RUTGERS
Robert Wood Johnson Medical School

DEPARTMENT OF MEDICINE

21st ANNUAL RESIDENCY & FELLOWSHIP RESEARCH DAY

June 5, 2020

Poster Viewing: 11:00-12:00 noon
Grand Rounds Oral Presentations: 12:00 – 1:00 pm

Vimal and Pappu Sodhani have been friends and supporters of Robert Wood Johnson Medical School (RWJMS) since 2017. Their generosity has provided essential funding to support research conducted by our residents & fellows in the Division of Education, the Division of Infectious Diseases and the Infectious Diseases Grand Rounds Series. The Division of Education thanks Mr. and Mrs. Sodhani for their support of Research Day. Their investment in training today helps shape tomorrow's physicians.

DEPARTMENT OF MEDICINE
RESIDENCY & FELLOWSHIP
21st ANNUAL RESEARCH DAY
JUNE 5, 2020
ZOOM MEETING

11:00 a.m.

Introduction:
David A. Cohen, M.D.
Vice Chair for Education, Department of Medicine
Rutgers Robert Wood Johnson Medical School

Opening Remarks:
Michael B. Steinberg, MD, MPH, FACP
Chair, Residency Research Committee

11:10 - 12:00 p.m.

Poster Viewing/Judging

12:00-1:00 p.m.

Fredric E. Wondisford, MD
Chairman, Department of Medicine

Michael B. Steinberg, MD
Moderator for Oral Presentations (below)

12:05-1:00 p.m.

Resident & Fellow Presentations

Yera Patel, M.D., PGY 5 Fellow in Infectious Disease
Initial Experience with Tocilizumab for COVID-19 at RWJUH: Inflammatory Markers, Clinical Outcomes and Adherence to Monitoring Protocols

Jonathan Stoll, M.D., PGY 3 Internal Medicine Resident
Hypoxic Index as a Measure to Determine the Presence of Prevalent Hypertension in Obstructive Sleep Apnea (OSA)

Debashis Reja, M.D., PGY 3 Internal Medicine Resident
Electronic Cigarettes are Associated with increased risk of Depression: An Analysis Of the National Health and Nutrition Examination Surveys, 2015-2016

Carlos Osorio, M.D., PGY 6 Fellow in Pulmonary and Critical Care Medicine
Obstructive Sleep Apnea And Upper Airway Sensation In World Trade Center Responders - Role Of Chronic Rhinosinusitis

"I remember fondly how important this event was to me during my training. The research questions that I first asked as an intern were to become the basis for a research theme that still permeates my work today. I want to congratulate you all on this large body of work. Finding out something new in medicine takes intelligence, persistence, and sometimes a little luck. There is, however, nothing like the feeling of accomplishment that comes from discovery. Regardless of your future career choice, we hope this experience will be a formative one."

Fredric Wondisford, M.D.
Professor and Chair; Department of Medicine

"I am excited to see so many physicians-in-training get involved in research. Asking important questions and searching for the answers is at the heart of scientific exploration. I hope for all of you that this is just the beginning of a career-long passion to find solutions to our clinical challenges."

Michael B. Steinberg, MD, MPH, FACP
Professor and Chief
Division of General Internal Medicine
Vice-Chair of Research
Department of Medicine
Director - Rutgers Tobacco Dependence Program

"We are pleased to publish this booklet of abstracts representing the current research by Residents and Fellows. For the advancement of knowledge, maintaining and fostering curiosity – the ability to ask questions is indispensable. A foundation in research design will help them question peers, consultants and reference sources about the appropriateness of medical interventions and therapies.
As advocates for patients, we must inspire our learners to remain critical thinkers who continue to learn. Our primary purpose is to encourage critical thinking, and the self-confidence to continue to ask questions long after training is completed.
We congratulate our residents and fellows for their contributions and we thank the faculty for their mentorship."

Ranita Sharma, MD, FACP
Program Director
Internal Medicine Residency
Chief, Division of Education

ORAL PRESENTATIONS

PGY 5
ORAL PRESENTATION

Abstract Title: Initial Experience with Tocilizumab for COVID-19 at RWJUH: Inflammatory Markers, Clinical Outcomes and Adherence to Monitoring Protocols

Associate & Authors: Yera A. Patel, MD; Pinki Bhatt, MD; Navaneeth Narayanan, PharmD, MPH; Susan E. Boruchoff, MD

Introduction: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), was first identified in December 2019 in Wuhan, China and rapidly became a pandemic. A common complication has been COVID-19 induced cytokine release syndrome (CRS) with interleukin-6 (IL-6) being a key component. Tocilizumab (TCZ) is an IL-6 receptor antagonist being used to treat COVID-19 induced CRS. We performed a quality improvement (QI) study to assess the clinical and laboratory outcomes of patients who received TCZ and assess follow up on T-SPOT testing as biologic agents such as TCZ increase the risk of latent tuberculosis (LTBI) activation.

Methods: This was a single center, retrospective study of patients who received at least 1 dose of TCZ from 3/15/20-5/20/20. TCZ was considered if symptomatic for ≥7 days with worsening symptoms and rising inflammatory markers plus met 3 of the following: 1. persistent dyspnea with minimal activity, 2. tachypnea, 3. increasing oxygen demand, 4. PaO2 <65 mmHg or SpO2 <90% on room air. Exclusions included: 1. enrollment in Remdesivir clinical trial, 2. active infection, 3. pregnancy or breastfeeding, 4. Do Not Resuscitate code status. Il-6 level and T-SPOT were supposed to be ordered pre-TCZ. Data on pre-and post-treatment daily inflammatory markers, overall clinical outcome (survival, hospital discharge), patient location (medical floor vs intensive care unit and mode of oxygenation at TCZ administration were collected. If a specific marker was not ordered on a patient, it was excluded from analysis.

Results: 136 patients received TCZ between 3/15 and 5/20. Patients were eligible to receive up to 2 doses, but we analyzed only the first dose. Of these, 105 (77.2%) were male, 87 (64.0%) were >55 years of age. 102 (75.0%) were in the ICU, 34 (25.0%) were on the medical floor. 69 (50.7%) were ventilated, 32 (23.5%) were on a non-rebreather mask (NRBM). 57 patients (41.9%) were successfully discharged. To date 48 patients (35.3%) have expired. Table 1 shows clinical outcomes based on location of TCZ administration. The majority of IL-6 values were <100 pg/mL (normal ≤1.8). Figures 2, 3, and 4 show the C-reactive protein (CRP), D-dimer and ferritin levels, respectively, pre- TCZ, 1 day post- and 1-week post-TCZ, or at discharge/expiration. The majority of patients had a negative T-SPOT. (Table 2) Of the 3 with positive results, 1 expired, 1 had a positive Quantiferon with plan to follow up as outpatient, and for the third, the lab canceled the Quantiferon. 40 patients had no T-spot reported, either because the test wasn't ordered or because it was cancelled by the laboratory.

Discussion: Pre-TCZ IL-6 levels were analyzed to see whether clinical suspicion for CRS correlated with elevation of the inflammatory marker that is the target of this drug. Of patients with IL-6 levels between 0 and 100 pg/mL about 70% were discharged successfully, and most had received TCZ on the floor; the 3 who expired received TCZ in the ICU. Earlier receipt of TCZ, prior to requirement for ICU, was associated with improved survival. Most had some decrease in inflammatory markers, especially in CRP, within 1-2 days, and the majority responded after 1 week. Whether improvement in inflammatory markers correlated with clinical outcome is unclear. Assessing the effect of TCZ on survival is limited by the lack of a control group. LTBI testing was mandated in our protocol. Our initial concern was whether physicians followed up on the results and ensured treatment of patients with evidence of LTBI. This QI study found significant gaps in testing which need to be addressed.

PGY 3
ORAL PRESENTATION

Abstract Title: Hypoxic Index as a Measure to Determine the Presence of Prevalent Hypertension in Obstructive Sleep Apnea (OSA)

Associate & Authors: Jonathan Stoll, MD, Marisa Palmeri, BS, Jag Sunderram, MD

Introduction: Multiple epidemiological studies have confirmed a strong association between prevalence of hypertension and the severity of OSA, as determined by the apnea-hypopnea index (AHI). Animal studies suggest that it is the depth of hypoxemia and the time to recovery to normoxemia that is important for the development of hypertension. Although there is clear evidence of the role of intermittent hypoxia in the genesis of hypertension in animal models, no human studies have examined whether the depth and duration of episodes of desaturation influence the development of hypertension. In this study, we hypothesized that the greater the depth and duration of hypoxemia (termed Hypoxic Index), the greater the odds of the presence of hypertension.

Methods: 281 patients at RWJ Comprehensive Sleep Disorders Center in Hillsborough, NJ were recruited from 2012-2019 for participation in this study. The study was approved by the Institutional Review Board and informed consent was obtained from each participant. Saliva samples for future genetic testing were collected. Presence of hypertension was identified by the NHANES questionnaire and if the average of two blood pressure measurements had readings of either Systolic ≥ 140mmHg or Diastolic ≥ 90mmHg. Sleep apneas and hypopneas were scored using standard AASM criteria. Hypoxic index (HI) was calculated as follows:

$$HI = \frac{\sum (a-b) \times c}{TST}$$

Where a= the base line oxygen saturation, b= oxygen de-saturation nadir at a given oxygen saturation, c= time spent in that range in minutes and TST is total sleep time in minutes. Classification of Hypoxic Index was separated into quartiles defined as 0-0.04, 0.04-0.29, 0.29-.97, and >0.97. OSA was classified based on AHI into mild (5-14.9 events per hour), moderate (15-29.9 events per hour) or severe (>30 events per hour) as well as no OSA (<5 events per hour). Univariate and multivariate logistic regression analysis was performed to determine the odds ratio of the associations of HI and AHI to hypertension, controlling for gender, age, and BMI in sequential order.

Results: Patient characteristics are displayed in **Table 1**. HI>0.29 (highest two quartiles) and AHI>15 were significantly associated with prevalent hypertension, unadjusted and after adjusting for gender. After adjusting for age and gender HI>0.39 and AHI>30 showed an odds of 2.8 (CI 1.2-6.7) and 2.3 (CI 1.1-5), respectively. These significant associations become insignificant when further adjusted for BMI. The C-statistics for association of AHI and HI to prevalent hypertension are 0.73 and 0.73, respectively.

Table1. Patient Characteristics

	Hypertension	
	Yes(n=150)	No(n=131)
Age, mean ± std	57.3±14.1	49.7±14.0
BMI, mean ± std	34.0±7.5	30.4±6.8
Female, %	30.7	32.1
HI (%)		
0≤HI<0.04	37.3	55.7
0.04≤HI<0.29	24.7	25.2
0.29≤HI<0.97	22.7	12.2
0.97≤HI	15.3	6.9
OSA (%)		
No OSA	19.3	32.8
Mild OSA	26.0	30.5
Moderate OSA	27.3	20.6
Severe OSA	27.3	16.0

Conclusions: Given identical concordance statistics for AHI and HI, we conclude that these measures are equally predictive of prevalent hypertension. Additionally, the association of both HI and AHI to prevalent hypertension are affected by obesity as illustrated by the insignificant odds ratios once the data was adjusted for BMI.

PGY 3
ORAL PRESENTATION

Abstract Title: Electronic Cigarettes are Associated with increased risk of Depression: An Analysis Of the National Health and Nutrition Examination Surveys, 2015-2016

Associate & Authors: Debashis Reja MD, Augustine Tawadros1 MD, Lauren Pioppo1 MD, Ranita Sharma, MD

Introduction:
Depressed individuals are more likely to smoke cigarettes, resulting in inadequate smoking cessation, worsening depression, and increased usage. This study examines whether this remains true for e-cigarette users in a U.S. population study.

Methods
Data from adults >18 years old who completed the tobacco and mental health questionnaire in the National Health and Nutrition Examination Surveys 2015-2016 were examined (n=1675). Smoking status was assessed by self-report of use in the last 30 days as: cigarette only, cigarette + e-cigarette, e-cigarette only, and non-smokers. The main outcome is moderate to severe depression (PHQ-9 >10). Comparisons of baseline characteristics were done using Student's T-test and Rao-Scott Chi-Square. A multivariate logistic regression stepwise model selection procedure was utilized, from which demographic and comorbidities were chosen to be included in the model.

Results
The prevalence of current smokers in this study are[E-Cigarette only 2.5%, Cigarette Only 15.7%, E-Cigarette + Cigarette 3.8% ($p<0.01$)] and 77.9% non-smokers. The prevalence of moderate-severe depression in current smokers are [E-Cigarette only 19.1%, Cigarette Only 15%, E-Cigarette + Cigarettes 17.5%] and 4.4% in non-smokers ($p<0.01$). After adjusting for confounders, E-Cigarette users were more likely to have Depression [OR 6.4, 95% CI 2.8-14.6] vs non-smokers. E-Cigarette + Cigarette users [OR 5.0, 95% CI 2.1-12.0] and Cigarettes users [OR 3.8, 95% CI 2.0-7.0] were also more likely compared to non-smokers. Of note, females were 60% more likely than males to exhibit Depression [OR 1.6, 95% CI 1.0-2.5).

Conclusions:
E-Cigarette users are over 6 times more likely to exhibit Depression than non-smokers. Historically we know that people with depression smoke cigarettes at higher rates, and it appears that is also true for e-cigarette users. Patients with depression are often a stigmatized and under-treated group. More efforts should be taken to offer treatment for tobacco users who have depression.

PGY 6
ORAL PRESENTATION

Abstract Title: Obstructive Sleep Apnea And Upper Airway Sensation In World Trade Center Responders - Role Of Chronic Rhinosinusitis

Associate & Authors: Carlos Osorio MD, H. Romero Castillo, Clarimel Cepeda, Adriana Do Santos, Lydia Ko, Ankit Parekh PhD, Kathleen Black PhD, Shou-en Lu PhD, O. E. Burschtin, Iris Udasin MD, Rafael E. de la Hoz MD, David M. Rapoport MD, Indu. A. Ayappa PhD, Jag Sunderram MD.

Introduction: Our data from WTC SNORE showed a prevalence of 75% Obstructive Sleep Apnea (OSA) in World Trade Center (WTC) responders. We found a strong association between new or worsening Chronic Rhinosinusitis (CRS) symptoms since 9/11 and OSA controlling for age, gender and BMI. (Sunderram, et.al.CHEST2019;155(2):375-383) This association was not explained by increased nasal resistance, suggesting that other mechanisms including reduced upper airway (UA) sensation that impairs mechanoreflexes to negative pressure could impact UA function in CRS. We hypothesized that an impaired afferent limb of UA reflexes relating to rhinosinusitis reduces the ability to perceive and/or process UA loading contributing to failure of UA stiffening from reflex muscle activation.

Methods: In an on ongoing study examining the mechanism of OSA in WTC responders, we used validated questionnaires to obtain CRS symptom scores, Epworth Sleepiness scores (ESS), and the Hospital Anxiety Depression Scores (HADS). Diagnosis of OSA was confirmed either by a recent in-lab polysomnogram or by a Home Sleep Test (HST). Apnea+Hypopneas with 4% O2 desaturations (AHI4) and/or arousal surrogates (Respiratory Disturbance Index) (RDI) were calculated. OSA was considered present if AHI4 was ≥5 or RDI was ≥ 15 and CRS present if the CRS symptom score was ≥3. UA sensitivity was assessed using vibration threshold (VT) testing and 2-point discrimination (2PD) in the posterior pharynx, fingertip and lower lip using previously described methods(Kimoff,et,al. AJRCCM 2001;164:250-255). Linear regression analysis was performed and Pearson's correlation coefficient's calculated.

Results: We have so far recruited 104 subjects (92 M, 12F; mean age 59; mean BMI 29.9 Kg/M2). 74% had OSA and 36% CRS. The median (25-75%) AHI was 9 (3-15.8); RDI 19 (13-28); ESS 6 (3-9) and HADS 6.5 (2-12). CRS scores correlated with upper airway VT (R=0.2 (CI 0.004-0.38); p=0.05) on univariate analysis. CRS scores also correlated with 2PD (R=0.23 (CI 0.04- 0.41); <0.05) and remained significant (R=0.2 (CI 0.07-0.51); p<0.05) after controlling for age, gender and BMI. No association was found between either AHI4 or presence of OSA to either VT or 2PD. Interestingly HADS scores correlated with upper airway VT (R= 0.22 (CI 0.07-0.4); p<0.05) on univariate analysis and fingertip VT even after controlling for age, gender and BMI (R=0.26 (CI 0.01-0.48); p<0.05).

Conclusion: Our preliminary data shows that upper airway sensitivity as determined by VT and 2PD are affected in subjects with CRS. Higher levels of anxiety may affect VT testing. OSA does not appear to play a role.

CLINICAL
AND/OR
BASIC SCIENCE
RESEARCH ABSTRACTS

Abstract Title: Assessing RWJUH Internal Medicine Resident Impressions in the COVID Era

Associate & Authors: Amy Suhotliv, MD, Payal Parikh, MD

Introduction: The COVID-19 pandemic was an unprecedented medical event in the modern era of medical training, leading the GME curriculum to enter stage 3 defined by the ACGME as "crossing a threshold beyond which the increase in volume and/or severity of illness creates an extraordinary circumstance where routine care education and delivery must be reconfigured to focus only on patient care." This lead to the cancellation of the RWJMS educational activities including board review and noon report, the creation of multiple new COVID teams and ICU teams, and cancellation of electives, as well as converting of our clinic to primarily telemedicine visits. Through our study, we sought to evaluate resident perceptions of all these changes and evaluate how working through the COVID-19 pandemic impacted them.

Methods: A completely anonymous survey created through google forms was sent to all 73 internal medicine residents via email. It identified PGY year, weeks on COVID services whether regular floors, MICU, or nights. Residents were asked to list their top 5 grievances, and rate how their experiences affected their sleep, mood, anxiety, level of trust in hospital administration, and specialty decision making both at the peak of COVID (week of 4/12/2020 at RWJUH) and after patient volume plateaued.

Results: Of 73 residents, 21 responded to the survey, including 38.1% PGY1s, 38.1% PGY2s, and 23.8% PGY3s. 76.2% had done some time in the MICU. 71.4 had spent time on specific COVID teams. Using a word cloud, the top grievances were related to PPE, deaths, time, family concerns, leadership, and policies.

The following results apply to the first month of the pandemic: 52.4% responded they had no change in sleep, and 47.6% said it was worse or much worse. 61.9% said they were more down, 23.8% felt depressed. 90.5% of respondents said their anxiety was worse or much worse. 76.2% of respondents said they had less or much less trust in administration, and 14.3% had more trust.

Compared to the covid peak when cases began to plateau, 52.4% rated their sleep as the same, with 25% worsening and 19% improvement. In terms of mood, 38% were about the same, 24% were more down and 19% more depressed. In terms of anxiety, 53% were more or much more anxious, 24% were about the same, and 24% were less anxious. 76.2% were overall less trusting of administration, and 23.8% felt the same level of trust.

Discussion: Based on the results of the survey, there was a massive impact by the COVID pandemic on resident mood, level of anxiety, and sleep. Most grievances were related to feelings of lack of PPE, emotional distress related to patient care and deaths, issues with administration policies, and safety for self and family members. While these numbers are small, there are some patterns that emerge that we need to be cognizant of in preparation for the next phase to help improve resident wellness.

Abstract Title: Angioedema in the Emergency Department: A Retrospective Cohort Study

Associate & Authors: Puja Chabra, MD, Gopi Patel MD, Vima Patel MD, Patricia Greenberg MS, Catherine Monteleone MD

Introduction: Angioedema is defined as a localized, transient swelling of the deep dermis, subcutaneous, or submucosal tissues and can be life threatening requiring prompt management when it results in airway swelling and compromise. Angioedema can be histamine-mediated, such as in anaphylaxis, and is treated with epinephrine, histamine blockers, and glucocorticoids. Angioedema can also be bradykinin-mediated, which is medication-induced through the use of Angiotensin-converting enzyme (ACE) inhibitors or is genetic in nature, such as in hereditary angioedema. Directed therapies for ACE-inhibitor induced angioedema are an active area of clinical investigation. Bradykinin-mediated and histamine-mediated angioedema require different management, but they are frequently treated in the same manner. The purpose of this study is to identify how patients admitted for angioedema are triaged and managed in the Emergency department.

Methods: A retrospective cohort study was conducted investigating adults admitted to the emergency department for angioedema from 2015 to 2016. A total of 116 patients were included in this study and demographics, comorbidities, and management were studied.

Results: 44.8% of patients in this study were taking ACE-inhibitors. There was no difference in admission and readmission rate in patients on ACE-inhibitors versus those that were not (p=0.17). In terms of triage, there was no difference in admission to the intensive care unit, inpatient floor unit, and observation units for patients on ACE-inhibitors versus those who were not taking ACE-inhibitors (p=0.78). 0.9% of patients received treatment dedicated to treating bradykinin mediated angioedema. 11% of patients with suspected medication induced angioedema continued to use their medications after discharge.

Discussion: In this population, close to half of the patients presenting to the emergency department with angioedema were taking Ace-inhibitors. For these specific patients, dedicated treatment for bradykinin-mediated angioedema should be considered after emergent stabilization. Lastly, it is imperative for patients with suspected or confirmed Ace-inhibitor induced angioedema to discontinue the offending agent.

Abstract Title: Telomere Shortening Associated with Progression of Hepatic Fibrosis in NAFLD

Associate & Authors: Debashis Reja MD, Aayush Visaria MD, Augustine Tawadros MD, Lauren Pioppo MD, Abhishek Bhurwal MD, Vinod K. Rustgi MD

Introduction: Through genetic studies, telomere shortening has proven to be a hallmark of cirrhosis, fibrosis progression, and hepatocarcinogenesis. Previous cross-sectional analysis of NHANES has shown that telomere shortening is evident in NAFLD and advanced fibrosis. In this study, we aim to demonstrate telomere lengths in base pairs in NAFLD, mild to moderate fibrosis, and advanced fibrosis.

Methods: A population of 2,994 non-pregnant adults ≥ 20 years with data on telomere length were included in this secondary analysis of NHANES 1999-2001 (the only available telomere data). We excluded those with acute transaminitis (AST or ALT > 500 IU/L), excessive alcohol consumption (> 10 drinks/week for females and > 20 drinks/week for males), iron overload (transferrin saturation > 50%), and positive hepatitis B or C serology. The main predictor of interest was mean telomere length, determined using the average of six identical assays of a validated quantitative polymerase chain reaction (PCR) method to measure telomere length relative to standard reference DNA (T/S ratio). Base pair (BP) was assessed via BP= (3,274 + 2,413 * (T/S)). The main outcome of interest was NAFLD severity, defined as ALT>30 IU/L for men, >19 IU/L for women, a definition put forth by Prati *et al.* and used in epidemiological literature for noninvasive suspicion of NAFLD. Mild-to-moderate fibrosis was defined as FIB-4 score between 1.45 and 3.25 and advanced fibrosis as FIB-4 score > 3.25. Comparisons of baseline characteristics between NAFLD and no NAFLD groups were done using Student's T-test for continuous variables and Rao-Scott Chi-Square test for categorical variables. We used multivariable linear regression to estimate the average telomere lengths, adjusting sequentially for demographics, examination and laboratory values, and social factors. All analyses accounted for the complex survey design and were conducted using SAS 9.4 with a significance level of 0.05.

Results: 2,994 patients met inclusion criteria. NAFLD was seen in 36% of population. Telomere length was shorter in NAFLD compared to non NAFLD (1.023 vs 1.045 T/S). Leukocyte telomere length was inversely correlated with fibrosis progression in both univariate and multivariate analysis. General population had mean of 72 base pairs longer than NAFLD patients. Progression of reduced T/S ratio and base pairs of leukocyte telomere shown in Table 2).

Conclusions: In a large nationally representative population, we show a reduced number of telomere base pairs associated with fibrosis progression in NAFLD. This is consistent with the telomere hypothesis of liver cirrhosis that proposes chronic liver injury induces continuous destruction and regeneration, resulting in telomere shortening and ultimately senescence.

Abstract Title: The Association between Lean NAFLD and Extra-Hepatic Malignancy: A Nationwide Inpatient Cohort

Associate & Authors: Mishal Reja, MD, Aakash Patel, MD, Kuldip Singh, MD, Daniel Marino BA, Jatin Shah, MD

Background & Aims

A paucity of data exists regarding the link between NAFLD and extra-hepatic malignancies. We sought to examine the association between NAFLD and gastrointestinal, genitourinary, and endocrine mediated malignancies in NAFLD and lean (non-obese) NAFLD.

Methods

We performed a retrospective analysis of The Nationwide Inpatient Sample of 5,515,667 patients ≥18 years old with and without NAFLD. Cohorts were matched with propensity scores based on a multivariate logistic regression model accounting for patient variables. Multivariate logistic regression analysis was used to determine the association between malignancies and NAFLD and Lean NAFLD.

Results

In a multivariate logistic regression model, lean NAFLD was significantly associated with 4 of the 17 extrahepatic malignancies, including Gastric [adjusted odds ratio (95% CI): 9.51 (2.22-40.78)], Esophageal [(3.27 (1.21-8.8)], Anorectal [(2.09 (1.21-3.59)], and Lung Cancer [(4.34 (2.8-6.72)]. These malignancies were also significantly associated with NAFLD, in addition to Bladder Cancer [1.94 (1.13-3.36)].

Conclusion

There exists a significant link between non-obese NAFLD and Gastric, Esophageal, Anorectal, and Lung Cancer. Bladder cancer was significantly associated with NAFLD, but this relationship attenuated after adjusting for obesity.

Abstract Title: Prognostic Significance of Non-Ischemic FFR (>0.80) in LAD versus Non-LAD Lesions

Associate & Authors: Kulin Shah MD[1], Linle Hou MD, Bobby Ghosh MD, Ahmed A. Almomani MD, Mohan Mallikarjuna Rao Edupuganti MD, Jason Payne, Naga Venkata Pothineni, Sabha Bhatti MD, Zubair Ahmed, Barry F. Uretsky MD, Abdul Hakeem MD

Introduction: Fractional flow reserve (FFR) has been validated as an important tool in the assessment of coronary stenosis severity for percutaneous coronary intervention (PCI).[1] Its use has been shown to optimize revascularization of functionally ischemic lesions (<0.80) and improve long-term outcomes.[2] It has also been shown to safely defer PCI of functionally non-ischemic lesions (≥0.80) with a more favorable prognosis.[3] This is of particular importance for left anterior descending (LAD) lesions which have independently been associated with a higher risk of major adverse cardiac events (MACE).[4]

While deferral of PCI in hemodynamically non-significant LAD lesions has been shown to have excellent long-term survival, little is known regarding the prognostic significance of FFR-based deferral in LAD versus non-LAD lesions.[5]

Methods: 575 patients in whom revascularization was deferred based on a non-ischemic FFR (<0.80) were followed for a median of 3.8 years. Maximum hyperemia was induced with adenosine for FFR measurement. The Central Arkansas Veterans Health System Institutional Review Board approved the study.

Primary outcome was major adverse cardiac events (MACE) defined as a composite of target vessel revascularization (TVR), myocardial infarction (MI), and death. Secondary outcome was target vessel failure (TVF) defined as a composite of TVR and MI. Survival curves free from MACE were produced using Kaplan-Meier analysis and compared via log-rank test. Multivariate Cox proportional hazards regression was used to identify independent predictors of MACE.

Results:

	DEFERRED LAD (242)	DEFERRED NON-LAD (333)	P VALUE
MEAN FFR	0.85 ± 0.04	0.88 ± 0.05	<0.0001
MEAN PD/PA	0.95 ± 0.02	0.97 ± 0.06	<0.0001
MACE	22% HR 0.72 (0.50-1.03)	29%	0.03
TVF	15% HR 0.56 (0.30-0.50)	22%	0.01

Discussion: Our study demonstrates that patients with FFR-based deferral of LAD lesions have a better overall prognosis with respect to MACE-free survival than with those of non-LAD lesions. In a recent post-hoc analysis of DEFINE-FLAIR, Sen et. al demonstrated a 1 year MACE rate of 5.5% in FFR deferred LAD stenoses versus 5.2% in non-LAD stenoses.[6] Our results are consistent with this finding with equal MACE rates at 1 year however, over longer follow-up, Kaplan-Meier curves begin to diverge around 2 years.

One explanation is the greater significance of LAD versus non-LAD disease on long-term outcomes. The LAD subtends approximately 50% of left ventricular myocardial mass and when significantly diseased, has been noted to have a worse prognosis compared to non-LAD vessels.[7] Therefore, confirming the absence of ischemia in the LAD may be more protective than doing so in non-LAD coronaries. It has also been suggested that FFR may overestimate the severity of LAD disease.[8] This could isolate a lower risk cohort of patients deferred based on a non-ischemic FFR in the LAD compared to non-LAD arteries. Additional investigation is necessary to elucidate the potential etiologies of our findings.

Abstract Title: Acute Kidney Injury is Associated with Increased Mortality in Diabetic Patients Hospitalized with Staphylococcus Aureus Bacteremia: Nationwide Analysis 2000-2014

Associate & Authors: Augustine Tawadros, MD

Introduction:

Staphylococcus aureus bacteremia (SAB) is a serious infection with an incidence rate ranging from 20 to 50 cases/100,000 population per year. van Hal et al. showed that increasing age and the presence of comorbidities definitively increase mortality in SAB [1,2]. However, there is a paucity of data on in-hospital SAB outcomes in diabetic patients with Acute Kidney Injury (AKI). Our aim was to investigate the outcomes of hospitalized SAB diabetic patients with and without AKI.

Methods:

We analyzed the National Inpatient Sample (NIS) database from 2000 to 2014 inclusive of all hospitalized diabetic patients with and without AKI on admission with a primary diagnosis for SAB. We used the ICD 9 codes for SAB, AKI, and diabetes during the period from 2000 – 2014. Inclusion criteria were age above 18, inpatient admission, and primary diagnosis of SAB. Exclusion criteria included patients who had pre-existing Chronic Kidney Disease (CKD) or End-Stage Kidney Disease (ESRD) to reduce confounders of AKI development. Multivariate logistic and linear regression models were used to adjust for patient demographics (age, gender, race, type of insurance, income quartile, Charlson Comorbidity Index (CCI)), and hospital characteristics (location, teaching status, size, region). The primary outcome measure was mortality. Secondary outcomes were length of stay and cost of hospitalization. All analyses were performed using STATA (v. 13).

Results:

A total of 985,751 diabetic patients with primary diagnosis of SAB were admitted to U.S. hospitals between 2000 – 2014. AKI was a comorbid condition in 29.38% of all SAB diabetic patients. The incidence of AKI was 15.66% in 2000, compared to 44.35% in 2014. Demographics and hospital characteristics were significantly different between patients with and without AKI. Overall unadjusted mortality was 15.85%. After adjusting for confounders using the multivariate regression model, mortality rates were higher in the AKI group (25.4% vs. 11.8%, odds ratio 2.15, $p < 0.001$). Secondary outcomes of length of stay (14. 8 days vs 11.2 days, odds ratio 1.32, $p < 0.01$) and hospitalization charges ($133,000 vs $83,000, odds ratio 1.60, $p < 0.01$) were also significantly higher in SAB diabetic patients with AKI.

Conclusion:

Prevalence of AKI in diabetic patients hospitalized for SAB has substantially increased over the study period and is associated with increased mortality rate, length of stay and total hospital charges. Consequently, AKI can be used as a marker for disease severity in diabetic patients hospitalized with Staphylococcus aureus bacteremia. Further studies to investigate causes for the significant increase in AKI from co-existing shock and level of diabetes control to antibiotic selection and bacteriologic virulence should be explored.

Abstract Title: Beyond Arthritis: What We Have Learned from Gout about Erectile Dysfunction. A systematic review.

Associate & Authors: Kyle Park, MD, Nikhil Gupta, MD, Ephrem Olweny, MD, Naomi Schlesinger MD

Erectile dysfunction (ED) is significantly more common in patients with gout. This review aims to evaluate the association between gout and ED.

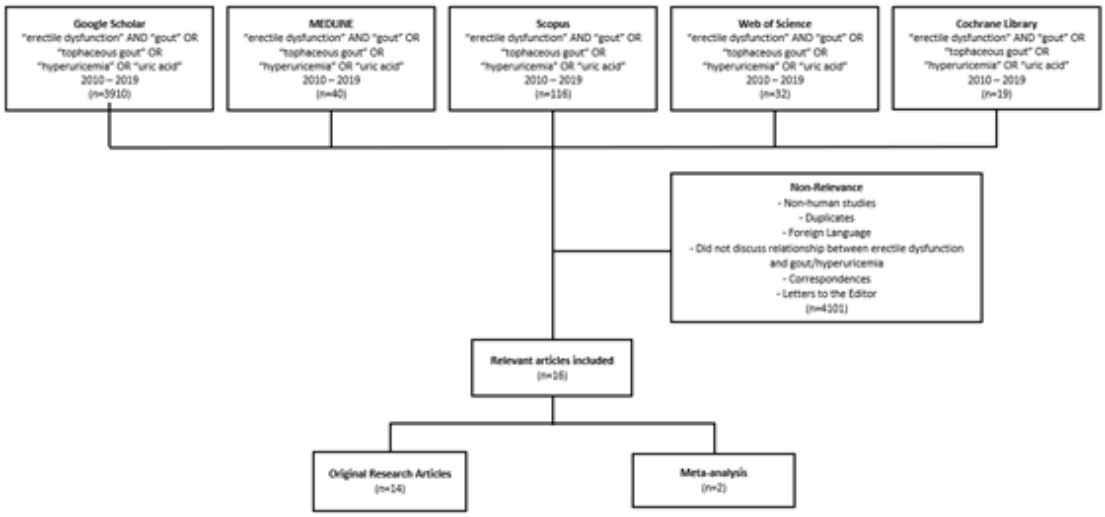
We report a systematic literature review of Google Scholar, Medline, Scopus, Web of Science and the Cochrane Library databases for studies published in the English Medical literature from January 1, 2010 to January 1, 2020. Studies were included if they were randomized or quasi-randomized controlled trials, cross-sectional studies, case cohort studies, or metanalyses performed using search terms “erectile dysfunction” AND “uric acid” OR “hyperuricemia” OR “gout” OR “tophaceous gout”.

The search yielded 4116 publications. Only sixteen publications were included: 14 clinical and 2 metanalyses. The association between hyperuricemia and ED was found to be significant in 5 of 6 studies, whereas all 10 gout studies found a significant association with ED.

Hyperuricemia and gout lead to increased reactive oxygen species and decreased nitric oxide synthesis as well as chronic low-grade inflammation with elevated inflammatory markers such as C-reactive protein, and proinflammatory cytokines such as interleukin (IL) -6, IL-1β, and tumor necrosis factor, and thus lead to endothelial dysfunction and hence ED.

Healthcare providers should be aware of the higher prevalence of ED amongst gout patients.

Figure 1. Studies Selection Process for the Systematic Review



Abstract Title: Risk Factors for Increased Mortality and Hospital Utilization in Cirrhotic Patients With Acute Renal Failure

Associate & Authors: Debashis Reja MD, Savan Kabaria MD, Vinod K. Rustgi MD

Introduction: Acute Kidney Injury is a known complication of liver cirrhosis. We sought to investigate mortality and hospital utilization outcomes of patients admitted with cirrhosis and comorbid AKI, as well as identify socioeconomic and clinical predictors of outcomes.

Methods: The United States Nationwide Inpatient sample was used. Patients admitted for a primary diagnosis of cirrhosis with and without AKI were identified. Primary outcomes were mortality, length of stay, and hospitalization costs. Secondary outcome was cirrhosis-related complications. Socioeconomic and clinical predictors of all outcomes were identified using multivariate regression analysis. A propensity matched cohort was created to compare outcomes.

Results: Overall sample included 7,135,090 patients. Among 9,974 patients admitted with cirrhosis, 1,757 (17.5%) had comorbid Acute Kidney Injury. Compared to a propensity-matched cohort without AKI, patients with AKI had greater mortality (aOR 6.5; 95% CI 4.2-10.08), length of stay (beta 4.65; 95% CI 4.05-6.25) total hospitalization charge (beta $70,407.31; 95% CI 57,883-82,931), and decompensation events (Hepatorenal Syndrome [aOR 19.1; 95% CI 11.78, 30.98), Ascites [3.76; 95% CI 3.26-4.33), Variceal Bleeding [aOR 1.61; 95% CI 1.39-1.86), and Portal Hypertension [aOR 1.87; 95% CI 1.62-2.16). Multivariate logistic regression analysis revealed predictors of mortality, length of stay, and hospital costs were race/ethnicity, insurance status, and cirrhosis-related complications.

Conclusions: AKI in cirrhosis leads to increased mortality, hospital utilization, and decompensation events. We identify race/ethnicity, insurance, and common cirrhosis related complications that are key drivers for these outcomes. Targeted interventions are needed for the subgroups identified in this study.

Abstract Title: Systematic Evaluation of Accelerate Pheno, a New Automated System for the Rapid Identification and Antimicrobial Susceptibility Testing of Bacteria Isolated from Blood Culture

Associate & Authors: Yera A. Patel, MD; Thomas J. Kirn, MD, PhD; Priyanka Uprety, Ph.D; and Melvin P. Weinstein, MD

Introduction: Bacteremia is a major cause of morbidity and mortality. Rapid identification (ID) of pathogens for early targeted antimicrobial therapy is crucial for detecting emergence of antibiotic resistance and improving outcomes. The Accelerate PhenoTest (AP) BC kit is a new, FDA-cleared, diagnostic instrument used to identify bloodstream pathogens in approximately 2 hours and determine AST in 7 hours. We undertook a systematic quality improvement (QI) study to compare AST results obtained with AP with standard methods (STD) in the RWJUH Microbiology Laboratory.

Methods: This was a single center, retrospective (5/10/19-8/1/19) and prospective (8/1/19-1/31/20) study that evaluated all blood cultures growing gram-negative rods. We compared AST results (Susceptible [S], Intermediate [I], Resistant [R]) obtained using the reference disk diffusion (DD) susceptibility method with those obtained by AP.

We calculated the error rates as follows: very major errors (VME), major errors (ME) and minor errors (mE). Very major errors (VME), or falsely susceptible, were defined as Susceptible on AP and Resistant by DD. Major errors, or falsely resistant, were defined as Resistant on AP and Susceptible by DD. Minor errors were defined an intermediate result by one method and susceptible or resistant result by the other method. Categorical agreement is the percentage of isolates that resulted in the same category result (S, I, or R) as the reference method. In addition, we subsequently stratified our analysis further based on the type of error by organism and drugs tested. We also calculated the categorical agreement between AP and DD for each organism and specific drug tested.

Results: We evaluated 355 blood cultures growing GNR, of which 284 met the inclusion criteria. We excluded 71 blood cultures: isolates not available (21), polymicrobial (7), no ID by AP (26), no AST results by AP (17). We grouped all Enterobacteriaceae (n=263) - 156 *E.coli*, 60 *Klebsiella* spp, 20 *Proteus mirabilis*, 17 *Enterobacter*, and 10 *S. marcescens*. The 21 *P. aeruginosa* isolates were analyzed separately. For Enterobacteriaceae (Table 1), categorical agreement (CA) was >= 90% for amikacin (AK), aztreonam (AZ), cefepime (CFP), ceftriaxone (CTX), ertapenem (ERT), gentamicin (GENT), meropenem (MER), and tobramycin (TOB); and VME was <5% for ampicillin/sulbactam (A/S), GENT, MER, TOB, CTX, and ceftazidime (TAZ). For P. aeruginosa, CA was >-90% for AK and TOB, and VME was <=5% for AK, TAZ, GENT, MER, piperacillin/tazobactam (P/T), and TOB.

Discussion and Conclusions: This in-house QI study identified potential benefits and liabilities of implementing the AP rapid ID/AST system for GNR isolated from BCs at RWJUH. Based on more detailed analyses than can be shown in an abstract as well as discussions with the RWJMS/RWJUH Antimicrobial Stewardship Team, AP AST reporting for GNR will be limited to Enterobacteriaceae only, and only the following antimicrobial agents will be reported: CTX, TAZ, P/T, ciprofloxacin, AZ, GENT. Limitations of this study are that it was a single center evaluation and there were small numbers of certain organisms, most notably Pseudomonas aeruginosa, for which the available data were too limited to draw conclusions regarding routine implementation of the AP system.

Table 1: Enterobacteriaceae (n=263)

	Categorical Agreement		VME		ME		mE	
	N	%	N	%	N	%	N	%
Amikacin	261	97	3	60	1	0.4	4	2
Ampicillin-sulbactam	277	64	1	2	29	14	71	26
Aztreonam	262	93	2	7	3	1	13	5
Cefepime	263	90	4	13	3	1	20	8
Ceftazidime	263	88	1	4	10	4	21	8
Ceftriaxone	263	94	2	5	3	1	11	4
Ciprofloxacin	262	87	7	8	0	0	26	10
Ertapenem	262	97	3	60	2	1	2	1
Gentamicin	263	99	0	0	1	0.4	2	1
Meropenem	240	98	0	0	1	0.4	4	2
Piperacillin-tazobactam	261	88	1	11	6	3	25	10
Tobramycin	263	93	1	3	2	1	16	6

Table 2: - Pseudomonas aeruginosa (n=21)

	Categorical Agreement		VME		ME		mE	
	N	%	N	%	N	%	N	%
Amikacin	12	100	0	0	0	0	0	0
Cefepime	14	79	1	50	1	9	1	7
Ceftazidime	12	25	0	0	6	67	3	25
Ciprofloxacin	21	76	2	40	0	0	3	14
Gentamicin	21	81	0	0	0	0	4	19
Meropenem	20	80	0	0	0	0	4	20
Piperacillin-tazobactam	21	38	0	0	3	19	10	48
Tobramycin	21	95	0	0	0	0	1	5

Abstract Title: Prevalence of different malignancies in patients with primary hyperparathyroidism

Associate & Authors: Jeena Mathew, MD, Xiangbing Wang, MD

Objective: To compare the prevalence of different malignancies among primary hyperparathyroidism (PHPT) patients of different ethnicities.

Methods: In this retrospective EMR chart review study, we reviewed charts of patients age > 18 years old, all of whom were patients seen at the Endocrinology and General Surgery clinics at Robert Wood Johnson Medical School beginning in 2000-2017 and diagnosed with primary hyperparathyroidism (ICD9 252.01). The prevalence of different malignancies were recorded and calculated as %, comparing different ethnicities. The prevalence of different cancers in PHPT patients was compared to the prevalence reported in the total U.S population from 1975-2017 from the Surveillance, Epidemiology, and End Results (SEER) Program.

Results: Among 499 PHPT patients in the retrospective study, 80 patients were diagnosed with a malignancy, which represents 16.03%. With that, 17.27% of males compared to 15.68% of females had malignancies. The prevalence of malignancy was higher compared to that of the total population in majority of malignancies (%). The prevalence of malignancy in the total population was significantly lower at 4.51% based on data from the New Jersey State Cancer Registry. Ethnicities including African American, Hispanic, Native American, Asian/Pacific Islander, Middle eastern were found to have similar cancer prevalence 15.89% compared to 16.07% of Caucasians. For breast cancer, prevalence was 2.2267% of PHPT patient compared to 1.0050% of the total population. The most common malignancy in PHPT was papillary thyroid cancer, 6.2753% compared to 0.2117% in the total population. In PHPT patients, females had higher prevalence of thyroid, brain, breast, Hodgkin's lymphoma, whereas in males, there was a higher prevalence in renal/bladder and melanoma. The malignancy prevalence in Caucasian females was 15% and 19.57% in males. In other ethnicities, malignancy prevalence in females was 17.98%, while in males was 5.56%.

Discussion: Specific studies have looked at PHPT causing increased risk of specific malignancies, including thyroid cancer and prostate cancer [3]. For instance, in a Swedish study looking at malignancy incidences comparing PHPT patients after parathyroidectomy and total population, there were increased risks of breast, kidney, colon, and squamous cell cancers [4]. With that, one study in Denmark found increased hematopoietic malignancies among PHPT [5]. In this chart review, overall, PHPT patients were found to have higher prevalence of malignancies compared to the total population which is consistent with previous studies. However, many studies found breast cancer to be most common, however in our study, thyroid cancer was significantly more common in PHPT patients. The underlying mechanisms are unclear at present. The metabolic differences associated with PHPT, like hypercalcemia, obesity or insulin resistance might contribute to higher malignancy risk. Interestingly, there was a disparity among cancer prevalence in gender, as non-Caucasian females had significantly increased malignancy prevalence compared to that in non-Caucasian males. Perhaps, estrogen may also contribute, as seen in previous studies showing increased risk of breast cancer in nontoxic goiter. However, other studies have shown even after parathyroidectomy with normal calcium levels, risk of malignancies did not change [4]. Based on the previous studies and our current study, PHPT patients have an increased malignancy risk regardless of the race.

Conclusion: PHPT patients have higher risk of various malignancies, especial thyroid and breast cancer, compared to the general population [1]. We suggest that PHPT patients may benefit from more stringent cancer screening, especially with thyroid and breast cancer.

Abstract Title: Weight and Metabolic Outcomes Associated with Endoscopic Sleeve Gastroplasaty: An International Multicenter Study

Associate & Authors: Debashis Reja MD, Haroon M. Shahid MD, Amy Tyberg MD, Romy Bareket BA, Elizabeth S. John MD, Shruti Patel MD, Deepak Bommisetty MD, Prashant Kedia MD, Juan C. Carames MD, Barham K. Abu Dayyeh MD, Matar Reem MD, Monica Gaidhane MD, Michel Kahaleh MD, Avik Sarkar MD

Introduction: Endoscopic Sleeve Gastroplasty (ESG) is an incisionless, minimally invasive remodeling of the greater curvature of the stomach to achieve weight loss in obese patients. Multiple studies have demonstrated significant reduction in Total Body Weight Loss (TBWL) with minimal adverse effects. However, a paucity of data exists regarding metabolic outcomes associated with ESG. We aim to identify 3-month metabolic outcomes in an international multicenter cohort of obese patients who underwent ESG.

Methods: This is a retrospective multicenter international study of 92 consecutive patients across four centers who underwent ESG between 7/2018 and 8/2019. Electronic medical records were used to collect baseline data. Primary outcome was metabolic outcomes, as defined by mean systolic and diastolic blood pressure, liver enzymes, lipid profile, BMI, weight, and A1C. Secondary outcome was medication requirements for comorbidities. Data was collected pre-ESG and at an average of 2.4 month follow up.

Results: 92 consecutive patients across four centers that underwent ESG were included in the study with a mean age of 43.2 years (SD 11.4) and BMI 39.9 kg/m^2 (SD 8.1). Baseline labs and anthropometric data pre-op and at 2.4 month follow up are shown in Table 1. At 2.4 months, we noticed a significant reduction of systolic blood pressure by 11mmHg ($p<0.00003$), diastolic blood pressure by 4.65 ($p<0.004$), weight by 24.4 lbs ($p<0.00001$), BMI by 4.1 kg/m^2 ($p<0.00001$), and ALT by 8.62 units ($p<0.004$) (see Table 2). Other metabolic outcomes were nonsignificant. 23/67 diabetic patients reported they were able to reduce or stop insulin, 10/66 GERD patients reported stopping PPI, and 24/68 hypertensive patients reported stopping or reducing hypertensive medications.

Conclusions: Endoscopic Sleeve Gastroplasty resulted in improved blood pressure, liver injury, and significant weight loss at 2.4 month follow-up. Also patients reported a significant reduction in insulin, anti-hypertensive and GERD medications. ESG has a prominent role in weight loss but also a significant impact on metabolic diseases.

Abstract Title: Aortic Stenosis Incidence, Management and Outcomes

Associate & Authors: Emily Hiltner, MD, Stavros Zinonos, Davit Sargsyan, John B Kostis, MD, Javier Cabrera, PhD, Nora Cosgrove, Abel E Moreyra, MD, Issam Moussa, MD, William Kostis, MD

Background: Operative management of aortic stenosis (AS) evolved over the last 20 years, and it is unknown how those advances changed outcomes and management of patients with AS. We aimed to define the incidence of AS in the State of New Jersey (NJ) and describe the operative management and outcomes of patients with AS.

Methods: Using the Myocardial Infarction Data Acquisition System (MIDAS) data repository, a database including all admissions with cardiovascular (CV) disease in NJ, we identified all AS admissions from 1995- 2015 (ICD-9 395.0, 395.2, 424.1, 746.3). Procedures included surgical aortic valve repair (SAVR) (35.21, 35.22) and transcatheter aortic valve repair (TAVR) (35.05, 35.06). Outcomes included all-cause and CV death, and survival free of hospitalizations for AS, congestive heart failure (CHF), stroke (CVA), and myocardial infarction (MI) at 1 and 3 years after discharge if discharged alive.

Results: We identified 15,347 patients with an index hospitalization of AS during the study period. The incidence of AS admissions increased from 10.0/100,000 in 2007 to 14.6/100,000 in 2015 ($p<0.001$). Of these patients, 11,126 had SAVR and 508 had TAVR. At 1-year follow-up, there was an increased risk in all-cause mortality (HR 1.73, p= 0.002) in patients who underwent TAVR compared to SAVR. At 3 years follow-up, there was an increased risk in both all-cause (HR 1.58, p= 0.002) and CV (HR 1.51, p= 0.041) mortality in patients who underwent TAVR compared to SAVR.

Conclusions: During the study period there was a significant change in incidence of AS hospitalizations. All-cause and CV mortality were significantly higher in patients who underwent TAVR compared to SAVR at 3 years follow up.

Abstract Title: Sex, Insurance Status, and Race/Ethnicity are Key Drivers in Acute Pancreatitis Mortality and Hospital Utilization

Associate & Authors: Debashis Reja MD, Avik Sarkar MD, Haroon M. Shahid, MD, Amy Tyberg, MD, Michel Kahaleh, MD

Introduction: Acute Pancreatitis (AP) is a major cause of gastrointestinal hospitalization in the United States. However, a lack of data exists on the role of gender, insurance status, and race/ethnicity on recent outcomes of mortality, length of stay (LOS), and total hospitalizations. We seek to identify those risk factors in hopes of reducing AP related morbidity and mortality.

Methods: All patients >18 years old with Acute Pancreatitis that were admitted in 2016 were identified from Nationwide Inpatient Sample. Multivariate Regression analysis was used to estimate the odds ratio of in-hospital mortality, average length of stay and hospital charges, after adjusting for age, gender, race, Charlson and Elixhauser score, primary insurance payer, hospital type, hospital bed size, hospital region, and hospital teaching status. Statistical analysis were performed by using SAS Survey Procedures (SAS 9.4, SAS Institute Inc, Cary, NC, USA). Statistical significance was defined by the two-sided test with a p-value < 0.05.

Results: Overall sample size included 7,135,090 patients. 74,240 patients were admitted for AP in 2016. Mortality was 0.8%, Length of stay was 4.7 days (5.6), and mean total hospital charges was $43,932. Primary drivers of increased Mortality were male sex, septic shock, acute respiratory failure, necessitating blood transfusion, and acute renal failure. Drivers for increased LOS are male sex, medicare and medicaid insurance, septic shock, acute respiratory and renal failure, and needing blood transfusion. For total hospitalization charges, male sex, Hispanic and Asian/Pacific Islander race, septic shock, acute respiratory and renal failure, and blood transfusions was associated with increased charges, and self-pay decreased charges (see Table 1). Patients admitted with AP were 48.8% women, primarily Caucasian (65.1%), mean age 52.8 years (17.3), insurance distribution was 33.0% Medicare, 23.3 Medicaid, 31.1% Private, 8.6% self-pay, primarily in South (42.8%), seen at Urban teaching hospitals (58.1%), and income deviation skewed to bottom quartile (33.2% in lowest quartile).

Conclusions: Mortality and hospital utilization outcomes have been reported historically in AP. We show the role that gender, race/ethnicity, insurance, and clinical outcomes have on mortality, length of stay, and total hospitalization charges in 2016. Interventions are needed in targeted populations outlined in this study to minimize morbidity and mortality.

Abstract Title: Secondary blood stream infections in hospitalized patients with covid19: A risk factor and outcome analysis

Associate & Authors: Kinjal Solanki, MD, Pinki Bhatt, MD, Pak Au, MD, Sana Mohayya, PharmD, MHS, BCPS, Navaneeth Narayanan, PharmD, MPH, BCIDP, BCPS, Stephanie Shiau, PhD, MPH, Priyanka Uprety, MSPH, PhD, D(ABMM)

Introduction: First identified in Wuhan, China in December 2019, a novel coronavirus now designated as coronavirus disease 2019, or Covid19, has become a global pandemic affecting over 5 million and killing over 350,000 people worldwide. This virus causes severe inflammatory response and exhibits tissue tropism affecting multiple organ systems. Morbidity and mortality in Covid19 is attributed largely to complications, which can range anywhere from mild to moderate hypoxic respiratory failure, acute respiratory distress syndrome (ARDS), cytokine release syndrome (CRS), multi-organ failure, and in some, secondary infections. Severe Covid-19(S-Covid) is associated with immune dysregulation as well as CRS and lung damage which can predispose patients to concurrent bacterial or fungal infection. However, there is very limited data regarding secondary infections in patients with severe Covid-19. Zhang et al described in their retrospective case series that patients with severe Covid-19 suffered a significantly higher rate of bacterial and fungal co-infections compared to patients with non-severe covid19. A retrospective multicenter cohort study published in the Lancet, which looked at clinical course and risk factors in patients with Covid-19 in Wuhan, China, revealed that 50% of their non-survivors had a secondary bacterial infection; however, it did not specify the organism or predisposing risk factors associated with it. Thus, there is a large gap in the literature regarding secondary infections, specifically blood stream infections in hospitalized patients with severe Covid-19. In this study, we aim to describe epidemiology, risk factors, clinical features, microbiology, and outcomes of patients confirmed to have severe Covid-19 with a concurrent bacterial or fungal blood stream infection. We hypothesized that patients hospitalized with Covid-19 with concurrent secondary blood stream infection are likely to have an increased mortality rate. Further, we hypothesized that the presence of gastrointestinal symptoms or abnormal abdominal imaging could contribute to acquisition of blood stream infections with enteric organism indicating that there is likely a GI translocation.

Methods: A single center, observational, case control study of secondary bacterial and fungal blood stream infections in hospitalized patients diagnosed with S-Covid from March 1, 2020 to May 7, 2020. After obtaining Institutional Review Board approval, we reviewed electronic medical records on 131 adult patients admitted with S-Covid, who had a set of blood cultures drawn during hospitalization and gathered data on key demographic, clinical, radiological and microbiologic variables. S-Covid was defined as saturation on room air <94% on admission. Those patients who did not have S-Covid, were positive for Covid19, but did not have blood cultures during hospitalization, had 1 bottle of blood culture drawn, non hospitalized, pediatric patients (<18 yrs), and those with a negative Covid test were excluded. cultures were obtained with two peripheral sticks, and T2CandidaPCR test which is a blood test which can identify 5 common candida species that cause bloodstream infections (*C. albicans* and/or *C. tropicalis*, , *C. glabrata* and/or *C krusei, C. parapsilosis*). Patients were cohorted into blood stream infections (BSI), contaminants, and non-BSI S-Covid groups.

Results: We will perform descriptive and inferential statistics for all data collection. We will utilize regression modeling to fit an adjusted model to best assess for risk factors for secondary bacteremia.

Discussion: To follow

Abstract Title: Per Oral Endoscopic Myotomy for Zenker's Diverticulum: A Novel and Safer Technique Over Septotomy?

Associate & Authors: Mahpour, Noah Y.; Bareket, Romy; Marino, Daniel; Kedia, Prashant; John, Elizabeth S.; Patel, Shruti; Bommisetty, Deepak; Nieto, Jose; Deshmukh, Ameya A.; Eleftheriadis, Nikolas P.; Shahid, Haroon M.; Sarkar, Avik; Tyberg, Amy; Bapaye, Amol; Gaidhane, Monica; Kahaleh, Michel.

Introduction: Endoscopic management of Zenker's diverticuli has traditionally been via septotomy technique. The recent development of the tunneling technique has shown to be efficacious and safe in 3rd space endoscopy. The aim of this study is to evaluate the tunneling technique using per oral endoscopic myotomy (Z-POEM) versus septotomy for the treatment of Zenker's Diverticulum.

Methods: Patients who underwent endoscopic management of Zenker's Diverticulum either by Z-POEM or septotomy from March 2016 until November 2019 from 5 international academic centers were included. Demographics, clinical data pre and post procedure, size of the diverticulum, procedure time, adverse events, and hospital length of stay were analyzed.

Results: A total of 42 patients (mean age 74.2 years old, 47.6% Male) were included: septotomy (n=25), Z-POEM (n=17). Pre-procedure FOIS score and Eckardt score was 4.9 and 4.1 for the septotomy group and 6.4 and 3.4 for the ZPOEM group. The median diverticulum size was larger in the ZPOEM group, ranging from 30-49mm pre intervention, versus less than 30mm in the septotomy group. Technical success was achieved in 100% of both groups. Clinical success was achieved in 90% and 88% in the septotomy vs ZPOEM groups. Procedure time was 52 minutes vs 38 minutes for septotomy vs Z-POEM (p-value 0.03). Adverse events occurred in 24% (n=6) in septotomy group vs 0% (n=0) in the Z-POEM group.

Post-procedure FOIS score and Eckhardt scores were 6.5 and 0.16 in the septotomy group, and 7 and 0.4 in the ZPOEM group. Re-intervention for ongoing symptoms was required in 2 patients in septotomy group and 1 patient in the ZPOEM group. Mean hospital length of stay was 1.4 days vs 1.6 days (p-value 0.59).

Conclusions: The Z-POEM procedure is an efficacious and safe endoscopic treatment for Zenker's Diverticuli. Z-POEM is faster, with less adverse events compared to traditional septotomy technique. Endoscopists treating Zenker's Diverticuli should familiarize themselves with this technique.

Abstract Title: Outcomes of Mitral Valve Surgery During an Acute Myocardial Infarction

Associate & Authors: Harsh Doshi MD, Yi Yang, Stavros Zinonos, Nora M. Cosgrove, Mingyao Xiao, John B. Kostis, Javier Cabrera, William J. Kostis , Abel E. Moreyra.

Background: Acute mitral valve insufficiency (AMVI) is a catastrophic complication of ST-elevation myocardial infarction (STEMI). We hypothesize improvements in medical and surgical treatment have reduced hospital and 1-year mortality.

Methods: Using the New Jersey MIDAS database, we identified 831 patients admitted from 1986 to 2015 with STEMI and AMVI requiring mitral valve surgery (MVS). Trend analysis was done using the admission year as a continuous variable. Predictors of hospital mortality were evaluated by multivariate logistic models, and 1-year mortality by Cox proportional hazard models.

Results: From 1986-2004, the rate of MVS increased from 15 to 78/10,000 STEMI patients ($p<0.0001$) and declined thereafter to 17/10,000 STEMI in 2015 ($p=0.0001$). Hospital mortality decreased from 43% in 1986 to 29% in 2015. After discharge, the 1-year all-cause mortality was 12% without any yearly trend (Figure A-B). Predictors of hospital mortality were older age (OR 1.03, CI 1.05-1.07), cardiogenic shock (OR 2.3; CI: 1.6-3.3) and antero-lateral STEMI location (OR 3.3, CI 1.3-9.5). Predictors of 1-year mortality were older age (HR 1.04, CI 1.02-1.05), heart failure (HR 2.2, CI 1.2-4.2) and cancer (HR 2.2, CI 1.2-3.9).

Conclusion: The number of STEMI patients requiring MVS has declined since 2004. There was a significant downward trend in hospital mortality, while one-year mortality remained relatively stable. These encouraging results may reflect the recent advances in medical and surgical treatment.

Abstract Title: Clostridioides difficile infection *is Associated with Adverse* Clinical Outcomes *in Patients with* Acute Diverticulitis*: A* Nationwide Study

Associate & Authors: Michael Makar, MD, Weiyi Xia, BS, Patricia Greenberg, Anish Vinit Patel, MD

Background: Acute diverticulitis (AD) is a common gastrointestinal disease with a significant healthcare associated burden. Patients hospitalized with AD have many risk factors for developing *Clostridioides difficile* infection (CDI). CDI is associated with poor outcomes in many diseases but has yet to be studied in AD.

Methods: We utilized data from the National Inpatient Sample from January 2012 – October 2015 for patients hospitalized with AD and CDI. Primary outcomes were mortality, length of stay, and hospitalization cost were compared. Secondary outcomes were complications of diverticulitis and need for surgical interventions. Risk factors for mortality in acute diverticulitis and risk factors associated with CDI in AD patients were analyzed.

Results: Among 767,850 hospitalizations for AD, 8,755 also had CDI. Patients with CDI had significantly greater mortality than those without (2% vs .4, p<.001), require longer hospitalizations (8 days vs 3 days, p<.001) and had higher hospitalization charges $74525 vs $37571. Predictors of CDI among patients with AD included age (1.01 OR, 95% CI 1.01, 1.02) female gender (1.12 OR, 95% CI 1.01, 1.24), three or more comorbidities (1.81 OR, 95% CI 1.57, 2.09), and admissions to teaching hospitals (1.44 OR, 95% CI 1.22, 1.70).
CDI was independently associated with mortality in patients with AD (OR 2.02, 95% CI 1.38, 2.96). Other factors associated with increased mortality included increasing age (OR 1.09, 95% CI 1.08,1.10), three or more comorbidities (OR 4.71, CI 95% 3.73, 5.95) and length of stay (OR 1.04, 95% CI 1.03,1.05).
Patients with CDI were more likely to undergo open colectomy (28% vs 22.6%, p<.001), require colostomy (9.6% vs 5.5%, p<.001) and abscess drainage (9.1% va 4.3%, p<.001). CDI patients had increased obstruction 13.6% vs 7.8%, p<.001), abscess (5.6% vs 3.0%, p<.001) and hemorrhage (7.8% vs 6.0%, p<.001).
Patients who required surgical interventions had increased mortality including colectomy (OR 2.36, 95% CI 1.83, 3.06), colostomy (OR 2.99, 95% CI 2.30, 3.90) and abscess drainage (OR 1.85, 95% CI 1.39, 2.47). Patients with complications of diverticulitis had increased mortality including perforation (OR 3.90, 95% CI 2.16, 7.04) and hemorrhage (OR 1.73, 95% CI 1.38, 2.18).

Conclusions: CDI in AD is associated with increased mortality, length of stay and hospital charges. Preventative measures should be made for at-risk patients with AD to decrease infection rate and poor outcomes.

Abstract Title: Lead (PB) Exposure and Risk of Non-Alcoholic Fatty Liver Disease and Advanced Fibrosis: An Association Modified by Race/Ethnicity and Gender in NHANES 2011-2016

Associate & Authors: Debashis Reja MD, Aayush Visaria BA, Augustine Tawadros MD, Lauren Pioppo MD, Abhishek Bhurwal MD, Vinod K. Rustgi MD MBA

Introduction and Objectives:
Non-Alcoholic Fatty Liver Disease (NAFLD) is linked to obesity and metabolic syndrome, but increasing evidence also implicates environmental toxins. In this study, we aim to show that in elevated blood Lead levels in NAFLD patients result in worsening liver fibrosis.

Materials and Methods:
30,172 patients from NHANES 2011-2016 met inclusion criteria. 2,499 patients ages 20-74 were identified with NAFLD as determined by the Fatty Liver Index score, and 425 with advanced liver fibrosis were identified using the NAFLD Fibrosis Score. Simple linear regression, Student's T-test, and Rao-Scott Chi-Square test was used for continuous and categorical variables. Multivariate regression analysis was used to adjust for confounders to determine odds of Advanced Fibrosis.

Results
Increased serum Lead level was independently associated with increased risk of Advanced Fibrosis (OR 5.93, 95% CI 2.88-12.24) in the highest Lead quartile (Q4). In subgroup analysis stratified by BMI, a significant association between advanced liver fibrosis and blood Lead levels was consistently present, Q4 (OR 5·78, 95% CI 0·97-33·63) and Q4 (OR 6·04, 95% CI 2·92-12·48) in BMI <30 and >30, respectively. Increased Lead exposure was also evident in patients who were older, less educated, male, and drank alcohol and smoked tobacco.

Conclusions
Our findings show that advanced liver fibrosis is up to six times more likely in NAFLD patients with increased Lead exposure.

Abstract Title: Breast Cancer Receptor Subtypes in East Africa: A Systematic Review and Meta-analysis.

Associate & Authors: Pallvi Popli, MD, Elane M Gutterman, PhD, Coral Oghenerukevwe Omene, MD, Shridar Ganesan, MD, PhD, Richard Marlink, MD;

Purpose: Among women worldwide, breast cancer (BC) is the most frequently diagnosed cancer and the leading cause of cancer associated deaths, accounting for almost one quarter of incident cancer cases and 15% of cancer deaths. With a mortality to incidence ratio of 0.51, mortality rates for breast cancer in East Africa are among the world's highest. In East Africa, the estimated five-year survival (37.7%) is far lower than the US average (90%). Estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor-2 (HER2) are determinants of treatment regimens and prognosis for patients with breast cancer (BC). This meta-analysis investigates BC receptor subtypes within East Africa to identify cross-country patterns and prioritize treatment needs.

Sample and Methods: Receptor distributions for female samples >30 in all BC articles for Ethiopia, Kenya, Rwanda, Tanzania and Uganda were obtained from PubMed, 1/1/1998–6/30/2019. Outcomes were proportions of ER+, PR+, and HER2+ and/or molecular subtypes. Data included study characteristics and mean/median patient age. Using metaprop, STATA 16, we estimated pooled proportions (ES) with 95% confidence intervals (CI) and assessed heterogeneity.

Results: Among 35 BC studies with receptor data, 21 met criteria. Weighted mean age was 47.5 years (SD 3.2) and median, 48. For ER+ (18 studies/n=2,875), overall ES was 0.55 (0.47, 0.62), range 0.62 Ethiopia (0.52, 0.71) to 0.42 Uganda (0.36, 0.49). For HER2+ (18 studies/n=2,689), overall ES was 0.23 (0.20, 0.26), range 0.27 Ethiopia (0.18, 0.37) to 0.21 both Tanzania (0.14, 0.30) and Uganda (0.15, 0.29). For triple negative (TN, 16 studies/n = 2,575), overall ES was 0.27 (0.23, 0.32), range 0.21 Ethiopia (0.16, 0.27) to 0.35 Uganda (0.29, 0.41).

Conclusions: Our study shows that ER+ BC is the dominant subtype (55%), which indicates the need to prioritize systemic treatment with endocrine therapy. Overall rates of HER2 subtype, 23%, approached rates of TN, 27%, yet HER2 testing and treatment were infrequent. Lastly, TNBC remains a considerable proportion of BC in East Africa, thus emphasizing the need to maximize effective and robust treatment of this aggressive subtype. Testing and reporting of receptor subtypes is thus a critical step in the delivery of more effective treatment and reducing the mortality disparity for BC in East Africa.

Abstract Title: The Impact of Obesity on Mortality and Clinical Outcomes in Patients with Acute Diverticulitis in the United States

Associate & Authors: Michael Makar, MD, Thomas John Pisano, PhD, Weiyi Xia, BS, Patricia Greenberg, MS, Anish Vinit Patel, MD

Introduction: Diverticular disease represents a significant cause of morbidity and is a leading cause of gastrointestinal-related hospitalizations. By the age of 85, approximately two-thirds of individuals will develop diverticular disease and up to 25% will develop acute diverticulitis (AD). Obesity confers an increased risk of morbidity and mortality and has been associated with poor outcomes in many diseases. However, its impact on hospitalized patients with AD has not previously been studied.

Methods: We utilized data from the National Inpatient Sample from January 2012 – October 2015 for patients hospitalized with AD and obesity. Multivariate regression analysis was performed to identify predictors of mortality and length of stay to adjust for confounders. Primary outcomes were mortality, length of stay, and hospitalization cost were compared. Secondary outcomes were complications of diverticulitis and need for surgical interventions.

Results: There were 660,820 hospitalizations for acute diverticulitis and 115,785 had obesity. Patients with obesity were younger (mean age 55.47 years) than controls (mean age 61.20 years, p< .001), more likely to be female (62.9 vs 57.32 p<.001), black (13.1 vs 7.8, p<.001), Hispanic (12.8 vs 10.2, p<.001) and had greater co-morbidities. 10.8% of patients in the infection group had a score of 3 or more on the Charlson-Deyo Comorbidity Index compared to 8.8% of controls. Patients with obesity were more likely to be Medicaid patients (12.1 vs 7.3, p<.001), self-pay (6.9 vs 5.6%, p<.001) and from the Midwest (22.5 vs 20.8, p<.001), South (41.5 vs 40.2, p<.001). The overall in-hospital mortality rate was .4% for patients with obesity and .5% for non-obese patients. Length of stay was greater for obese patients (4 days vs 3 day). Hospitalizations charges were higher for patients with obesity at $25,969 vs $23,072 (p<.001).
Patients with obesity were more likely to undergo open colectomy (14.4 vs 12.4, p<.001), colostomy (6.4 vs 5.4, p<.001) and abscess drainage (4.9 vs 4.3, p<.001). Patients with obesity had increased complications of diverticulitis including obstruction (8.2% vs 7.8%) and abscess (3.5 vs 3.0, p<.001) but less likely to have hemorrhage (5.2% vs 6.2%).
A multivariate logistic regression analysis demonstrated that overall, obesity was associated with an increased risk of mortality (OR 1.1, 95% CI .87,1.41). When stratified for morbid obesity defined as a BMI > 40 (OR 1.69, 95% CI 1.23, 2.31), morbid obesity was independently associated with mortality.

Conclusion: This is the first and most comprehensive analysis that reports the effects of obesity on AD. Patients with obesity have an increased risk for mortality, longer hospitalization stay and greater healthcare cost.

QUALITY IMPROVEMENT RESEARCH PROJECTS

Abstract Title: Reduce Inappropriate Telemetry Renewal – Improving Physician Understanding

Associate & Authors: Janet Cai, MD; Linle Hou, MD, Payal Parikh, MD

Background: Overuse of telemetry monitoring is a widely recognized which can lead to increased cost and unnecessary use of resources. The purpose of this study is to reduce inappropriate telemetry renewal, with a focus on residents' understanding of telemetry use.

Methods: Telemetry renewal orders placed for patients on the inpatient Medical Teaching Services were reviewed for appropriateness based on the 2017 American College of Cardiology/American Heart Association (ACC/AHA) practice standard. We hypothesized that some targetable causes for inappropriate renewal were lack of familiarity with ACC/AHA guidelines and lack of reminders in the electronic medical record (EMR) to consider if telemetry is needed. Physician factors for overutilization were identified using a pretest and survey to determine baseline knowledge and current practice.

Results: Of 125 renewal orders placed, 32% (40/125) were deemed inappropriate. Our pretest and survey showed only 22.2% (10/45) of residents are aware of the daily cost of telemetry, 33.3% (15/45) reported checking telemetry daily for patients with active orders, and 62.2% (28/45) reported not documenting their telemetry findings daily. About 15.56% reported "never" and 42.22% reported "sometimes" considering indications for telemetry prior to placing renewal orders (Figure 1).

Conclusion: Our results indicated a significant margin for improvement in both knowledge and practice among physician trainees.

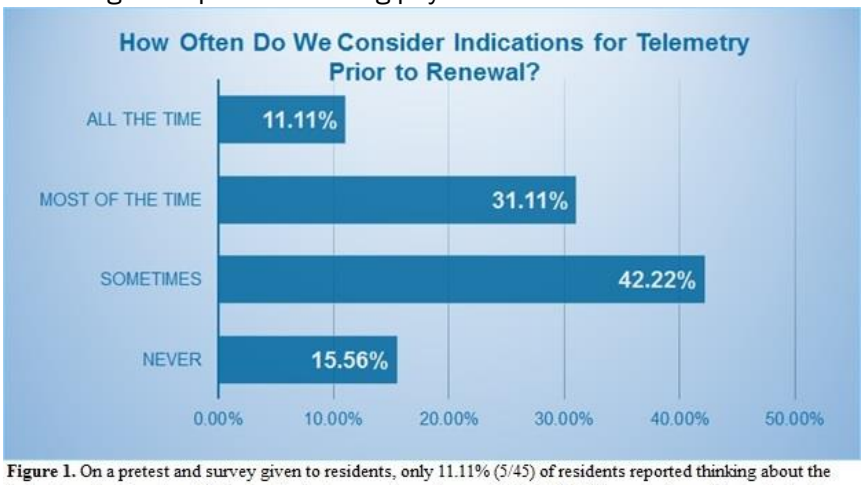


Figure 1. On a pretest and survey given to residents, only 11.11% (5/45) of residents reported thinking about the indications for telemetry "all the time" prior to renewing orders and 31.11% (14/45) reported considering indications "most of the time." A significant number of telemetry orders are renewed without proper consideration for whether monitoring is still indicated.

Abstract Title: Improving Admission Medication Reconciliation Completion in the Medical Intensive Care Unit (MICU)

Associate & Authors: Priya Jaisinghani MD, Anoushka Dua MD, Sara E. Lubitz, MD, David A Cohen, MD

Medication errors lead to adverse outcomes, hospital readmissions, and increased health care costs. A JGIM study noted that 257 of 2066 medication discrepancies were unintentional and potential adverse drug events.72% of discrepancies were secondary to errors with pre-admission medication history. Our project aimed at improving patient safety through appropriate MICU medication reconciliation (med rec) amongst the interprofessional team including APNs, nurses, residents, fellows, and pharmacists. Our baseline pre-intervention data showed that only 43.3% of all daytime admission med recs were completed by the 48-hr mark. Using QI methodology, we performed a root cause analysis to identify barriers to timely completion. From February-May 2019, we aimed to increase MICU med recs completed by residents from 43.3% to 70%. We undertook several PDSA cycles including: 1) meeting with the MICU Director to clarify roles and responsibilities and to gain perspective on feasible interventions like "Dr First", a medication management platform which pharmacists use to access outpatient medications 2) launching an education campaign on the algorithm of expectations for med rec completion based on admission time 3) ensuring sustainability by implementing reminders on MICU computers asking " Is your med rec complete?" 4) highlighting the importance of 24-48hr med rec completion, a national standard, through emails sent out by the Chief Residents and the MICU Director. Post-intervention analysis by the 48hr mark showed: fellow completion rate of 26.1% to 78.8%, resident completion rate of 54.1% to 56.8 %, and overall completion went from 43.3% to 66.2%. To continue this project, we integrated best practice of timely completion of medication reconciliation into orientation and are working with the hospital to gain access to "Dr. First" for all medical residents.

Abstract Title: Improving Thyroid DNA Education: Implementation of a Formal Clinical Procedure Assessment Tool for Teaching Thyroid FNA to Endocrinology Fellows

Associate & Authors: Priya Jaisinghani MD, Anoushka Dua MD, Sara E. Lubitz, MD, David A Cohen, MD

Fellows must demonstrate competence in the performance of thyroid biopsy (bx) from the 2019 ACGME Program Requirements for GME in Endocrinology, Diabetes, and Metabolism. During fellowship, trainees are often taught thyroid bx using an unstructured approach, through demonstration followed by supervised performance on patients. Concerns regarding patient safety, lack of readily available faculty & patients, and lack of competency checkpoints limit the utility of such an approach to teaching procedural skills [(1)]. Application of Psychomotor Learning Theory to teaching procedural skills has modified prior philosophy to "learn, see, practice, prove, do, maintain." [(2)] Two phases exist: 1) cognitive- conceptualization and visualization of the procedure and 2) psychomotor- acquisition of procedural skills. Formal training has been shown to improve FNA diagnostic accuracy along with fewer surgical procedures for benign lesions.[(2)] There is no evidence to support any specific recommendations for training fellows on safe and efficient thyroid bx techniques further highlighting the need for a competency based approach.[(3)] Since the didactic lecture format is not well suited for the acquisition of complex manual operations, in our study, we seek to 1) create, implement, and standardize the thyroid FNA curriculum for Endocrine fellows at our institution by employing global learning objectives and a skill checklist to help guide competency, and 2) assess the impact of this curriculum on knowledge, performance, and comfort. The goal is to prepare fellows for unsupervised practice through clinical procedure assessment tools to guide practical learning in conjunction with didactic lectures. Curriculum could be implemented not only across the nation to other endocrine fellowships but widely across multiple disciplines such as otolarynology, radiology, pathology. To assess the nationwide need for a formal means of teaching and evaluating thyroid US/ FNA skills within fellowship programs, we will be administering a nationwide survey to all Endocrinology Program Directors and recently graduated Endocrinology Fellows.

Abstract Title: Treatment of Micronutrient Deficiencies Pre- and Post- Bariatric Surgery

Associate & Authors: Roohi Patel, MD; Monica Saumoy MD

Obesity is a chronic and relapsing condition in which energy homeostasis mechanisms are altered. This can result in dysfunctional adipose tissue pathways that lead to disease states which may negatively impact a patient's mortality and morbidity. As the prevalence of obesity continues to increase, the healthcare system will continue to feel the burden of this disease in medical, economic, and psychosocial spheres. A commonly overlooked diagnosis that can exist in this patient population is nutrient deficiency, in particular of micronutrients. Bariatric surgery is increasingly becoming a popular option amongst patients in whom strict lifestyle changes and pharmacologic weight loss methods have failed to produce a desirable outcome. The resultant weight loss from these procedures is not only due to changes in gut anatomy, but also involves changes to neural and gut hormone signaling pathways, intestinal microbiota, and nutrient sensing. This can contribute to poor nutritional intake post intervention due to food intolerance and changes to eating patterns, which in the setting of altered absorption and poor compliance with required dietary changes and supplementation, can lead to the development of micronutrient deficiencies. Studies have previously shown that many patients also have at least one micronutrient deficiency prior to surgery as a result of high energy but low micronutrient diets, complications of disease states, and medication side effects. If left untreated, these deficiencies can lead to worse post-surgical outcomes. Micronutrient deficiencies can affect multiple organ systems and will vary in clinical presentation depending on the severity and duration of the deficiency or deficiencies that are present. Common disease states that can be seen include anemia, osteoporosis, neurological deficits, mood changes, fatigue, and dermatologic changes. In this review, our goal will be to shed light on the nutrient deficiencies that can occur in bariatric patients pre- and post-surgery. We will further highlight the importance of performing a complete nutritional evaluation to further assess, intervene on, and monitor a patient's nutritional status throughout their pre- and post- operative course. Treatment of these deficiencies will require a multidisciplinary and multimodal approach involving medical and psychosocial support that is individualized to each patient.

CASE REPORTS

Abstract Title: More Than Meets the Eye: A Rare Case of Optic Neuritis Caused by Herpes Zoster Ophthalmicus

Associate & Authors: Kush Patel, MD, Jessica Kunadia, MD, Michael Trottini, OD

Introduction: Herpes zoster ophthalmicus (HZO) is a presentation of herpes zoster that occurs when varicella zoster virus reactivates in the ophthalmic division of cranial nerve 5. Optic neuritis is a very rare but recognized complication of HZO that can cause vision loss. We present a case of optic neuritis that developed within days of the eruptive phase of HZO.

Case Description: A 76 year old female with history of left eye vision loss due to untreated cataract, chickenpox as a child and no history of shingles vaccine presented with right eye swelling, rash, and painless vision. Four days prior to admission, she suffered trauma from a tree branch to the right eye. The next day she developed a burning sensation around the right eye followed by intense swelling leaving her unable to open the eye, copious discharge and an associated rash around the eyelid. Vital signs were unremarkable. Her exam was notable for a raised brownish yellow rash in the right V1 dermatome with underlying erythema, scattered blisters and crusting, and clear discharge. The rash did not cross midline. Bilateral EOMs were intact and painless. Pupillary light reflex was sluggish on the right and prompt on the left. Right afferent pupillary light reflex was absent but present on the left. Intraocular pressures were 17 on the right and 18 on the left. Bilateral corneas were clear and fluorescein test was negative. Cornea was completely clear without NaFl uptake on the right. Left cornea showed a hypermature cataract. Dilated right retinal exam showed normal optic nerve, no disc edema, no signs of retinal infection or detachment, engorged retinal veins, and small intra-arterial retinal hemorrhage. CT scan and MRI of the orbits were notable for soft tissue swelling on the right region of the face, along with enhancement of the right prechiasmatic optic nerve with minimal associated edema, but no intra-orbital abnormality. These findings were consistent with infectious optic neuritis. Patient had a positive VZV rapid test with negative cultures of the eye discharge. Neurology was consultd and she was treated with 1g of methylprednisolone daily and acyclovir 690mg three times daily for 5 days. Slight vision improvement was after initiation of steroids. She was discharged with valacyclovir 1g three times daily to finish a 14 day course of therapy. Prior to discharge, she regained the ability to see light during the day and see figure outlines in the dark. She was discharged with a scheduled MRI of the orbits 1 month from her steroid course.

Discussion: HZO is a complication of reactivated varicella virus. The viral particles are thought to spread to the cranial or spinal neuroganglia via the sensory nerve fibers on the skin or through hematologic spread where the virus remains dormant in the ganglia. It can become reactivated when host immunity fails to due to immunosuppression, stress, or trauma. A common site of reactivation is the ophthalmic division of the trigeminal ganglia. Based on reported cases of optic neuropathy with HZO, it was noted that optic neuropathy generally develops about 2 weeks after development of rash and systemic antiviral therapy is key for its treatment, but the benefit of steroids were unclear. In our case a patient developed optic neuritis likely concurrently or shortly after her herpetic rash developed. The patient started showing improvement in eyesight with a 5-day course of pulse dose steroids. We would like to bring awareness that optic neuritis is a rare complication of HZO, likely because the optic nerve does not have a direct route for the virus to lay dormant in. Additionally, the neuritis appears to occur after the rash. This raises the question of the efficacy and timing of corticosteroid use. We hope to add to the collection of optic neuritis from herpes zoster cases to help future studies in elucidating these questions.

Abstract Title: An Unusual Cause of Cavitary Lung Lesion: Polyangiitis Overlap Syndrome

Associate & Authors: Manank Patel, MD Jessica Kundia, MD Michael Makar, MD Sarah Orfanos, MD and Jared Radbel, MD

Case Presentation:
A 23-year-old male with intermittent controlled asthma, presented to the emergency department for recurrent hemoptysis and night sweats of two months duration. The patient also complained of loss of sensation in his left thumb, index and middle fingers and bilateral lower extremity rash of two days duration. On examination, lung fields were clear to auscultation bilaterally with normal percussion. Neurologic examination was remarkable for decreased tactile sensation in left hand of ulnar distribution. Skin examination was remarkable for palpable purpuric lesions bilaterally on the lower extremities. Chest X-ray revealed a large cavitary lesion with air fluid level in the right upper lobe. Computed tomography of the chest further defined the cavitary lesion size as 11.5cm*7cm with significant fluid and irregular walls with extensive pleural contact. Laboratory results were remarkable for white blood count of 19 thousand/ul with 42% eosinophils (7.960 thousand/ul). Autoimmune work-up revealed positive proteinase 3 anti-neutrophil cytoplasmic antibody (c-ANCA PR3+). A punch biopsy of the purpuric rash performed before initiation of steroids revealed leukocytoclastic vasculitis with a large number of eosinophils in capillaries and post-capillary venules. After multidisciplinary discussions involving pulmonary, rheumatology, and infectious disease consultants, a diagnosis of polyangiitis overlap syndrome was made. Patient was treated with pulse dose steroids with clinical improvement and was discharged with maintenance therapy of Rituximab.

Discussion:
A cavitary lung lesion has a wide differential and includes infection, septic emboli, malignancy, and non-infectious granulomas. Less common etiologies include sarcoidosis, pulmonary infarct and cryptogenic organizing pneumonia. Given this broad differential, it is important to determine the underlying etiology and treat it appropriately. In our case, patient had several features that pointed towards the diagnosis of vasculitis, in particular small vessel vasculitis. The diagnosis of the underlying vasculitis was challenging as patient had features overlapping granulomatosis with polyangiitis (GPA) and eosinophilic granulomatosis with polyangiitis (EGPA). After discussion with the consultants, our patient was diagnosed with polyangiitis overlap syndrome, given his history of asthma, peripheral and tissue eosinophilia which are more associated with EGPA and presence of PR3 positive C-ANCA and cavitary lesions which are more consistent with GPA. Of the 15 cases of GPA- EGPA polyangiitis overlap syndrome reported in literature, 4 cases described nodular lesions on chest CT, 9 cases reported ground glass opacities and 2 cases reported cavitary lesions. Therefore, Polyangiitis overlap syndrome needs to be considered as a part of differential diagnosis while evaluating patients with cavitary lung lesion. Our patient was appropriately treated with methylprednisolone 1mg/kg for 3 days inducing a decrease in peripheral and tissue eosinophils. Patient's symptoms improved and he was discharged on Rituximab for immunosuppression. During post hospitalization follow up, he was noted to have significant reduction in size of his cavitary lesion.

Conclusions:
Cavitary lung lesions are a common presentation of several disease entities and vasculitis needs to be considered as a part of differential diagnosis. It is also important to identify the type of vasculitis as treatment differs significantly.

Abstract Title: Emphysematous Gastritis: Resolution with Conservative Management in a Patient with Cocaine Use

Associate & Authors: Taeyang Park, MD; Michael Makar, MD; Cindy Law, MD; Evan Orosz, DO; Anish Patel, MD

Introduction: Emphysematous gastritis (EG) is a rare gastrointestinal disease characterized by air in the stomach wall caused by gas-forming bacteria with an estimated mortality rate of 50-60%. Previously reported risk factors include ingestion of corrosive substances, alcohol use, recent abdominal surgery, pancreatitis and nonsteroidal anti-inflammatory drug use. We present a case of EG in the setting of cocaine use. Given the significant mortality, clinicians should maintain a high suspicion for EG in patients with recent drug use.

Case Presentation: This is a 33 year-old female with a past medical history of illicit drug use (cocaine and heroin) and chronic liver disease secondary to chronic hepatitis C who presented with progressively worsening dyspnea, cough, abdominal distension with severe epigastric abdominal pain, nausea, and vomiting. Patient was found to have mild hypotension and tachycardia with laboratory findings notable for leukocytosis. Infectious work up including urine and blood cultures were negative. Urine drug screen was positive for cocaine. Computed Tomography (CT) of abdomen and pelvis revealed air in the gastric wall at the fundus. Based on these findings, patient was diagnosed with EG. Upper endoscopy was not performed due to concern for perforation. Patient improved clinically after a five day course of piperacillin-tazobactam and repeat CT imaging demonstrated resolution of EG.

Discussion: Emphysematous gastritis is a rare condition with presence of air within the stomach wall. Clinical presentation can range from abdominal pain, nausea and vomiting to fulminant shock. Diagnosis is made with abdominal imaging, with CT scan being the study of choice, demonstrating intramural gas throughout the stomach. Pathophysiology of EG is unclear but it is suggested that an infection with gas-producing bacteria occurs due to disruption of the gastric mucosa or through hematogenous spread. Normally, gastric mucosal barrier lines and protects the gastric wall from infection but this barrier can be disrupted by many factors, including ingestion of corrosive substances, alcohol abuse, recent abdominal surgery, and gastric infarction. Cocaine use can lead to various gastrointestinal complications including bowel ischemia, infarction, and perforation. It is proposed that cocaine causes vasoconstriction and alters gastric motility, contributing to disruption of mucosal barrier and formation of ulcer.

Conservative management of EG includes fluid resuscitation, keeping the patient NPO, proton pump inhibitor, and broad-spectrum antibiotics covering gram-negative and anerobic organisms. Role for surgical intervention is not well-established. It is reserved for those who fail optimal medical management or develop perforation and necrosis as there is a high risk of complications after surgery.

EG is a rare disease caused by infection of stomach wall by gas-producing bacteria and can have a wide range of presentations. Clinicians should hold an index of suspicion for EG in patients with cocaine use and gastrointestinal symptoms for early diagnosis and favorable outcomes. Our case illustrates that cocaine can cause EG by damaging the protective gastric mucosal barrier and predisposing patients to infection. As with other EG cases, conservative management with adequate fluid resuscitation and antibiotics covering gram-negative and anerobic bacteria is warranted.

Abstract Title: A Case of Mitral Disease and Marantic Endocarditis in Granulomatosis with polyangiitis

Authors: Carol Nasr, MD, Michael Makar, MD, Ilja Dejanovic, MD, Linle Hou, MD

Introduction: Granulomatosis with Polyangiitis (GPA) is an antineutrophil cytoplasmic antibodies (ANCA)-associated vasculitis characterized by lung, kidney, upper respiratory tract, and skin involvement. Cardiac involvement is an uncommon finding in patients with GPA. We present a patient with mitral valve involvement and marantic endocarditis in the setting of newly diagnosed GPA.

Case: A 62-year-old female from India with a PMH significant for hypertension, hypothyroidism and tuberculosis (treated with RIPE therapy in 1995) who presented with hemoptysis, dyspnea, fever, and worsening bilateral ear pain. Her physical exam was notable for diffuse rhonchi in the posterior lung fields and a 3/6 holosystolic ejection murmur heard in the apex. Laboratory data demonstrated: elevated erythrocyte sedimentation rate 77mm/hr, C-reactive protein 22.3 mg/dL and large hematuria on urinalysis. ANCA test was positive in cytoplasmic pattern with titer of 1:80. Anti-proteinase 3 antibody was positive with 742.0 AU/ml. CT scan of the temporal bones revealed bilateral mastoid and middle ear mucosal disease with fluid concerning for otomastoiditis. CT of the chest revealed extensive bilateral dense pulmonary infiltrates. During the hospital course, the patient had worsening respiratory status requiring admission to the ICU with intubation. Bronchoscopy was performed and BAL was negative for active infection. Transesophageal echocardiogram was done that demonstrated a large mass attached to the anterior mitral leaflet with resultant severe mitral regurgitation. Patient was diagnosed with GPA with severe mitral regurgitation. Treatment was initiated with high-dose methylprednisolone and Rituxan which resulted in drastic improvements in terms of respiratory status and patient was subsequently discharged from the ICU to the regular medical floor. The patient was continued with prednisone and RTX and discharged home in stable condition.

Discussion: Cardiac involvement is an extremely rare manifestation in GPA. Cardiac involvement with GPA can include pericarditis (50%), myocarditis (25%), valvular involvement (21%), conduction block (17%), and myocardial infarction (11%) Cardiac involvement has been associated with an independent risk of increased mortality with a reported rate between 15% and 45%. Various diagnostic modalities can be used to identify cardiac disease including, electrocardiogram, holter electrocardiogram, echocardiography, magnetic resonance imaging (MRI). Patients with newly diagnosed GPA should undergo electrocardiogram and echocardiography to evaluate for cardiac involvement. Valvular involvement can lead to perforation of the leaflets and may cause severe complications if an early and proper diagnosis is not made. Early treatment with immunosuppressive therapy can allow for complete resolution of valvular lesions in a subset of patients when initiated promptly.

Conclusion: Cardiac involvement is an extremely rare manifestation in GPA and mitral valve disease is rarely reported in literature. Clinicians should maintain a broad differential diagnosis as patients with GPA can present with a wide variety of clinical symptoms and involvement of various organ systems. Newly diagnosed GPA patients are recommended to undergo electrocardiogram and echocardiography to evaluate for cardiac disease. Initiating immunosuppressive therapy early can be crucial in preventing further critical cardiac complications.

Abstract Title: Malignant Perivascular Epithelioid Cell Neoplasm of Colon in Young Male

Associate & Authors: Briette Karanfilian, MD; Ryan Jackson, MD; Vicky Bhagat, MD, MPH; Ryan Cristelli, MD; Marina Chekmareva, MD; Avik Sarkar, MD

Introduction: Perivascular epithelioid cell neoplasms (PEComas) are a rare type of mesenchymal tumor that can be found in various visceral and soft tissues in the body. Approximately fifty cases have been reported in the gastrointestinal (GI) tract. Typically, management of these lesions is laparoscopic or open surgical resection followed by chemotherapy if there is metastasis. The majority of GI PEComas are benign, colonic masses in middle-aged females. This case describes a malignant, colonic PEComa in a 16-year-old male. To the best of our knowledge, this is the largest malignant, colonic PEComa in an adolescent, and this is the first case to demonstrate successful endoscopic mucosal resection (EMR) of a PEComa.

Case Report: A 16-year-old male with history of IgA vasculitis during childhood presented with acute onset of bilious emesis in the setting of severe, intermittent, left lower quadrant abdominal pain and constipation for one month. Lab testing was unremarkable. Computed tomography revealed a non-obstructing, nodular mass in the transverse colon. The patient underwent colonoscopy, during which the 6-cm large, semi-sessile, broad-based polyp was removed by piecemeal EMR. EMR was technically challenging due to the size, broad base, and location of the mass. Histology of the tissue showed a predominance of fascicular spindled cells, scattered areas with epithelioid morphology, and prominent vasculature, consistent with a PEComa. The tissue stained positive for HMB-45, MART-1, and cathepsin. Based on the size (>5cm), nuclear atypia, and high mitotic activity, the lesion was defined as malignant. Though the lesion was removed to the submucosa, there was concern for deeper extension, so he underwent laparoscopic transverse colectomy with primary anastomosis. Pathology confirmed there was not any residual tumor in the resected colon or metastasis to lymph nodes. Positron emission tomography did not show metastasSis. Fifteen months have elapsed and the patient has not had recurrence on imaging.

Discussion: There are few cases of GI PEComas. This case demonstrates a rare presentation of a large, malignant GI PEComa in a young male and is the first case of successful endoscopic removal of a malignant PEComa. The surgical specimen revealed no evidence of residual PEComa, and the patient has not had evidence of recurrence on imaging, verifying successful removal of his PEComa. This supports the notion that EMR should be considered for definitive management in patients with these lesions.

Abstract Title: A Heterogeneous Manifestation of Malignancy: Extranodal NK/T Cell Lymphoma presenting as a Knee Mass and Suspected Small Bowel Mass

Associate & Authors: Aakash Patel, MD; Joseph Ho, MD; Roger Strair, MD

Introduction: Extranodal natural killer (NK)/T-Cell Lymphoma (EN-NKTL) is a malignancy of NK and T-cell origin. Most cases manifest as upper airway or nasal lesions with tissue destruction. Uncommonly, EN-NKTL manifests as lesions outside of the upper airway, such as in the skin or digestive tract. EN-NKTL is exceedingly rare in the United States and Europe, representing less than 1% of lymphoma cases. However, in Central and South America and Asia, EN-NKTL may represent 5-10% of all lymphoma cases. This is a unique case of newly diagnosed EN-NKTL manifesting concurrently as both a knee mass and a suspected small bowel mass.

Hospital Course: A 37 year old female who was born in Central/South America with no significant past medical history presented to an outside hospital with right knee pain with swelling and right lower quadrant abdominal pain. Her abdominal pain was thought to be due to a partial small bowel obstruction and improved with conservative management. Her knee pain prompted CT imaging, which demonstrated findings of a hemorrhagic effusion. Needle aspiration showed signs of possible bacterial infection, but her symptoms did not improve after antibiotics. Given concern for septic arthritis, she underwent an incision and drainage which demonstrated negative cultures; however, pathology demonstrated lymphoid hyperproliferation. She was transferred to our hospital for workup of a suspected malignancy. Further history demonstrated three months of knee pain with swelling, fevers, and a weight loss of 15 pounds prior to presentation. Knee aspirate pathology was diagnostic of EN-NKTL, demonstrating angiodestructive lymphocytic infiltrate with an elevated Ki67 proliferation index and positivity for Epstein-Barr Virus, CD3, CD2, CD5, CD7, CD8, CD30, and MUM1. Bone marrow biopsy and peripheral blood flow cytometry were negative for lymphoma. The patient was started on SMILE, a chemotherapy regimen composed of dexamethasone, methotrexate, ifosfamide, L-asparaginase, and etoposide. Despite chemotherapy, her knee pain returned. CT demonstrated a large intra-articular soft tissue mass. Knee operation with mass excision resulted in improvement of her symptoms. Knee mass pathology was positive for EN-NKTL. During hospitalization, the patient complained of abdominal pain with nausea and emesis. CT revealed circumferential bowel wall thickening of the cecum and terminal ileum with enlarged right inguinal lymph nodes. Colonoscopy demonstrated a submucosal cecal mass, yet biopsy showed small lymphoid aggregates without overt evidence of EN-NKTL. After cycle 1 of SMILE chemotherapy, CT showed improved intestinal thickening and repeat colonoscopy demonstrated resolution of submucosal mass. After colonoscopy, her abdominal pain worsened and CT demonstrated signs of bowel perforation. Exploratory laparotomy resulted in bowel resection with ostomy placement. Pathology showed multiple nodules of necrotic lymphoid tissue, likely representing EN-NKTL tumor necrosis secondary to chemotherapy. On future hospitalizations she completed three total cycles of SMILE chemotherapy with PET/CT demonstrating remission.

Conclusion: This is a rare case of EN-NKTL presenting as both a knee mass and suspected small bowel mass. EN-NKTL is rare in the United States itself, and this case is even more remarkable in its manifestation at two uncommon sites concurrently. When malignancy is on the differential, clinicians should have a high suspicion for EN-NKTL as a unifying diagnosis in cases of multisystem disease, especially in patients of Central/South American and Asian descent.

Abstract Title: Transthyretin Cardiac Amyloidosis: A Diagnostic Challenge

Associate & Authors: Aakash Patel, MD; Puja Chabra, MD; Gabriela Ferreira, MD

Introduction: Cardiac amyloidosis (CA) is an infiltrative cardiomyopathy that can manifest as heart failure and a myriad of other cardiac conditions. The most common causes of CA are light chain amyloidosis and transthyretin amyloidosis [1]. Definitive diagnosis of CA subtype has become increasingly important with the advent of novel treatments for transthyretin CA [2]; however, making the diagnosis can be difficult.

Case Presentation: An 85 year old male with hypertension and hyperlipidemia presented with progressively worsening dyspnea on exertion and lower extremity edema. ProBNP was greater than 6000 and chest x-ray demonstrated a significantly enlarged cardiac silhouette. Echocardiography demonstrated severely decreased LV systolic function with an EF of 20-25% and severe concentric LV hypertrophy with an appearance suggestive of an infiltrative cardiomyopathy. Light chain amyloidosis was ruled out with negative serum/urine protein electrophoresis and urine immunofixation. He was treated for an acute heart failure exacerbation and discharged. Upon cardiology follow-up, he was referred for nuclear pyrophosphate scintigraphy to evaluate for transthyretin CA; however, the patient did not have this done. Five months later, he was re-hospitalized with sudden onset dyspnea and weakness with ambulation. He was found to have a junctional bradycardia with a heart rate intermittently under 40 beats/minute. Echocardiography demonstrated persistent LV hypertrophy. In the setting of recurrent cardiac hospitalizations concerning for CA, an endomyocardial biopsy was performed. Pathology and genetic testing were consistent with wild-type transthyretin CA. He had a dual chamber pacemaker placed with improvement in symptoms.

Discussion: This case demonstrates both the varied and recurrent cardiac manifestations of transthyretin CA and the challenges of obtaining a definitive diagnosis. Here, despite a high index of suspicion and initiation of testing at first presentation, a repeated hospitalization occurred before definitive diagnosis was obtained. The challenge of timely diagnosis in transthyretin CA is that it can be a multiple step process and potentially involve an invasive procedure. With the recent availability of novel therapeutics for transthyretin CA and advancements in noninvasive diagnosis methods [3], expediency in diagnosis should be sought to improve outcomes in this patient population.

Abstract Title: A Dangerous Masquerade: New-onset Systemic Lupus Erythematosus Presenting as Spontaneous Coronary Artery Dissection and SLE-associated Colitis

Associate & Authors: Puja Chabra MD, Aakash Patel MD, Roman Zuckerman DO, Vivien Hsu MD

Introduction: Systemic Lupus Erythematosus (SLE) manifests most commonly in young women with cutaneous findings and arthralgias[1]. However, in this unique case, new-onset SLE presents with both spontaneous coronary artery dissection (SCAD) and SLE-associated colitis.

Case Presentation: A 28 year old female with no past medical history initially presented to a different facility with diarrhea, emesis, and fevers in the setting of poultry consumption from a restaurant. CT demonstrated colitis and blood cultures grew group A streptococcus thought to be secondary to pharyngitis. The patient was treated with antibiotics with resolution of bacteremia but without improvement in her symptoms. On hospital day three, she developed sudden onset crushing chest pain. Her troponin was over 20, EKG demonstrated diffuse ST changes, and echocardiogram demonstrated an EF of 40% with regional wall motion abnormalities. She was thought to have myocarditis and was transferred to our institution for further management. Cardiac MRI was obtained and demonstrated an RCA territory infarct. Cardiac catheterization demonstrated spontaneous dissection of the left posterior descending artery. Gastrointestinal workup included a colonoscopy demonstrating right colonic ulcerations and biopsy showed non-diagnostic cryptitis. Infectious workup was negative for viruses, bacteria, fungi, and ova/parasites and antibiotics were discontinued. Rheumatologic workup demonstrated an ANA of 1:5120 in a diffuse pattern, anti-dsDNA of 1:640, low complement levels, proteinuria, hematuria, significantly elevated ESR/CRP and positive lupus anticoagulant testing. The patient was also noted to have signs of serositis with new pleural effusion, small pericardial effusion, and ascites with ascitic fluid demonstrating an ANA of 1:2560 in a diffuse pattern. Further history demonstrated that the patient had a longstanding history of Raynaud's, chronic fatigue, hand joint pain, and ankle swelling. A diagnosis of SLE manifesting primarily as SCAD and SLE-associated colitis was made. For SLE management the patient was started on steroids and hydroxychloroquine. SCAD was medically managed with dual antiplatelet therapy among other cardiac medications, and her cardiac symptoms and biomarkers improved. Her SLE-associated colitis significantly improved after steroid initiation.

Discussion: SLE can present with a variety of symptoms that can often make diagnosis difficult. In this case, the patient's initial presentation with primarily gastrointestinal and cardiac symptoms was concerning for potential infectious etiology but was ultimately related to new-onset SLE. With both SCAD and SLE-associated colitis being uncommon presentations of newly diagnosed SLE [2,3], this is a rare case of both presenting concurrently. There should be a high clinical suspicion for SLE as a unifying diagnosis for patients with multisystem disease to allow for improved diagnosis and potential outcomes in this patient population.

Abstract Title: Infliximab Drug-Induced Autoimmune Hepatitis in Patient with Crohn's Ileocolitis

Associate & Authors: Briette Karanfilian, MD; Noah Mahpour, MD; Mishal Reja, MD; Virian Serei, MD; Avik Sarkar, MD

Introduction: Infliximab is an anti-tumor necrosis factor alpha inhibitor commonly used in the treatment of Crohn's Disease. It is known to produce mild elevations in liver enzymes, however, severe damage and marked elevations in transaminases are rarely reported. We present a case of a patient with Crohn's Disease who recently began infliximab, and presented to our hospital with severe drug-induced liver injury (DILI) secondary to infliximab.

Case Report: A 37-year-old man with Crohn's ileocolitis, diagnosed at age 28 and recently inducted with infliximab, presented with fatigue, weakness, and epigastric pain. He had previously been on 6-mercaptopurine, adalimumab, and ustekinumab, but had most recently been on azathioprine (AZT) and began infliximab two months prior to presentation. Approximately one month prior to presentation, he developed elevated transaminases with aspartate transaminase (AST) and alanine transaminase (ALT) in the 300s, so AZT was discontinued as this was thought to be the cause. Despite discontinuation of AZT, his liver function tests (LFTs) rose dramatically, prompting hospitalization. Labs on admission revealed a hepatocellular pattern with total bilirubin 7.1, AST 2153, ALT 2931, alkaline phosphatase 156, and international normalized ratio 1.25. Notably, antinuclear antibody was positive 1:1280, smooth muscle antibody was weakly positive, and cytomegalovirus (CMV) IgM was elevated. Hepatobiliary scan and magnetic resonance cholangiopancreatography were consistent with hepatocellular disease. Core liver biopsy revealed active hepatitis with moderate activity (interface moderate), cholestasis, and an infiltrate of eosinophils and plasma cells. CMV staining was negative. Overall, the testing was consistent with drug-induced AIH. Infliximab was stopped and steroids were begun, resulting in normalization of LFTs.

Discussion: Infliximab has already been implicated in mild cases of hepatotoxicity, and thus comes with the recommendation to monitor liver function tests and viral serology before and after induction of the medication. There are very few reports of severe DILI that have been linked specifically to infliximab, as there are often cases of hepatotoxicity secondary to reactivation of hepatitis or CMV viral infections, as well as other biologic therapies. In our case, with all other causes being ruled out, we can confidently theorize that infliximab led to DILI, and posit that other clinicians should be aware of the possibility of such an adverse event and maintain vigilance and serial monitoring of liver function tests.

Abstract Title: Myxedema Madness: A Rare Case of Severe Hypothyroidism Presenting As Psychosis

Associate & Authors: Kevin Kohm, MD, Shivani Vekaria, MD, Jack Xu, MD, Carol Nasr, MD, Lauren Hogshire, MD

Introduction: Myxedema coma is a rare, life-threatening medical emergency resulting from uncontrolled hypothyroidism. Myxedema coma refers to the neurological sequelae of severe hypothyroidism, which classically manifests as depressed mental status. Rarely, myxedema coma can present with a hyperactive mental state and psychosis. We present an unusual case of a drug overdose secondary to myxedema coma-induced psychosis.

Clinical Case: A 48 year old woman with a history of seizure disorder and hypothyroidism presented to the hospital after lamotrigine overdose. The patient's spouse witnessed her ingest forty-five tablets of lamotrigine after an argument. The patient had no previous psychiatric diagnoses or suicide attempts. On examination, the patient was hemodynamically stable but was agitated, disoriented, and uncooperative. She had a normal neurologic exam and no peripheral edema. Her lamotrigine level was 25.4 ug/ml (2.5-15.0 ug/ml). The patient's mental status did not improve with lamotrigine cessation. Psychiatry determined that the patient's psychosis was not consistent with lamotrigine overdose. Given these recommendations, alternative causes of psychosis were considered. The patient's husband stated she had not taken levothyroxine for over one year. Thyroid function tests revealed a thyroid stimulating hormone (TSH) of 299 mcIU/ml (0.35-5.50 mcIU/ml) with a free thyroxine (T4) level of 0.27 ng/dl (0.89-1.76 ng/gl). The patient was started on levothyroxine intravenously. After five doses of intravenous levothyroxine, her mental status improved to baseline and she was transitioned to oral levothyroxine. She denied that the lamotrigine ingestion was a suicide attempt. Based on the patient's presentation and clinical course, we concluded that her overdose was due to severe hypothyroidism leading to myxedema madness.

Conclusion: Severe hypothyroidism with myxedema coma often presents with depressed mental status, which can manifest as progressive confusion, lethargy, and eventually coma. However, in the case of our patient, severe hypothyroidism presented as psychosis, a rare manifestation. Remarkably, the patient had no other obvious physical manifestations of severe hypothyroidism. Psychosis, though rare, has been seen in cases typically after thyroidectomy or in patients with previously undiagnosed Hashimoto's thyroiditis. In this patient's case, it is likely that her myxedema madness was precipitated by long-term nonadherence with her thyroid replacement therapy, as the patient had no prior psychiatric history. Additionally, her rapid reversal of symptoms after the administration of levothyroxine supports the diagnosis of hypothyroid-induced myxedema madness.

Abstract Title: An Uncertain Case of Chronic Osteomyelitis

Associate & Authors: Jacob Zaslavsky, D.O., Naomi Schlesinger, M.D.

Introduction: A 59-year-old woman with an initially questionable history of rheumatoid arthritis (RA), presented to the emergency department with progressive anterior chest pain over the course of approximately 1 year, with imaging findings consistent with chronic osteomyelitis of the sternum.

Case Presentation: 59-year-old female had established care in a Rheumatology clinic 1 month prior to ED visit, reporting a diagnosis of RA 14 years ago without prior records. At initial visit reporting diffuse joint pain worst at right sternoclavicular (SC) joint, right wrist, right elbow; found to have evidence of R SC joint swelling, warmth, tenderness, limited ROM. With associated right wrist and elbow synovitis, left toe dactylitis. Bone scan obtained with results of significant increased activity noted in bilateral clavicular heads, manubrium, and anterior left ribs, consistent with active osteoblastic process. CT Chest ordered for follow up, with findings noted to be most consistent with chronic osteomyelitis. Patient was contacted upon results of CT Chest, told to go to ED for evaluation. Main complaint at admission was bilateral anterior chest pain at clavicles near SC joints, pleuritic in nature. ROS otherwise negative. Physical exam notable for middle aged female in mild distress, lungs CTABL, heart with no murmurs/friction rubs, TTP to manubrium and SC joints with mild erythema overlying, decreased ROM to right shoulder, otherwise remainder of joints with no evidence of inflammatory disease. Skin exam unremarkable. Laboratory results were notable for elevated ESR 66 and CRP 3.59, WBC normal at 8.8 with normal differential. Initial differential diagnosis of the admitting primary team at hospitalization included infectious versus inflammatory process: septic arthritis, osteomyelitis versus a rheumatologic disorder. Infectious disease specialists were consulted, impression was chronic osteomyelitis of manubrium, bilateral clavicular heads, and bilateral anterior first ribs with septic arthritis of bilateral SC joints. Recommended holding antibiotics until diagnosis confirmed via CT guided biopsy of the sternoclavicular joints. Pathology of bone biopsy revealed signs of chronic inflammation with no evidence of osteomyelitis. Bacterial/fungal/AFB cultures all negative. On subsequent Rheumatology follow ups, patient reported polyarthritis involving SC joints and numerous large/small joints, as well as dactylitis of toes, AM stiffness of right hand lasting several hours, and recurrent plantar fasciitis left foot. Laboratory results on follow up notable for WBC count WNL. RF negative. Anti-CCP Abs as high as 38 (varying degrees). HLA B27 positive. Remainer of serology panel negative. Ultimately treated with Etanercept then Infliximab, maintained on MTX, with significant improvement in arthritis.

Discussion: Osteomyelitis is a serious condition which requires a high degree of clinical suspicion. The broad differential however includes not only infectious sources, but also inflammatory etiologies. This case illustrates how an inflammatory arthritis can mimic clinical findings associated with osteomyelitis. Given the workup that continued after the initial presentation of this patient, it is now presumed that although she is RF negative, anti-CCP positive, her presentation and HLA B27 positivity support a diagnosis of an undifferentiated spondyloarthritis. While known for its high specificity for RA (reported as high as 96%), anti-CCP antibodies can be elevated in numerous other rheumatic and non-rheumatic conditions, including SLE, SS, psoriatic arthritis, PMR, as well as active TB. Given her concurrent findings of synovitis, osteitis, enthesitis, and significant anterior chest wall involvement, it is certainly within the realm of possibility that the patient manifests a form of Synovitis–Acne–Pustulosis–Hyperostosis–Osteitis (SAPHO) syndrome without skin involvement. SAPHO syndrome, a rare condition, may be a subset of spondyloarthropathies (due to the frequent affliction of the axial skeleton, enthesitis, and association with inflammatory bowel diseases). The patient's vast clinical improvement with combination of a TNF inhibitor and oral DMARDs supports this diagnosis. In summary, though osteomyelitis should be considered and ruled out, the combination of osteitis and synovitis on clinical and imaging findings should raise suspicion of underlying inflammatory process, particularly in patients with a known rheumatic disorder.

Abstract Title: Clinical Evidence for an ARMC5 Tumor Syndrome: A Rare Case of Cushing's syndrome from Primary Bilateral Macronodular Adrenal Hyperplasia Caused by ARMC5 Mutation with Concomitant Presence of Meningiomas and Primary Hyperparathyroidism

Associate & Authors: Sahil Parikh, MD, Jeena Matthew, MD, Sara E Lubitz, MD, Stephen Schneider, MD

Background: Primary Bilateral Macronodular Adrenal Hyperplasia (PBMAH) is a known rare cause of Cushing's syndrome (CS). A mutation in the armadillo repeat containing 5 (ARMC5) sequence is associated with up to 55% of PBMAH cases. Recent studies have linked ARMC5 mutations to presence of other benign neoplasias such as meningiomas, colonic polyps and parathyroid tumors suggesting that ARMC5 could be a tumor suppressor gene.

Case: 72-year-old Caucasian female with a history of obesity, HTN, DM2, osteoporosis, multiple meningiomas, breast cancer and recurrent kidney stones was incidentally found to have multifocal bilateral adrenal nodules on CT imaging. She had mild cushingoid features with truncal obesity and moon facies. Hormonal evaluation confirmed the presence of endogenous hypercortisolism. She had multiple low dose dexamethasone suppression tests with AM cortisol levels in 17-21 ug/dL range (<1.8 ug/dL). Her 24-hour urinary cortisol was 8ug/L and 12ug/L (0-50 ug/L) on two separate tests. She had elevated late night salivary cortisols noted on 2 samples, 0.885ug/dL and 1.935ug/dL (0.022-0.254 ug/dl in PM) The overall clinical picture of obesity, hypertension, hyperglycemia in combination with biochemical testing and presence of multiple bilateral adrenal adenomas were suggestive of CS secondary to PBMAH. During her prior evaluation for recurrent kidney stones she was also noted to have calcium and PTH levels, PTH 107.2 pg/mL (15-65 pg/mL), and calcium 10.8 mg/dL (8.3-10.5 mg/dL). She was diagnosed with primary hyperparathyroidism. Sestamibi and CT imaging studies discovered a 1.1 cm ectopic parathyroid adenoma situated at the aortic pulmonary window just above the carina. She was evaluated by two different surgeons who declined surgical intervention given the precarious location of the parathyroid tumor. She opted for watchful monitoring approach for her hypercalcemia. Lastly, she had a known history of multiple meningiomas, four in all, of which two were resected and two were considered unresectable. PBMAH in presence of all her other medical comorbidities prompted genetic evaluation for the patient. She tested negative for MEN syndromes. Genetic analysis revealed she had heterozygous ARMC5 mutation. Given the familial pattern of inheritance associated with ARMC5 mutations, patient's daughter also underwent genetic testing which showed that she too was positive for the mutation. Patient was offered surgical and medical therapy options for her PBMAH. She is currently undergoing surgical evaluation for possible unilateral adrenalectomy.

Conclusion: The pathophysiology of CS from PBMAH remains poorly understood which often leads to an insidious delay in diagnosis and treatment. Inactivating ARMC5 mutations of familial origins are known genetic triggers for development of PBMAH. ARMC5 is also a proposed tumor suppressor gene whose proteins are found in endocrine tissues all over body. Mutation of ARMC5 gene potentially can lead to multi-glandular tumor syndromes. Screening PBMAH patients and their family members for ARMC5 mutations may lead to more optimized CS diagnosis/treatment times as well as better understanding of the gene's neoplastic potential.

Abstract Title: Recognizing A Rare Disease: Primary Thyroid Diffuse Large B Cell Lymphoma

Associate & Authors: Jessica Kunadia, MD, Anupam Ohri, MD

Objective: To present a rare case of primary thyroid lymphoma (PTL).

Case Description: A 60 year old male with a history of hypertension, coronary artery disease, and resected meningioma was diagnosed with thyroid enlargement in 2013. He was asymptomatic at the time. In January 2015, he noticed growth of the right side of his neck that rapidly progressed over the next 2 months. He began to experience localized neck pain, dysphagia, and severe dyspnea which prompted him to go to the hospital in March 2015. CT scan of the neck showed an enlarged right thyroid lobe measuring 10.5 x 5.3 x 6.1cm with new cystic degeneration throughout, left-sided tracheal deviation, and tracheal narrowing to 1cm in transverse diameter. Given the airway compromise, he was started on dexamethasone with subsequent improvement in symptoms. US guided biopsy of the thyroid mass was performed. The cytology specimen showed large cells with atypical nuclei. Morphology and immunophenotype were consistent with diffuse large B-cell lymphoma (DLBCL). Bone biopsy did not show involvement and PET scan showed localized disease. He was started on rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP) chemotherapy in April 2015. After 6 cycles of R-CHOP, PET scan done in September 2015 showed interval progression of his right thyroid mass and a new supraclavicular mass. In October 2015, the patient again experienced rapid enlargement of his neck with associated pain and dysphagia. Since the DLBCL was refractory to R-CHOP, he underwent a full course of radiation therapy with symptomatic improvement. He then completed 2 cycles of rituximab, ifosfamide, carboplatin, and etoposide salvage therapy over the next 3 months. Repeat PET scan in December 2015 showed resolution of the supraclavicular mass and decrease in size of thyroid mass to 3 x 3cm. He received an autologous stem cell transplant in June 2016 and has since remained asymptomatic.

Discussion: PTL is a rare disease with an incidence of 1-2 cases per 1 million people. It accounts for 5% of all thyroid malignancies and presents as a painless enlarging neck mass in about 70% of cases. More rapid and aggressive growth has been noted in DLBCL, the most common subtype of PTL, and can lead to compressive symptoms and respiratory compromise requiring emergency attention. This case highlights a potentially fatal presentation of PTL, which should be considered early in the differential diagnosis of any patient with a growing neck mass. The importance of recognizing PTL lies in the fact that this disease has a very favorable response to a combination of chemotherapy and radiotherapy, and is quite curable without the need for extensive surgery if diagnosed early.

Abstract Title: ECG Interpretation Of Wolff-parkinson-white (wpw) Syndrome With Accessory Pathway Suppression Due To Flecainide

Associate & Authors: Dean Marella MD, Andrew Aboyme MD

Background: Wolff-Parkinson-White (WPW) syndrome results when there is an accessory pathway (AP) that conducts directly between the atria and ventricles bypassing the normal antegrade AV node conduction, usually manifesting on ECG as a pathognomonic delta wave and shortened PR interval. WPW can present as a symptomatic arrhythmia with palpitations, syncope, and even sudden death. Due to concerns of recurrent arrhythmias, patients should be placed on a chronic suppressive antiarrhythmic or if criteria allows, pursue catheter ablation of the AP.

Objective: Flecainide is a Class IC antiarrhythmic that is a drug of choice for the prevention of recurrent orthodromic AVRT. We seek to explain how its mechanism of action on the AP changes the morphology of the QRS complex on ECG.

Results: A 25 y/o male with no prior medical history initially presented to an out-of-state hospital for palpitations at rest without other symptoms such as lightheadedness or syncope. Because of concerns for WPW, he was started on metoprolol succinate and flecainide with a plan to travel home. Initial ECG at our institution demonstrated sinus rhythm with PACs and intermittent ventricular preexcitation with morphology suggestive of a left-sided AP. Electrophysiologic study confirmed orthodromic AVRT. Catheter ablation of the AP was pursued which resulted in no further evidence of preexcitation. Patient remained in NSR on follow-up.

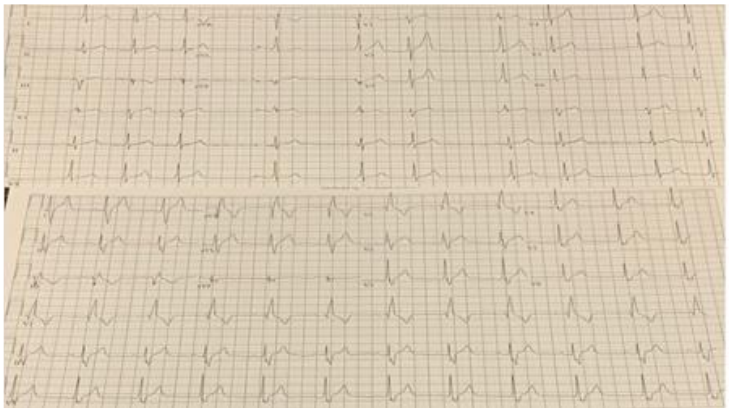


Figure 1a (above) Intermittent accessory pathway blockage due to flecainide as seen as alternating widened and narrow QRS complexes

Figure 1b (below) Post-catheter ablation of the left accessory pathway as seen as transient widened QRS complex due to right bundle branch block

Abstract Title: Seeding the Cancer: Acute Infectious Thyroiditis Preceding the Diagnosis of Invasive Follicular Thyroid Cancer

Associate & Authors: Jeena Mathew, MD, Julie Zaidan, MD, David Cohen, MD

Objective: Highlight the risk of underlying thyroid cancer in patients presenting with acute infectious thyroiditis.

Case: A 26-year-old female with active IV drug use presented with five days of fever with right sided anterior neck tenderness and swelling. Labs showed white blood cell count 23.8 $x10^9$cells/L (4.0-10), with differential neutrophils 84.6%, lymphs 10.1%, monos 4.8%, eosinophils 0.3%, basophils 0.3%, TSH 0.02 mIU/L (0.35-5.50), free T4 3.89 ng/dL (0.90-1.80), and free T3 5.1 pg/mL (2.3-4.2 pg/mL). Thyroid ultrasound showed a 6.4 x 6.1 x 7.1 cm heterogeneous mass in the right thyroid gland with multiple septations and calcifications in the posterior aspect of this mass, suggestive of acute infectious thyroiditis (AIT). FNA cytopathology showed inflammation with focal follicular cell atypia, corresponding to Bethesda category III (follicular lesion of underdetermined significance), and tissue cultures grew MSSA. She was treated with 14 days of intravenous antibiotics with resolution of her fever and improvement in her neck tenderness. Unfortunately, the patient was lost to follow-up.

Two years following the presentation, she presented with progressive enlargement of the thyroid mass. Lab testing revealed free T4 1.14 ng/dL (0.90-1.80), TSH 0.84 mIU/L (0.35-5.50), thyroglobulin Ab <1.8 IU/mL (<4.0), thyroglobulin IA 278 ng/mL (<10 ng/mL). Thyroid ultrasound showed a heterogeneous right thyroid lobe 93x57x66 mm solid nodule. Cytopathology on repeat FNA of the nodule was again Bethesda III and next-generation molecular testing showed PAX8-PPARg_2 gene mutation. The same week, the patient discovered she was 8 weeks pregnant.

After a multidisciplinary meeting with the patient, endocrinology, surgery, anesthesiology, and high-risk obstetrics, a decision was made for her to undergo a right hemithyroidectomy with isthmusectomy during the second trimester. Surgical pathology revealed invasive follicular carcinoma with extensive vascular and capsular invasion. Specimen from the FNA performed during the episode of thyroiditis was obtained, and next-generation molecular testing showed the same PAX8-PPARg_2 gene mutation.

Discussion: AIT represents a rare phenomenon, even less commonly in the adult population. Common presentation includes an acute onset of fever with neck swelling and tenderness, occasionally with thyrotoxicosis. The mechanism of infection can be direct (such as from piriform sinus fistula) or hematogenous (in the setting of immunosuppression). Interestingly, there is very limited evidence of thyroid carcinoma presenting as AIT, with only five case reports published.

In our case, given that the PAX8-PPARg_2 gene mutation likely predated the AIT, we presume that the follicular thyroid carcinoma was present as well and was the target of hematogenous spread. A previous report suggested abnormal blood supply from malignant tumor could facilitate infection, which could explain our case.

When there is no clear provoking factor for acute infectious thyroiditis, clinicians should consider follow up with ultrasound and possibly fine needle aspiration after resolution to assess for possible underlying malignancy.

Abstract Title: Acute Lower Gastrointestinal Bleeding Due to Multiple Colonic Polypoid Angiodysplasias in a Patient With Sickle Cell Disease

Associate & Authors: Noah Mahpour, MD, Abhishek Bhurwal, MD, Anish V. Patel, MD

Introduction: In patients with Sickle Cell Disease who present with hematochezia, ischemic colitis is often identified as the precipitating etiology. Angiodysplasia in sickle cell is infrequently described as the cause of hematochezia, especially in young patients. Our case illustrates the unusual finding of hematochezia due to multiple polypoid angiodysplasias distributed in the entire colon of a young patient with sickle cell disease

Case Description/Methods: A 26-year-old male with sickle cell disease leading to cirrhosis decompensated by ascites presented with multiple episodes of painless hematochezia for one day. On physical examination, he was noticed to have relative hypotension, with ascites and bright red blood on rectal exam. His initial lab work noted a hemoglobin level of 4.3 g/dL and an INR of 5.3. As he presented with hematochezia and hypotension, he underwent a computed tomography (CT) scan with intravenous contrast, which showed a blush of contrast at the splenic flexure, indicating an active luminal hemorrhage (Image 1). However, emergent mesenteric angiography was unsuccessful in detecting active bleeding, thus, embolization could not be performed. A subsequent colonoscopy revealed 11 actively bleeding polypoid angiodysplasias distributed throughout the entire colon (Image 2,3), each treated with argon plasma coagulation and clipping to prevent further bleeding. The patient did not have any recurrent episodes of bleeding throughout his hospital course, and was discharged.

Discussion: We present a case of acute lower gastrointestinal bleeding due to multiple colonic polypoid angiodysplasias in a young patient with sickle cell disease, successfully treated with argon plasma coagulation therapy. Colonic angiodysplasia is commonly found in individuals older than 40 years of age, generally appearing as a fern-like flat or elevated bright-red lesion on endoscopy. The polypoid form of angiodysplasia is extremely rare, reported primarily in the sigmoid and transverse colon, and is easily identified based on its striking appearance. Polypoid angiodysplasia has rarely been described in patients less than 50 years of age, and has no known association with sickle cell disease. CT angiography is a potentially crucial non-invasive initial test, as it can possibly detect extravasation from actively hemorrhaging angiodysplasias. Successful endoscopic eradication therapies include argon plasma coagulation, electrocoagulation, and snare polypectomy.

Abstract Title: Ogilvie's Syndrome: A Vicious Cycle of Refractory Hypokalemia in an ESRD Patient

Associate & Authors: Noah Y. Mahpour, M.D., Linle Hou, M.D., James D. Prister, M.D.

Introduction: Ogilvie's syndrome represents a form of functional colonic obstruction with a clearly defined pathophysiology. Patients typically are critically ill, undergone recent surgery, or have a myriad of medical conditions leading to colonic pseudo-obstruction. Typically, secretory diarrhea is a result of sodium and chloride imbalances, however, in CPO, the diarrhea is usually potassium predominant, predisposing to a state of persistent hypokalemia. Hypokalemia is rare in patients with ESRD, secondary to the inability to excrete potassium at the level of the nephron. Taken together, CPO and ESRD would not be expected to cause profound hypokalemia, however, we present a relatively rare case that displayed such pathology.

Case Presentation: A 72 year-old male with benign prostate hypertrophy (BPH) presented with confusion and lower extremity edema. He was found to have an elevated creatinine of 15.8mg/dL, hyperkalemia to 7.6 mmol/L, and an anion gap metabolic acidosis (Total CO2 of 6.4 mmol/L, anion gap of 28.4 mEq/L, pH of 7.16 on Arterial Blood Gas), likely secondary to long-standing obstructive uropathy, with resultant ESRD. He was treated with continuous renal replacement therapy, and his initial metabolic derangements resolved. After transition to intermittent hemodialysis, he was noted to have severe persistent hypokalemia, with a nadir of 2.7mmol/L (mean value of 3.0mmol/L). He was treated with a high-potassium dialysate bath and 200 mEQ of intravenous and oral potassium supplementation daily for two weeks. His daily urine output of 100-200mL and urine potassium level of 10 mmol/L excluded renal potassium wasting, with other common etiologies (including hypomagnesemia) excluded as well. Simultaneously, the patient began reporting daily large liquid bowel movements and abdominal distension. An Abdominal Plain Film Radiograph showed nonspecific colonic distension. Contrast-enhanced computed tomography of the abdomen and pelvis demonstrated severe and diffuse dilatation of the entire colon and rectum, a large stool burden, but no obstruction or wall-thickening of the colon, consistent with a diagnosis of CPO. He was treated with an aggressive bowel regimen resulting multiple large solid bowel movements, leading to rapid potassium normalization without need for any further supplementation.

Discussion: The patient's clinical picture represents a difficult diagnostic challenge and decision-making dilemma. The clinical and imaging findings are consistent with Ogilvie's Syndrome, likely secondary to new onset acute renal failure with resultant potassium derangements. The patient's concomitant critical illness led to reduced bowel function, constipation, and reduced gut absorption / increased secretion of potassium. This appeared to start a vicious cycle of hypokalemia-induced CPO, causing potassium-rich secretory diarrhea, further driving the hypokalemia. In our case, the normalization of bowel movements alleviated the cause of ongoing potassium loss. This case was unique that our patient with ESRD had apparently massive gastrointestinal potassium losses secondary to CPO, resulting in refractory hypokalemia. Restoring normal bowel function simultaneously treated the CPO as well as the secretory diarrhea. This case emphasizes the importance of considering gastrointestinal losses in the differential diagnosis of hypokalemia in patients with either renal disease or CPO.

Abstract Title: Color Vision Deficiency and Gastrointestinal Hemorrhage: A synergistically lethal combination

Associate & Authors: Mahpour, Noah, MD.; Hou, Linle, M.D.; Moy, Erwin, M.D.

Introduction: Color Vision Deficiency (CVD), also known as color blindness, is most often a congenital abnormality with a male predominance. The medical care of patients with color blindness involves awareness of such color discrimination issues, including preparatory advice and prophylactic action to avoid potentially dangerous situations, such as inability to detect sunburns from overexposure to UV radiation from the sun, or safe food handling and cooking meat and poultry to a safe level. In patients with deficiencies in identifying the color red, there represents a unique issue revolving around the detection of blood. We present an interesting case of a patient admitted to the hospital for hemorrhagic shock secondary to a gastrointestinal bleed, with a delay in presentation leading to an extended stay in intensive care unit due to the patient's inability to detect bright red blood per rectum.

Case Description: A 65 year-old male with coronary artery disease with multiple cardiac stents placed, on dual antiplatelet therapy (aspirin and prasrugel), presented with weakness, lightheadedness, and loose stools for 10 days. Notably, the patient was unable to determine any changes in his stools except a looser consistency. He denied a history of excessive alcohol or non-steroidal anti-inflammatory drugs use. Physical exam was notable for symptomatic hypotension, with a mean arterial blood pressure of 52 mm Hg, tachycardia to 135 beats per minute, a pale appearance and diaphoresis, with rectal exam revealing guaiac positive maroon stool. His laboratory studies revealed a hemoglobin concentration of 4.8g/dL with a normal baseline level, lactic acid level of 6.6mg/dL, and an elevated blood urea nitrogen level of 53mg/dL. The patient was admitted to the intensive care unit for hemorrhagic shock secondary to acute blood loss from the gastrointestinal tract, received multiple packed red blood cell transfusions, and underwent endoscopic evaluation, revealing multiple duodenal ulcers with biopsies positive for H. pylori organisms. Upon further questioning, the patient divulged that he had congenital red/green color blindness, preventing him from recognizing his stool's bright red blood color at symptom onset. The patient was educated on early recognition of blood loss, treated with triple-therapy for H. pylori, and discharged home with close gastroenterology follow-up.

Discussion: The literature on color vision deficiency as it relates gastrointestinal bleeding is extremely limited, with only two case reports identified in a review of scientific articles. Color vision deficiency is a common medical condition in the general population, with a prevalence estimated to be 8%. Screening for such deficiencies is through many different optical tests, the most common of which is the Isihara test, where multiple colors are used to compose an image of either a number or pattern, usually only visible to a person with full color vision. In our case, there are a multitude of potential dangers of an inability to detect life-threatening bleeding, and thus, it is an essential topic to reinforce among physicians caring for patients with color blindness.

Conclusion: For patients with Color vision deficiency, such as the case we present above, it is crucial to discuss signs of bleeding, and associated symptoms from anemia, as this large cohort of patients are at high risk for negative consequences from blood loss anemia due to the high potential for a delay in diagnosis and presentation to health care facility.

Abstract Title: The Road Less Traveled: ST-Elevation Myocardial Infarction with Multi-vessel Chronic Total Occlusions of Non-Infarct Related Arteries

Associate & Authors: Ilja Dejanovic MD, Tudor Vagaonescu MD, John Kossotis MD

Introduction: ST-elevation myocardial infarction (STEMI) with one concurrent chronic total occlusion (CTO) of a non-infarct related artery (non-IRA) is a relatively common presentation. However, less than 1% of STEMI patients present with associated multi-vessel CTOs of non-IRAs. Given the complexity and higher rate of mortality in such patients, the non-IRA CTOs are typically not intervened on during the index hospitalization. Nonetheless, we present a case which demonstrates that percutaneous coronary intervention (PCI) of non-IRA CTOs in STEMI patients can be a viable treatment option in future clinical practice.

Clinical Case: A 61-year-old male with a history of pulmonary sarcoidosis presented with an acute 100% occlusion of the proximal right coronary artery along with non-IRA CTOs of the mid-left anterior descending artery and distal left circumflex artery. The proximal right coronary artery lesion was successfully recanalyzed, but within 24 hours post-PCI, the patient became hemodynamically unstable. He was emergently taken back to the catheterization laboratory where both non-IRA CTOs were treated with resulting TIMI III flow. He was discharge two days later. At follow up, he was symptom free and his echocardiography showed an improved ejection fraction from 30-35% to 45-50%.

Discussion: CTOs are associated with higher rates of cardiovascular morbidity and mortality. However, due to the complexity of CTO lesions and the scarce body of evidence on CTO PCI of non-IRAs in STEMI, only 10% of CTOs are intervened on. Given our patient's hemodynamic instability, there was little choice but to pursue PCI of his CTOs. Recent evidence provides some support of this decision. In the EXPOLORE (Evaluating Xience and Left Ventricular Function in Percutaneous Coronary Intervention on Occlusions After ST-Elevation Myocardial Infarction) trial by Henriques et al., a significant improvement in left ventricular function (LVF) in STEMI patients who underwent non-IRA CTO PCI to specifically the left anterior descending artery; as was seen in our case. Moreover, a recent meta-analysis by Villablanca et al. found that CTO PCI of the non-IRA in STEMI was associated with a reduction in major adverse cardiovascular events, cardiovascular mortality, and heart failure readmissions.

With the development of novel percutaneous revascularization equipment and techniques, complete revascularization of non-IRA CTOs in STEMI should be explored as a viable option for improving patient outcomes. Further studies are needed to evaluate whether perhaps vessel-specific or multi-vessel CTO PCI of non-IRAs in STEMI patients can improve LVF and reduce the risk of major adverse cardiovascular events.

Abstract Title: Is Diffuse Idiopathic Skeletal Hyperostosis Truly a Non-Inflammatory Entity? What We Learned From a Patient

Associate & Authors: Tasneem Ahmed, MD ; Naomi Schlesinger, MD

Our patient is a sixty-five year old Caucasian male with a past medical history significant for diabetes mellitus type II and chronic cervical and spinal back pain. He had initially presented in 2013 to a pain management doctor with complaints of moderate to severe chronic left posterior neck pain over the past year that was associated with left arm paresthesia and dysesthesia but no other neurological symptoms. A previous MRI of the cervical spine had shown moderate to severe spinal stenosis and multiple disk bulges. He was referred to neurosurgery for further evaluation and was advised that corticosteroid injections of the involved facets would be helpful, as would physical therapy and meloxicam. A repeat MRI was ordered which now showed disc osteophyte complexes between C3 and C6 with flattening of the spinal cord and evidence of cord compression; endplate hypertrophic changes and prominent bridging anterior osteophytes were also noted compressing and deviating the airway. A diagnosis of Diffuse Idiopathic Skeletal Hyperostosis (or Forestier disease) was highly suspected based on the findings on this MRI. To follow-up, a CT cervical spine was obtained which showed contiguous bridging ventral osteophytes starting from C2 and extending to the upper thoracic spine consistent with a diagnosis of diffuse idiopathic skull hyperostosis, as well as skeletal hyperostosis. Ossification of the posterior longitudinal ligament was also seen spanning from C3 to T2 levels.

For these issues, the patient was regularly following with neurosurgery but his cervical and lumbar spinal stiffness progressed to the point of virtually no range of motion in those areas. Because of the lack of neurological deficits and because the risks associated with performing a neurosurgical procedure likely would outweigh the benefits, the patient was referred to rheumatology with a leading diagnosis of possible ankylosing spondylitis. His rheumatologist initially prescribed aqua therapy, cyclobenzaprine, and celecoxib but his symptoms did not improve. He was eventually started on adalimumab 40mg/0.4mL every other week in addition to what he was initially prescribed. Several months later, patient reported that his stiffness and pain slightly improved, as well as his range of motion. Dosing increased to weekly and patient reported further improvement in pain, stiffness and range of motion. Patient does not want to come off adalimumab and continues with aqua therapy, both of which are providing sufficient relief at this time.

DISH is generally considered a non-inflammatory skeletal disorder characterized by the abnormal hardening or calcification of the tendons and ligaments involving the spine. The etiology of this process is unclear but thought to resemble a degenerative arthritis. In this case, however, none of the conventional therapies typically prescribed for this disease provided ample relief but a TNF inhibitor seemed to do just that. Literature demonstrating the efficacy of TNF inhibitors in DISH is limited. Future research efforts should be performed to better characterize DISH and why and how TNF inhibitors can alleviate symptoms in such a disease that is believed to be noninflammatory in nature.

Abstract Title: Gastritis After Combination Ipilimumab and Nivolumab: A Rare Adverse Event After Immunotherapy

Associate & Authors: Noah Mahpour, MD, Vicky Bhagat, MD, MPH, Avik Sarkar, MD

Introduction: Immunotherapies are commonplace in the treatment of many neoplasms, and have an array of commonly reported toxicities. Among the reported gastrointestinal side effects, diarrhea and colitis are most frequently cited. However, there have only been a rare handful of reported cases of Immune-checkpoint modulator toxicity affecting only the upper GI tract. In this paper we report a case of Ipilimumab-Nivolumab associated Gastritis in a patient treated with these medications at our facility.

Case Description/Methods: The patient is a 78-year-old male with Stage IV Melanoma who presented to the hospital with nausea, vomiting, weight loss, and reduced oral intake for two weeks. The patient had most recently received 2 rounds of Ipilimumab and Nivolumab for his Melanoma 2 weeks prior to his presentation to our hospital, concurrent with the start of his symptoms. There had been no history of NSAID usage during this time, and physical exam was notable for mild epigastric tenderness. A Computed Tomography scan of the Chest/Abdomen/Pelvis showed diffuse thickening of the stomach, compatible with gastritis. Upper Endoscopy revealed diffuse severely erythematous mucosa with bleeding on contact in the entire examined stomach, and patchy, mildly erythematous mucosa without bleeding was found in the duodenal bulb, with the second portion of the duodenum being normal. The pathology report revealed subacute gastritis with acute inflammatory exudate consistent with an area of mucosal ulceration, with other etiologies of gastritis ruled out.

The patient was begun on glucocorticoid therapy, with rapid resolution of his symptoms. Repeat endoscopy 2 weeks later revealed resolution of the previously noted gastritis and inflammation. Pathologic examination of biopsies confirmed resolution of the inflammatory process.

Discussion: On review of the literature, gastritis resulting from immune-checkpoint modulators has rarely been reported on. Some common side effects associated with these immune modulating medications, colloquially called immune-related adverse events (irAEs), include diarrhea, colitis, and hepatitis. However, there are a few case reports concerning the development gastritis without enterocolitis after Nivolumab treatment alone. Approximately 3 case reports and 1 case series of 20 patients describe such a side effect, To date, there are no reported cases of a patient treated with both Nivolumab and Ipilimumab who developed gastritis as the only adverse event.

Abstract Title: Piecing together the puzzle that is Cushing's Disease

Associate & Authors: Sandhya Bassin, MD; Dean Marella, MD; Roohi Patel, MD; Payal Parikh, MD

Cushing's Disease results from an ACTH secreting pituitary adenoma where augmented steroid production leads to a variety of physical, mental, and biological changes. Given the progressive nature of this disease, changes occur at a slow pace, which often leads to a delay in diagnosis and failure to associate these symptoms into a unifying disease process.

A 25-year-old male with no previous medical history presented with blurry vision after several months of uncontrolled hypertension refractory to two anti-hypertensive medications. Over the preceding 1.5 years, he gained 100 pounds, developed neck thickening, proximal muscle weakness, significant abdominal striae, dorsocervical fat deposition, and decreased libido (See Figure 1). Five months prior, he was admitted to a psychiatric facility due to suicidal ideation, hallucinations, and depression, and was trialed on various antipsychotics and antidepressants. As a result, he experienced emotional blunting and developed tardive dyskinesia, presenting as uncontrolled lip smacking. Concerned for Cushing's disease, his endocrinologist sent him to the ED. This was the first time this unifying diagnosis had been considered in the preceding 1.5 years. During his hospital workup, the diagnosis became clearer because of two positive chemical tests, his AM cortisol remained unsuppressed after high dose dexamethasone and his elevated twenty-four-hour urine cortisol. An MRI of his brain showed a subtle 3mm centrally located lesion that likely represented a pituitary microadenoma. His hospital course was complicated by persistent sinus tachycardia and multiple renal calculi. With Cushing's Disease now strongly suspected, the patient completed outpatient inferior petrosal sinus sampling (IPSS), confirming the diagnosis and identifying right sided laterality of the mass. He then successfully underwent transsphenoidal resection of the pituitary microadenoma.

This case highlights the importance of associating the multiple signs and symptoms of Cushing's disease and the role of IPSS in disease management. Steroid induced psychosis affects more than fifty percent of Cushing's patients, but our patient's hallucinations were treated as an isolated condition, which ultimately delayed his final diagnosis[1]. Worse still, the psychotropic medications used to manage his psychosis led to the development of tardive orofacial dyskinesia. Furthermore, affected men are younger, and have significant symptoms including nephrolithiasis, striae, and muscle wasting[2]. Despite the nonspecific nature of many Cushing's symptoms, it is imperative to identify them as one coherent disease. IPSS can also play an important role in the diagnosis and treatment of Cushing's disease when not all of the diagnostic criteria are met for the diagnosis. At a minimum, it may provide neurosurgeons with additional information in mapping the surgical course when definitive treatment is pursued[3]. While our patient met criteria of two positive chemical tests, the size of the adenoma did not meet the diagnostic criteria. As such, he did undergo outpatient confirmatory testing via IPSS and subsequently surgical treatment.

Abstract Title: Ventricular Tachycardia/Fibrillation Storm Attributed to Transient Renal Failure and Profound Acidosis

Associate & Authors: Dean Marella MD, Kareem Niazi MD, Tudor Vagonescu MD, John Kassotis MD

Background: Ventricular Tachycardia/Fibrillation storm (VTS) is defined as at least 3 episodes of VS within a 24-hr period. Inciting factors include but are not limited to ischemia, drug toxicity, and channelopathies (e.g Brugada syndrome, Arrhythmogenic RV dysplasia).

Case: 57 year old male whose PMH was significant for lymphocytoplastic lymphoma, complicated by cold-agglutinin hemolytic disease and warm autoimmune hemolytic anemia, presented to the emergency room complaining of progressive fatigue and weakness. Patient had just underwent recent chemotherapy consisting of bendamustine and rituximab with daily inbrutinib maintenance. On admission, patient was anemic to 6.2, afebrile, and hypotensive to 70/40 before being started on vasopressors. Initial transthoracic echocardiogram showed new systolic dysfunction with ejection fraction of 25%, depressed from 55% three months prior. His hospital course was complicated by distributive shock and severe acidosis (Lactate 17 and pH of 7). The patient developed incessant ventricular fibrillation (VF), requiring 11 defibrillations, and continued despite multiple antiarrhythmic therapy. Due to his metabolic disarray, he was not deemed an ablation candidate. Hemodialysis was emergently performed. With resolution of his acidosis (pH 7.5) there were no further episodes.

Decision Making: Despite multiple anti-arrhythmic agents, the patient continued to have incessant VF, which only responded to resolution of acidosis with emergent hemodialysis.

Conclusion: This case highlights the importance of correcting acidosis in the management of VTS in a patient with no other predisposing risk factors.

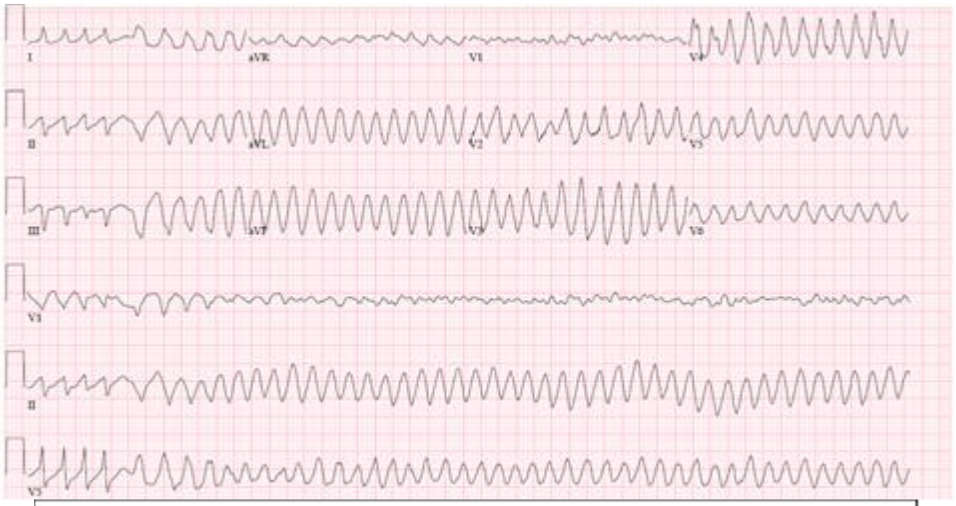


Figure 1: A rare capture of ventricular fibrillation on a 12-lead ECG during the patient's ventricular storm

Abstract Title: Adrenal Plasmacytoma in Multiple Myeloma Patient : an unusual presentation

Associate & Authors: Jeena Mathew, MD, Julie Zaidan, MD, Sara Lubitz, MD

Introduction: Extramedullary plasmacytomas are plasma cell tumors that arise outside of the bone marrow. They are solitary lesions, and are most often located in the head and neck region, mainly in the upper aerodigestive tract. However, involvement of adrenal gland is extremely rare, with only nine case reports published to date. A mass in the adrenal gland carries a broad differential, and identification is important, as diagnosis drives treatment options. CT imaging with attenuation, timing of contrast medium washout, size, and shape, with biopsy is necessary for diagnosis of a high Hounsfield unit mass. Ruling out pheochromocytoma before biopsy of the adrenal glands is crucial.

Clinical Case: A 64-year-old female was diagnosed with multiple myeloma after presenting with back pain and altered mental status. Imaging revealed diffuse lytic lesions in clavicles, pelvis, calvarium, long bones, ribs, and compression fractures of T8, T10, and T12 vertebral bodies. A 1.5 cm left adrenal nodule was also noted. She was treated with bortezemib, cyclophosphamide, lenalidomide, and dexamethasone, and clinically improved. Four months after initial presentation, patient was to undergo chemotherapy with melphalan and autologous stem cell transplantation. Further imaging was performed, and CT Chest revealed an enlarging left adrenal mass measuring 3.0 x 3.2 cm with increased attenuation at 37 Hounsfield units and lobulated borders with no invasion of adjacent structures. The endocrinology team was consulted for evaluation of the adrenal mass, as patient's disease from multiple myeloma was presumed to be in remission. Differential for the adrenal mass included pheochromocytoma, primary adrenal carcinoma, and metastatic disease from multiple myeloma vs other primary. Plasma fractionated metanephrines and DHEAS were within normal range. CT guided core biopsy was performed. Cytology revealed diffuse infiltrate of atypical plasma cells. IHC studies were positive for CD138, CD56, and showed lambda light chain restriction. Cyclin D1 stain was negative, consistent with plasmacytoma. Clinically, the patient started developing progressive disease, including cutaneous plasmacytomas, and she was treated with additional chemotherapy.

Conclusion: Adrenal plasmacytoma is extremely rare, and in a patient with multiple myeloma, should be considered in the differential diagnosis of a rapidly enlarging adrenal mass with high CT attenuation . CT guided biopsy is the definitive test for diagnosis.

Abstract Title: A Rare Case of Re-Expansion Pulmonary Edema

Associate & Authors: Sandhya Bassin, MD; Priya Jaisinghani, MD; Payal Parikh, MD

Re-expansion pulmonary edema is a rare complication which can occur after the rapid reinflation of a collapsed lung, seen in the setting of conditions such as a pleural effusion[1], pneumothorax[2], or thoracic surgery[3]. It is estimated that the occurrence rate is less than 1%[4] . While this is a rare condition, it can be fatal with a 20% mortality rate[5]. The etiology remains unclear. Risk factors include age between 20-40, longer duration of lung collapse, and more than 1.5 liters of fluid drained. While patients can remain asymptomatic, they can also present with a wide range of symptoms such as dyspnea, tachypnea, chest pain, and cough, and signs such as new hypoxemia, crackles on the affected side, and increased fluid drainage from the chest tube[6].

We share the case of SB, a 67-year-old female with a past medical history of uterine cancer who presented with three days of worsening shortness of breath and pleuritic chest pain. On presentation, the patient was found to have an oxygen saturation of 85% on room air, no breath sounds, and dullness to percussion of the left lung. The patient required oxygen via nasal cannula with improvement to 93% oxygen saturation. Chest x-ray showed a large left pleural effusion with mediastinal shift to the right (see Figure 1.). A chest tube was inserted with 1,600mL of pleural fluid drained, consistent with an exudative effusion. Chest x-ray after chest tube placement showed re-expansion of the left lung (see Figure 2). The following morning the patient was clinically stable, but her chest x-ray showed worsening interstitial infiltrates concerning for pneumonia versus pulmonary edema (see Figure 3). The patient was monitored for fever and leukocytosis off antibiotics, neither of which presented during hospitalization. Three days after chest tube insertion, the left sided infiltrate self-resolved, leading to the clinical diagnosis of re-expansion pulmonary edema (see Figure 4). The patient's clinical status improved, and her oxygen saturation was 97% on room air. She remained inpatient for further workup of her unilateral pleural effusion, which was likely malignant in nature.

In conclusion, re-expansion pulmonary edema is a rare but life-threatening complication following reinflation of a collapsed lung. The patient, SB, was at increased risk given the longer duration of her lung collapse and 1.6-liter fluid removal. Additionally, the chest x-ray showed a mediastinal shift, suggesting a significant amount of pressure against the left lung. While management of this condition is supportive, it is essential for practitioners to recognize and diagnose re-expansion pulmonary edema in order to avoid the high mortality rate it is associated with.

Abstract Title: Fungal Bezoars; A rare case of ascending Candida pyelonephritis

Associate & Authors: Rabia Soomro, MD, Evita Sadimin, MD, Tanaya Bhowmick, MD

Introduction: Emphysematous pyelonephritis and fungal bezoars have been reported in patients with diabetes mellitus, anatomical abnormalities of the urinary tract and immunosuppressed patients however this is a very rare complication. We present a rare case of fluconazole (FL) resistant Candida tropicalis (C.tropicalis) ascending urinary tract infection with fungal balls.

Case Report: A 35year old male with uncontrolled diabetes mellitus type 1 and ureteral stent presented with complaints of left flank pain and "passing fungus balls in urine." Patient was afebrile and stable with costovertebral angle tenderness. The urine contained soft, white balls. Computed Tomography (CT) revealed distal migration of ureteral stent, emphysematous pyelonephritis and fungal balls. Percutaneous nephrostomy tube (PCN) was placed with amphotericin B irrigation. Flucytosine and micafungin were started. Percutaneous Nephrolithotomy (PCNL) for evacuation of fungus balls was performed with clinical improvement and resolution of air and fungal masses on follow up imaging. He was discharged on high dose voriconazole (VL) 400mg q12hrs (5.5 mg/kg) for several weeks.

Methods: Ureteral stent and yellow soft tissue specimens were sent to the pathology and microbiology laboratory for analysis. Specimens were cultured on blood and chocolate agar plates and gram stain was performed. Identification was done via Matrix-assisted laser desorption/ionization- time-of-flight mass spectrometer (MALDI-TOF). Susceptibilities were set up using Yeast One susceptibility kit. MICs were interpreted per CLSI guidelines. Immunohistochemical analysis was performed with H&E staining using Leica Autostainer XL in our pathology laboratory.

Results: Histologically, the tissue was entirely composed of viable fungal organisms at the edge and necrotic center (Figure 1). Cultures grew C.tropicalis susceptible to micafungin (MIC 0.03), dose-dependent susceptible to voriconazole (MIC 2), resistant to fluconazole.

Discussion: There is no established standardized treatment for fungal balls (5). Currently, non-albicans Candida species account for more than 65-70% isolates from urine (7). The Infectious Diseases Society of America strongly recommends surgical debridement and antifungals (13) based on sensitivities of the cultured organism. Local irrigation with intermittent or continuous Amphotericin B (AmB) or fluconazole can be considered, but studies to determine optimal dosage and duration have not been done (12). Because it is a fluconazole congener, voriconazole might be considered the "heir apparent" for Candida UTIs refractory to fluconazole therapy (12).

Abstract Title: A rare case of cryptococcosis caused by Cryptococcus gattii

Associate & Authors: Kinjal Solanki, MD, Kuldeep N. Yadav, BA, Mohammed Arsalan, MD, Pak Au, MD, Thomas Kirn, Phd, Julia Cornett, MD

Introduction: Cryptococcus gattii cryptococcosis (Cgc) is a rare infection caused by Cryptococcus gattii (Cg), a soil dwelling fungal pathogen which is associated with organic debris. Pneumonia or meningitis can result in humans from inhalation of environmental spores ollowing a prolonged incubation period of two to thirteen months or longer. Although more prevalent in immunocompromised patients, Cg is often also reported in healthy individuals and is endemic only to certain regions. Cg infections have been reported in Papua New Guinea, Australia, South America, British Columbia, Canada and the US Pacific Northwest. Oregon and Washington constitutes of the majority of cases reported in the US Pacific Northwest outbreak of 2004 due to the molecular subtype VGII. Here we present a case of Cryptococcemia from Cgc in an immunocompromised host from North-east US

Clinical Case: A 44 year old female with a history of HIV/AIDS and medication noncompliance (CD4 count of 19/mm and Viral load of 18,600 copies/mL) 2 weeks prior to admission(PTA), was sent to the ED for two days of high fevers, weakness, and headaches which were migratory, moderate intensity, not associated with photophobia, blurred vision, nausea, vomiting, rash or nuchal rigidity. She denied any tobacco use, recent travels, exposures to pets or sick contacts. She was born in the US and had lived in the east coast all her life. Upon initial evaluation, patient was afebrile, but tachycardic with BP of 90/68mmHg. There were no focal neurological deficits. Blood work was significant for a leukocyte count of 3.1K with bandemia of 30% and lactate of 0.8. CXR and CT head without contrast were unrevealing of any acute pathology. Treatment was initiated for sepsis of unclear source with a negative UA and Influenza test. She responded to fluid resuscitation, antibiotics, and PO Fluconazole with complete resolution of symptoms shortly. CT C/A/P done to determine the source of sepsis, reported mild bronchiectasis in the middle lobe and lingula; resolution of prior air space opacities; and increased precarinal lymphadenopathy. Hospital course was complicated by recurrent low grade fevers. Lower extremity doppler was negative for DVT. Admission blood cultures remained negative, but one of two blood cultures during fever spikes reported yeast which eventually was identified as Cg. She underwent LP with CSF opening pressure of 17mmHg, protein of 137 mg/dL (15-45 mg/dL), glucose of 14 mg/dL(40-80mg/dL), total nucleated cell count of 83/mm lymphocytic predominant (72/mm), CSF culture grew few Cg, negative BioFire panel, Fungal culture with Cryptococcal species, CSF Cryptococcal antigen test positive with 1:256 titre and blood cryptococcal antigen test with 1:256 titre. She was started on Liposomal Amphotericin B and Flucytosine for two weeks. Her repeat LP after two weeks showed a CSF gram stain with few yeast, no growth ,CSF cryptococcal ag continued to be positive at 1:128. She continued to remain asymptomatic with negative subsequent blood cultures

Discussion: Cg lung infection may initially present as pneumonia-like illness, which spread to the brain causing cryptococcal meningitis as seen in our patient. Untreated meningitis can be fatal with prognosis of weeks to months. Patient may develop lung, brain or muscle cryptococcomas (large nodules or mass lesions). Testing: Serum or CSF Cryptococcal antigen test is the first line, but it cannot differentiate between CN and Cg. A culture is needed for speciation. Treatment: Choice of antifungal agents depend on the site of infection. For CNS infection and severe pulmonary disease, intensive induction therapy with Amphotericin B and 5-flucytosine is necessary. Recommended duration of atleast 6 weeks of induction with total duration of therapy of 18-24 months. For isolated lung disease, induction therapy may be limited to 2 weeks, with 12 weeks of total treatment.

Abstract Title: Rapid Onset Traumatic Pericardial Effusion During CPR After Myocardial Infarction

Associate & Authors: Abhigyan Mukherjee, MD. Daniel Shindler, MD.

The incidence of pericardial effusion as a complication of cardiopulmonary resuscitation (CPR) is not well characterized. Post myocardial infarction (MI) patients may be uniquely susceptible to developing effusions from traumatic CPR via myocardial rupture.
An 88 year old female presented with typical chest pain and was found to have an anterior wall ST-elevation MI. The culprit vessel was re-vascularized with one drug eluting stent. On hospital day 2, during bedside transthoracic echocardiography the patient suddenly became unresponsive. Pulseless electrical activity was noted and CPR was started. The echo probe was kept on during CPR and a pericardial effusion was visualized within 2 minutes of CPR initiation.

Upon visualizing the new pericardial effusion during CPR, preparation was made to perform urgent bedside pericardiocentesis. The pericardial space was accessed via ultrasound, and immediate return of serosanguineous fluid was noted. However, after 20 minutes of CPR, the patient became asystolic and was pronounced deceased.

This case highlights the unique challenges of performing CPR on peri-infarct patients and provides sonographic correlates to rapid onset traumatic effusions. The underlying peri-infarct myocardium may be more susceptible to trauma and fluid accumulation from chest compressions.

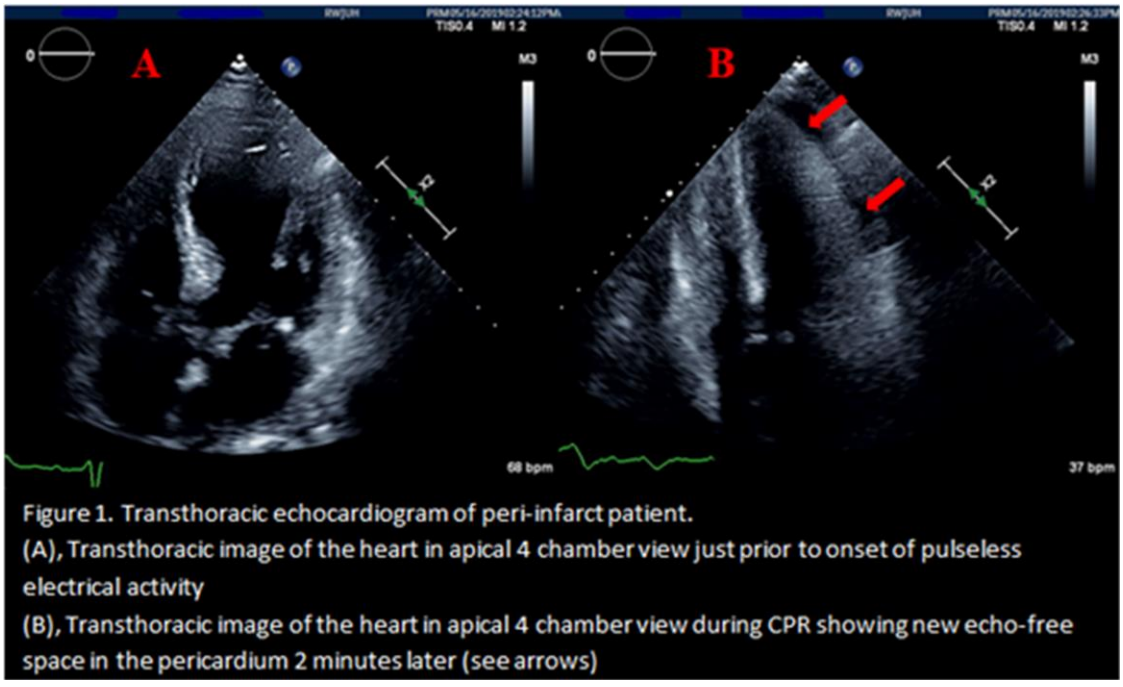


Figure 1. Transthoracic echocardiogram of peri-infarct patient.
(A), Transthoracic image of the heart in apical 4 chamber view just prior to onset of pulseless electrical activity
(B), Transthoracic image of the heart in apical 4 chamber view during CPR showing new echo-free space in the pericardium 2 minutes later (see arrows)

Abstract Title: Bone Marrow Sarcoidosos Presenting as Severe Thrombocytopenia? A Challenging Diagnosis

Associate & Authors: Lokesh Lahoti MD, Neeraj Hotchandani MD, Payal Parikh MD

Case Presentation:

A 32-year old female with complicated past medical history of intravenous drug use, mitral valve endocarditis status/post repair, and recent diagnosis of Immune thrombocytopenia (ITP) was transferred from another hospital for management of severe thrombocytopenia refractory to Intravenous Immunoglobulin (IVIG) and steroids. She had initially presented with intermittent high-grade fevers and fatigue without associated arthralgia or dyspnea. She was found to have labs significant for pancytopenia with white blood cell count of 3000/microliter, hemoglobin of 8 gram/deciliter and platelets of 4000/microliter (prior admission labs 3 months with similar labs except for platelets of 174 thousand), reticulocyte proliferative index 1.30, unremarkable hemolysis labs. Of note, prior to the current admission, she recently had a bone marrow (BM) biopsy to work up her thrombocytopenic episodes, which was significant for non-caseating granulomatous inflammation. Her vital signs on arrival were stable. Her physical exam was notable for lungs with bibasilar crackles, generalized abdominal tenderness more prominent on left side and petechiae on all extremities. Imaging of her chest, abdomen and pelvis was unremarkable except for noted hepatosplenomegaly. Peripheral smear was negative for schistocytes. As per Hematology recommendations, patient was started on solumedrol 60 mg twice daily and given a second dose of IVIG. Patient's platelets increased to 18,000 but did not sustain. Extensive infectious evaluation was negative, including parasite work-up and blood cultures. Trans-thoracic echocardiogram was negative for vegetations. Due to suspicion for connective tissue disorder (CTD) based on prior BM biopsy, rheumatology was consulted. Extensive rheumatologic workup was notable for elevated RF (320) and angiotensin converting enzyme (ACE) 94 along with low C3 (51) and C4 (7) complements and vitamin D25 (14). All other workup including immunofixation, other CTD antibodies and ANCA panel were negative. There was a high concern for BM sarcoidosis after review of the BM biopsy in the setting of low vitamin D25, elevated ACE level and negative workup for other diseases. With no significant increase in platelets with IVIG and steroids, patient was started on Rituximab resulting in favorable response. After a multi-interdisciplinary discussion, it was noted that the patient likely has secondary ITP from underlying bone marrow sarcoidosis.

Discussion:

Severe thrombocytopenia is a rare presentation of sarcoidosis. Three possible mechanisms are generally stated to cause thrombocytopenia in sarcoidosis – 1) sequestration in spleen 2) bone marrow involvement 3) autoantibody production. All three mechanisms are likely contributing to the patient's severe thrombocytopenia, which is why secondary ITP was considered in this patient. ITP secondary to sarcoidosis is treated similar to primary ITP.

Conclusion:

Sarcoidosis is a disease known to commonly affect the pulmonary and musculoskeletal system. Bone marrow involvement with severe thrombocytopenia is an uncommon presentation of sarcoidosis, making it difficult to recognize in the inpatient setting. In a patient with refractory thrombocytopenia, rheumatologic diseases such as sarcoidosis should always be considered as a possible underlying etiology. This case highlights both the difficulty and importance in identifying bone marrow involvement of sarcoidosis in order to provide appropriate management.

Abstract Title: Pulmonary Embolism Presenting as Seizure

Associate & Authors: Kevin Kohm MD, Ilja Dejanovic MD, Payal Parikh MD, Kathryn Robison MD

Introduction: Seizure as a presenting feature of pulmonary embolism (PE) is a rare phenomenon. Reported cases typically have a number of risk factors for PE, but the diagnosis is delayed because of evaluation for seizure. The majority of the few reported cases were found to have large clot burden at the time of diagnosis of PE.[1] The mechanism for PE associated seizure is unclear, but is thought to result from cerebral hypoxia.[2] We present an unusual case of submassive pulmonary embolism presenting as seizure.

Clinical Case: A 69 year old man with squamous cell carcinoma of the tongue presented after two episodes of syncope. On the day of admission he had witnessed loss of consciousness with a small amount of urinary incontinence without associated tongue biting, chest pain, recent illness, fever, or shortness of breath. He experienced a second episode of brief loss of consciousness while en route to the hospital. Initial EKG on presentation showed sinus tachycardia (rate 128), regular rhythm normal axis; Q wave lead III with T wave inversion III, V1, and V2 and T-wave flattening in aVF and V3; also with new incomplete RBBB compared to EKG 3 months prior suggestive of new a RV conduction delay. His temperature, blood pressure, and pulse ox were within normal limits. Troponin was elevated to 0.26. The patient had witnessed seizure activity while in the CT machine which resolved after administration of IV lorazepam. CT head and MRI brain were unremarkable; there was no evidence of metastatic disease. Lower extremity dopplers showed pulsatile venous flow but no evidence of VTE. Routine EEG was found to be unremarkable. Transthoracic echocardiogram (TTE) was notable for moderate RV dilatation. At this point alternative causes of syncope were explored. CT angiogram of the chest showed extensive bilateral pulmonary emboli including a nonocclusive saddle embolus. These findings were consistent with submassive pulmonary embolism. He was started on heparin drip and transferred to a quaternary care center for evaluation for catheter directed thrombolysis (CDL) which was performed successfully. He was initiated on oral apixaban after CDL therapy and was discharged to home.

Conclusion: This patient presented with two episodes of loss of consciousness and a witnessed seizure after arrival to the ED. The immediate concern given his malignancy history was new metastatic disease to the brain causing seizure, though distant metastasis of head and neck cancers is rare. Clues suggestive of PE in this patient were his ECG which showed evidence of right heart strain, elevated troponin, lower extremity dopplers which showed pulsatile venous flow, and TTE which showed RV dilatation. He had no further seizures while hospitalized or upon discharge and anti-epileptic medication was discontinued. His seizure activity appears to have been provoked by cerebral hypoxia caused by development of a submassive PE.

Abstract Title: Non-Invasive Scintigraphy in the Identification of Treatable Transthyretin Cardiac Amyloid

Associate & Authors: Janet Cai, MD, Joanna Rock, MD, Brandon Oberweis, MD

Introduction: The previous gold standard for diagnosing transthyretin amyloid cardiomyopathy (ATTR-CM) was cardiac biopsy. Nuclear scintigraphy using technetium-99m-pyrophosphate (Tc-99m-PYP) is a non-invasive underutilized method of diagnosing this condition.

Background: An 83 year old man with a past medical history of hyperlipidemia and paroxysmal atrial fibrillation presented with dyspnea and volume overload on physical examination. Echocardiogram showed a left ventricular ejection fraction of 47%, severe diastolic dysfunction, increased left ventricular wall thickness, and bi-atrial enlargement.

Decision Making: Non-ischemic evaluation was unremarkable including negative serum/urine protein electrophoresis and immunofixation. Left heart catheterization showed mild non-obstructive coronary artery atherosclerosis. Cardiac MRI revealed late gadolinium enhancement consistent with amyloidosis. Nuclear scintigraphy (Figure 1) was consistent with ATTR-CM. The patient was referred to a cardiac amyloid specialist for further care.

Conclusions: While cardiac biopsies are classically recommended for diagnosing ATTR-CM, bone scintigraphy offers a non-invasive method to attain the same diagnosis. If incorporated into the algorithm for initial non-ischemic cardiomyopathy evaluation, Tc-99m-PYP scintigraphy can quickly and safely identify patients with ATTR-CM who would benefit from the newer transthyretin stabilizer tafamidis, which halts the progression of ATTR-CM.

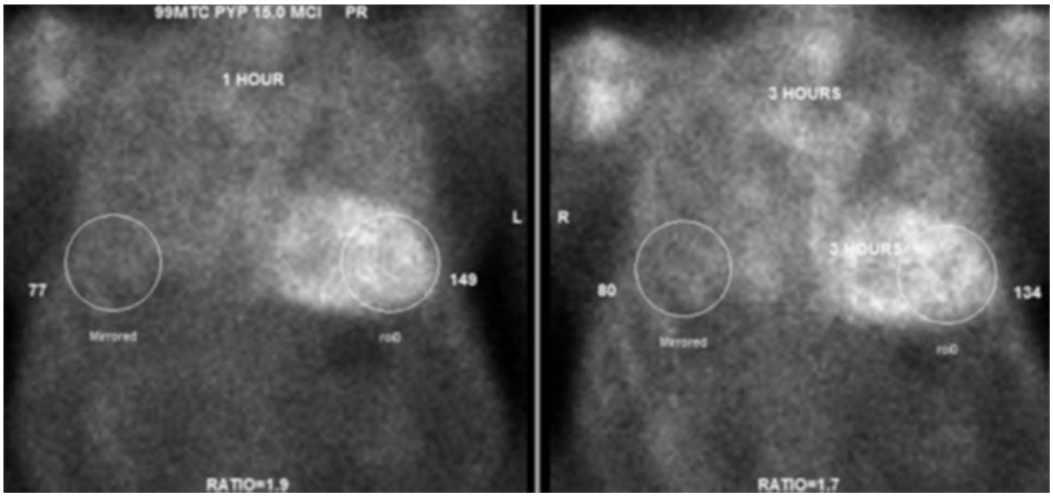


Fig 1. Noninvasive bone scintigraphy with Tc-99-PYP confirms ATTR cardiac amyloidosis. Ratio of cardiac to rib Tc-99m-PYP uptake ratio at 1 hour (A) and 3 hours (B) was 1.9 and 1.7 respectively. A ratio of greater than 1.5 indicates a positive test for ATTR amyloidosis, with 100% specificity in absence of a monoclonal protein by serum/urine testing.

Abstract Title: Subclinical Leaflet Thrombosis After Transcatheter Aortic Valve Replacement: To Treat or Not To Treat

Associate & Authors: Janet Cai, MD, Ayesha Salahuddin, MD

Introduction: Recent studies have noted that hypoattenuated leaflet thickening (HALT) and hypoattenuation affecting motion (HAM) are common complications after transcatheter aortic valve replacement (TAVR), however, there is limited literature on these topics. We present a case of a patient who developed HALT with HAM within three months after TAVR while off anticoagulation due to history of recurrent gastrointestinal bleeding.

Case Report: A 62 year old female with past medical history of coronary artery disease, heart failure with preserved ejection fraction (EF), severe aortic stenosis with TAVR done three months ago, end stage renal disease on hemodialysis, atrial fibrillation, and recurrent gastrointestinal bleeding, presented with dyspnea and cardiogenic shock from decompensated heart failure. On arrival, the patient was hypoxic, tachypneic, unable to speak in full sentences, and was intubated. Exam revealed holosystolic murmur heard throughout the precordium, rales in bilateral lung bases, and moderate pitting edema in lower extremities. Bloodwork showed elevated lactate, pro-BNP, and troponin level. Transthoracic echocardiogram showed newly reduced EF of 20% with elevated gradient across the aortic valve and possible restenosis. Computed tomography (CT) angiography with focus on the TAVR valve confirmed the presence of HALT with HAM. The patient was deemed a poor candidate for further intervention on the TAVR valve at the time by cardiothoracic surgery. After much discussion, she was started on anticoagulation with a heparin infusion. She was gently diuresed and successfully extubated. Hospital course was complicated by atrial fibrillation with rapid ventricular response requiring cardioversion due to hemodynamic instability, refractory cardiogenic shock, and mild hemoptysis which prompted discontinuation of heparin. Even off heparin, however, the patient had an episode of massive hemoptysis leading to hypoxic cardiac arrest. Family ultimately requested to stop resuscitative measures and the patient expired.

Discussion: HALT has been identified in as much as 35% of post-TAVR patients and HAM in about 50% of HALT cases within 140 days of the procedure. Our patient was in an unfortunate position where both risks and benefits of anticoagulation were significant. She was noted to have significant re-stenosis of her aortic valve despite recent TAVR. Anticoagulation can decrease risk of developing HALT or HAM, though regression has been seen even without treatment in some cases. Further study is needed to understand the best practice regarding treatment of HALT and HAM, including duration of treatment and anticoagulant choice.

Abstract Title: Severe Rheumatic Mitral Stenosis Diagnosed in Setting of Influenza A Infection

Associate & Authors: Janet Cai, MD, Abel Moreyra, MD

Introduction: Influenza infections pose a serious threat to individuals with cardiovascular diseases. We present an interesting case of rheumatic heart disease with mitral stenosis discovered in the setting of influenza A pneumonia, a combination which ultimately led to the patient's demise.

Case Report: A 57 year old woman with past medical history of hypertension, visiting the United States from her home country in South America, presented after a week of flu-like symptoms and acute respiratory distress leading to cardiac arrest while at her friend's home. Emergency Medical Services found the patient in arrest with pulseless electrical activity in the field, initiated chest compressions, and intubated her. Return of spontaneous circulation was achieved.

In the emergency room, vitals showed hypothermia and mean arterial pressures in the 40's. Exam revealed a diastolic murmur at the apex and poor neurological status while off analgesics and sedatives. Bloodwork showed acute kidney injury, shock liver, and severe metabolic acidosis with elevated lactate. Nasal swab was positive for Influenza A H1N1. Transthoracic echo showed normal ejection fraction and severe mitral stenosis consistent with rheumatic disease with mean diastolic gradient of 14 mmHg. Computed Tomography (CT) of the head noted global hypoxic injury. CT angiography of the chest showed acute respiratory distress syndrome with no pulmonary embolism. The patient was started on vasopressors, oseltamivir, and broad-spectrum antibiotics. Unfortunately, she continued to deteriorate, developed multiorgan failure, and ultimately expired. Family stated she had no known history of valvular disease though was hospitalized with pneumonia one year ago.

Discussion: Patients with heart disease are at higher risk for developing complications from influenza including pneumonia, respiratory failure, heart attacks, and even death, thus patients in this population must be monitored closely. Influenza A H1N1 was responsible for the 2009 flu pandemic and our patient had not received any prior flu vaccines. This case enforces the recommendation that patients with heart disease should receive annual flu vaccines to prevent serious complications including death.

Abstract Title: Spontaneous Coronary Artery Dissection (SCAD) in the Setting of Newly Diagnosed Systemic Lupus Erythematosus (SLE) and Positive Lupus Anticoagulant

Associate & Authors: Nirav Haribhakti, PharmD; Janet Cai, MD; Joanna Rock, MD; Anum Aslam, MD; Kaavya Mahajan; Tabitha Copeland, MD

Introduction: Spontaneous coronary artery dissection (SCAD) is defined as the dissection of the epicardial coronary artery not associated with atherosclerosis, trauma, or iatrogenesis. Systemic lupus erythematosus (SLE) is believed to increase the risk of SCAD due to chronic inflammation of the vessels. There have been only nine cases reported in the literature of patients with a history of SLE experiencing SCAD. Here we present a unique case of SCAD in the setting of newly diagnosed SLE.

Case Report: A 28 year old female with no significant past medical history presented to another facility with 4 days of subjective fevers, abdominal pain, nausea, vomiting, and nonbloody diarrhea. She was found to have leukocytosis, anemia, and blood cultures positive for group A streptococcus (GAS). CT abdomen/pelvis showed acute colitis/enteritis, and functional asplenia. She subsequently developed substernal chest pain radiating to her left flank. Troponin T were found to be elevated > 20, and EKG showed diffuse ST segment elevation. She was transferred to our hospital for possible myocarditis. On arrival she was febrile and tachycardic with decreased bibasilar breath sounds and 2+ bilateral pedal edema. Leukocytosis of 34.9 was present and troponins had downtrended. Transthoracic echocardiogram showed reduced left ventricular ejection fraction of 40% with inferolateral wall abnormalities and no valvular vegetations. Colchicine, aspirin, and ceftriaxone were started for possible myopericarditis in the setting of GAS. Patient underwent simultaneous rheumatologic and additional cardiac workup due to her presentation of enteritis and cardiomyopathy. Laboratory results revealed elevated ANA at 1:5120, elevated dsDNA, low complement C3 and C4 levels, positive direct Coombs, and positive lupus anticoagulant screen. Patient was given a new diagnosis of SLE. Evaluation of cardiomyopathy with a cardiac MRI showed right coronary artery (RCA) infarct with nonviable mid to distal inferior wall. Left heart catheterization (LHC) was conducted to determine if thrombosis in the setting of newly diagnosed SLE was the cause of her myocardial infarction. LHC showed SCAD of the RCA and inability to rule out thrombosis.

Discussion: We suspect the patient possibly infarcted her spleen in the setting of SLE, and consequently developed GAS bacteremia. The abdominal pain and diarrhea were likely lupus enteritis as symptoms resolved after starting steroids and there was a reduction of inflammation on repeat CTAP. The initial diagnosis of myopericarditis was actually SCAD in the setting of SLE, leading to STEMI and RCA infarct, causing systolic heart failure. This case demonstrates the need to maintain a high clinical suspicion of SCAD in a young patient with chest pain and no traditional risk factors of ACS who has elevated troponins in the setting of inflammation such as acute colitis/enteritis.