of dissection, management, associated morbidity and mortality, and outcomes.

Case Presentation: A 29-year-old G5P5 woman with a past medical history of preeclampsia during her 3rd pregnancy presented to the Emergency Department (ED) with substernal chest pain 18 days postpartum. The pain was pressure-like, non-exertional, and radiated into bilateral upper extremities. She initially attributed her symptoms to anxiety, but with a 3rd episode of pain and her measured systolic blood pressure of 180 mmHg at home, she sought medical attention. Evaluation in the ED demonstrated normal chest radiograph and electrocardiogram (ECG) with ST segment depression in precordial leads concerning for subendocardial ischemia. Initial troponin was 0.739 ng/mL and 4.27 ng/mL six hours later prompting angiogram which showed multiple dissections in left anterior descending (LAD) & left circumflex arteries with antero-apical hypokinesis, but preserved ejection fraction. The most significant of these dissections was within the LAD which had extensive anterograde and retrograde involvement. Two long stents were placed in this vessel, one extending proximally to left main coronary and one distally to the distal third of the LAD. The left circumflex dissection showed no intimal flap and good wall integrity. Vessel branches off the marginal branch also showed areas of dissection with no wall compromise. The patient was placed on dual antiplatelet therapy along with statin and beta blocker therapy and recovered well.

Conclusion: SCAD is an important and rare cause of acute coronary syndrome (ACS) more commonly found in younger women who generally carry far fewer comorbidities than other ACS patients. Yet, SCAD is associated with significantly increased mortality above other ACS causes. Depending on findings during angiogram, SCAD management can vary from conservative management (hypertension control and beta blocker use) to interventions including coronary stenting.

45. Treatment induced neuropathy of diabetes; how much is too much control?

Lauren Hutson, MD, MBA; Christopher Hearne, MD

Abstract: Treatment Induced Neuropathy in Diabetes (TIND) can develop from the rapid correction of glycemic level. It has been reported that patients with a long history of hyperglycemia have

an increased chance of this occurring (Gibbons and Freeman, 2010). Additionally, noted, in both type I and type II (Dabby, 2009) with the use of insulin or oral hypoglycemic agents.

The first case was described in 1933 by Charles Caravati, of a woman that had severe burning pain after starting treatment with insulin. The pain returned when insulin was restarted, at this time this was called "insulin neuritis" and presumed that the patient had an allergic reaction (Caravati, 1973).

Similar descriptions have been introduced by case reports over the years with terms such as "acute painful neuropathy" or "diabetic neuropathic cachexia." In review of (Gibbons, 2017) it appears that the common theme among the cases is that the symptoms begin with rapid improvement of glycemic control.

In 2010 a case series reported by (Gibbons and Freeman, 2010) described 16 cases that were inclusive of both type I and type II. Two common factors to describe TIND are neuropathic pain and autonomic dysfunction both correlated to the rate at which the glycemic level correction takes place.

Patients with TIND present with pain and autonomic dysfunction after the glycemic level has been controlled rapidly. Our patient, observed progression of his tingling/pain after rapid correction of his glycemic level, accompanied by an upset stomach subsequently found to be gastroparesis. His neuropathy was small fiber in nature, similarly, reported by the literature (Gibbons and Freeman, 2010). Similarly, to most of the previous patients described our case report fits the classical description of TIND. Therefore, TIND should be kept in mind when approaching the patient with hyperglycemia. A gradual reduction in A1C should prevent this devastating complication.

46. Stuck between a rock and a hard place: the dangers of prolonged hospitalization

Lucy Esteve; Libia Vasquez; Carolyn April

Learning Objectives:

1. Recognize health inequalities in incarcerated patients
2. Assess the dangers of prolonged hospitalization

Case: A 44-year-old woman presented from county jail with a two-week history of daily fevers, chills and night sweats. She also reported right scapula pain and intermittent nausea but denied any other systemic symptoms such as cough, shortness of breath, chest pain, diarrhea, vomiting, abdominal pain, dysuria, rash or weight loss. Her past medical history was significant for intravenous heroin abuse which she last used one month prior to incarceration.

On physical exam, she was febrile to 103.2 degrees Fahrenheit, tachycardic, tachypneic and had an ejection systolic murmur as well as track marks on her extremities. Sepsis workup was completed and she was immediately started on broad spectrum antibiotics (Cefepime and Vancomycin). She was diagnosed with Methicillin Sensitive Staphylococcus Aureus (MSSA) bacteremia secondary to native tricuspid valve endocarditis with associated pulmonary septic emboli and transitioned to Cefazolin for a total of six weeks. As she was incarcerated, she remained hospitalized for the duration of her treatment. She was followed by ten different physicians and received weekly lab draws. Despite a clear downward trend in white blood cell counts, her Cefazolin-induced neutropenia was only detected thirty days post admission. She was switched to Vancomycin at this point. Ten days later, she developed recurrent fevers, hypotension refractory to fluid resuscitation and a new diffuse erythematous pruritic rash so her antibiotic regimen was broadened to Vancomycin, Cefepime and Micafungin and she was transferred to the intensive care unit (ICU) where she required vasopressor support for two days. Her skin biopsy was consistent with an exanthematous drug eruption secondary to Cefepime that was treated with steroid therapy. Her admission was complicated by ICU delirium and steroid induced psychosis. She completed her six-week antibiotic regimen and was discharged back to jail.

Impact: This case reinforces the dangers of prolonged hospitalizations and multiple transitions of care between healthcare providers. Additionally, it highlights the importance of following trends to prevent high complication rates including hospital acquired infections, reactions to therapeutic drugs, poor long term cognitive outcomes (ICU delirium) which have been shown in multiple prospective cohort studies.

Discussion: The patient's incarcerated status made her structurally vulnerable to health inequalities. She was considered a "rock" while hospitalized due to her prolonged stay which led to the delayed detection of her progressive leukopenia and exposed her to potentially avoidable hospital acquired infections, re-exposure hypersensitivity drug reactions and ICU related complications including delirium.

47. IgA nephropathy: a rare case in a man of African descent on warfarin

Luis C. Segura, DO; Anuj Goel, MD; Roberto Collazo-Maldonado, MD

Introduction: Immunoglobulin A (IgA) nephropathy is a mesangial proliferative glomerulonephritis characterized by diffuse mesangial deposition of IgA. It is more commonly seen in Asians, Caucasians, and Hispanics, but is rarely diagnosed in African Americans. Anticoagulant related nephropathy (ARN) is a newly recognized cause of acute kidney injury (AKI) and risk is increased in those patients with IgA nephropathy. We present such a case.

Case Presentation: A 57-year-old African-American man with a past medical history of thromboembolic disease on warfarin therapy, hypertension, and chronic kidney disease stage 3 presented to our hospital with foot pain and gross hematuria. On physical examination, he was afebrile, blood pressure of 140/60 mmHg, clear lungs fields, and no peripheral edema. His admission laboratory data showed creatinine of 15.17 mg/dL (baseline 1.6 mg/dL), BUN 100 mg/dL, HCO-3 14 mmol/L, and INR 3.8. Urinalysis showed large blood, with red blood cell casts and nephrotic range proteinuria of 4.1 grams. Serologic evaluation was non-diagnostic. Renal ultrasound showed echogenic kidneys without hydronephrosis. After reversing the anti-coagulant effects of warfarin, kidney biopsy was performed and was consistent with IgA nephropathy with cellular crescents and moderate interstitial fibrosis. The patient was treated with methylprednisolone 1 gm/daily for 3 days and was then transitioned to prednisone 60 mg daily. He also received 1 gram of cyclophosphamide, with recommendations to continue cyclophosphamide once per month for 6 months. His creatinine improved throughout his admission from 16.15 mg/dL to 6.60 mg/dL and he was discharged without need for dialysis. In addition, he was discharged on apixaban instead of warfarin.

Discussion: Anticoagulant related nephropathy (ARN) is defined as an acute increase in serum creatinine of >0.3 mg/dL within 1 week of an INR >3.0. Chronic kidney disease and in particular, IgA nephropathy, are risk factors for ARN. We must be aware of the relationship of these two conditions and include both in the differential diagnosis of glomerulonephritis in African American patients.

48. The devil, the doctor, and the wolf

Luyang Jin, MD, MPH; J. Alex Zamora-Legoff, MD; Henry Kwang, MD; Laura Garcia, MD, FACP

Introduction: The etiologic relation of viral infections, particularly Coxsackie virus Group A/B, to acute pericarditis is well-known. Here we present a case of perimyocarditis in a young male on clozapine, a medication associated with myocarditis, who had an intriguing differential diagnosis. Coxsackievirus's ubiquitous nature, and its widely known "devil's grip," was discounted for a curious association.

Case Presentation: A 27-year-old Caucasian male, with a past medical history of underlying schizophrenia requiring care at a long-term residential inpatient psychiatric facility (LTRIPF), was transferred to our emergency department (ED) with complaint of chest pain. He initially experienced nausea and subjective fevers that progressed to non-exertional pressure-like pain over his left chest, as well as sternal pain that improved upon sitting up and leaning forward. Per the accompanying LTRIPF employee, clozapine was the sole medication that was recently initiated. Patient was afebrile, tachycardic, normotensive, and on exam auscultation was negative for a pericardial friction rub. Workup revealed an initial troponin of 72.9, and EKG showed diffuse ST segment elevation, PR depression, and PR interval elevation on aVR. Cardiology performed a bedside echocardiogram which showed normal left ventricular systolic function without wall motion abnormalities or pericardial effusion. Patient

was admitted with a presumed diagnosis of acute perimyocarditis due to recent initiation of clozapine. After discussing with the psychiatry consultant and primary inpatient psychiatrist, clozapine was tapered down and switched to olanzapine. ANA and viral antibody-titer levels were sent. Patient improved symptomatically with treatment, troponins down-trended appropriately and formal echocardiogram confirmed benign findings. Patient was discharged on NSAIDs and colchicine. Serology later demonstrated significantly positive Coxsackie A/B titer antibodies.

Discussion: The most common cause of acute pericarditis is viral, presumed to be up to 80–90% of cases with Coxsackie A and B being the most ubiquitous. Other possible etiologies encompass idiopathic, non-viral infections, autoimmune, and rarely drug-related causes. Clozapine—"the doctor"—has an association with myocarditis and a reported international incidence rate of 0.015% to 8.5%. Additionally, pericarditis in a young male is a potential presentation for SLE—"the wolf." The intriguing drug association dominated the differential of the team, despite the high pre-test probability of a viral cause especially coxsackie—"the devil." At the time of discharge, we anchored to clozapine-related sudden perimyocarditis. Our patient's rapid improvement after clozapine discontinuation contributed confirmation bias to our thought-process. The final results of a positive serology for Coxsackie highlight the importance of following outcomes as a formative habit. In performing a group cognitive autopsy, we re-calibrated our problem representation to better reflect epidemiology, reviewed our diagnostic schema for undifferentiated chest pain, and refined illness scripts for conditions such as pericarditis that have multiple causes.

49. Abdominal pain as an unusual presentation of non-bacterial thrombotic endocarditis in the setting of pancreatic cancer

Matthew Yang, MD; Ashley Patel, MD; Rachna Goswami, MD, MPH; Michelle Sibille, MD

Non-bacterial thrombotic endocarditis (NBTE) is a rare condition that is most often seen in the setting of advanced malignancy or connective tissue disease. Here we present a case of NBTE diagnosed after further investigation of infarcts that were incidentally found during evaluation of abdominal pain.

A 49-year-old man with metastatic pancreatic adenocarcinoma diagnosed three months ago, and not yet on therapy, presented to the emergency room with symptoms of nausea, vomiting, and abdominal pain for one day. Computed tomography of the abdomen and pelvis showed splenic infarcts, bilateral renal infarcts, and increased size of hepatic metastases. On the second day of hospitalization, he developed confusion and aggressive behavior. Magnetic resonance imaging of the brain demonstrated multifocal acute infarcts scattered throughout the cerebral hemispheres bilaterally. Subsequent transthoracic echocardiogram and transesophageal echocardiogram showed a broad-based mitral valve vegetation. At that time, the differential diagnosis included infectious endocarditis or NBTE. He was started on therapeutic enoxaparin and empiric antibiotic treatment. Blood cultures and other infectious evaluations that had been obtained remained negative. Despite these treatments, the patient remained intermittently confused and agitated with declining functional status. Oncology was consulted and recommended against chemotherapy, and he was transitioned to inpatient hospice care. Therapeutic enoxaparin was discontinued due to patient and family preference for comfort-only interventions, and he died four days later.

This case presented both diagnostic and management dilemmas. NBTE is often difficult to diagnose due to its insidious nature. Patients often lack the classic symptoms of infectious endocarditis such as fever and murmurs. The initial abdominal pain was the only clue to the presence of NBTE in our patient. In patients with adenocarcinomas, embolic phenomena such as NBTE should be on the differential as a cause of new and nonspecific symptoms including abdominal pain.

This case also highlights the challenges of anticoagulation in patients with life-limiting illnesses that confer poor prognoses. Evidence for anticoagulation is limited in this population due to the low incidence of NBTE. One could advocate for continuing

anticoagulation to decrease the propagation of further emboli. On the other hand, there is an increased risk of intracranial bleeding in patients with known cerebral infarctions. Ultimately, the decision regarding anticoagulation in patients with NBTE needs to account for individual patient factors and values.

50. Manifestation of gastrointestinal histoplasmosis in patient without predominant exposure

Matthew McGlennon, DO, MS; Nathan Markel, MD; Tapasdip Gajjar, MD; MaryAnn Tran, MD; Dan Cohen, MD

Introduction: Histoplasmosis is a fungal pathogen caused by *Histoplasma capsulatum* that typically affects people living in the Mississippi River region of the Northern Midwest United States, causing lung infections in thousands of people per year. Rarely, the infection can spread to other parts of the body, including bone marrow, blood, and the gastrointestinal tract. We present a case of gastrointestinal histoplasmosis without lung findings that arose purely within Texas from unknown sources.

Case Description: A 37-year-old man is seen in the ED for nausea, vomiting, and one bloody bowel movement. Patient has a past medical history of systemic lupus erythematosus with anti-phospholipid syndrome, Factor V Leiden mutation controlled with warfarin, CVA, and ESRD from lupus-associated nephritis on peritoneal dialysis. Patient admitted for endoscopy where multiple lesions were found within the stomach, duodenum, and large intestine with biopsies taken of each ulceration for suspected inflammatory bowel disease. Pathology reported a few days later of cell body inclusions indicative of *Histoplasmosis capsulatum* infection. Patient was readmitted to the hospital where full workup was done. Patient started on amphotericin B and transitioned to itraconazole for one year. CBC indicated pancytopenia, with bone marrow biopsy showing no *Histoplasma capsulatum* infection, but hypocellular marrow w/ negative leukemia/lymphoma workup. Patient had been off immunosuppressants for over 6 months by date of initial biopsy, had not visited any at risk areas. CT scans of chest negative for acute inflammatory changes or chronic calcifications indicative of an acute or chronic infection. Initial blood fungal cultures positive, but repeat fungal cultures negative after initial dose of amphotericin B.

Conclusion: This case highlights a few aspects, namely that the level of induction for systemic infection of Histoplasmosis may be lower than suspected, especially given the absence of immunosuppressant medications, but there are cases of variable immunodeficiencies that are linked to SLE, namely common variable immunodeficiency and chronic granulomatous disease. Although he previously was seen by Heme/Onc in the past for pseudo-thrombocytopenia and ESRD-related anemia, it is possible he also has a functional T cell deficit, given frequent gastrointestinal and subcutaneous infections. Route of acquisition remains unknown, given that the current state is not typically endemic for Histoplasmosis, and that his history lacks risk factors for contraction, such as spelunking or working on a farm, but may have been acquired through other means.

51. I've got you under my skin: a case of *Chlamydia pneumoniae* induced rash and mucositis

Meera Bhakta, DO, MPH; Meghana Gadgil, MD, MPH

Introduction: Chlamydia pneumoniae-induced rash and mucositis (CIRM) is a newly characterized dermatologic complication of C. pneumoniae infection.

Case Description: A 19-year-old man with no significant past medical history presented with a two-week history of worsening intraoral, ocular, and genital ulcerations. The patient reported he initially had sinus congestion, rhinorrhea, and bilateral edematous conjunctiva, for which he received amoxicillin and pseudoephedrine from urgent care. Four days later, he presented to a dentist with swollen lips, intraoral mucosal ulcerations, and odynophagia and was given lidocaine mouthwash, steroids, and trimethoprim-sulfamethoxazole, after which the patient had mild improvement. One week prior to admission, the patient developed daily fevers between 101–103F and worsened oral ulcerations. The day prior to admission, he developed new rashes on his

genitalia and reported dysuria. He was given valacyclovir and fluconazole at an urgent care. When his symptoms worsened overnight, he was admitted from our ER.

The patient's family history was negative for autoimmune disease and the patient denied use of tobacco, alcohol, or drugs. He worked as a lifeguard, in fresh water and a chlorinated pool. He had one monogamous sexual partner with whom he used condoms consistently. The patient reported his latest sexually activity was two weeks prior to admission. He denied a history of STIs.

During admission, the patient's workup was negative for HIV, chlamydia trachomatis, gonorrhea, and HLA-B27. His chest x-ray was unremarkable. The patient was started on azithromycin empirically. Dermatology biopsied an oral vesicle which had a negative HSV PCR result. His respiratory mucosal swab was PCR-positive for chlamydia pneumoniae. He was diagnosed with chlamydia pneumoniae-induced rash and mucositis. The patient was treated with moxifloxacin per infectious disease consult, chosen due to concern for macrolide resistance reported in some chlamydial infections, and discharged home.

Discussion: Recent case reports in the literature characterizes a new syndrome, CIRM, to describe the mucocutaneous sequalae of *Chlamydia pneumonia* infection. A related entity, Mycoplasma pneumoniae induced rash and mucositis (MIRM), has been recognized in recent years as a unique mucocutaneous condition related to erythema multiform and Stevens-Johnson syndrome. CIRM strongly resembles MIRM: both have oral and genital erosions, but with a discrete provoking pathogen.[1] The pathophysiology is thought to involve polyclonal B-cell activation and antibody production.[2] The reactivation of the immune system in CIRM infections may lead to false diagnosis of other viral infections if only immunoassay is used. Cases of CIRM have been reported with HSV co-infection, requiring treatment of both pathogens.[1,3,4] This patient had a positive HSV serology, but confirmatory PCR proved negative for HSV infection. This case contributes to our understanding of CIRM as this is the second case in the literature and the first in an adult.

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52. Obesity: the forgotten and unaddressed diagnosis in primary care

Meily Arevalo; Rita Medrano; J. Drew Payne

Purpose: Obesity is a well-known health problem with an increasing prevalence over recent years. One-third of Americans are currently obese; however, it is estimated that only 29% of obese individuals are correctly identified in primary care visits in the United States. The goal of our study was to increase the rate of obesity documentation and diagnosis by 10% in a 2-month period. We projected that by highlighting the Body Mass Index (BMI), clinicians would document and diagnose obesity more frequently, and, therefore, offer interventions aimed at weight loss reduction.

Methods: A change to the check-in process was made to highlight BMI as part of the vital signs, and it was included in the card given to the providers before their encounter with the patient. This intervention was done for 2 months. Improvement was measured by comparing obesity documentation rates before and after the intervention and obesity-related therapeutic plans after the intervention.

Results: Before the intervention, 1486 charts were reviewed. 72 were excluded due to missing or

miscalculated BMI. The documentation of overweight patients was 0.42%, obesity class I was 1.18%, obesity class II was 13.52%, and obesity class III was 26.2%.

After our intervention, 1303 charts were reviewed. 542 patients were excluded due to missing BMI or BMI below 25. The documentation of overweight patients was 0.4%, obesity class I was 6.8%, obesity class II was 22.3%, and obesity class III was 44.3%. The total overweight and obesity diagnoses were 12.7% compared to 6.8% prior to the intervention. In summary, our intervention increased overweight and obesity diagnosis by 86.2%.

The most compelling evidence to highlight the BMI resides in the fact that those diagnosed with overweight and obesity were offered an intervention in 93.9% of the cases. These interventions ranged from diet and exercise counseling, printed education, dietitian, behavioral, obesity clinic or bariatric surgery referral. Also, not surprisingly, patients with obesity class III were much more likely to be offered an intervention in comparison to other obesity classes.

Conclusion: Our results show that our clinic has significant under-diagnosis of obesity, even lower than the national average. One of the limitations of our study was ensuring all encounters had the BMI highlighted; we hope to correct this in the future by highlighting the BMI in the electronic medical record. Obesity management requires a multidisciplinary approach. Our intervention, simple yet cost-effective, can encourage primary care physicians to increase the recognition, early identification, and, therefore, strategies aimed to promote weight loss and manage obesity.

53. Murine typhus: an atypical cause of acute respiratory distress syndrome

Christopher Nguyen, DO; Michelle Baliss, DO

Introduction: Murine typhus is a condition that is often difficult to diagnose due to its tendency to mimic other etiologies of fever, headache, and rash. Here we present a case of Murine Typhus with pulmonary involvement leading to acute respiratory distress.

Case description: A 22-year-old previously healthy female presented with fevers, vomiting, and diarrhea for 1 week. She also reported myalgias, headaches with jaw pain, and dizziness. She had been living in the Dominican Republic 2 months previously. She did not report any insect bites. Upon presentation she was febrile to 38.9, BP 105/76, HR 114, RR 24, O2 95% on room air. Labs were significant for leukocytosis of 12.72 with bandemia, Hgb 9.9, platelets 139, Cr 1.28, ALT 324, AST 324, ALP 240. Chest X-ray showed bilateral perihilar, bibasilar interstitial opacities, with evidence of pulmonary edema. The bedside echocardiogram was negative, and the abdominal US showed evidence of acute hepatitis. She was admitted and started on Vancomycin and Piperacillin-Tazobactam. She developed worsening leukocytosis, lactic acidosis of 2.64, HR 130, RR 38, and MAP 84 despite volume resuscitation and was transferred to the ICU.

On day 2 she developed acute hypoxic respiratory failure with PaO2/FiO2 ratio of 160 and CTA chest showing bilateral pleural effusions with compressive atelectasis. She was started on high flow supplemental oxygen by nasal cannula and diuresis. Her antibiotic therapy was switched to Doxycycline as there was strong clinical suspicion for Murine Typhus despite negative serologies (<1:64).

On day 4 she became afebrile, her tachycardia resolved, and her overall appearance was markedly improved. She also continued to be less dependent on supplemental oxygen. Repeat serologies for Murine Typhus returned positive on day 7 (1:256). She no longer required supplemental oxygen was discharged to finish her 7-day course of Doxycycline.

Discussion: Murine Typhus is typically a benign flea-borne illness caused by Rickettsia typhi, usually in areas with large populations of rats. The presenting symptoms are often non-specific, involving fever, headaches, rash, myalgias, vomiting, and diarrhea. More severe cases can result in acute renal failure, widespread vasculitis, splenomegaly, altered mental status, septic shock, and acute respiratory distress as was in our case. The pulmonary involvement is thought to be due to vasculitis causing damage to

the pulmonary microcirculation leading to pulmonary capillary leak and acute respiratory failure. Due to the initial serologies often being inconclusive, early diagnosis is established by typical clinical findings in the appropriate epidemiologic setting.

Positive indirect fluorescent antibody serologies can confirm the diagnosis with a fourfold antibody titer rise from the initial negative serologies. It has been suggested that early empiric antibiotic treatment with Doxycycline for 7–10 days is correlated with fewer relapses and more effective resolution of the condition.

54. Ignoring the subtleties of Poe: a literal and non-metaphorical case of misreading POEMS

Miguel Chavez, MD; Ethan Burns, MD; Martina Ogbonna, MD; Lawrence Rice, MD

Introduction: POEMS is a rare neoplastic syndrome due to an underlying plasma cell dyscrasia. Important clinical features include Polyradiculoneuropathy, Organomegaly, Endocrinopathy, Monoclonal plasma cell disorders, and Skin changes. However, this acronym does not include all the possible features, which may also include papilledema, volume overload, sclerotic bone lesions, thrombocytosis/erythrocytosis (PEST), elevated vascular endothelial growth factor (VEGF) levels, thrombosis, and abnormal pulmonary function tests. The following case illustrates a case of POEMS misdiagnosed as chronic inflammatory demyelinating polyneuropathy (CIDP).

Case Description: The patient is a 28-year-old male diagnosed with CIDP three years prior to presentation who presented from his primary care provider with progressive anasarca, hypocalcemia, and acute on chronic renal failure. He has remained quadriplegic due to his treatment resistant CIDP. Treatment included trials of plasma exchange therapy (PLEX), intravenous immune globulin, and high-dose steroids. Physical exam was significant for anasarca with significant ascites and 3+ lower extremity pitting edema, plus unusual skin thickening with patchy areas of hyperpigmentation with a waxy/shiny appearance on his bilateral lower extremities and dorsal aspects of his hands. Initial laboratory work-up indicated pancytopenia (WBC 2.91 $\times$ 103/uL, Hb 7.9 g/dL, Plt 59 $\times$ 103/uL) hypocalcemia (5.2 mg/dL) and hyperphosphatemia (4.7 mg/dL). He was placed on hemodialysis for volume control and administered intravenous calcium.

Further work-up demonstrated hypothyroidism, primary hypoparathyroidism, adrenal insufficiency, primary hypogonadism and hyperprolactinemia. He was also noted to have a 0.6 g/dL monoclonal IgG lambda spike on serum protein electrophoresis. He underwent a bone marrow biopsy that did not point toward a plasma cell dyscrasia. CT scan of abdomen/pelvis revealed splenomegaly, but no lymphadenopathy. Serum vascular endothelial growth factor (VEGF) levels were negligible. Bone survey was remarkable for right distal femoral osteosclerotic lesion. Patient met criteria for POEMS syndrome and was started on cyclophosphamide, dexamethasone and lenalidomide, as well as XRT to his femoral lesion.

Discussion: POEMS is a diagnosis easily missed if not considered, and patients with treatment resistant CIDP should be evaluated for POEMS. Diagnostic criteria include a composite of mandatory criteria, major criteria and minor criteria, requiring 3 major and 1 minor to establish the diagnosis. Assessing VEGF, radiographic assessment for sclerotic lesions, and bone marrow evaluation is necessary for diagnostic evaluation. EMG may be helpful in elucidating the differential, with POEMS syndrome having greater axonal demyelination, perivascular inflammation, and conduction slowing in the intermediate nerve segments compared to CIDP. Treatment is primarily based on case series, and typically targets the underlying plasma disorder with systemic chemotherapy or radiation.

55. Improving the no-show rate in an internal medicine clinic

Milazzo Eliana, MD; Perez Carlos, MD; Kiani Sarah, MD

Introduction: In ambulatory clinics, “No-shows”, also known as “Did not attend”, cause significant concern for healthcare providers. Ambulatory care

no-show rates vary from an average of 30% to 19%. The quality of therapeutic and preventive care decreases; emergency department visits and hospitalizations increase; health care staff productivity and job satisfaction decreases and costs increase. Multiple barriers jeopardize patients' ability to attend their scheduled appointments. Literature review shows that multifaceted interventions are successful in decreasing a clinic's no-show rate.

Methods: An interdisciplinary team including all stakeholders (clinic management, physicians, IT specialists, staff, and nursing) was created to address the rising no-show rate in a state-sponsored, university-affiliated, Internal Medicine clinic. The project aimed to decrease the clinic no-show rate to less than 15% in 6 months. We identified reasons for no-show by calling our no-shows. Using this data, the team met regularly to develop pragmatic and innovative interventions. We conducted consecutive Plan-Do-Study-Act (PDSA) cycles from January 2019 to June 2019. Trending no-show rate and reasons for no-shows monthly helped to study the impact of interventions. Patient feedback was sought employing focus groups and targeting satisfaction surveys.

Results: At the beginning of the project our no-show rate was 19.3%. Three interrelated reasons accounted for more than 80% of all no-shows: patient unaware of appointment, inability to contact the patient, and duplicate appointments scheduled. Our first PDSA cycle aimed to improve our appointment reminder system. Before project initiation, patients received automated phone calls as the only reminder of their appointments. A patient feedback survey was conducted, which showed that 79% of patients preferred to receive appointment reminders via text message. Starting in February 2019, all patients with an updated cell phone number in the electronic health record (EHR) began receiving text message reminders. The no-show rate improved to 13.1% in March 2019. The second PDSA cycle targeted at increasing the accuracy and efficiency of patient contact information entry in the EHR. A multi-disciplinary team studied the current process maps and identified areas of improvement. We developed a new clinic check-in process, simplifying intake forms, and front desk personnel were trained to verify patient contact information upon every visit. The no-show rate improved to 11.6% in June 2019.

Conclusion: In our practice most patients were unable to show up for their clinic appointments due to an ineffective reminder system. An innovative interdisciplinary team effort to increase text message reminders and improve contact information entry was effective in decreasing our clinic no-show rate.

56. Non-traumatic rupture of hepatic metastases from high-grade neuroendocrine carcinoma of the uterine cervix

Minh Tran; Maddie Kubiliun; Changhong Xing; Lisa Casey

Introduction: High-grade neuroendocrine carcinoma of the uterine cervix is a rare malignancy, of which few cases have been reported in the United States. Among its complication, metastasis-related liver rupture is devastating but has not been well described in the literature. Here, we report the case of a patient with high-grade neuroendocrine carcinoma of the uterine cervix which metastasized and induced fatal hepatic rupture.

Case Description/Methods: A 49-year-old woman presented with five days of worsening abdominal pain and two months of abnormal uterine bleeding, nausea, vomiting, and 12-pound weight loss. She had a history of submucosal leiomyoma and recent finding of atypical glandular cells of undetermined significance with positive high-risk human papillomavirus infection. Exam was notable for tachycardia, pale conjunctiva, ecchymosis on the anterior chest with scattered petechiae. Labs revealed anemia with low platelet count and elevated transaminases. CT showed moderate volume of pelvic free fluid and small volume of pericholecystic fluid. She was transferred to the ICU due to acute respiratory failure and disseminated intravascular coagulation. Patient continued to deteriorate and required resuscitation twice before expiring on the third day. Her family requested autopsy which confirmed her death to be hemorrhagic shock caused by multiple liver laceration. There were

a large hematoma found around the liver and a voluminous amount of blood in the peritoneal cavity. In addition, there were multiple well-circumscribed nodules on liver surface, in the mesentery, on the serosal surface of the intestines, the bladder, and the uterus, and throughout the myometrium. The biopsy of these nodules, the liver, and the uterine cervix revealed cells of the following immunohistochemistry findings: synaptophysin (+), chromogranin (+), and CD56 (+). The diagnosis was made of invasive high-grade neuroendocrine carcinoma of the uterine cervix.

Discussion: High-grade neuroendocrine carcinoma of the uterine cervix is rare and has a poor prognosis. Neuroendocrine carcinoma is an infrequent type of cancer in the gynecological tract and comprises of <2% of all cervical carcinomas and <1% of all endometrial carcinomas. IHC studies play an important role in the diagnostic process, but locating the primary site of the metastatic neuroendocrine cancer may require additional clues from the clinical history, imaging, and sites of metastases. Hepatic rupture is a devastating consequence of its metastasis to the liver. In contrast to hepatocellular carcinoma, metastases induce liver rupture via necrosis and infarction. Uterine cervix NEC is associated with high-risk human papillomavirus infection. Given the aggressive nature and poor prognosis, there needs to be more awareness and improvement in the screening method as well as preventive measures to reduce the incidence of this cancer.

57. Gastric intestinal metaplasia is a common finding among veterans undergoing endoscopy in South Texas

Muhammad Haris; Alfredo Camero Jr.; David Valadez; Cameron A. Fazeli; Farah H. Ladak; Juan F. Echavarria; Christine Andrews; Elizabeth Coss; Shail M. Govani

Introduction: Gastric intestinal metaplasia (GIM) is a premalignant change of the mucosa of the stomach. Risk factors for intestinal metaplasia previously identified include chronic infection with Helicobacter pylori (HP), dietary factors, smoking, alcohol consumption, and chronic bile reflux. We aim to study the prevalence of GIM and its risk factors in a Texan Veteran population.

Methods: A retrospective chart review was performed among adults undergoing outpatient esophagogastroduodenoscopy (EGD) in 2013 and 2017 at a large Veterans Administration facility in Texas. Patient records were reviewed for demographic information, medication use, smoking and alcohol use, indication for EGD, presence of HP or GIM on gastric biopsies. Studies performed specifically to survey for known GIM were excluded. For patients with presence of GIM, data for type and location on biopsy were recorded. Student's t test was used for quantitative comparisons while the chi-square test or Fisher's exact test was used for qualitative comparisons using R.

Results: A total of 860 EGDs were reviewed, of which 340 (39.5%) underwent gastric biopsy. Of those undergoing gastric biopsy, 298 (87.7%) were male with a mean age of 58.0 years (+/–12.5) and 155 (45.6) were Non-Hispanic Caucasian, 92 (27.1) were Hispanic, and 39 (11.5%) were African-American. A total of 38 (11.2%) patients were found to have GIM. Among patients with GIM, 6 (15.8%) were found to have incomplete GIM. There was no significant difference in mean age among patients with GIM, 61.1 (+/–13.1) versus those without GIM, 57.6 (+/–12.4), p=0.11. The rate of GIM among the non-Hispanic Caucasian population was significantly lower than patients of other ethnicities (7.7% vs. 16.9%, p=0.02). We did not identify a statistically significant difference between GIM rates among those with HP and those without HP (18.4% vs. 10.3%, p=0.17). PPI use was associated with lower rates of GIM (8.4% vs. 16.0%, p=0.03).

Conclusions: GIM was identified in 1 out of 9 patients in this Veterans cohort in Texas. As previously reported, GIM rates were higher in the Hispanic, African American and Asian patients. Patients taking PPIs were less like to have GIM. HP infection was not associated with GIM in this cohort. Longitudinal data is needed to better understand the risks of gastric cancer and how to risk stratify patients for ongoing surveillance in this diverse population.

58. An unexpected truck stop: management of *Clostridium perfringens* bacteremia

Nadia Haj-Ismail, MD; Taylor Riggs, MS4; Gabriel Aisenberg, MD

Introduction: *Clostridium perfringens* is more commonly recognized for its role in necrotizing muscle infections, but is also a known cause of hepatic abscesses. Rarely, it can progress to bacteremia, which often has a fatal outcome. There is an association of *Clostridium perfringens* bacteremia in patients with colon cancer, but it has been observed in other populations, including diabetics and those with liver or biliary disease.

Patients usually present with vague symptoms, such as weakness and epigastric pain, which in the setting of hypotension and fever, is usually treated as septic shock. However, unless the source is identified early and drained, patients will worsen clinically despite appropriate antibiotics and usually will succumb to the infection.

Case Presentation: A 70-year-old man with CAD and Type 2 diabetes presented with fatigue, dyspnea, and epigastric pain that started acutely while he was parked at a truck stop on his way through Houston. Vitals were significant for systolic blood pressures in the 80s and normal oxygen saturation. Labs were notable for elevated liver enzymes, increased INR, and Cr 1.8. CT of the abdomen with contrast showed two gas-containing lesions in the liver concerning for abscesses. Blood cultures were collected, which became positive for Gram positive rods in both anaerobic bottles after 10 hours of incubation. He also later grew Gram positive cocci in clusters in both aerobic bottles.

He was started on broad-spectrum antibiotics with vancomycin, cefepime, and metronidazole, but continued to appear ill and weak after 24 hours of treatment. Repeat labs showed worsening AKI, new leukocytosis, and a 3.5 g/dL drop in hemoglobin. Urinalysis revealed 3+ blood but no RBCs; peripheral smear showed no schistocytes. Given his clinical deterioration, interventional radiology was consulted and placed two intrahepatic drains, with the release of a large amount of gas and small volume of fluid.

After drain placement, he improved clinically with normalization of labs. Cultures ultimately grew *Clostridium perfringens* and MSSA, so antibiotics were narrowed to metronidazole and cefazolin. He completed 14 days of IV antibiotics and was discharged with an additional two weeks of oral antibiotics. One of the intrahepatic drains was left in place, with a scheduled appointment to reassess the drain in two weeks.

Discussion: Given the non-specific symptoms associated with the infection, it is difficult to maintain a high index of suspicion, especially given the rarity and the rapid progression, often before cultures have resulted. However, labs indicative of intravascular hemolysis should raise concern for *Clostridium perfringens* bacteremia, and prompt a search for a source of infection. The development of readily available imaging modalities has likely played a role in early detection and prompt treatment of hepatic abscesses, and has improved outcomes of this once deadly diagnosis.

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59. A case of mixed cryoglobulinemia syndrome presenting with membranoproliferative glomerulonephritis in a patient with cocaine abuse, hepatitis C infection and connective tissue disease

Nathaniel Staley

Introduction: Mixed Cryoglobulinemia Syndrome is an uncommon type of vasculitis that presents with systemic symptoms. Autoimmune disease, malignancy and infections like hepatitis C have been associated with it. Cocaine induced cryoglobulinemia is thought to be a diagnosis of exclusion based after excluding other testable etiologies with known associations.

Case description: A 59-year-old Caucasian male presented to the hospital with worsening generalized weakness, shortness of breath with non-productive cough, developing rash on the chest and upper extremities. Past medical history included 30 pack year smoking history with moderate interstitial pulmonary fibrosis, cocaine abuse, rheumatoid arthritis and untreated hepatitis C infection. Physical examination revealed arthritis in proximal and distal interphalangeal joints in both hands. Examination of the skin revealed an erythematous papular rash over the arms and back with petechia present on chest, and a malar rash. Laboratory results showed anemia with hemoglobin 8.80 g/dL, creatinine 2.24 BUN 34.87, urinalysis with positive blood and prot/cr 6 g/g. Cocaine toxicology positive, serum cryoglobulin positive, low C3 and C4 levels, ANA + Titer 1:320 with speckled pattern, P-antineutrophil cytoplasmic antibodies (ANCA) elevated >1:640, rheumatoid factor +. Double Stranded DNA Antibody, Sjogren's Ab, Scl-70 Ab and HIV Ab negative. SPEP and immunofixation negative for monoclonal proteins, HCV + with HCV RNA undetectable. X-ray of hands bilateral erosive arthritic changes and osteopenic bones without fracture or dislocation. The patient underwent kidney biopsy with findings of membranoproliferative glomerulonephritis, consistent with cryoglobulinemic glomerulonephritis. Treatment was initiated with IV methylprednisolone with transition to oral steroids and rituximab.

Discussion: Mixed cryoglobulinemia syndrome is a type of vasculitis with various possible etiologies. In this case the patient presented with renal disease, skin disease and arthralgias/arthritis along with non-specific systemic symptoms. Given the fact that the patient has a chronic hepatitis C infection the first thought is to associate this presentation with the viral infection but since the patient has also history of rheumatoid arthritis with + RF and also chronic cocaine abuse inducing ANCA-p antibodies it is possible that multiple etiologies are playing a role in the current presentation. Interestingly, the HCV RNA is undetectable that also may question the association with the vasculitis. Cocaine induced cryoglobulinemia is thought to be a diagnosis of exclusion, however, an emerging association of cocaine-induced cryoglobulinemia should be considered when ANCAs are present as indicated by previous case reports. This case illustrates a classic presentation of an unusual diagnosis with possible multiple etiologies.

60. Anemia, neutropenia, and severe myelopathy secondary to copper deficiency in the setting of zinc toxicity

Nathaniel Wilson, MD

A 62-year-old woman presented to clinic in July, 2019 for a consultation of macrocytic anemia and neutropenia, with bone marrow biopsy showing monoclonal B-cell lymphocytosis. She had a history of pancreatic cancer resected fourteen years prior with pancreaticoduodenectomy. She reported four months of progressive numbness and loss of sensation in both legs, with associated weakness and loss of balance leading to multiple daily falls, ultimately requiring a wheelchair for mobility. Physical examination was remarkable for 4/5 bilateral lower motor strength, depressed patellar and ankle reflexes, diminished perception of touch below the knees, absent Babinski, and positive Romberg.

The hemoglobin level was reduced at 9.7 g/dL (RR, 12.0–16.0 g/dL), mean corpuscular volume was elevated to 106 fL (RR, 82–98 fL), leukocytes reduced to 2.3 K/uL (RR, 4.0–11.0 K/uL) with absolute neutrophil count of 0.85 K/uL (RR, 1.70–7.30 K/uL), and normal platelet count. Other investigations revealed normal electrolytes, vitamin B12, folate, homocysteine, thyroid stimulating hormone, serum protein electrophoresis,

and iron studies. Peripheral blood smear showed macrocytic, hypochromic anemia with occasional anisopoikilocytosis and scattered burr cells, with no rouleax formations and no schistocytes. Histopathological examination of bone marrow aspirate revealed a normocellular marrow and flow cytometry detected 0.6% of total cell monoclonal CD-5 positive B-cell population.

Serum copper measurement was included in the workup because of literature describing patients with a similar neurologic syndrome that was linked to isolated copper deficiency.[1–6] Serum copper level returned undetectable, and the serum zinc level was increased at 1.46 µg/mL (RR, 0.66–1.10 µg/mL). Oral copper therapy (3 mg/d) was initiated, with correction of the patient's hematologic manifestations.

Copper deficiency presents as a hematologic syndrome with anemia and neutropenia, along with bone marrow findings that can mimic myelodysplasia. It can be recognized clinically with neurological findings such as myelopathy and peripheral neuropathy, resembling subacute combined degeneration.[1] Risk factors for copper deficiency include gastric or duodenal surgery, dietary deficiency, malabsorptive enteropathies, and prolonged total parenteral nutrition.[2] Syndromes presenting similarly include folate or B12 deficiency, drug toxicity, autoimmunity, aplastic anemia, and myelodysplastic syndromes. Copper replacement may quickly correct hematological findings, with a slower response of neurologic deficits. Thus, early diagnosis is imperative.[3] We present a case of neutropenia and macrocytic anemia alongside progressive neurologic dysfunction mimicking subacute combined degeneration without vitamin B12 deficiency. Ultimately, we attribute all of our patients' findings to copper deficiency in the setting of prior abdominal cancer surgery and zinc toxicity from unknown etiology.

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61. Nephrolithiasis causing acute hypoxia?

Prashanth Reddy; Som Aftabizadeh; Luna Liu; Nisha Dhanabalasamy; Sahityan Viswanathan; Harsh Patel; Anand Subramanian; Saravanan Balamuthusamy; Machaiah Madhrira; Senthil Thambidorai; Satish Chandraprakasm

Introduction: The overall incidence of complications following closure of ASD is reported to be around 8.6% with majority involving embolization or migration of the device. Migrations occur most commonly to the left atrium, left ventricle, ascending aorta, aortic arch or the descending aorta and rarely to the main pulmonary artery. Most cases are reported on early device migration (up to 12 months following ASD closure). We present a rare case of a patient who developed migration of ASD closure device into the main pulmonary artery 2.5 years after placement.

Case presentation: A 55 y/o Hispanic male with a PMHx significant for nephrolithiasis presented to our ED with complaints of left flank pain and dysuria. The patient was initially worked up in our ED for nephrolithiasis. A CT Abdomen showed multiple bladder stones with left hydronephrosis and left renal perinephric stranding. The patient was also incidentally found to have an O2 Sat of 80% on RA. He denied any shortness of breath or chest pain. The patient required 10L O2 to improve his O2 Sat to 92%. Upon

further review it was found that the patient had a history of ASD repair in the 1970s. He developed a leak in 2016 and had it repaired again with an Amplatzer septal occluder.

He was then lost to follow up. We postulated at that time that the ASD closure device could have developed a leak again. While our suspicion for PE was low (Wells score: 0), a STAT CTA was ordered secondary to acute hypoxia. The CTA ruled out PE but it showed a foreign body in the main pulmonary artery which appeared to be the ASD closure device. An Echocardiography was obtained STAT showing a dilated right ventricle and an ASD was noted with moderate right to left shunting. Cardiothoracic surgery was consulted and the ASD device was extruded from the main pulmonary. Following the procedure, the patient's oxygen requirements improved to baseline.

Discussion: ASD closure device migration is a potentially fatal complication that may be overlooked following percutaneous ASD closure. Clinical features may vary widely based on the location and type of the device used. A study looking at complications following the placement of Amplatzer septal occluders showed only 1/1000 cases where the device embolized with hemodynamic compromise. In other cases, the ASD device embolized in minutes to hours after the device was initially placed. In this case the patient lacked secondary erythrocytosis on presentation, which made us believe that the patient had a recent embolization of the device. This case report illustrates the need for suspicion of device migration in patients who exhibit variation in saturation levels despite oxygen supplementation and the importance of close clinical follow-up post device placement.

62. A travel medicine disaster–mycobacterial misdiagnoses and pretest probability

Olubadewa A. Fatunde, MD, MPH; Loren Albritton, DO; Anita Scribner, MD; Gary Jacobs, MD; Tiffany Egbe, MD

Introduction: Mycobacterial infections are common in immunosuppressed patients, but can also occur in immunocompetent individuals. Rapidly growing mycobacteria are an increasingly recognized human pathogen, with *Mycobacterium abscessus* responsible for a large share of morbidity and mortality. Risk factors include recent cosmetic surgery, using contaminated materials or accidental contamination of wound by soil. Rate of growth can distinguish various infective agents. Most infections are pulmonary in nature.

Case: We report a case of a 57-year-old woman with a past medical history of hypertension, hyperlipidemia, major depressive disorder and a past surgical history of mastopexy and abdominoplasty fifteen years ago referred to the infectious disease clinic after developing recurrent culture negative abscesses.

Patient underwent a repeat abdominoplasty and fat transfer in Honduras. She returned home to the US two months following her surgery, and shortly thereafter, patient fell onto the concrete, landing on her buttocks, while carrying a container, causing extensive bruising around her right hip and shoulder regions. Initial evaluation was unremarkable, and her hematomas resolved except for a persistent ecchymotic lesion on her left buttock. This lesion slowly became warm, indurated, and painful over a month's time. This was accompanied by constitutional symptoms, including a 10-pound unintentional weight loss. She had no pulmonary abnormalities. An MRI revealed an abscess, which was debrided by a surgeon.

One month later, patient developed another abscess on her contralateral buttox (right), now accompanied by Right inguinal LAD. The surgeon in Honduras, who performed the original fat transfer, performed several incisions with tissue cultures over one month, with repeatedly negative aerobic & anaerobic cultures. Six weeks later, cultures grew M. tuberculosis, and the patient returned to the US for treatment. Initially she was started on standard therapy for tuberculosis. Confirmatory tests were negative, and her wounds became purulent. Staged surgical incision & drainage was performed. Local tissue cultures, eventually grew *M. abscessus* from several biopsy sites. Initially she was started on Clarithromycin, Doxycycline, Rifampin and Ethambutol for empiric therapy per local expert recommendations. When sensitivities matured revealing macrolide resistance she was started on Cefoxitin 2 gm q8hrs IV, Amikacin

1000 mg daily IV, and Tigecycline 25 mg daily IV and admitted for inpatient IV Antibiotics. She completed her course of antibiotics and wound care at an LTAC, with near resolution of her lesions.

Conclusion: This case highlights the importance of obtaining an accurate diagnosis, avoiding premature diagnostic closure, and confirming laboratory values incongruent with clinical presentation. Our patient is immunocompetent without lung disease and relatively few risk factors. Macrolide resistance is associated with treatment failure and worse outcomes. Obtaining sensitivities prior to long-term therapy is critical to avoid promulgating antibiotic resistance, as improperly treated Mycobacterial infection can prove fatal.

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63. Beers criteria as an educational and quality improvement tool in hospitalized elderly patients

Oluwadamilola Babaniji, DO; Preetivi Ellis, MD, FACP; Syeda Javaid, MS III; Megan Anthony, MS III

Introduction: Beers Criteria is a list of medications that was created to aid physicians in safely prescribing medications in the geriatric population. During this 4-week project, we strove to find an effective way to educate members of Internal Medicine inpatient ward teams to conduct a thorough assessment of all medications for patients age 60 and above who were admitted to the teams.

Objective: Our aim was to bring sensitivity and awareness to identifying Beers listed medications and polypharmacy in the inpatient setting. These two major domains of Geriatric Medicine have been shown to have a direct impact on morbidity and length of hospital stay as well as promoting patient safety by reducing falls in the community after hospital discharge. The goal was to educate medical students, interns, and residents about potentially inappropriate and hazardous medications in inpatient older adults. This project was designed for both quality improvement and educational purposes.

Procedure and Measurements: Data was collected from patients aged 60 years or older in an internal medicine inpatient setting from Methodist Dallas Medical Center, Dallas, Texas. The outpatient medication list of each patient was elicited from the patient, confirmed by the hospital pharmacist, and subsequently recorded in the patient's electronic health record. All medications included in Beers Criteria were noted. Finally, the indication for each medication on Beers Criteria list was elicited from appropriate patients through patient interviews and confirmed through electronic health records.

Outcomes: 27 patient medication histories were reviewed upon admission to the hospital. Only 3 of 27 patients were admitted on zero medications, while over 13 were admitted with 10 or more medications. 11 out of the 27 patients were on 1 or more medication(s) under the Beers criteria, while 16 were not. 17 of the 27 patients were admitted with polypharmacy, defined in this project as 5 or more medications. Therefore, 100% of patients on potentially inappropriate medications (PIMS) were also on polypharmacy.

Conclusion: From the results, it is evident that there is an association between polypharmacy and prescription of PIMs. These medications could potentially lead to age-associated side effects and avoidable drug interactions that could increase morbidity

and adverse patient outcomes. Physicians should be aware of medications that can harm these patients in the long term. Our hope is that this study creates an awareness in the medical community about the need for further research, active surveillance, safe prescribing and intentional medication reconciliation during inpatient and outpatient encounters.

64. Thinking locally about a global problem: assessing knowledge, attitudes and behaviors around medication reconciliation at an academic safety-net hospital

Rebecca Thrasher, MD; Meghana Gadgil, MD, MPH

Introduction: Over recent decades, healthcare systems have come to recognize the value of accurate and timely medication reconciliations (MRs) as a key component of efforts to prevent adverse drug events. While training institutions rely on house staff, pharmacists and nursing to conduct most MRs, little evidence exists on healthcare professionals' knowledge, attitudes, and behaviors. Within our safety-net academic hospital, we recognized the need to improve MR.

Objective: To assess knowledge, attitudes, and behaviors of healthcare professionals regarding the process of MR to inform future Plan-Do-Study-Act (PDSA) cycles.

Procedure: We developed and distributed an anonymous questionnaire regarding MR for healthcare professionals within our institution. We targeted groups widely perceived to be engaged in admission and/or discharge MR. Of 91 total respondents, represented were Internal Medicine (IM) interns (16%), IM residents (19%), IM attendings (1%), medical students (8%), nurses (41%), pharmacists (10%), and pharmacy technicians (5%). Overall response rate was 46%. We also conducted semi-structured interviews with 19 participants. The information was used to develop a detailed process map and root cause analysis of incomplete, inaccurate and/or delayed MRs at our hospital.

Outcomes: A total of 98% of respondents thought a complete and accurate admission medication reconciliation was "very important" or "extremely important." Respondents provided heterogeneous answers when asked who was partially or primarily responsible for completing MRs, though more so for admission MRs than discharge MRs. Amongst respondents who reported completing MRs, only 48% felt either "extremely confident" or "very confident", and only 36% felt "extremely knowledgeable" or "very knowledgeable" about what 'gold standard' medication reconciliation entails. Literature suggests high- quality MRs require 30–60 minutes, but 74% of respondents estimated <20 minutes were necessary. Only 16% responded that they spent >20 minutes per patient on average for MR. The most commonly cited barriers to MR were poor patient knowledge of medications (93%), time (83%) and limited external sources of information (63%).

Respondents' attitudes varied regarding when the MR should be completed. No housestaff reported high confidence in their knowledge of how MR would be relayed to patients or primary care providers on discharge. Only 18% of respondents reported they review discharge MRs with patients at least 80% of the time.

Conclusion: Our interprofessional survey revealed several surprising elements around MR that are important to address in improvement efforts. We discovered gaps between provider knowledge and best practices in how and when to conduct a high-quality MR. The high heterogeneity in responses about which healthcare professionals were primarily or partially responsible for MR highlighted key gaps in our process map. Barriers described in our data are similar to those in existing literature. Next, we anticipate leveraging our data to develop multi-disciplinary PDSA cycles to improve medication reconciliations and patient safety.

65. Acute hepatitis E presenting after first dose chemotherapy for breast cancer

Rita Medrano; Meily Arevalo; Catherine Jones

Introduction: Hepatitis E is a recognized cause of acute hepatitis in developed countries. Hepatitis E

is rarely reported in patients receiving chemotherapy, and there are no studies systematically assessing the incidence of HEV among patients on active chemotherapy. We present a case of acute hepatitis E in a patient on chemotherapy.

Case Presentation: The patient is a 45-year old female diagnosed recently with right breast invasive ductal carcinoma stage IB (T2N2M0) 2.6 cm, grade 2, ER + 99%, PR + 99%, HER2 negative. She underwent the first cycle of adjuvant chemotherapy with doxorubicin/cyclophosphamide and five days later developed rapidly progressing bilateral upper quadrant abdominal pain, nausea, bilious vomiting, and anorexia. She denied fever, chills, SOB, diarrhea, prior hepatitis. No history of smoking, drug or alcohol use. On admission, vital signs were normal, including temperature. Examination of the abdomen revealed mild generalized RUQ tenderness with no rebound.

Laboratories showed ALT-1643 IU/L, AST-734 IU/L, Alkaline phosphatase-296 IU/L and total bilirubin-2.1 mg/dL. Abdominal ultrasound and Duplex scan of portal and supra-hepatic veins were normal. Gastric emptying study was negative. Upper endoscopy reported acute gastritis and normal esophagus and duodenum. Acute hepatitis panel was negative for A, B, or C infection. Autoimmune hepatitis workup was negative including anti-ANA, anti-mitochondrial antibody, smooth muscle antibody and, liver-kidney antibody. Ceruloplasmin and alpha 1 antitrypsin levels were also normal. Hepatitis E antibodies were sent to an outside laboratory. The patient clinically improved, and she was discharged on day six. Two weeks later lab work showed positive Hepatitis IgM and negative IgG suggesting acute Hepatitis E infection.

Discussion: Hepatitis E virus (HEV) is the most common cause of acute hepatitis in the world. However, there is low prevalence in developed countries. Liver disease caused by HEV is primarily due to ineffective immune response as HEV is generally considered non-cytopathic. Special populations have been identified at risk including pregnant women, preexisting liver disease, malnutrition, solid organ transplant recipients, and other immunosuppressed hosts.

Clinical HEV disease is usually self-limited. Diagnosis is made with anti-HEV IgM assay (specificity of up to 95.6%). After infection, IgM titers increase acutely and remain present for 8 weeks. Viremia is usually transient in immunocompetent patients but can be prolonged in immunocompromised patients and ultimately lead to chronic hepatitis.

Treatment includes antiviral therapy directed against genotype 3 and reduction of immunosuppressive agents. Viral clearance has been reported after decreasing immunosuppressive therapy in solid organ transplant recipients. The preferred regimen is 12-week ribavirin, which can be extended until a sustained virologic response is achieved.

Conclusion: In patients presenting with acute hepatitis, particularly immunosuppressed such as cancer patients undergoing chemotherapy, Hepatitis E virus should be considered as a possible cause.

66. Primary myelofibrosis status post allogeneic stem cell transplant followed by a rare insidious onset of gamma-delta T cell leukemia

Robert Hoard, DO; George Shahin, MD; Florin Andreca, MD; Michael Osswald, MD

Introduction: Primary myelofibrosis (PMF) is a rare but aggressive Philadelphia chromosome negative myeloproliferative neoplasm (MPN). Transformation to acute myeloid leukemia is the most common identifiable cause of death. The only curative treatment is an allogenic stem cell transplant. A concurrent hepatosplenic T cell lymphoma (HSTL) is even more rare, accounting for <1% of non-Hodgkin's lymphoma (NHL). Peripheral T cell lymphomas comprise a separate and heterogeneous group of neoplasms including HSTL. The gamma-delta subgroup of HSTL have an aggressive clinical course with poor prognosis and an unknown pathogenesis. Chronic immunosuppression such as in solid organ and hematopoietic transplants are proposed risk factors. Diagnosis of the malignancy is challenging, commonly presenting with hepatosplenomegaly and thrombocytopenia in absence of lymphadenopathy

similar to myelofibrosis. An extensive literature review indicated only one other case discussing this simultaneous occurrence. Our case, however, is unique from Gabali et al case report as our patient likely had primary rather than a secondary myelofibrosis (due to HSTL) given the presence of JAK2 positive gene mutation.

Case: A 43-year-old male with an initial diagnosis of PMF who first presented in October 2016 with several weeks of abdominal pain, drenching sweats, recurrent fevers and early satiety. He was noted to have massive hepatosplenomegaly with transfusion dependent anemia. A bone marrow biopsy demonstrated moderate reticulin fibrosis associated with JAK2V617F positive gene mutation. He was initially treated and responded well with Ruxolitinib. One year later the patient developed worsening disease with transfusion dependent cytopenias necessitating an allogenic stem cell transplant. He received reduced intensity conditioning followed by a mismatched unrelated allogenic stem cell transplant. He demonstrated initial count recovery but unfortunately developed graft failure with recurrent constitutional symptoms and splenomegaly. In an effort to palliate symptoms while preparing for a second transplant, he underwent partial splenic embolization for symptomatic splenomegaly. Within days, he developed a CD3+/CD56+ hyperleukocytosis (white blood cell count >250 $\times$ 10 (3)) with positive T cell gene rearrangement studies consistent with HSTL (gamma delta subtype) and died from multi-organ failure.

Discussion: Our patient developed a fulminant T cell leukemia of gamma/delta subtype consistent with HSTL leading to rapid multi-organ failure and death. Whether a diagnosis of HSTL was present at the time of initial myelofibrosis diagnosis or developed as a result of chronic immunosuppression was undetermined. More importantly it raises a flag to the clinician to maintain an open differential and reconsider additional malignancy when treating a refractory disease. Secondly the potential of spleen directed therapy in relation to observed leukemogenesis is undetermined. It additionally raises the question whether splenic therapy exacerbated this underlying HSTL. This case serves to highlight the coexistence of 2 extremely rare neoplasms with phenotypic overlap making diagnosis difficult but essential to delineate prognosis and treatment.

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67. Rhabdomyolysis: a rare presentation of Hashimoto's thyroiditis

M Rubayat Rahman, MD; Divya Vangipuram, MD; Mohamed Elmassry, MD; Ana Marcella Rivas, MD; Leigh Ann Jenkins, MD

Hashimoto's thyroiditis is the most common form of primary hypothyroidism. Myopathy is an infrequent but well-known manifestation of the disease. Rhabdomyolysis as the initial presentation of Hashimoto's disease is extremely rare, particularly in the absence of precipitating factors such as statin use. We report a case of new-onset autoimmune thyroiditis presenting with rhabdomyolysis and severe hypercholesterolemia.

A 39-year-old male without significant past medical history presented with progressive fatigue and generalized muscle soreness associated with weight gain, facial and limb puffiness for the last six months. He denied strenuous activity in the months prior to presentation. Family history was significant for a great maternal aunt had some form of thyroid illness. He was a long-term heavy smoker but quit one year prior to presentation, but reported no alcohol or recreational drug abuse. Vital signs at admission were normal. On physical exam, he appeared tired and had a slow speech. Peri-orbital and mild bilateral pitting edema were present. Extremities were cold and the relaxation phase of the ankle jerk reflexes were delayed bilaterally. Initial laboratory testing showed creatinine kinase (CK) of 6400 IU/L. Cholesterol and triglycerides were 745 mg/dl and 785 mg/dl respectively. Thyroid function panel revealed a TSH of 83 mcIU/ml, free T4 of 0.18 ng/dl and free T3 of 0.46 pg/ml, consistent with severe hypothyroidism. Autoimmune workup revealed positive anti-thyroid peroxidase antibody. ANA, anti-tissue transglutaminase and anti-Jo1 antibodies were negative. Morning cortisol and ACTH were normal. He was started on IV levothyroxine and liothyronine with improvement of CK within twenty-four hours. He was transitioned to oral levothyroxine prior to discharge. At one-month follow-up, he reported improvement in his fatigue and puffiness but some muscle soreness persisted. Repeat lab work showed normalization of CK and thyroid hormone levels as well as significant improvement of his lipid panel.

This case highlights the importance of considering hypothyroidism in the differential diagnoses of rhabdomyolysis. Various mechanisms have been proposed to explain muscle breakdown in hypothyroidism, including decreased glycogenolysis, impaired oxidative metabolism and ATP utilization. Myopathy may be the predominant manifestation of hypothyroidism in a small subset of patients. Prompt diagnosis and treatment can often prevent further complications.

68. Urine and history are all you need

Ruchit Rana, MD; Cyrus Iqbal, MD; Annie Xu, MD; Matthew Novakovic, MD

Introduction: Disseminated histoplasmosis is often diagnosed with antigen studies and confirmed with culture and histopathology. Histoplasmosis can cause granulomatous adrenal masses resulting in life-threatening adrenal insufficiency (AI), which may prompt physicians to consider empiric treatment prior to biopsy confirmation. Here, we present a case of likely bilateral adrenal histoplasmosis causing primary AI in an immunocompetent host, clinically diagnosed by history and urinary Histoplasma antigen.

Case presentation: A 67-year-old HIV-negative man, with a history of previously diagnosed laryngeal histoplasmosis, presented with acute nausea and vomiting in the setting of abdominal pain for four months.

Five months prior to the present admission, he had progressive hoarseness and was found to have laryngeal histoplasmosis confirmed via arytenoid cartilage biopsy. He was given itraconazole for one month with resolution of his presenting symptoms; however, he developed diffuse abdominal pain over the ensuing four months. Ten days prior to admission, he developed daily vomiting and fatigue with minimal activity. He had no exposure to bird or bat droppings, tobacco, intravenous drugs, unsafe sex, incarceration, nor TB contacts. All health maintenance screenings were up-to-date.

He was afebrile, tachycardic to 110 bpm and hypotensive to 99/59 mmHg. Physical examination

was pertinent for diffuse skin hyperpigmentation. Initial laboratory studies revealed absolute eosinophilia (1030 cells/uL) and Na 127 mmol/L. Computed tomography (CT) of the abdomen and pelvis revealed large bilateral adrenal masses; there was no prior imaging for comparison. Further investigation revealed undetectable 8 a.m. cortisol and aldosterone, elevated serum ACTH 1072 pg/mL, and normal thyroid function. Liver enzymes were mildly elevated (AST 69 U/L, ALT 41 U/L, ALP 154 U/L, total bilirubin 2.1 mg/dL). Urinary Histoplasma antigen was elevated at 5.22 ng/mL. Repeat HIV-1/HIV-2 testing was negative. Urine and plasma metanephrine results were pending during hospitalization (one week later resulted normal). Treatment with hydrocortisone and fludrocortisone rapidly improved his blood pressure and electrolyte derangements. Confirming the etiology of adrenal masses with biopsy necessitated ruling out pheochromocytoma; however, a multidisciplinary discussion concluded his post-test probability of disseminated histoplasmosis was sufficiently high to initiate itraconazole. On follow up, liver enzymes normalized, and MRI of adrenal glands showed decreased adrenal mass size.

Discussion: Due to difficulty in obtaining an adrenal biopsy, this case posed a diagnostic dilemma requiring clinical decision-making based on data aforementioned. His history pointed against other infectious and malignancy-related causes of AI while his known history of laryngeal histoplasmosis greatly increased the pre-test probability of disseminated histoplasmosis. Though urinary Histoplasma antigen is less specific in immunocompetent hosts, a positive result of this magnitude in this scenario effectively diagnoses disseminated histoplasmosis.[1] This case highlights the importance of understanding the value of diagnostic tests in patient-specific contexts to make key clinical decisions.

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69. Chemotherapy-induced coronary vasospasm in a patient with colorectal cancer

Ryan Kabir, MD; Nestor Vasquez, MD; Neil Keshvani, MD; Wanpen Vongpatanasin, MD

Case Presentation: A 59-year-old man with history of stage IV rectal cancer on palliative chemotherapy presented to the emergency department with severe substernal chest pain that radiated down his left arm. He had no associated shortness of breath, palpitations, diaphoresis, nausea, or vomiting. Three months prior, the patient was diagnosed with stage IV mucinous adenocarcinoma and was subsequently initiated on chemotherapy with FOLFOX (5-flouro-uracil, leucovorin, oxaliplatin) and bevacizumab. For his first two cycles of chemotherapy, the patient only received infusions of 5-flourouracil without any incidence of chest pain. Two days prior to his presentation for chest pain, he completed his first full cycle of the FOLFOX with bevacizumab regimen. On physical examination in the emergency department, his heart rate was 90 beats per minute, blood pressure was 155/84 mmHg, and oxygen saturation was 99% on room air. Cardiac examination revealed normal S1 and S2 with no extra heart sounds. His lungs were clear to auscultation bilaterally. He had no jugular venous distention or lower extremity edema. His initial high sensitivity troponin T was 41 ng/L (normal limit <51 ng/L). The troponin T levels increased to 61 ng/L and 67 ng/L after 1 and 3 hours, respectively. His ECG was significant for ST segment elevations and hyperacute T waves in leads II, III, aVF, V2, V3, V4, V5, and V6. The patient was taken immediately for left heart catheterization, where no coronary artery disease was found. His presentation was thus attributed to vasospasm induced by recent chemotherapy initiation. He was started on amlodipine, and his chemotherapy regimen was switched to capecitabine and oxaliplatin (XELOX). At cardiology follow-up 8 months later, he reported no further chest pain and his ST segment elevations on ECG had resolved.

Discussion: Cardiotoxicity is a well-known side effect of various chemotherapeutic agents. 5-flourouracil (5-FU) is a flouropyrimidine antimetabolite agent used in the treatment of gastrointestinal adenocarcinomas. Cardiotoxicity with 5-FU may

include cardiomyopathy, coronary thrombotic events, or coronary vasospasm.[1] Studies have suggested that coronary vasospasm with 5-FU therapy is most likely to occur with the first cycle of treatment.[2,3]

Bevacizumab is a VEGF (vascular endothelial growth factor) inhibitor known to increase risk of cardiotoxicity when used with a regimen that also contains 5-FU.[4] However, this increased risk is largely attributable to endothelial dysfunction resulting in arterial thrombotic events, and there are very few reports of bevacizumab-induced vasospasm.[5,6] Our patient experienced vasospasm after being initiated on therapy with FOLFOX and bevacizumab, and vasospasm attributed to this combination of chemotherapy has never before been reported in the literature. Management for these cardiotoxicities may involve screening for modifiable cardiovascular risk factors and their optimization prior to initiating chemotherapy. Calcium channel blocking agents have also been effectively used in the treatment of vasospasm.[7]

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70. Crowdfunding medical care: an exploratory comparison of Canada, the United Kingdom, and the United States

Sameh N. Saleh, MD; Ezimamaka Ajufo, MD; Richard J. Medford, MD

Background: Despite major differences in the healthcare systems of Canada (CAN), the United Kingdom (UK), and the United States (US), medical crowdfunding (MCF) has become an important part of the personal healthcare funding landscape in each country. However, little is known about the overall trends and characteristics of MCF campaigns. We pursue a systematic comparison of the characteristics, purpose, and determinants of success of MCF campaigns in these countries to explore gaps in healthcare provision and potential inequities in MCF in each setting.

Methods: We conducted a cross-sectional study of campaigns from GoFundMe (GFM), one of the largest MCF platforms worldwide, between February 2018 and March 2019 in CAN, the UK, and the US. Through web scraping, we directly extracted variables from all popular medical campaigns on each country's GFM discovery webpage under the "Medical" subheading. We also performed a manual two-person review to evaluate demographics, diagnoses, type of treatment, and funding purpose. Concordance was >89.2% and Cohen's kapa >0.77 for all manual variables. We explored descriptive statistics for all variables and compared campaign demographics to national census data to evaluate representation. We also performed a multivariate linear regression between the procured variables and funds raised to assess markers of fundraising success.

Results: There were 1,091 CAN, 1,081 UK, and 1,223 US campaigns. The majority of campaign beneficiaries in all three countries were non-black adult cancer patients. Blacks were significantly underrepresented in the US (5.3% vs. 13.4%, $p < 0.001$) and CAN (1.9% vs. 3.5%, $p = 0.004$). Females were also underrepresented in the US (38.3% vs. 50.8%, $p < 0.001$), while in CAN, females raised $2,914 (95% CI, $1,277 to $4,552; $p < 0.001$) less per campaign than

males. US campaigns used to primarily fund treatment were mostly for routine care (CAN 21.9% vs. UK 26.6% vs. US 77.9%; $p<0.001$), while fundraising for experimental and alternative therapies were significantly more common in CAN and the UK. Overall, US campaigns set higher goals (median, CAN $19,000 vs. UK $13,200 vs. US $50,000; $p<0.001$) and raised more funds (median, CAN $12,662 vs. UK $6,285 vs. US $38,204; $p<0.001$). Number of donors and the fundraising goal were positively predictive of funds raised in all three countries. In the US, routine care was predictive of significantly decreased funds raised (–$11,060; 95% CI, –$14,800 to –$7,358; $p<0.001$).

Conclusion: Racial and gender inequality were evident in CAN and the US. US MCF campaigns set higher goals and raised more funds than those in CAN and the UK. Contrasted to UK and CAN campaigns, US campaigns fundraised much more often for routine care than experimental or alternative care. However, US campaigns with routine care were associated with raising less funds.

71. A cutaneous metastasis with an unknown primary origin: a case report

Sariya Wongsaengsak, MD; Somedeb Ball, MD; Arunee Motes, MD; Anita Sultan, MD; Catherine Jones, MD

Background: Cutaneous metastases occur in 0.6–10.4% of all patients with underlying malignancy. Only 4–15% of these cases, the primary cancer site remains unknown. The clinical manifestations of metastasis vary from papules, plaques, nodules to ulcers. In general, cutaneous metastases are accounting for a poor prognosis factor.

Case: A 61-year old Caucasian female presented with a rapidly growing skin lesion at anterior aspect left shin area which was first noticed one month ago associated with tenderness, intermittent bleeding, and foul smell drainage. Physical examination showed a 4 cm in diameters pedunculated exophytic, friable polypoid violaceous nodule with superficial erosion and scant seropurulent crust at left anterior lower leg. CT of leg left showed $5.3 \times 4.7 \times 2.4$ cm soft tissue mass on anterolateral aspect of tibial- fibular area. Shaved biopsy of the nodule was performed and pathology revealed metastatic adenocarcinoma of probable of upper gastrointestinal/lung and genitourinary origin with involved margins which positive Cytokeratin 7 and negative Cytokeratin 20. Patient received a wide excision of the left leg mass again which showed negative margin and cancer TYPE ID test demonstrated neuroendocrine small/large lung carcinoma with 90% probability. The patient denied all constitutional symptoms, respiratory symptoms, abdominal symptoms, and history of heavy smoking. PET/CT scan showed an 8 mm fluorodeoxyglucose avid pulmonary nodule at the right lower lobe. The patient received CT guided lung biopsy which pathology showed fibrosis with anthracosis. Other investigations were unremarkable including colonoscopy, EGD, mammogram, ultrasound pelvis, and PAP smear. Laboratory revealed carcino-embryogenic antigen (CEA) of 0.7 ng/ml, CA-15-3 of 11 U/ml, CA 19-9 18.1 U/ml, CA 125 10.9 U/ml and CA 27.29 16 U/ml. The patient remains asymptomatic one year afterward and still continues to follow up with our oncology clinic for surveillance without any sign of recurrent of skin lesion.

Conclusion: Identifying the primary tumor of cutaneous metastases remained a challenging issue in some cases. Here, we described an uncommon case of cutaneous metastases which the original tumor has not been established. Even though a minority of these patients will have a curable disease, the appropriate use of pathological diagnosis and selected imaging studies for an optimal management of patients with a tumor of unknown primary site should not be overlooked.

72. 2,4 DNP—a lethal slimming pill

Sarwar Muhammad Hasham, MD; Hassan Anam, MD; Zafar Bilal, MD

Introduction: 2,4-dinitrophenol (DNP) is an industrial chemical that has found illegal use recently as a weight-loss drug. It is extremely toxic in overdose with no antidote available and can often lead to death despite management based on current

recommendations. We report a case of a young man with an intentional overdose of DNP. The course highlights the need for increased awareness among frontline medical staff, especially ER and ICU physicians, of the effects of DNP poisoning.

Case Description: A previously healthy 25-year-old obese (BMI 31) male was brought to the ER after he had ingested 4000 mg of DNP (16 pills of 250 mg each) intentionally. He initially complained of palpitations, diaphoresis, nausea, vomiting and shortness of breath. Initial examination revealed an anxious man with a temperature of 37.3 C, tachycardia of 140 and mildly increased respiratory rate of 26. Within a few minutes of arrival, the patient became extremely agitated, requiring administration of 8 mg of lorazepam in 2 doses and intubation shortly thereafter. Poison control was consulted with recommendations of aggressive fluid resuscitation, benzodiazepines for seizures and control of hyperpyrexia and rhabdomyolysis. The critical care team was consulted but the patient quickly deteriorated and went into cardiac arrest with asystole. ACLS was started and CPR was continued for 25 minutes, but ultimately unsuccessful. The patient was pronounced dead within 90 minutes of arrival to the ER.

Discussion: More than 60 deaths have been reported in the medical literature from 2,4-DNP overdose and most of these were in the 1930s when it was used as a diet pill in Europe and America.[1] It has been banned since then but in recent years has come back on the internet black market, being sold as a weight loss pill under the brand name American Muscle. The increasing incidence, high mortality rate and lack of an effective antidote pose a challenge to frontline physicians. Management is limited to the administration of activated charcoal within 1 hour to reduce gastric absorption. Severe agitation and seizures can be treated with benzodiazepines. Fever and diaphoresis should be promptly treated with active cooling measures such as cooling blankets. IV acetaminophen and Dantrolene can be considered if first line cooling measures fail.[2] There are no case reports of any patient surviving DNP-related cardiac arrest. Because of extremely high mortality, an intensive approach should be adopted early in symptomatic patients who present after taking a potentially fatal dose. These patients should be managed in an ICU setting with early intubation and mechanical ventilation. Physicians should be aware that deterioration can rapidly occur, leading to a fatal outcome.

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73. Pre-treatment with P2Y12 inhibitors in unstable angina and non-ST elevation myocardial infarction

Som Aftabizadeh; Senthil Thambidorai; Saravanan Balamuthusamy; Machaiah Madhrira; Gerardo Mederos; Roshanda Carlisle; Seline Haci; Gabriel Gonzalez; Junaid Iqbal

Abstract Body/Text: Dual antiplatelet therapy with aspirin and a P2Y12 inhibitor is well established in the treatment of patients with acute coronary syndrome (ACS). These guidelines, however, are unclear on the ideal time to start the second antiplatelet agent. The benefits of pretreatment (i.e., treating before knowing the coronary anatomy) are conflicting and despite guideline recommendations, a significant number of patients with ACS do not receive DAPT upon diagnosis and instead receive aspirin and heparin and undergo percutaneous coronary intervention (PCI) first. One study looking at NSTEMI patients showed a rate as low as 22% compliance with DAPT before PCI. One randomized study testing pretreatment using prasugrel in NSTEMI did not show any benefits in reducing ischemic events but did show increased bleeding events. This and other studies have brought into question the benefit of pretreatment in ACS.

Methods: A retrospective review of EMR of patients admitted to Medical City Fort Worth with unstable angina or NSTEMI from January 2016 to

January 2018 who underwent PCI within 48 hours from presentation. The primary outcome to study was the overall DAPT utilization rate. Secondary outcomes were in-hospital mortality, readmission in one month, length of stay, and rate of major bleeding (defined as bleeding requiring >2U of packed RBCs within 48 hrs from PCI) comparing patients who received pretreatment with DAPT vs those who received only aspirin and heparin initially and P2Y12 after PCI. 223 charts were reviewed thus far out of 896.

Results: 21% of patients received DAPT before undergoing PCI and 79% of patients received aspirin and heparin before and P2Y12 after. Among those receiving DAPT after PCI, 22% of patients received DAPT within 6 hours, 10% within 12 hours and 65% within 24 hours. Readmission rates were 9% in patients who received DAPT before PCI and 6% in those who received DAPT after PCI. There was no statistically significant difference in readmission rate, in-hospital mortality or length of stay among these two groups. There was a statistically significant difference in bleeding rates (p-value 0.05) with those receiving pretreatment with DAPT having a higher risk of bleeding.

Conclusion: Although guidelines are unclear, this ongoing study suggests no correlation between pretreatment with DAPT and improved outcomes in centers with pretreatment and suggest potential increased bleeding risk with pretreatment.

Clinical Implications: Despite guideline recommendations, a significant number of patients with unstable angina and non-ST elevation myocardial infarction do not receive DAPT before coronary angiography "pretreatment" for fear of delaying coronary artery bypass graft in patients with multivessel disease. The clinical implications in the degree of variability in DAPT usage are unknown and need to be investigated.

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74. A deceptive presentation of levamisole toxicity as pyoderma gangrenosum

Supraja Thunuguntla, MD; David Diaz Voss Varela, MD; Rafael Otero, MD; Eddy Valdez, MD; David Patel, MD; Henry Kwang, MD; Laura Garcia, MD, FACP

Introduction: Eighty percent of cocaine is cut with levamisole, a substance banned in the US since 2000 due to a spectrum of adverse effects ranging from agranulocytosis to vasculopathy. Pyoderma gangrenosum (PG) in patients below 60 years of age has a well-known association with inflammatory bowel disease (IBD). Similarly, levamisole related cutaneous vasculitis has been a cited entity. The patient we

discuss below has had chronic cocaine abuse, poor health literacy and self-negligence presented to us with PG secondary to levamisole toxicity-a rarity.

Case: A 40-year-old Caucasian male with obscure past medical history and multiple hospital visits, presents to the emergency department complaining of right groin pain. A swelling was present which progressively grew over the next couple of days and drained open by itself.

Physical examination revealed multiple ulcerative erythematous papules and plaques on all four extremities and groin in various sizes and at various stages of healing. Scars with cribriform appearance were evident throughout. Patient stated that they are all painful and started appearing five years ago. On a previous hospitalization (6 months ago) the patient was evaluated for these lesions with a biopsy but he left against medical advice.

Levamisole toxicity was suspected by neutropenia, cocaine positive urine drug screen and serology test results of low C3, C4, positive myeloperoxidase and p-ANCA antibodies. Biopsy demonstrated dermis with neutrophilic infiltration, focal microabscess formation, edema and hemorrhage suggestive of Sweet syndrome. Treatment with antibiotics was initiated as presumptive diagnosis of cellulitis was made which was later discontinued as results of laboratory work up surfaced. Systemic steroids were initiated with no resolution of symptoms. The patient left against medical advice again.

Discussion: Top amongst the differential diagnosis was Drug induced- Sweet Syndrome and Levamisole induced PG. Patient did not meet the diagnostic criteria for Sweet syndrome despite meeting the major criteria for this condition. Sequential resolution of lesions following treatment of systemic steroids was not observed (one of the minor criteria for Sweet syndrome). Multiple cutaneous lesions with some on the shin, undermining ulcer border, preceding vesicle formation that ulcerate, “wrinkled paper” scars and neutrophilic infiltrate on biopsy of the ulcer edge is diagnostic of PG. The most common presentation of cocaine induced skin lesions-the vasculitis was ruled out with the biopsy results. Data regarding PG induced subcutaneous injection of IFN-apha2b (treatment for Polycythemia Vera) is available. Levamisole acts by inducing interferon synthesis. IBD is a cause of both Sweet Syndrome and PG, was ruled out in this patient with absence of characteristic history and serology. This case demonstrates the temporal association of adulterated cocaine abuse with PG formation and emphasizes the importance of methodical and step wise work up.

75. Cavitary lesion in an immunocompromised adult

Syed Talha Qasmi, MD; Turuvekere Jayaram, MD; Enrique Rincon, MD

Background: The pulmonary cryptococcosis prevalence has increased in the last twenty years. This increase is primarily due to the human immunodeficiency (HIV). However, other associations are increasingly recognized, such as organ transplant recipients, and patients on chronic immunomodulatory agents or glucocorticoids.

Case Report: A 57-year-old man, with rheumatoid arthritis (RA), presented with dyspnea on exertion, night sweats, unintentional weight loss, and cough which had been progressing over the last four weeks. Symptoms had been well controlled with methotrexate, prednisone, and leflunomide. Recent travel history to El Paso, Texas and St. Louis, Missouri. On physical exam, patient had normal vital signs. Decreased breath sounds in right lower lung fields. Nuchal rigidity and skin lesions were absent. Laboratory studies were notable for a WBC count of $7.4 \times 103/\mu L$ with normal differential and an elevated ESR at 72 mm/hr. Chest radiography (CXR) and subsequent computed tomography (CT) of the chest revealed a right upper lobe cavitation and right lower lobe consolidation. Serum cryptococcal antigen was negative. Fungal culture from the broncho-alveolar lavage (BAL) grew *Cryptococcus neoformans*. Head CT and lumbar puncture (LP) revealed no evidence of CNS infection. Testing for HIV was negative. Therapy with fluconazole 400 mg daily was initiated with significant improvement in functional status.

Immunosuppressive therapy was stopped with the exception of low dose prednisone. Given the long half-life of leflunomide (15 days), cholestyramine washout was performed. Antifungal therapy recommended for six to twelve months.

Discussion: Cryptococcus, an opportunistic fungal infection, presents most commonly as meningitis, but may affect any organ system. Isolated pulmonary involvement is the second most common presentation, with symptoms ranging from asymptomatic colonization to severe pneumonia with respiratory failure. The severity of disease is based on degree of immunosuppression in the affected host. The most common radiographic finding in non-HIV patients is solitary or multiple pulmonary nodules, followed by multifocal airspace consolidation. Lobar infiltrates and cavitary lesions occur more commonly in immunosuppressed host. Diagnosis can be made from culture following sputum sampling, bronchoscopy with BAL, or open lung biopsy. Serum cryptococcal antigen detection is highly specific when found in titers greater than 1:4, though isolated pulmonary involvement of the non-HIV patient, only 25–56% of patients have positive titers. Treatment largely depends on the patient's immune status and extent of disease. Immunocompromised patients with mild to moderate disease may be treated with fluconazole 400 mg daily for 6–12 months. Severe lung disease or disseminated disease should be treated with induction therapy with an amphotericin preparation for 2–4 weeks followed by fluconazole therapy until immune reconstitution is achieved. Cryptococcal pneumonia has been reported with methotrexate concurrent with steroid or leflunomide therapy.

76. Modern day pirate

Nicholas Gurney, MD; Hiba Ali, MD

Introduction: Vitamin C deficiency, which results in scurvy, is an underrecognized syndrome. Initial symptoms such as fatigue, weight loss, diarrhea, and anemia can often be nonspecific. With progression, more classic symptoms appear, including follicular hyperkeratosis, perifollicular hemorrhage, ecchymoses, gingivitis, arthralgias, and impaired wound healing. The presentation can mimic vasculitis or clotting factor deficiencies resulting in delayed diagnosis and treatment. Scurvy is thought to be an uncommon disease in developed nations. However, a United States National Health and Nutrition Examination Survey found the overall prevalence of vitamin C deficiency was 7–8%.[1]

Case Presentation: A 37-year-old man with prior diagnoses of irritable bowel syndrome, neuropathy, and bipolar disorder presented with six months of spontaneous petechiae and ecchymoses on his bilateral lower extremities associated with arthralgias, right knee edema, and a fifty-pound weight loss. Due to progressive right knee pain, the patient eventually became mostly bedbound. On physical examination, he was edentulous, had atrophic glossitis, petechiae on his hard palate, clubbing of his fingernails, multiple ecchymoses, a presumed petechial rash throughout his body, and suspected right knee hemarthrosis. A recent prolonged hospitalization revealed a negative evaluation for malignancy, normal hemoglobin, and normal platelet levels. He was treated empirically for a vasculitis given elevated ESR (16 mm/hr) and CRP (47.4 mg/dL) although several steroid courses provided no relief. During the current hospitalization, an extensive hematologic, rheumatologic, and endocrine evaluation was unremarkable. Upon further questioning, the patient revealed that his daily diet consisted of 10–15 energy drinks and packaged macaroni and cheese. He smoked 2 packs of cigarettes daily, and until 5 months ago, was drinking one liter of vodka daily. Serum levels of multiple vitamins revealed severe deficiencies in vitamin C (<0.1 mg/dL), folate (3.5 ng/mL), B6 (3.6 ug/L), and vitamin D (<4 ng/mL). He was started on vitamin C, folate, thiamine, and ergocalciferol supplementation, as well as multivitamins, resulting in dramatic symptomatic improvement. At discharge, the patient was ambulating and resolution of his ecchymoses revealed more noticeable follicular hyperkeratosis and perifollicular hemorrhages as well as hair coiling. A malabsorption evaluation including serologic Celiac testing, EGD, and colonoscopy were unremarkable. His clinical presentation, undetectable vitamin C levels, and

rapid improvement with vitamin C supplementation confirmed a diagnosis of scurvy.

Discussion: Vitamin C is an antioxidant and essential nutrient, important in the synthesis of collagen, carnitine, neurotransmitters, and tyrosine. A diet deficient in vitamin C starts to produce symptoms in approximately one to three months. This case emphasizes the importance of a good history and physical exam to aid in diagnosis. By obtaining a thorough social and dietary history and observing the physical signs of nutrient deficiency, the team was directed to pursuing the correct diagnosis of vitamin C deficiency.

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77. Non-incarcerated inguinal hernia with sigmoidal diverticulitis

Khan U., MD; Hassan A., MD; Dah K., MD; Lambing M., B.; Mathew P., MD

Introduction: Abdominal wall hernia is defined as a protrusion of a part or whole organ through the wall of a cavity. Inguinal hernias account for 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women. Indirect inguinal hernia account for 80% of total inguinal hernias. A wide variety of pathological processes can present as inguinal hernias; however, large reducible inguinal hernias are quite rare. Recent studies have associated abdominal wall hernia with colonic diverticulosis, a term referred to as herniosis. This association suggests that an underlying connective tissue disorder could be a common etiological factor in abdominal wall hernias and direct inguinal hernias. Approximately 10–20% of diverticula progress to diverticulitis which along with inguinal hernias are common diseases processes encountered in clinical practice separately, however, the occurrence of these two conditions in tandem is a rarity.

Case: Here we represent a case of a 51-year-old man who presented to our emergency department with an erythematous and extremely tender left scrotum. Upon further examination and radiological imaging, patient was found to have a non-incarcerated sigmoid colon herniating through the inguinal canal who then developed an uncomplicated diverticulitis in the herniated segment. Patient was managed medically for his diverticulitis and surgery was consulted for possible surgical repair. Diverticulitis was treated with IV antibiotics and patient was scheduled for a surgical repair of his hernia in 4–6 weeks after acute diverticulitis symptoms subside, to reduce the risk of complication.

Discussion: Large inguinal-scrotal (indirect) hernias are an uncommon pathological condition in modern clinical practice however, when present, can become challenging to manage. Diverticulitis in the herniating bowel segment is an unusual complication of abdominal wall hernias which can lead to hemorrhage, abscess, fistula formation, bowel obstruction and perforation. In such patients, timely intervention and close monitoring can reduce the risk of complications. Patient with such presentation can be managed medically for their diverticulitis initially and once stabilized, the hernia can be surgically corrected.

78. All that turns red is not infection: a rare case of pyoderma gangrenosum

Xinyu Cao; Anita Scribner; Tiffany Egbe

Introduction: Pyoderma gangrenosum (PG) is a rare ulcerative skin condition characterized by neutrophilic inflammation of the skin, estimated to have an incidence of 3–10 cases per million per year. It is associated with inflammatory conditions such as inflammatory bowel disease, inflammatory arthritis, hepatitis, or neoplasms. Patients tend to be female and between ages 40–60. It commonly presents as multiple, tender, cutaneous vesicles that quickly ulcerate, most commonly affecting the lower extremities. Diagnosis is made by biopsy showing neutrophilic infiltration of skin as well 4 of 8 minor criteria: 1) exclusion of infection, 2) pathergy, 3) history of inflammatory disease, 4) rapidly ulcerating skin

lesions, 5) erythema, 6) multiple ulcerations, 7) cribriform scars at ulcer sites, or 8) decrease in size within 1 month of immunosuppression.

Case: A 56-year-old Caucasian female presents to the hospital for worsening right leg pain and redness. One month prior, she noticed vesicles around her right knee that quickly ulcerated and slowly developed into a large ulcer within two weeks. She was diagnosed with cellulitis at previous hospitalization and discharge with antibiotics. However, her pain and erythema progressed. Patient denied any trauma or injury to the area. Her other history was significant for hepatitis C, status post treatment 2 years before. On examination, she had a temperature of 100.1 Fahrenheit with three small, 1 cm ulcers and one large 3 cm ulcer of right anterior leg. She had blood-tinged drainage from the largest ulcer and erythema of the lower leg. Patient was started on vancomycin and infectious disease was consulted. On examination by infectious disease, there was suspicion of other underlying disease process and surgery was consulted for skin biopsy. Biopsy showed dermal necrosis with neutrophilic infiltration, without bacterial growth. This led to a diagnosis of PG. On further laboratory testing, patient was found to have positive ANA and rheumatoid factor but denied joint swelling or arthritis. She was also found to be positive for phosphatidylserine IgG and IgM, but denied history of blood clots. Her hepatitis C viral load was negative. She was discharged on steroids to follow-up with infectious disease and rheumatology.

Discussion: This case is a classic example of PG in a woman with an underlying undiagnosed rheumatologic disease. History of hepatitis C has also been associated with PG, however the etiologic role of hepatitis in this patient is unclear as she had completed curative therapy. In all patients with diagnosis of PG, work-up should focus on identifying underlying systemic inflammatory diseases. Missed and delayed diagnosis of PG are common and cause unnecessary antibiotic usage, which increased cost of care, and (potentially) increase patient morbidity. While rare, PG should always be considered for patients with erythema and ulcers, not responding to therapy.

79. A rare case of a chromophobe RCC with a TSC1 mutation has an unexpected response to everolimus

William Schwartzman; Viral Patel; Roy Elias; Layton Woolford; Suneetha Chintalapati; Payal Kapur; Dwight Oliver; James Brugarolas

Abstract: Cancer is the second leading cause of death in men and women in the United States in 2019, with >73,000 new cases and >14,700 deaths estimated from renal cancer alone. Chromophobe renal cell carcinoma (chRCC) is a rare subtype (4–5%) of renal cell cancer (RCC) that arises from the distal nephron with genetic mutations that commonly result activation of the mTOR pathway. In this case study, we present a patient who was diagnosed with chRCC with an identified TSC1 somatic frameshift mutation who had a partial response to everolimus after failing VEGF and Immunotherapy. The patient initially underwent a left nephrectomy with radical LN dissection and was started on Sunitinib 50 mg. Unfortunately, this was poorly tolerated and the patient developed persistent diarrhea and dehydration leading to an AKI and sunitinib was discontinued one month after starting therapy. Repeat imaging demonstrated progressive disease with increased mediastinal and retroperitoneal adenopathy as well as two new soft-tissue nodules in the subcutaneous tissues. The patient was then started on second-line therapy with the dual immune checkpoint inhibitors Nivolumab + Ipilimumab, but again demonstrated rapid progression with overall enlargement of lymphadenopathy and the appearance of new nodules. The decision was made to transition to Lenvatinib + everolimus.

After three months on Lenvatinib + everolimus, imaging was obtained which showed a deep partial response to therapy with decreased mediastinal and abdominal lymphadenopathy, decreases in the soft tissue nodules, and stable pulmonary nodules. Unfortunately, the patient continued to have chemotherapy related diarrhea and dehydration and suffered another AKI while on lenvatinib and everolimus and lenvatinib was subsequently discontinued. At this time, the patient notices decreased fullness in her neck and is feeling well overall and able to maintain her daily

routine. We think that this patient's chRCC developed loss of heterogeneity in the TSC1 gene, which led to the activation of the mTOR cellular growth pathway. Recent clinical trials have demonstrated the superiority of VEGF inhibitors compared to everolimus, relegating everolimus to be used as a third line regiment. However, recent subgroup analysis and case studies have suggested that patients with gene mutations in the mTOR pathway including PTEN, mTOR, TSC1 and TSC2 may have improved responses to rapamycin analogs. In this case the patient had continued progression while on traditional first line agents and in addition had severe side effects, thus highlighting the utility of NGS to identify the molecular genetics of tumors prior to initiating chemotherapy and improve patient's quality of life.

Ultimately, this case suggests that not all RCC should be treated or managed equally and further breakdown of RCC into various subtypes and understanding the genetic makeup of the tumors can lead to increased patient care and quality of life.

80. Evaluating mean corpuscular volume as predictor for erythropoiesis stimulating agent response in elderly patients diagnosed with myelodysplasia

Muñiz J.; Yellapragada S.; Rivero, G.

Background: Low-Risk Myelodysplastic Syndrome (LR-MDS) is genetically heterogeneous. Transfusion dependency (TD) adversely impacts overall survival (OS). Erythropoiesis-stimulating agents (ESAs) are first line for anemia and delay onset of TD, improving quality of life. In older LR-MDS patients harboring a larger number of mutations, ESA response is dramatically reduced. Predictors of ESA response include hemoglobin between 8–10 g/dL, del (5q) anomaly, erythropoietin (EPO) level <100 IU/L, low blast count, and transfusion independency (TI). Macrocytosis is not only observed at MDS diagnosis, but it is also associated with inflammasome activation upon mutation acquisition. Mean Corpuscular Volume (MCV) is the most practical way to detect red cell size modification in MDS patients. There are no prior studies that have investigated the correlation between diagnostic red cell size and prediction of response to MDS directed therapy [i.e. ESA, hypomethylating agents]. Given the known association between myeloid mutations and red cell size modifications, we investigated the correlation between MCV and ESA response in LR-MDS patients older than 65 years. Methods: After IRB approval, 81 LR-MDS patients diagnosed at the Michael E. DeBakey VA were screened. 68/81 (83.9%) patients had data to evaluate ESA response. ESA response was classified by IWG MDS 2016 criteria. Statistical analysis was performed with SAS software. Relevant variables with ability to predict ESA response including age, hemoglobin, lactate dehydrogenase, blast percentage, ferritin, erythropoietin (EPO) level, and TD history were investigated. Logistic regression analysis was used to examine the independent MCV modification effect on ESA response when adjusting for potential confounders selected from our univariate analysis. Results: 26/68 (38.2%) and 42/68 (61.7%) patients were ESA responders and non-responders, respectively. Median MCV among LR-MDS patients exhibiting erythroid response was 98.6 fL (79.4–116.3) vs 93.9 fL (74.6–112.8) in non-responders, p=0.04. Median (range) for age, hemoglobin, LDH, blast percentage, ferritin, and EPO among responders and non-responders were 75.7 years (66-91) vs 76 years (66–88), p=0.80; 9.4 g/dL (8-11.1) vs 8.9 g/dL (5.3–13), p=0.24; 159.2 U/L (68–278) vs 203.1 U/L (119-372), p=0.04; 0.89% (0–5) vs 0.92% (0-10), p=0.96; 249 ng/mL (8.2–649) vs 395 ng/mL (9.3–945), p=0.02; and 195 mIU/mL (7.7–925) vs 174 mIU/mL (19–1626), p=0.80.

TD history was observed in 50% and 66% of responders and non-responders, respectively, p=0.34. After accounting for potential confounders, MCV remained the only predictor for ESA response among LR-MDS patients, p=0.04, HR=1.12 (95% CI 1.01–1.25). Conclusions: Superior ESA response was observed among LR-MDS patients older than 65 years who exhibited higher MCV at diagnosis. In LR-MDS patients exhibiting higher MCV, probability of ESA response increases by 12% per 1-unit MCV increase at diagnosis. Although investigation into a "mutation type" leading to higher MCV is needed, MCV could discriminate subgroup of elderly LR-MDS patients who exhibit suboptimal ESA response.

81. Are Sundays better for a code blue?: incidence and outcomes of code blues based on clock and calendar

Nisha Dhanabalsamy

Introduction: The outcomes of a Code Blue (CB) initiated for cardiopulmonary arrest are dependent on several parameters including time to code initiation, duration of code, type of health care personnel and patient comorbidities. There is a paucity of data on the outcomes of a code blue based on the time of the day or week cardiopulmonary arrest occurred that prompted the initiation of a code. According to literature, mortality rates of in-hospital code blue ranges between 75–80%.[1,2] In our study we compared the outcomes of CBs performed during weekdays and weekends as well as daytime and night in our institution.

Methods: Single center retrospective analysis of all CB in the past 12 months (Jan 2018–Jan 2019). Data including time and day of the code, patient demographics, indication for code blue, admission diagnosis, duration of code, patient comorbidities, outcomes and hospitalization days were collected for the analysis. The proportionate mortality was compared between code blues that occur on Saturdays, Sundays and Weekdays using N1-Chi-Square test.

Results: 91 patients underwent a CB in the study period. 45% were females, with a mean age of 65.3 years. 61 codes occurred during weekdays and the rest occurred during weekends. The mortality rates after a code blue was 66%, 75% and 35% when it occurred during weekdays, Saturdays and Sundays respectively. There was a higher mortality when code blue occurred on a weekday when compared to Sunday (31%, 95% CI 3.06–52.86; p=0.03) and on a Saturday when compared to a Sunday (40%, CI 3.31–64; p=0.03). There was no significant difference when mortality was compared between Saturdays and Weekdays or cumulative mortality on weekends to weekdays. Comparing the percentage of ROSC achieved, it was higher for weekdays (72.5%, n=45) as opposed to weekends (55%, n=16) (needs to calculate p value).

Conclusion: Mortality rates were higher when code blue occurred on Saturdays and weekdays when compared to Sundays. Though there was a difference in mortality, many of these patients included those who withdrew care the next day after the code was called. However, we noticed an increased rate of ROSC achieved over weekdays compared to weekends. Since there was a significant difference in ROSC achieved on weekdays when compared to weekends and the calculated mortality rates being lower on Sundays, we have initiated a second phase to our project. This will include a larger cohort over an extended period of time and in turn may help to elucidate factors that can improve the observed effect and impact patient care.

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82. Euthyroid Graves' ophthalmopathy with negative immuno-reactive TSH receptor autoantibodies

Aliuddin Ammar, MD; Mooen Z; Wlazlo T; Kolli S

Introduction: Graves' ophthalmopathy is one of the most discernible features of Graves' disease, an inflammatory autoimmune condition of the retroocular tissues. It is characterized by eyelid retraction, proptosis, lid lag, restrictive extraocular myopathy and optic neuropathy. In 10% of patients, the disease presents independent of other symptoms of thyroid dysfunction and is otherwise known as Euthyroid Graves' ophthalmopathy (EGO). It is very rare to see a case of Graves' ophthalmopathy with absent autoantibodies. We report such a case.

Case Description: A 25-year-old female was referred to our department with an 8-month history of gradual bilateral vision loss and intermittent

left-sided retroocular headache. At the time of admission ophthalmologic examination revealed bilateral proptosis, conjunctival redness and decreased visual acuity (VA). The patient displayed the following ocular signs: Dalrymple sign (lid retraction), von Graefe sign (retarded descent of upper lid at downward gaze) and Stellwag sign (infrequent blinking). Her Clinical Activity Score (CAS) was 3—conjunctival redness, retrobulbar pain and decreased VA. Fundoscopy showed optic atrophy. Due to classic ocular features of Graves, thyroid function tests including thyroid autoantibodies were done but results were all normal: free T4 of 1.10 ng/dL and TSH of 1.989 mIU/ml, thyroglobulin Ab <0.9 IU/ml, thyroid-stimulating immunoglobulin (TSI) 89 % and thyroid peroxidase antibody (TPO) 1.5 IU/ml. MRI of the brain and orbits was performed to rule out other causes of proptosis and to determine the extent of ocular disease. This showed bilateral enlargement of the medial rectus muscles compressing both optic nerves. The right inferior rectus muscle was mildly enlarged with notable bilateral orbital fat stranding and extensive edema. MRI brain did not show mass, hydrocephalus or infarcts.

With these findings, a diagnosis of Euthyroid Graves' ophthalmopathy was made. The patient was started on pulse dose IV steroids for 3 days. Her proptosis, swelling and visual acuity improved significantly over the next 3 days. When her condition had improved to an acceptable point for discharge, she was transitioned to oral steroids and sent home with a 4-week prescription and follow-up with endocrinology and ophthalmology.

Conclusion: This case illustrates the potential for Graves' ophthalmopathy to occur while being seronegative for Thyroid autoantibodies. Its pathophysiology is still not fully understood but this case provides some insight into the significance of Thyroid autoantibodies and the role they play in disease manifestation. Diagnosing Graves' ophthalmopathy is a complex process requiring careful and meticulous review of signs, symptoms and imaging results, while excluding other causes of proptosis such as orbital mass/tumors. Relying alone on thyroid hormone and autoantibody levels is not always adequate for the diagnosis of Graves' disease.

83. Strongyloidiasis hyperinfection syndrome in an immunosuppressed West-African patient

W. Hussain, MD; E. Clark, MD, PhD; B. Zeluff, MD

Introduction: *Strongyloides sterocoralis* (SS) infects over 70 million people globally. Immunosuppressed individuals, including those on corticosteroid therapy, are at risk for developing disseminated SS and Strongyloides hyperinfection syndrome (SHS), a life-threatening illness with up to 90% mortality without appropriate treatment. Here we present a patient on immunosuppressive therapy from an endemic area with SHS manifested as recurrent gram-negative bacteremia and upper gastrointestinal bleed.

Case Presentation: A 54-year-old woman from Ivory Coast with polymyositis on high dose prednisone presented with two weeks of epigastric pain and 2–3 days of confusion, lethargy, and melena. On examination, she was febrile, hypotensive, tachycardic, and tender in the epigastrium. Laboratory testing showed Hgb 9 mg/dL with positive FOBT; the absolute eosinophil count was zero. Admission blood cultures grew Klebsiella pneumoniae. She was treated with broad-spectrum antibiotics, blood transfusion, and IV pantoprazole therapy. Three days later, she became febrile and hypotensive. Repeat blood cultures grew Enterococcus sp. Her endoscopy revealed duodenal ulcers, which when biopsied, demonstrated SS larvae. Subsequently, sputum ova/parasite analysis showed SS larvae. Her steroid therapy was held, and she was treated with IV antibiotics and daily ivermectin until stool and sputum samples were negative.

Discussion: SS is a unique gut nematode that can complete its lifecycle via autoinfection in a human host. It can survive in the host for years producing few or no symptoms. However, once the host is immunosuppressed, the SS autoinfection cycle can significantly increase parasite burden, leading to hyperinfection and parasite dissemination away from the gastrointestinal and pulmonary systems into organ systems not typically involved in the SS life cycle, like the CNS. Gram-negative and polymicrobial bacteremia and meningitis can occur as disseminating larvae coated with enteric organisms exit the gastrointestinal tract. In hosts with normal immune systems,

SS infection is treated with one dose of ivermectin; in immunosuppressed individuals with disseminated disease or SHS, daily ivermectin is required until eradication. Thus, all individuals from SS endemic areas, especially those with persistent peripheral eosinophilia, should be tested for SS exposure and treated prior to starting immunosuppressive medications or undergoing procedures requiring immunosuppressive therapy like solid organ transplant. Also, patients from endemic areas who are immunosuppressed and present with Gram-negative or polymicrobial bacteremia or meningitis should be tested for SS through stool or sputum ova/parasite analyses—they likely will not have peripheral eosinophilia due to steroid administration. Appropriate preventative testing and treatment, as well as early recognition of SHS, will lead to decreased morbidity and mortality from this parasite.

84. A very sweet rash: a case of dermatosis and malignancy

Sarah Herrman

History: 47-year-old previously healthy male with a 2-week history of diffuse, non-pruritic, tender rash which began on his posterior neck/occipital scalp and spread to his forehead, face, upper and lower extremities, trunk, and abdomen:

- Endorsed subjective fever/chills and a cough productive of yellow sputum
- Oral antibiotics and topical steroids had not helped
- Moved from Mexico 4 years prior, denied receiving childhood vaccines, sexually active with female partners only and used barrier contraception.

Physical exam:

- normal vitals at presentation
- Skin: Coalescent erythematous papules, some with central pustulation across his face, scalp, bilateral upper/lower extremities, abdomen, and buttocks. Lesions of the lower extremities had a superimposed purpuric component. Palms and soles were spared.
- HEENT: Erythematous lesions with central erosions on hard palate and posterior oropharynx and conjunctival injection
- No palpable lymphadenopathy
- Liver and spleen were palpable.

Investigations:

- pancytopenia with neutropenia
- LFTs mildly elevated, INR 1.5
- Normal hemolysis labs
- Hepatitis C ab positive, negative viral load
- Elevated inflammatory markers
- ANCA negative for C and P HIV negative
- HSV positive cryoglobulins negative RPR negative
- Bone marrow biopsy: atypical lymphocytes involving more than 90% of the bone marrow
- Flow Cytometry: 34% aberrant lymphocytes with monotypic surface lambda light chain expression compatible with a mature B lineage non-Hodgkin lymphoma
- CT chest: Diffuse lymphadenopathy, bronchial wall thickening, peribronchial ground glass opacities and diffuse 1–3 mm pulmonary nodules.

Hospital Course:

- Started on broad spectrum antibiotics but rash continued to progress
- HSV serology returned positive but all others were negative
- On 4th day, skin biopsies were consistent with Sweet's Syndrome and folliculitis
- Bone marrow biopsy results consistent with a non-Hodgkin B cell lymphoma and flow cytometry confirmed hairy cell leukemia

– Initiated cladribine 0.14 mg/kg/day over 5 days after bone marrow biopsy results.

Discussion: Sweet's syndrome, or acute febrile neutrophilic dermatosis, is a rare inflammatory disorder characterized by the abrupt onset of painful erythematous/violaceous plaques and papules often in association with fevers, arthritis, and leukocytosis. SS has been categorized.

85. Widespread bruising and petechiae in a 58-year-old female

Dr. James Cuvillier

Abstract: A 58-year-old female with a past medical history of Lewy body dementia and rheumatoid arthritis (RA) presented to the emergency room with a diffuse petechial rash and was found to have isolated thrombocytopenia with platelets <9,000/ul. She reported one episode of melena the week prior but no active bleeding. Her white blood cell (WBC) count, C-reactive protein and serum lactic acid levels were within normal limits, and she was sent home on prednisone for suspected idiopathic thrombocytopenic purpura. She was admitted two days later after returning to the hospital with gingival hematomas and persistent petechiae and bruising. Vital signs were pertinent initially only for mild tachycardia. Hypomimia, cogwheel rigidity, and hematomas of the tongue and lower lip along with a diffuse petechial rash on the extremities and trunk were noted on exam. Repeat labs showed platelets persistently <9,000/ul with a normal WBC count and hematocrit, though on differential the patient had absolute monocytopenia. A peripheral blood smear revealed a total decrease in platelets without platelet clumping, schistocytes, or dysplastic blood cells. Coagulation factor assays were normal, and HIV and hepatitis C serologies were negative. An abdominal ultrasound showed no evidence of splenomegaly. The patient was evaluated by hematology and started on intravenous dexamethasone, standard first line treatment for immune thrombocytopenia, planned four days. On hospital day one, the patient developed pancytopenia and a headache, though no intracranial hemorrhage was present on CT scan. On hospital day two, the patient's platelets remained <9,000/ul, and she developed hemoptysis progressing to acute hypoxic respiratory failure requiring intubation. A new right-sided pulmonary opacification was identified by chest x-ray concerning for possible pneumonia versus hemorrhage, and sepsis workup was initiated. Blood cultures were drawn and the patient was started on broad spectrum antibiotics. However, the patient rapidly developed vasopressor-refractory shock and diffuse bleeding leading to cardiac arrest despite maximal resuscitation efforts. By autopsy, the patient was found to have diffuse hemorrhagic sequelae of disseminated intravascular coagulation (DIC), and each of her blood cultures returned positive for E. coli.

This case illustrates the rapid, unexpected development of septic shock and DIC in an immunosuppressed patient in the absence of persistent signs and symptoms of infection. Septic shock has been associated with estimated mortality rates exceeding 40 percent*, and the timely implementation of sepsis protocols is key to preventing this outcome. Leukopenia is a primary component of the systemic inflammatory response syndrome criteria. Laboratory data revealing new-onset bone marrow suppression, including peripheral thrombocytopenia progressing to pancytopenia, as in this case, should also prompt physicians to consider infectious causes of these phenomena in immunosuppressed patients.

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86. Cost effective and appropriate use of continuous cardiac monitoring in inpatient population

John Odneal, MD; Olubadewa A. Fatunde, MD, MPH; Tom Hu, DO; Nadeen Audisho, MD; Tiffany Egbe, MD; Sushama Brimmer, MD; Khashayar Vahdat, MD, FACC

Introduction: Continuous cardiac monitoring is often utilized in inpatient populations. This utilization

is not always clinically appropriate or evidence based. Overutilization results in increased costs and delays in care as patients board in the Emergency department waiting for telemetry beds. The contribution of cardiac monitoring to alarm fatigue and false positive results demonstrates the need in addition to cost considerations to limit monitoring to appropriate patients. ACC/AHA provide clinical guidelines for inpatient monitoring, but approximately one third of inpatients with telemetry orders do not meet these indications. In 2017, the cost of telemetry in our community tertiary care hospital was $1.67 million.

Objective: Reduce unnecessary use of continuous cardiac monitoring in patients not meeting AHA/ACC & other indications for severe/serious illness; to lower costs; reduce alarm fatigue; improve resident & staff education about telemetry; while preserving patient safety.

Procedure & Measurements: Pre-intervention, a cross sectional review of 112 patient records was conducted on intermediate care and medical floor patients to assess the quantity & indications of telemetry orders. A pre-intervention survey of 36 internal medicine residents and 20 hospitalists was conducted to assess practice patterns. Our primary intervention was the addition of telemetry indications for cardiac and serious noncardiac conditions (e.g. sepsis, alcohol withdrawal, COPD) to the telemetry order in the EMR, alongside implementation of nursing criteria allowing medically stable patients to be taken off telemetry. Post-intervention a prospective cohort of 100 patient charts was reviewed to analyze telemetry utilization appropriateness.

Outcomes: On pre-intervention chart review, 83% of patients met indications for cardiac monitoring, with 28% overutilization. Of the surveyed physicians, 24% were aware of AHA/ACC criteria, but only 13% actively used them in their decision making when ordering monitoring. Post-intervention, 95% of telemetry orders met indications, with 17% overutilization. Pre-intervention total telemetry waste (no indication & overuse) was 45%, reduced to 22% post-intervention. A total of 49% of patients evaluated by RNs met discontinuation criteria. The estimated cost savings were $89,947.68 for no-indication and $113,757.40 for overuse, translating to a 55–75% reduction in telemetry costs. One episode of NSVT was captured on a pre-intervention no-indication patient, with no clinically significant sequelae.

Conclusion: Our project identified significant resource waste & appropriate indications for telemetry. We included these indications in the EMR and educated staff on telemetry usage. Our intervention resulted in a significant decrease.

87. A demographical review of submitted electrocardiograms among first-class airmen medical certification denials

Lynda Chowdhury, MD; Warren Silberman, DO

Introduction: Under Title 14 of the Code of Federal Regulations, Part 67.111, the Federal Aviation Administration requires airmen seeking first-class medical certification to “demonstrate an absence of myocardial infarction or other clinically-significant cardiac abnormalities” on an electrocardiogram (ECG) at the time of the initial application after reaching his or her 35th birthday and then annually following the 40th birthday.

Methods: Over an approximate five-year span from June 2013 to December 2017, 476,315 electrocardiographic examinations were conducted by certified Aviation Medical Examiners during designated clinical encounters for receipt or renewal of medical clearance-to-fly. Of the above cases, 134 of them were those where the ECG was not cleared, and the pilot ultimately was denied a medical certificate. All who received ECGs, designated ECG diagnostic codes, and submitted health information were individually reviewed via the FAA-specific electronic medical record system. Demographical data including age, sex, and current country-of-residence were also noted.

Results: Fifteen of these denials were a result of other medical conditions that the pilot was also being evaluated for other than the noted ECG abnormalities. 83 of the 134 airmen were denied simply for a failure to provide adequate medical documentation within the 60-day deadline required to affirm their eligibility to perform flight duties. Most common cardiac

abnormalities detected among the 134 case-ECGs, in descending order, comprised specific and non-specific T-wave changes including biphasic T-waves (T), right bundle-branch blocks (RBBB), premature ventricular contractions (PVC), ST-segment aberrations (ST), atrial fibrillation (AFIB), and left-ventricular enlargement (LVE) and hypertrophy (LVH).

Discussion: As no prior review of these submitted ECGs has been done before, this snapshot offers an intriguing look at the merits of this certification demand in protecting the ultimate safety of civil airspace. Many of the listed cardiac arrhythmias, save some exceptions, do not immediately disqualify a pilot from obtaining first-class medical clearance if additional information specified by FAA guidelines are submitted before established deadlines. Logistical challenges in either obtaining records or performing the requested tests (with or without out-of-pocket costs) are deemed likely culprits in the delays leading to case denials.

Conclusion: Such research can highlight the aerospace industry's resolve to mitigate likely impediments to the performance of designated occupational duties. This information can thus set standards for related fields, particularly those involving extreme environments, where one must recognize medical conditions that could reasonably prohibit an individual from successfully executing his or her assigned tasks and could jeopardize the larger mission at-hand.

88. Nephrolithiasis causing acute hypoxia?

Prashanth Reddy; Som Aftabizadeh; Luna Liu; Nisha Dhanabalasamy; Sahityan Viswanathan; Harsh Patel; Anand Subramanian; Saravanan Balamuthusamy; Machaiah Madhrira; Senthil Thambidorai; Satish Chandraprakasm

Introduction: The overall incidence of complications following closure of ASD is reported to be around 8.6% with majority involving embolization or migration of the device. Migrations occur most commonly to the left atrium, left ventricle, ascending aorta, aortic arch or the descending aorta and rarely to the main pulmonary artery. Most cases are reported on early device migration (up to 12 months following ASD closure). We present a rare case of a patient who developed migration of ASD closure device into the main pulmonary artery 2.5 years after placement.

Case presentation: A 55 y/o Hispanic male with a PMHx significant for nephrolithiasis presented to our ED with complaints of left flank pain and dysuria. The patient was initially worked up in our ED for nephrolithiasis. A CT Abdomen showed multiple bladder stones with left hydronephrosis and left renal perinephric stranding. The patient was also incidentally found to have an O2 Sat of 80% on RA. He denied any shortness of breath or chest pain. The patient required 10L O2 to improve his O2 Sat to 92%. Upon further review it was found that the patient had a history of ASD repair in the 1970s. He developed a leak in 2016 and had it repaired again with an Amplatzer septal occluder. He was then lost to follow up. We postulated at that time that the ASD closure device could have developed a leak again. While our suspicion for PE was low (Wells score: 0), a STAT CTA was ordered secondary to acute hypoxia. The CTA ruled out PE but it showed a foreign body in the main pulmonary artery which appeared to be the ASD closure device. An Echocardiography was obtained STAT showing a dilated right ventricle and an ASD was noted with moderate right to left shunting. Cardiothoracic surgery was consulted and the ASD device was extruded from the main pulmonary. Following the procedure, the patient's oxygen requirements improved to baseline.

Discussion: ASD closure device migration is a potentially fatal complication that may be overlooked following percutaneous ASD closure. Clinical features may vary widely based on the location and type of the device used. A study looking at complications following the placement of Amplatzer septal occluders showed only 1/1000 cases where the device embolized with hemodynamic compromise. In other cases the ASD device embolized in minutes to hours after the device was initially placed. In this case the patient lacked secondary erythrocytosis on presentation, which made us believe that the patient had a recent embolization of the device. This case report illustrates the need for suspicion of device migration in patients who exhibit variation in saturation levels despite oxygen supplementation and the importance of close clinical follow-up post device placement.

89. A twisted case of jaundice

Hung Hoang, MD; Tara Norris, MD

Introduction: With biliary obstruction, patients often present with clinical signs of yellowing skin, known as jaundice. Typically, laboratory data demonstrates conjugated hyperbilirubinemia and imaging studies show dilation of the common bile duct. Extrahepatic obstruction due to diaphragmatic hernia is rare. We present such a case of extra-hepatic obstructive jaundice due to diaphragmatic hernia (DH).

Case Description: A 71-year-old woman presented to the hospital after her granddaughter noticed two days of worsening jaundice. The patient reported a one-week history of fatigue, early satiety, poor appetite, nausea, and vomiting. She also noted having tea-colored urine and a 30-pound unintentional weight loss during the previous eight months. She denied a history of trauma, recent surgery, abdominal pain, fever, or chills.

Upon admission, the patient was noted to be diffusely jaundiced. Her liver function tests were elevated, and abdominal ultrasound demonstrated a mildly dilated common bile duct at 8 mm, as well as intrahepatic ductal dilation. Magnetic resonance cholangiopancreatography (MRCP) demonstrated stomach, pancreas, small bowel and most of the colon to be above the diaphragm with abnormal orientation of the extrahepatic bile ducts extending superiorly to the duodenum which was located in the thorax. Computed tomography (CT) of thorax, abdomen, and pelvis revealed a large diaphragmatic hernia, and it confirmed the presence of pancreas, small bowel, and colon in the thorax.

Surgical repair of the defect was considered, however, due to the patient's poor functional status, the risks of surgery were determined to outweigh the benefits. Biliary decompression with stent placement was performed instead. This was accomplished percutaneously, as her anatomy was not amenable to an endoscopic approach. She tolerated the procedure well, and her jaundice and transaminase elevation subsequently resolved. Plan was made for stent replacement as needed for recurrence of jaundice.

Conclusion: Painless jaundice with early satiety and weight loss in the elderly population most commonly raises concern for biliary obstruction due to neoplasm. These signs and symptoms can also be caused by compression of the common bile duct from complication of a diaphragmatic hernia. Newly discovered anatomic anomalies are rare in elderly patients, but nonetheless should be considered by clinicians when evaluating patients with jaundice. Appropriate treatment involves surgical or non-invasive techniques as highlighted in our case.

90. The eight of hearts: acute cerebrovascular accident from a left ventricular thrombus in a patient with an underlying hypercoagulable disorder

Daniela Hagenasr, DO; Spencer Shastid, OMS-III; Tom Hu, DO; Monica Mutyala, MD; Andrei Scherer, MD; Joe Bowers, MD; Shafik Hanna-Moussa, MD, FACC, FASCI; Shahab Akvan; Rama Koya, MD; Sreenath Meegada, MD; Tiffany Egbe, MD

Introduction: Left ventricular thrombus (LVT) is a devastating complication of left ventricular (LV) dysfunction, commonly precipitating systemic emboli, and consequent morbidity and mortality. With the success of PCI and medical management of acute myocardial infarction (MI), heart failure (EF <40%) is now the most common precipitating factor of LVT (68%). LV dysfunction is often global (approximately 66% of cases); the apex is the most common location of regional LV dysfunction. In the United States, intracardiac sources of emboli account for up to 20% of all strokes annually. We present a patient with an acute cerebrovascular accident (CVA) secondary to a large left ventricular thrombus despite a normal left ventricular wall motion (LVWM) and EF on transthoracic echocardiography (TTE).

Case Description: A 45-year-old African American gentleman with a past medical history of CAD, hypertension, diabetes type II, and chronic tobacco use presented with a headache and multiple episodes of left sided paresthesias of one-day duration. Each episode lasted 2–3 minutes, and was associated with a right sided non-radiating headache with sinus pressure.

Of note, three weeks prior to admission the patient complained of sudden onset slurred speech, resolving in less than 24 hours. Neurologic exam revealed 5/5 strength, and 4/4 sensation in all extremities, intact cranial nerves, and normal speech.

MRI revealed acute and subacute embolic infarcts of the right MCA territory. TTE showed an EF of 60–65% and a large, mobile, pedunculated 3.4 × 1.2 cm LV mass with normal LV wall motion suggesting cardiac tumor, but not excluding thrombus. Cardiac catheterization revealed no evidence of CAD. A hypercoagulability workup was notable for an elevation in factor VIII. The patient was initially conservatively managed, discharged on warfarin. On follow up 2.5 weeks later, the size of the mass was unchanged; thus, patient elected for surgical resection of the mass, revealing a thrombus on pathology.

Due to nonadherence to warfarin, six months following LV thrombectomy, the patient developed a recurrent right MCA CVA with near complete left hemiparalysis, receiving tPA. Eight days later, he developed extensive DVTs in left popliteal, posterior tibial and peroneal veins as well as submassive bilateral pulmonary emboli. He is on lifelong anticoagulation.

Conclusion: This case presents an uncommon finding of LVT with a normal EF, LV wall motion, and an elevated factor VIII. It is unlikely that the pedunculated thrombus formed in an area of transient ischemic hypokinesis as cardiac catheterization was negative. Elevated factor VIII likely contributed to the thrombus formation, as chronic elevation increases the risk for VTE more than fivefold. Early studies show elevated factor VIII levels may be a strong thrombotic risk factor in black patients. While likely heritable, the genetic determinant has not been elucidated. More research is needed.

91. Case report: ozone therapy: when cure becomes harm

Khan A; Bangash S; Nguyen N; Huayanay I; Gonzales T1; Heath T

Introduction: Ozone (O3) therapy was first introduced in the medical community in the 19th century, however due to its innate volatility, its use has always prompted caution. The benefit of O3 application in the treatment of diabetic foot ulcers is a subject still under review, and therefore its safety, and efficacy have not yet been established. Administration of O3 outside of its therapeutic window can have grave consequences. Herein, we describe a case of a diabetic patient who developed severe foot necrosis and infection after receiving topical ozone therapy for a non-healing wound.

Case Presentation: A 60-year-old Hispanic lady with DM Type 2 status-post left 5th metatarsal amputation presented to the ED with gangrenous ulcer on the left mid foot following an amputation performed in Mexico. Post amputation she received intravenous antibiotics and had normal wound healing. However, she then received topical ozone therapy treatment and reported rapid deterioration with it. She noted that the wound initially changed color, started having malodorous discharge, and then completely turned black within the next 3 days. On physical examination, she had 5th metatarsal amputation with a necrotic gaping wound extending from 3rd metatarsal dorsally to the plantar surface. According to Texas ulcer classification, it was a grade 3 stage D ulcer with malodorous discharge, and feeble peripheral pulses with loss of sensation distal to the wound. Inflammatory markers on admission were elevated: WBC 29.6 × 109/µl, C-reactive protein (CRP) 27.1 mg/dL, erythrocyte sedimentation rate (ESR): 113 mm/h. She had poor glycemic control with hemoglobin A1c being 11.6%. She was admitted with sepsis secondary to osteomyelitis confirmed on CT foot. Bilateral lower extremity arterial Doppler revealed severe PAD. A comprehensive management plan comprising culture-driven intravenous antibiotic regimen, surgical consultation for wound debridement, and glycemic control was initiated. She initially underwent sharp wound debridement, however, became hypotensive with MAP at 65 mmHg post debridement. The following day left below knee amputation was performed, and she was discharged 4 day later without any acute complications.

Discussion: The purpose of this case study is to bring to attention the controversial role of Ozone

therapy in diabetic foot ulcers. Although ozone therapy is gaining popularity as an adjuvant therapy for diabetic foot ulcer, its use has to be initiated with extreme caution. There is a lack of established evidence favoring its use-some of the factors that need to be taken under consideration before initiation of O3 therapy include patient selection, wound characteristics, time and duration of intervention, and introduction of adjunctive therapies. The role of ozone therapy is still poorly defined in the management of foot ulcers and therefore its administration can result in more harm than benefit.

92. Cardiac thrombosis

Micahel Sansait, DO

Thrombocytopenia in the setting of chemotherapy when treating metastatic cancer is not an uncommon finding. In the setting of cardiac thrombus, however, it presents a therapeutic dilemma. Recommendations regarding anticoagulation in these patients are scarce; additionally, data behind recommendations is insubstantial making it difficult to make a strong recommendation based on current evidence. In this case report, we present a patient with metastatic gastric carcinoma with thrombocytopenia who was initially admitted for hypomagnesemia and automatic implanted cardiac defibrillator discharge while in the emergency department. He was found to have a deep vein thrombus in his right lower extremity on venous ultrasound and an acute venous thrombus in the right side of his heart on echocardiogram. We discuss our management and include a brief review of current recommendations regarding management of cancer-associated VTE in the setting of thrombocytopenia.

93. A nodal mystery with recent ischemic history

Uchenne Mbaraonye, DO; Shaadi Abughazaleh, MD; Amol Patel, DO; Ethan Burns, MD; Christopher Force, MD; Sai Ravi Pingali, MD

Introduction: Ischemic stroke is a relatively common phenomenon that carries a significant morbidity and mortality rate. Malignancies are a known risk factor for stroke that is believed to perpetuate ischemic events through hypercoagulable prothrombotic cascades. Non-Hodgkin Lymphoma is not an uncommon cause of stroke. We present a case of a 53-year-old man with multifocal and recurrent strokes ultimately diagnosed with an extracardiac mass believed to be metastatic diffuse large B-cell lymphoma.

Case Presentation: A 52-year-old man with hypertension and paroxysmal atrial fibrillation was transferred from an outside hospital after multiple episodes of strokes without an identified cause. He had been trialed on aspirin and clopidogrel along with apixaban, dabigatran, and warfarin on each discharge only to have new or progressive focal neurologic deficits and imaging findings characteristic of new embolic strokes over a one-month period. A comprehensive infectious workup, paraneoplastic panel, CADASIL and CARASIL genetic workup, and coagulation workup were unrevealing. Additional workup with a CT coronary angiogram demonstrated a 2.7×2.7 cm extracardiac mass. Further workup with a PET scan showed diffuse thoracic and retroperitoneal adenopathy, and bilateral adrenal glands with varying degrees of uptake in a pattern that favored lymphoma. In addition, a magnetic resonance imaging of the spine showed diffuse thickening suspicious for leptomeningeal disease Ultimately, core needle biopsy of the retroperitoneal nodes was diagnostic for diffuse large B-cell lymphoma. He underwent R-HyperCVAD with plans for 21-day cycle. After completion of the cycle and no meaningful neurologic recovery, the decision was made to go into comfort care.

Discussion: We present a case of recurrent multifocal strokes secondary to an extracardiac mass with malignant emboli highly suspected to be diffuse large B-cell lymphoma of the intravascular subtype. Intravascular large B cell lymphoma (IVBCL) is a rare type of extranodal large B cell lymphoma characterized by selective growth of lymphoma cells within the microvasculature. The mechanism of recurrent multifocal strokes is malignant cell infiltration into the vasculature resulting in tissue ischemia. The disease is rare, with an estimated prevalence of one person per million. Rarer still is the presentation of recurrent strokes, with only a few prior cases reporting IVBCL with stroke-like symptoms in the literature. As this case suggests, the

presentation is vague, and clinicians should have a high index of suspicion if other causes are methodically rule out. While an uncommon diagnosis, patients presenting with recurrent cryptogenic strokes should have a workup to assess for lymphoma.

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94. An Unusual Case of Broken Heart

Ammar Hasan, MD; Enrique Rincon, MD

Background: For the past 15 years, Stress Cardiomyopathy (SC) was known as Takotsubo, The Japanese word for Octopus trap. Takotsubo resembles the apical ballooning form of the left ventricle seen in an echocardiogram or ventriculogram. SC comprises different variants. SC mimics acute coronary syndrome for EKG changes and/or cardiac enzymes elevation in the setting of no coronary obstruction. The left ventricular dysfunction in this entity is completely reversible. We present the case of a female who presented with chest pain and mild cardiac enzymes elevation. The left heart catheterization revealed an interesting variant, anterior segmental ventricular ballooning.

Case Report: A 59-year-old woman with a past medical history notable for Type 2 Diabetes Mellitus (T2DM), hypertension, and hyperlipidemia presented with substernal chest pain which lasts 10 minutes, palpitations, and numbness of the left arm. The patient presented with the symptoms after a heated argument at work. The patient's T2DM and Hypertension were well controlled. On physical exam, the patient was mildly hypertensive. However, the rest of the exam, CBC and BMP were unremarkable. Initial troponin was 0.11 ng/ml and peaked to 1.80 ng/ml. Chest radiography did not show cardiomegaly or pulmonary congestion. The patient was treated as no ST-elevation myocardial infarction. A left heart catheter was obtained showing left segmental anterior ventricular ballooning with an ejection fraction of 57%, and normal coronaries. The patient recovered and was discharged with a follow-up appointment in one month when a subsequent echocardiogram showed recovering of the EF to 72%.

Discussion: Stress cardiomyopathy was observed in 0.7–2.5% of patients with the suspected acute coronary syndrome. It affected women in 90.7% of the cases, especially post-menopausal. This entity is characterized by absence of coronary obstruction, reversibility of the left ventricular dysfunction, new EKG abnormalities or modest elevation in cardiac troponin. The EKG on admission showed ST-elevation in 71.1% of cases. The classical apical ballooning variant made up 54% of the cases, postero-basal 1%, basal and mid-ventricular 1%, diaphragmatic 2%, localized apical 2%, anterolateral 11%, and complete mid-ventricular 29%. The pathophysiology of SC is not fully understood, but several hypotheses have been postulated. Dysfunction of the microvasculature has the most acceptance following by transient vasospasm, the encircling of the left anterior descending artery, and the effect of the adrenaline. The pathological changes showed focal myocytolysis and infiltration of small mononuclear cells which makes SC likely to be an inflammatory heart disease rather than a coronary artery disease. In light of the reversibility of this entity, the treatment is supportive in addition to control of the risk coronary factors. Our case is unique for the rare localization of an anterior segmental ventricular ballooning causing left ventricular dysfunction.

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Author index

Author	Abstract #	Author	Abstract #	Author	Abstract #
Abreu	15	Gurney	76	Nezafati	44
Aftabizadeh	73	Hagenasr	90	Nguyen	53
Ali	3	Haj-Ismail	58	Odneal	86
Aliuddin	82	Haris	57	Paulk	6
Arevalol	52	Harris	30	Poddar	40
Argueta	25	Heredia	13	Qasmi	75
Avellan-Jimenez	24	Hernandez	36	Rahman	67
Babaniji	63	Herrman	84	Ramirez	20
Babcock	33	Hoang	89	Rana	68
Baliss	16	Hoard	66	Reddy	61
Becka	14	Hussain	83	Reddy	88
Bhakta	51	Hutson	45	Rico-Mesa	37
Bracamonte-Baran	10	Jagota	31	Rongo	19
Bravenec	9	Jin	48	Saleh	70
Calderon	12	Kabir	69	Sansait	92
Cao	78	Kapadia	8	Sarwar	72
Caravella	35	Kapten	11	Schwartzman	79
Chavez	54	Khan	77	Segura	47
Chowdhury	87	Khan	91	Shaikh	1
Cuvillier	85	Kou	17	Staley	59
Deoker	29	Lee	2	Stoll	43
Dhanabalsamy	81	Makram	32	Suarez	18
Dhayalan	21	Mbaraonye	93	Thrasher	64
El-Hag	4	McGlennon	50	Thunuguntla	74
Esteve	46	Mederos	27	Tran	56
Faruqi	34	Medi	28	Valdez	23
Fatunde	62	Medranol	65	Wilson	7
Garg	26	Mejia	22	Wilson	60
Gburi	39	Milazzo	55	Wongsaengsak	71
Gdowski	5	Muñiz	80	Yang	49
Ghimire	42	Muzaffar	38	Yu	41