

ACP NATIONAL ABSTRACTS COMPETITIONS
MEDICAL STUDENTS
2019

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MEDICAL STUDENT RESEARCH PODIUM PRESENTATIONS

COLOMBIA RESEARCH PODIUM PRESENTATION - ANDREY SANKO

Clinical Factors Associated with High Glycemic Variability Defined by the Variation Coefficient in Patients with Type 2 Diabetes

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Introduction: The term glycemic variability is defined as the degree of fluctuation in blood glucose values in a given period of time. In patients with type 2 diabetes the presence of high glycemic variability in the short term has been associated in multiple studies with the presence of hypoglycaemia. Following the 2017 recommendations of the international consensus of interpretation of CGM, the variation coefficient (%VC) is considered the metric of choice to describe the unstable diabetic patient. High variability is considered a value equal to or greater than 36%. The aim of this study was to determine the clinical factors that are associated with an increased risk of glycemic variability in patients with type 2 diabetes so that the clinician is able to identify those patients at higher risk of presenting with hypoglycaemia episodes.

Methods: A cross-sectional analysis was made of a registry of 148 adult patients diagnosed with type 2 diabetes mellitus who had been taken to continuous glucose monitoring using the iPro2 Medtronic equipment at the Diabetes Clinic of San Ignacio University Hospital in Bogotá, Colombia. A Medtronic Enlite sensor was inserted subcutaneously in the anterior area of the abdomen and maintained for 6 days in every patient. The information was downloaded using the iPRO CareLink version 3.0 software. Patients were classified into groups of high and low variability being a coefficient of variation equal to or greater than 36% considered as high variability. The statistical system STATA 14 was used for the analysis.

Results: 32% of patients had high glycemic variability. Using a bivariate analysis, overweight was significantly associated with a CV% above 36% (OR 0.44), considering in this case a protective variable compared to a normal BMI. Although obesity presented an OR of similar magnitude, it did not reach statistical significance (OR 0.41). A glomerular filtration rate below 45 mL/min was associated with twice the chance of presenting high variability, although this analysis does not reach statistical significance either. Using a multivariate analysis, both obesity and overweight were associated with less chance of having a CV greater than 36%, with a decrease of 58% and 66% respectively. On the other hand, decreased GFR was significantly associated with a 2.5-fold increase in the chance of presenting high variability (OR 2.55).

Conclusion: This study provides a slight approach to some clinical variables to which the physician must pay attention in the consultation which relate to glucose variability and therefore an increase or decrease in the risk of hypoglycaemia episodes in patients with type 2 diabetes. Yet, prospective and larger-scale studies designed to establish clinical variables that may constitute risk factors for variability are needed in the future.

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MARYLAND RESEARCH PODIUM PRESENTATION - ASMI PANIGRAHI

Influence of Individual-Level Neighborhood Factors on Health Promoting and Risk Behaviors in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)

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Introduction: There is a consistent body of evidence which indicates that neighborhood context influences a range of health behaviors and outcomes, yet there remains a dearth of research investigating the impact of neighborhood environment on immigrant health, particularly among Hispanic/Latino populations of diverse national backgrounds. Given that Hispanics/Latinos constitute nearly half of the US immigrant population and almost one-fifth of the US population at large, there is a crucial need to understand how neighborhood environment influences Hispanic/Latino health, especially as social position and ethnicity are often tightly linked to people's place of residence. To address this research gap, relationships between individual-level neighborhood factors and health promoting and risk behaviors were evaluated in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociocultural Ancillary Study.

Methods: Participants included 5313 foreign-born and US-born men and women, 18-74 years old, recruited from San Diego, Chicago, Miami, and New York City, and from Mexican, Puerto Rican, Cuban, Central American, Dominican and South American background. All participants underwent a baseline clinical exam and sociocultural survey including measures of neighborhood social cohesion and neighborhood problems. Health behaviors evaluated included physical activity; colorectal, prostate, breast, and cervical cancer screening; current smoking; excessive or binge drinking; uncontrolled hypertension; and obesity.

Results: Participants had a mean age of 42.5 years (SD 0.38), 54.8% were women, and 72.8% were foreign born. Over half (55.4%) of foreign-born participants did not have health insurance, compared to only 27.8% of US-born participants. Mean perceived neighborhood problems were greater in US-born vs foreign-born participants [Mean (SE)=12.9 (0.16) vs 11.6 (0.14), $p < 0.001$]. However there was no significant difference between mean perceived neighborhood social cohesion in US-born vs foreign-born participants (15.8 vs 15.8). Health protective behaviors were consistently less prevalent among foreign-born vs US-born participants including physical activity (62.2% vs 67.6%), colon cancer screening (50.5% vs 71.5%) pap smear (72.4% vs 80.8%), mammogram (74.4% vs 84.4%), and prostate cancer screening (51.9% vs 63.3%). At the same time, health risk behaviors including smoking (31.4% vs 15.8%), obesity (49.9% vs 36.5%), uncontrolled hypertension (60.3% vs 71.2%), and poor diet (16.8% vs 36.6%) were also consistently less prevalent among foreign-born vs US-born participants. Foreign-born participants with higher perceived neighborhood problems were less likely to meet physical activity recommendations [OR (95% CI)=0.74 (0.58, 0.95) $p < 0.05$]. Foreign-born participants with less perceived neighborhood social cohesion were less likely to be adherent to pap smear guidelines [OR (95% CI) = 0.48 (0.23, 0.98) $p < 0.05$].

Conclusion: These results suggest that neighborhood factors may uniquely contribute to health behaviors of Hispanic/Latino immigrants versus US-born Hispanics/Latinos, and that neighborhood environment is important for health systems and providers to consider in prevention and treatment strategies that influence Hispanic/Latino health. This research was supported by the NIH Intramural Research Program.

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NEW YORK RESEARCH PODIUM PRESENTATION - KATHRYN M LINDER

Implementation of a Medical Student-Led Emergency Absentee Ballot Voting Initiative at an Urban Tertiary Care University Hospital

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Introduction: Medical and allied health professionals are in a unique position to advocate for vulnerable patients. Students at Thomas Jefferson University Hospital (TJUH) launched an emergency absentee ballot voting initiative for the 2018 election, affording hospitalized patients (and their family members/support persons) the opportunity to vote despite acute hospitalization. This program sought to enable voting by absentee ballot for those with unexpected hospital confinement and absence from voting municipalities after the absentee ballot deadline passed. Recently, other medical institutions enacted nonpartisan voter registration and ballot activities in residency clinics, through hospital volunteer services, or with support of attorneys and law students. Our inaugural program, in contrast, was successfully initiated and led by undergraduate medical trainees.

Methods: Over the week before Election Day 2018, our interdisciplinary team of 50 medical student volunteers visited patients and caregivers at TJUH, assessing their interest in bedside voting via emergency absentee ballots. Hospital staff also directed volunteers to interested patients. We serviced Pennsylvania registered voters in Philadelphia County and neighboring Delaware, Montgomery, and Bucks Counties. The effort was nonpartisan; candidate or party-specific materials were strictly prohibited. Both a notary public and a physician were required for this process. A notarized affidavit was generated for each interested constituent, and physician sign-off affirmed hospitalization as the reason for an inability to vote in person. We submitted notarized absentee ballot applications to the Board of Elections (BoE). Ballots were issued upon application approval. Student volunteers distributed ballots to patients and aided in their completion by providing instructions, and reading text aloud, if necessary. Students collected and returned ballots to appropriate county election offices before the statutory deadline. HIPAA-compliance was assured using a spreadsheet tracking participants' room locations and stages within the application process.

Results: During the statewide timeframe, students visited over 500 patient rooms throughout our academic urban hospital. In total, our team submitted 92 ballots primarily to the Philadelphia County BoE in addition to three surrounding counties. All eligible individuals would likely have been otherwise unable to vote during these midterm elections. Responses from patients and their families, house staff and hospital personnel were overwhelmingly positive.

Conclusion: Hospitalized patients may not anticipate needing absentee ballots on Election Day. A medical student-driven hospital-wide voting initiative assisted inpatients in voting via emergency absentee ballots; such a program integrated civic engagement in patient care. Our program could be replicated at other academic centers with hospital support and student leadership. A key resource is access to certified notaries so that ballot applications can be authenticated. Many states have voting provisions allowing those hospitalized to participate; however, widespread education about state-specific requirements is necessary. Well-organized

emergency absentee ballot voting programs promoted in hospitals can allow vulnerable hospitalized patients to vote in local and national elections.

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OREGON RESEARCH PODIUM PRESENTATION - SHERRY LIANG

A Novel Student-Led Improvement Science Curriculum for Pre-Clinical Medical Students

Authors: Sherry Liang, BA, Oregon Health and Science University (OHSU) Reem Hasan, MD PhD, OHSU Division of Internal Medicine Christopher Terndrup, MD, OHSU Division of Internal Medicine Sherril Gelmon, DrPH, OHSU and Portland State University School of Public Health, Matthew DiVeronica, MD, Veteran Affairs Portland Health Care System

Introduction: Institutions are reforming undergraduate medical education to equip medical students with the knowledge and skills to engage in health systems improvement, but knowledge of best practices is limited. At Oregon Health and Science University (OHSU), a medical student-led project was created to design, implement and evaluate a novel improvement curriculum for pre-clinical students using the Institute for Healthcare Improvement Open School (IHIOS) Quality Improvement (QI) Practicum course. We present the findings on the educational outcomes of learners, the impact of a learner-led improvement project, and the barriers to implementation and sustainability.

Methods: This curriculum was piloted with seven medical students in the Student Navigator Project (SNaP), an 18-month program where students serve as patient navigators and medical assistants (MA) in OHSU primary care clinics. Acting in these roles across a longitudinal setting allows students to identify problems in clinical workflows and systematically address these issues through a team-based improvement project. Upon completing three IHIOS modules on improvement fundamentals, the students launched a project to decrease clinic wait times and led three mentored Plan-Do-Study-Act cycles. Students culminated their experience by submitting posters to various conferences and delivering an oral presentation to clinic staff.

Results: The curriculum was evaluated using a 17-question knowledge pre/post test, post-participation learner survey, and clinic staff satisfaction survey. All students had improved scores on the knowledge test with an average improvement of 5 points. All reported increased confidence in understanding and executing a project. Six students agreed or strongly agreed that they felt comfortable engaging with staff on improvement work, with all students stating they will likely be involved in future improvement work. Of the 12 MAs and 6 providers surveyed, 15 agreed or strongly agreed that student-led projects would help improve patient care in the clinic and 16 were open to helping students conduct a project.

Conclusion: This pilot study has demonstrated promising results from a novel curriculum for pre-clinical medical students to lead a clinical improvement project. The act of doing improvement work is important for building learner competence and confidence as they engage in systems thinking and take ownership of their ideas for change. This project demonstrates the value of leveraging medical students to accelerate curriculum development, increase learner buy-in, and expand the community of future physician improvers. Barriers to implementation and sustainability include the availability of faculty with requisite QI knowledge and capacity to mentor. To expand this model to all medical students, further work is needed to optimize resources and institutional support.

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TENNESSEE RESEARCH PODIUM PRESENTATION - ZARA LATIF

Impaired Brain Cells Response in Obesity

Authors: Zara Latif, Fiona E Harrison, Ph.D

Introduction: Obesity is an epidemic that affects more than one third of the U.S. adult population. The link between obesity and Alzheimer's disease has been firmly established in multiple studies. Obesity contributes to cognitive decline and a state of widespread inflammation that activates immune cells in the body. Neuroinflammation is a result of obesity and is believed to be linked to the pathogenesis of Alzheimer's disease. Microglia serve as the resident macrophages in the brain. They can be activated by a number of inflammatory factors including obesity and Alzheimer's disease pathological changes. The morphology of activated microglia is distinct, activation causes microglial processes to be retracted and causes the soma to increase in size. The effects of obesity on microglial activation are poorly understood particularly in the context of neurodegenerative diseases

Methods: In this study, GFP tagged microglia were isolated from brains of CX3CR1 adult mice fed either high fat or low fat diet. Percoll gradient centrifugation was used to isolate the microglia. The cells were then activated in culture using lipopolysaccharides (LPS) and imaged at 2, 6, 10 minutes post treatment. The soma area, process length, and number of processes were compared between groups using ImageJ.

Results: High fat diet microglia exhibit a delayed response to LPS compared to low fat diet cells. The soma area of low fat diet microglia is significantly bigger after 2 minutes of activation ($p < 0.05$). The same increase was not observed in high fat diet microglia. Similarly process retraction was slower in high fat diet mice at 2 minutes and 6 minutes of activation ($p < 0.01$).

Conclusion: The data suggest that microglia isolated from high fat diet mice display an altered state of responsiveness compared to low fat diet mice likely due to chronic inflammation as a result of obesity. The inflammatory triggers due to obesity could hinder the microglial ability to efficiently respond to insults from the surrounding microenvironment e.g. Amyloid.

MEDICAL STUDENT RESEARCH POSTER FINALISTS

CALIFORNIA RESEARCH POSTER FINALIST - ANNICA STULL-LANE

The therapeutic potential of antibiotics and vitamin A in treating disseminated infections with multidrug resistant non-typhoidal *Salmonella*

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Introduction: There are approximately 3.4 million cases and 680,000 deaths globally each year due to disseminated non-typhoidal *Salmonella* infection, a severe septic manifestation of a common cause of gastroenteritis (1). Children in sub-Saharan Africa are disproportionately affected, as the risk factors include young age, malnutrition and concurrent malaria (2). The mortality rate from disseminated infection is 20-25% and this is in part due to the emergence of multidrug resistant strains (3, 4). Better therapeutics are needed to alleviate disease in vulnerable populations. Vitamin A is an important micronutrient in immune cell development and has been successfully used to prevent diarrhea when given prophylactically in global health interventions (5). However, there is yet to be a study assessing vitamin A as treatment with antibiotics once a patient presents to the hospital with disseminated infection with non-typhoidal *Salmonella*. This study seeks to assess the therapeutic potential of vitamin A with antibiotics in a mouse model of invasive disease, utilizing a multidrug resistant non-typhoidal *Salmonella* clinical isolate.

Methods: We assessed severity of disseminated infection in a mouse model of vitamin A deficiency with and without vitamin A supplementation by enumerating colony-forming units of *Salmonella enterica* serotype Typhimurium (*S. Typhimurium*) at systemic sites. Response to vitamin A therapy was assessed with a survival curve. Efficacy of enrofloxacin administered in the drinking water was assessed *in vivo* by colonization level of *S. Typhimurium*, antibiotic efficacy and plasma antibiotic concentration. Statistical significance of the *in vivo* burden of *Salmonella* was determined on log-transformed values using an unpaired Student's *t* test or a one-way analysis of variance (ANOVA) with a post-hoc Tukey test, with significance at $P < 0.05$. The survival curve was assessed with a log-rank (Mantel-Cox) test, with significance at $P < 0.05$.

Results: Vitamin A deficient (VAD) mice have a significantly higher burden of *Salmonella* at the systemic sites of liver, spleen and blood ($P < 0.05$). Vitamin A supplementation prior to infection rescues this phenotype. Vitamin A therapy after infection increases survival in VAD mice by 66.7% ($P < 0.05$). *In vivo*, enrofloxacin significantly decreases bacterial burden ($P < 0.05$). Plasma antibiotic concentration peaks at 1-hour post-administration and bacterial burden in the blood is undetectable at 5 hours.

Conclusion: Our laboratory has found that VAD mice are unable to control bacterial replication at systemic sites. Importantly, vitamin A supplementation improves control of infection, and vitamin A treatment increases survival. Enrofloxacin is a potential therapy for multidrug resistant *Salmonella*. These results inform the next experiment of vitamin A and enrofloxacin co-treatment. Ultimately, our goal is to inform the efficacy of a clinical trial assessing routine care of antibiotics alone to co-treatment of antibiotics with vitamin A with the objective of decreasing mortality rate and improving human health outcomes globally.

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CALIFORNIA RESEARCH POSTER FINALIST - KIMNGAN NGUYEN

Health Literacy's Role Amongst Hospitalized Medicine Patients Health Literacy's Role Amongst Hospitalized Medicine Patients

Authors: Ojas Deshpande, Aram A. Namavar MS, KimNgan P. Nguyen MPH, John Tawfik, Eugene Park, Adam Braun, Erin Dowling MD, Neil Parikh MD MBA

Introduction: Health literacy (HL) is the measure of a person's ability to obtain, process and understand basic health information and services to make appropriate health decisions. Previous studies note positive correlation between high HL and patient understanding of their condition. Patients with low HL have greater needs in transitional care domains, citing inadequate caregiver support and transportation barriers. One study detailed that unadjusted 30-day post-discharge hospital reutilization incidence rate ratio for low HL was 1.76. Low health literacy has been associated with worse post-discharge outcomes in specific conditions such as acute myocardial infarction, but little research has examined its relation to other conditions. Both studies utilized the Brief Health Literacy Screen (BHLS), a 3-question subjective HL assessment. To the authors knowledge, this is the first study that utilizes the Test of Functional Health Literacy in Adults (TOFHLA) to evaluate the role of HL in readmissions.

Methods: This study occurred at the Ronald Reagan UCLA Medical Center and UCLA Medical Center, Santa Monica. Trained quality improvement personnel interviewed patients at the bedside on Medicine-Surgery units utilizing the TOFHLA tool. The TOFHLA consists of 17 numeracy items and 3 prose passages and takes 22 minutes to administer. Upon administration, a raw score was recorded, which was later translated to one of the TOFHLA's 3 levels of HL proficiency: Inadequate (score range: 0-16), Marginal (score range: 17-22), Adequate (score range: 23-36). Data was entered into a secure database and analyzed using t-test and chi-squared analysis. Demographic and 30-day readmissions data was recorded from chart review. Patients readmitted for organ transplant, maintenance chemotherapy, planned procedures or obstetrical delivery were considered planned readmissions and subsequently excluded.

Results: 134 patients were enrolled in our study to date and completed the TOFHLA. Statistically significant disparities amongst Hispanic Patients noted were that Hispanic patients on average score lower on the TOFHLA compared to all other groups ($P < 0.001$), difference in educational attainment for Hispanic/Latino patients vs. non-Hispanic/Latino patients ($P = 0.011$), and Hispanic and Asian patients rating their English language fluency lower compared to their counterparts ($P = 0.003$). Moreover, physicians perceive Hispanic/Latino health literacy lower ($P = 0.077$). Physicians are less correct in their estimation of patient health literacy in older patients ($P = 0.061$), patients with low health literacy rate their overall health lower ($P < 0.001$), and patients with higher health literacy rate easier ability to ask for help if they don't understand something ($P < 0.001$).

Conclusion: Disparities exist amongst hospitalized Hispanic patients with regards to health literacy level, educational attainment and physician perception of health literacy. Health literacy increases patient rating in ability to engage with healthcare team. Physicians do not correctly assess patient health literacy and often underestimate their health literacy level.

CALIFORNIA POSTER FINALIST – RESEARCH - WILL NOVEY

Orange County Transitions in Health Program: Linking Incarcerated Patients with Health Care in the Community

Authors: Will Novey, BS, BA; Mason Ronilo, BA; Kelton Mock, BS, BA; Mark Lieber, BA, MA, MS; Nathan Birnbaum, BA

Introduction: Compared with the general population, individuals in jail or prison have a prevalence:

- 7x higher for chronic hepatitis B
- 18x higher for TB
- 2-10x higher for all STIs
- 2-10x higher for substance use disorders.[1]
- Higher rates of diabetes, obesity, hypertension, asthma, and cardiovascular disease.
- 12x increased risk of death in the first 2-weeks post release.[2]
- Less than 1 in 4 will seek care outside the ED in the first year post release.[3]
- To address these disparities, medical students at UCI SOM partnered with Correctional Health Services and the OC Health Care Agency to link insulin-dependent diabetic patients in the OC jail system with primary care and social services to ease their transition back into the community.

Methods Phase 1

- The Orange County Transitions in Health Program (OCTHP) works with insulin-dependent diabetic patients in the OC jail system with an anticipated release date within 2-3 months.
- Medical students provide:
 - Baseline interview/needs assessment
 - Scheduling of primary care appointment within 2 weeks of release
- In 2017-2018 OCTHP expanded its activities to include serving patients at the Women’s Jail in Santa Ana and teaching classes on opioid overdose prevention. In these classes, 15-20 inmates are lead through a discussion on issues such as:
 - What is tolerance and how is it impacted by incarceration?
 - How can overdose be prevented?
 - How to recognize overdose
 - Myths about overdose

- Steps to take if you see someone who is overdosing
- How to use and where to get naloxone?
 - Resources tailored to patient’s specific vulnerabilities
 - Education about diet, diabetes, prescriptions, and utilization of health care resources

Results

- OCTHP has seen over 50 patients individually from November 2017-Present.
- We have expanded our patient-population to include women and those seeking education on opioid overdose prevention.
- Approximately 45 male and female inmates have attended opioid classes.
- There are currently 25 active medical student volunteers
- IRB pending approval to quantitatively analyze the demographics and needs of our patients.

Conclusion

- This program demonstrates how a small group of motivated and innovative students can collaborate with local jails to alleviate the burden placed on an exceptionally at-risk population.
- Students can play a key role in continuity of care for incarcerated patients while promoting a harm reduction approach to substance use after jail.
- Students gain exposure to patients they may not otherwise encounter during medical school.
- There are a number of goals that OCTHP hopes to achieve in the future:
 1. Conducting research on the efficacy of the program
 2. Work with stakeholders to promote the future provision of naloxone to trained participants as they leave the jail
 3. Work towards the creation of a primary care medical home (a “Transitions Clinic”) embedded within UCI’s clinical infrastructure to care for patients recently released from jail or prison.

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CALIFORNIA RESEARCH POSTER FINALIST - MIA KANZAWA

Attitudes of medical trainees towards Safety Quest: a novel, online, gamified Quality Improvement course

Authors: Mia Kanzawa; Mariposa Garth-Pelly, BSN; Kambria Evans, MEd; Laurence Katznelson, MD; Lisa Shieh MD, PhD

Introduction: It has been estimated that as many as 98,000 people die in any given year from medical errors that occur in hospitals. Even without accounting for error outside of hospital settings, this number falls within statistics attributed to the top 10 leading causes of death in the US. Reduction in medical errors begins with enhanced knowledge about safety, robust error-reporting systems, increased expectations for safety, and implementation of systems for safe delivery of care¹. In particular, quality improvement (QI) and patient safety education for medical trainees on the front-line of care is critical to addressing and preventing medical error. However, implementation of QI curricula is hindered by learner engagement and time constraints from competing educational demands². Gamification is gaining traction within education and has been shown to improve engagement of learners, including health professionals³⁻⁵. Moreover, online learning continues to grow and allows for increased flexibility for learners, as well as widespread distribution. The Stanford School of Medicine therefore developed Safety Quest, an online game for medical trainees that teaches core tenets of QI and patient safety. The purpose of this study was to assess attitudes of medical trainees towards Safety Quest and gamified QI education.

Methods: 1364 residents and 65 medical students at Stanford School of Medicine completed one case in Safety Quest (<http://safetyquest.stanford.edu>) and provided a ranking in comparison to other independent learning modalities. Learners were also surveyed for free-text feedback. 918 free-text responses from residents were examined using a content analysis.

Results: Safety Quest outranked other independent learning modalities with 45% of residents and 48% of medical students preferring Safety Quest over video, Healthstream modules, powerpoint, and articles. 3 areas of content emerged from resident comments: engagement, ease of use, and effectiveness. Overall, 72% of resident comments were positive, 6% were neutral, and 22% were negative. Engagement was the most frequently addressed content area, contained within 52% of resident comments, and 87% of comments referencing engagement were positive.

Conclusion: Safety Quest, an online gamified approach to QI and patient safety education, is engaging and preferred by medical learners compared to other independent learning modalities. 72% of comments were positive. Future work can build upon themes discovered within this qualitative analysis such as applicability to certain specialties, interface design and clarity of instructions, and depth of content. Further evaluation is necessary to assess the effect of Safety Quest on learned knowledge.

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COLOMBIA RESEARCH POSTER FINALIST - LAURA A PARRA GOMEZ

Clinical and Polysomnographic Characteristics Determining the Severity of Obstructive Sleep Apnea Hypopnea Syndrome (OSAHS) in Northeastern Colombia

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Introduction: OSAHS is characterized by the limitation of the passage of air by functional and/or anatomical alterations, which compromise the quality of life, becoming a public health problem that generates high costs in health due to its association with cardiovascular risk (hypertension, diabetes mellitus and obesity). Different tools have been developed to detect the risk of presenting OSAHS (Berlin, STOP-BANG, Epworth Sleepiness Scale). Its diagnosis must be made by polysomnogram (PSG), considered the gold standard.

Methods: Cross-sectional analytical study of 152 patients. Exclusion: secondary sleep disorders and pregnancy. Clinical data and PSG were taken. The clinical and logistic regression data were taken to determine the characteristics associated with OSAHS with apnea-hypopnea index (AHI) ≥ 15 .

Results: The average age was 56.1 ± 13.7 years, with a mean body mass index, abdominal diameter, neck perimeter and mento-sternal distance of 32.1 ± 6.3 kg/m², 107 ± 14 , 1cm, 41.3 ± 4.2 cm, 15 ± 2.3 cm respectively. Patients with AHI ≥ 15 had comorbidities such as coronary artery disease (70%), hypertension (69.7%), heart failure (66.7%), obesity (65.63%), diabetes (62.9%), smoking (50.9%), cerebrovascular accident (50%) and chronic obstructive pulmonary disease (41.1%). Among the relevant polysomnographic variables in patients with AHI ≥ 15 , a waking saturation of 91.6%, T90 of 19.4, desaturation index of 30.7, arrhythmia in REM of 23%, number of awakenings per breath 8.3, awakenings due to movement of limbs 0.2, awakening index in REM 25.8, awakening index in non-REM 27.4. A statistically significant association was found between the lower probability of having AHI ≥ 15 and the abrupt reduction or loss of muscle strength (OR 0.35; P 0.29; CI 0.13-0.94) and having lucid dreams while awake (OR 0.39; P 0.036; CI 0.16-0.94). We observed a higher probability of having AHI ≥ 15 in patients with mento-sternal distance > 15 cm (71.18; OR 2.47; P 0.09; CI 1.25-4.9), who fall asleep while sitting and inactive in a place (61.83%; OR 1.62; P 0.003; CI 1.18-2.23), who fall asleep as passengers in a car during one hour of journey (59.83%; OR 1.49; P 0.004; CI 1.13 -1.96), who fall asleep while talking to someone (65.15%; OR 1.87; P 0.007; CI 1.19-2.94), EPWORTH score > 14 (71.18%; OR 2.47; P 0.023; CI 1.13-5.39), who have sleep apnea (74.09%; OR 2.86; P 0.002; CI 1.45-5.63), have daytime fatigue (73.26%; OR 2.74; P 0.003; CI 1.39-5.38), STOP BANG ≥ 5 (68.65; OR 2.19; P 0.019; IC 1.13-4.26), REM sleep ≥ 46 minutes (25.92%; OR 0.35; P 0.003; CI 0.18-0.69) and Saturation $\leq 91\%$ (67.21%; OR 1.05; P 0.043; IC 1.02-4.1).

Conclusion: A lower relationship with other sleep disturbances was observed in patients with OSAHS with AHI ≥ 15 , who also showed higher drowsiness, daytime fatigue and presence of apneas with a better performance on the STOP-BANG scale in the diagnosis. The shortest duration of REM sleep and the lowest saturation of 91% are emphasized as the characteristics to be taken into account in the severity of OSAHS.

DISTRICT OF COLUMBIA RESEARCH POSTER FINALIST - RACHEL EGAN GRENIER

Stroke Disparities: Longer Lengths of Stay in Acute Stroke Patients with Medicaid

Authors: Rachel E. Grenier, Sydney Palka, William D. Zimmerman, Kelsey Monacci, Jacqueline Leutbecer, Anqi Yin, Xue Geng, M. Carter Denny.

Introduction: Prolonged hospital stays expose stroke patients to hospital-acquired infections, increase overall cost of care, and delay the initiation of rehabilitation therapies. We sought to examine the factors associated with length of stay (LOS) in acute ischemic stroke (AIS) patients at a comprehensive stroke center (CSC) in an urban center. We hypothesized that patients being discharged to subacute rehabilitation (SAR) or nursing home facilities would have longer LOS.

Methods: Consecutive patients admitted to our stroke service from April to July 2018 with a principal diagnosis of AIS were included. Patients with transient ischemic attack, intracerebral hemorrhage or subarachnoid hemorrhage were excluded. Demographics, admission NIHSS, baseline modified Rankin Scale (mRS), discharge mRS, and discharge disposition were collected. LOS was calculated from date/time of patient registration to discharge.

Results: Baseline characteristics are shown in table 1. LOS and NIHSS were significantly correlated (r_s 0.745, $p < 0.001$). Medicaid as primary insurance on admission was associated with longer LOS (21.9 days) as compared to Medicare (6.5 days) or commercial insurance (2.6 days) [$p=0.017$]. Higher discharge mRS was associated with longer LOS [$p=0.002$]. Discharge to SAR was associated with longer LOS (22.9 days) as compared to acute rehab (8.8 days), home with home health (3.2 days), or home (2.6 days) [$p = 0.001$]. There was no difference in LOS according to baseline mRS, age, gender, or race.

Conclusion: Higher admission NIHSS, Medicaid insurance on admission, discharge to SAR, and discharge mRS ≥ 4 were significantly associated with longer LOS in AIS patients. Systems of care interventions are needed to address disparity in LOS for Medicaid patients.

EGYPT - RESEARCH POSTER FINALIST - MOHAMED MOKHTAR

Saphenous Vein Harvesting Techniques for Coronary Artery Bypass Grafting: A Systematic Review and Network Meta-Analysis of Randomized Controlled Trials.

Authors: Mohamed A. Mokhtar¹, Nguyen Lam Vuong², Muhammed Khaled Elfaituri³, Peter Samuel Eid⁴, Mohammed Fathi Eldoadoa⁵, Mostafa Reda Mostafa⁶, Ahmed Hesham Bendary⁷, Ibrahim Radwan⁴, Mostafa Mohamed Aboelhossen⁸, Doaa Alaa Ibrahim⁴, Nirmeen Atef Abdallah⁸, Heba Abo El-Ghar⁹, Marwa Mostafa Mohamed Zaki¹⁰, Abdelrahman Elshafay⁷, Nguyen Tien Huy¹¹. 1) *Faculty of Medicine, Sohag University, Sohag, Egypt*, 2) *University of Medicine and Pharmacy at Ho Chi Minh City, Ho Chi Minh City, Viet Nam*, 3) *Faculty of Medicine, Tripoli University, Tripoli, Libyan Arab Jamahiriya*, 4) *Faculty of Medicine, Ain Shams University, Cairo, Egypt*, 5) *Faculty of Medicine, Mansoura university, Mansoura, Egypt*, 6) *Faculty of Medicine, Tanta University, Tanta, Egypt*, 7) *Faculty of Medicine, Al-Azhar University, Cairo, Egypt*, 8) *Faculty of Medicine, Aswan university, Aswan, Egypt*, 9) *Faculty of Medicine, Menofia University, Menofia, Egypt*, 10) *Faculty of Pharmacy, Fayoum University, Fayoum, Egypt*, 11) *Nagasaki University, Nagasaki, Japan*.

Background: The great saphenous vein (GSV) graft remains the most frequent used conduit for coronary artery bypass graft (CABG) surgery. A lot of debates about the technique of GSV harvesting have occurred.

Objectives: Evaluating the short-term and long-term outcomes of all different GSV harvesting techniques.

Methods: A systematic search of 12 electronic databases was performed to identify all randomized controlled trials (RCTs) of any GSV harvesting techniques, including conventional, no-touch, minimally open, closed endoscopic vein harvesting (EVH), and open EVH techniques. The outcomes were short-term complications, pain, and other technique measurements, and long-term efficacy, including death, myocardial infarction (MI), and graft patency. All outcomes were analyzed using the frequentist network meta-analysis.

Results: Regarding the risk of infection/inflammation, compared to open EVH, minimally open, and closed EVH techniques, no-touch technique increased 17.7, 18.7, and 29 times; while conventional technique increased 2.6, 2.7, and 4.2 times, respectively. Conventional technique increased 8.5 and 3.2 times of the risk of post-operative lymph problems and sensibility disorders, compared to closed EVH technique. However, open EVH technique increased the risk of hematoma/ecchymosis of 1.5, 1.7, and 2.2 times, compared to minimally open, conventional, and closed EVH techniques. Regarding post-operative pain, no-touch and conventional techniques increased the mean score of visual analogue scale of 3.7 and 1.2, compared to open EVH technique. EVH and minimally open techniques reduced approximately 25-44 cm of length of skin incision, compared to conventional and open techniques. Those techniques were not significantly different regarding the time of GSV harvesting, converting to conventional technique, length of harvested vein, vein injury, poor vein quality, length of hospitalization, and the long-term outcomes, including death, MI, and graft patency.

Conclusion: For GSV harvesting for CABG surgery, the minimally invasive techniques, including minimally open and EVH, reduce the risks of in-situ complications and the length of skin incision, with the comparable quality of vein and long-term death, MI, and graft patency.

References

References available upon request.

FLORIDA RESEARCH POSTER FINALIST - SYDNEY ZARRIELLO

Lack of Secondary Prevention among Uninsured Stroke Patients: A Free Clinic Study

Authors: Sydney Zarriello, B.S., Madeline MacDonald, M.S., Justin Swanson, M.P.H., Ashley Denslow, Justin Jimenez, B.S., Noura Ayoubi, B.S., Abu-Sayef Mirza, M.D.

Introduction: Stroke is the 5th leading cause of death in the United States, and an estimated 80% of strokes are preventable.¹ Major modifiable risk factors for stroke include lack of exercise, poor diet, obesity, hypertension, hyperlipidemia, diabetes, alcohol use, and smoking. According to the American Heart Association and American Stroke Association, patients with a history of stroke should be prescribed aspirin and other medications according to their modifiable risk factors.¹ There is limited research about stroke management in the uninsured and underserved populations in the United States.

Methods: A retrospective chart review was conducted to manually collect chronic disease parameters from electronic medical records and paper charts at nine free clinics in the Tampa Bay area in Florida. Demographics and risk factors were compared between stroke patients and the rest of the study population via chi-square test or independent-samples t-test (alpha of .05 for all tests). Stroke patients with pertinent comorbidities were assessed to determine the proportion receiving appropriate medications.

Results: Between 2016 and 2017, 8857 uninsured patients were seen at nine free clinics. Of these patients, 144 (2%) had a documented history of stroke. Stroke patients were older ($M = 55.9$, $SD = 10.8$) than the rest of the clinic population ($M = 39.5$, $SD = 16.9$), $p < 0.001$. Additionally, stroke patients were more likely to be male ($n = 76$, 53%), $p = 0.01$. Of these 144 stroke patients, 85 (59%) were not taking aspirin. Of the 110 stroke patients with hypertension, 19 (17%) were not receiving any anti-hypertensive medication. Of the 87 stroke patients with hyperlipidemia, 17 (20%) were not receiving a statin. Of the 62 stroke patients with diabetes, 16 (26%) were not receiving any anti-diabetic medication.

Conclusion: This study revealed that uninsured patients with a diagnosis of stroke may not be adequately medicated with aspirin, statins, antihypertensives, and anti-diabetic medications. Appropriate medical management of stroke risk factors is essential to prevent future strokes in this vulnerable population of patients. A variety of factors may have contributed to the under medication of this population, including limited access to healthcare and inability to afford medications. This study should bolster awareness of the medical vulnerability and lack of access to medical care in uninsured patient populations. Future studies are needed in uninsured populations.

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GEORGIA RESEARCH POSTER FINALIST - ISHA DABKE

Designing a Biomarker-Based Bedside Tool-Kit for the Clinical Evaluation of Bladder Cancer

Authors: Isha Dabke^{1,2}, Richard Pearce¹, Georgios Kallifatidis^{1,3}, Balakrishna Lokeshwar^{1,3}, Georgia Cancer Center¹, Medical College of Georgia at Augusta University², Charlie Norwood VA Medical Center³, Augusta, GA

Introduction: Urothelial Bladder Cancer (UBC) ranks second in mortality and morbidity among the genitourinary cancers causing 16,000 deaths annually. Currently, the diagnosis of UBC involves cystoscopy and biopsy culture, which can take weeks to yield results. Even imaging studies such as MRI and CT scans often aren't sensitive enough to detect bladder tumors. Morphologically, malignancies of the bladder can be divided into two subtypes: luminal and basal, which express distinct cytokeratin and stem cell markers and have differing sensitivities to therapy. Although diagnosis based on molecular signatures has the potential to be effective, a verification of their expression in strictly compartmentalized epithelial subtypes is not presently available. The implications of this project are the formation of a bedside tool-kit based on prognostic stem cell biomarkers that can be used following biopsy to efficiently evaluate cancer subtype and provide a preliminary diagnosis.

Methods: We analyzed genomic expression profiles in five bladder cancer cell lines (RT-4, 5637, T24, HT-1376, 253J), ranging from a grade I (RT-4) to a grade IV cancer cell line (253J). Based on existing literature, these cell lines were classified into either the luminal or basal subtype of UBC. Importantly, basal bladder cancers are more aggressive and lead to shorter survival times. Through RT-PCR and Western Blot studies, genomic expression levels of eleven biomarkers (luminal: UPK, GATA-3, RAB-25, E-Cadherin; and basal: CK-6, p63, CD44S, CD44V, CyclinB1, EGFR, CD49) were analyzed in the five cell lines.

To further our understanding of the differences between basal and luminal subtypes, MTT Cell Viability Assays were used to test the effects of Gemcitabine and Cisplatin on the five cell lines. Existing literature states that though basal bladder cancers are more aggressive, they are paradoxically more sensitive to chemotherapy initially compared to luminal UBC.

Results: Less aggressive/luminal UBC cell lines (RT-4, 5637) showed higher PCR/blot expression profiles for luminal biomarkers, and expressed GATA-3 100% of the time. The more invasive/basal cell lines showed only a slight upregulation of basal biomarkers, but expressed CD44S 100% of the time. Thus, the expression profiles of only two biomarkers (GATA-3 and CD44S) can be used to efficiently identify the molecular subtype of the patient's UBC to gauge a first-look prognosis at the bed-side before obtaining pathology results.

Furthermore, MTT Assays showed a *significant* toxic effect of Gemcitabine on basal cell lines (T24, HT-1376, 253J) earlier (t=24 hr vs 48/72 hr) than luminal cell lines. However, Cisplatin did not show a significant effect in luminal vs. basal UBC suggesting that the two subtypes of UBC have similar sensitivity to Cisplatin.

Conclusion: Currently, UBC is diagnosed through cystoscopy, biopsy, and urine cytology, which can take weeks to yield results. The study presented here suggests that a PCR-based, biomarker toolkit can aid in an efficient UBC diagnosis at the bedside, and treatment can be personalized based on the UBC subtype.

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GEORGIA RESEARCH POSTER FINALIST - BONNIE STEDGE

Requiring Discharge Summaries at Discharge to Improve Transitions to Subacute Rehabilitation Facilities

Authors: Bonnie Stedge MS3, Kristen Flint MS4, Natalie Giles MD, Julie Hollberg MD, Christopher O'Donnell MD, FHM

Introduction: Transitions of care from hospital discharge to subacute rehabilitation facilities (SARs) are an important time in patient safety. The state of Georgia does not require discharge summaries at the time of discharge. The quality and timeliness of communication during that transition impacts readmission rates. In October 2017, SARs had to start reporting readmission rates and now face potential penalties from Medicare based on those rates starting in October 2018. To further improve communication between hospitals and post-acute care facilities, this project creates a mandate that hospitalists at one institution complete and send discharge summaries with patients at hospital discharge. We aim to reduce readmission rates from SARs by 50% through mandating that discharge summaries accompany patients upon transfer by the end of 2018.

Methods: We educated hospitalist physicians about the new mandate to send discharge summaries with patients discharged to SARs. We partnered with five SARs to collect data including availability of discharge summary upon arrival, whether patients were readmitted, and availability of other patient information like follow-up appointments and medication lists. We calculated 30-day readmission rates from a hospital database data pull of over 700 patients discharged from our hospital to subacute rehab during the relevant time frames. We then compared pre- and post-intervention availability of discharge summaries and 30-day readmission rates.

Results: We gathered data from over 700 patients at five SARs. Following the intervention, 91% of patients arrived at the SAR with a discharge summary. We identified a subsequent statistically significant 39% relative and 5.5% absolute readmission risk decrease in the post-intervention 30-day readmission rate. All of the post-intervention patients had medication lists and 66% had follow-up appointments scheduled.

Conclusion: Discharge summaries are critical modes of communication at hospital discharge. Through mandating that discharge summaries accompany patients to SARs, we improved the timeliness of communication about the patient's hospital course and decreased the 30-day readmission rate. This is seen as a low cost and low effort intervention to prevent unnecessary readmission penalties.

GEORGIA RESEARCH POSTER FINALIST - JUSTIN YEH

Long Term Sustainability of Team Based Intervention to Reduce Impact of Nonactionable Alarms

Authors: Justin Yeh BA, Ruth Wilson RN, Lufei Young PhD APRN, Lisa Pahl RN MSN, Steven Whitney MSN CCRN, Kevin C. Dellsperger MD PhD, Pascha E. Schafer MD

Introduction: Nonactionable alarms comprise over 70% of alarms and contribute a threat to patient safety caused by clinician alarm fatigue and desensitization¹. Alarm fatigue has been recognized as an increasingly important safety issue in recent years, with The Joint Commission announcing alarm management as a 2014 National Patient Safety Goal to improve alarm safety. A variety of interventions were reported to be successful in reducing alarm overload: however, few studies have reported approaches to translate and sustain these interventions in clinical settings². The objective of this study is to examine short and long-term effectiveness of an interdisciplinary team based approach to alarm reduction intervention.

Methods: This is a pre- and post-, longitudinal cohort study performed in the adult cardiology intermediate care unit at a 480-bed academic medical center in Georgia. The data were collected at baseline (pre-intervention), two weeks after intervention, and across an 18-30 month span post-intervention. A multidisciplinary Clinical Alarm Management Workgroup analyzed baseline data to determine targetable alarms and safe adjustment parameters. Interventions included adjusting alarm thresholds and switching alarms off completely, and all changes are listed in Table 1. The primary outcome is the change in number of total alarm signals before and after intervention.

Table 1. Alarm settings changed during intervention

Alarm	Original Setting	Changed Setting
Respiratory rate high limit	30	35
SpO2 low limit	94	89
SpO2 desaturation	90	89
Non-sustained ventricular tachycardia	ON	OFF
Run premature ventricular contractions (PVCs)	ON	OFF
Pair PVCs	ON	OFF
Multiform PVCs	ON	OFF
Ventricular bigeminy & trigeminy	ON	OFF

Results: The number of total alarms was reduced from 46,358 to 28,388 (39%) over a 14-day period post-intervention. The total number of alarms per patient bed per day decreased from 132 to 70 (47%). The most prevalent nonactionable alarms, bedside parameter alarms and arrhythmia alarms, decreased from 3,457 to 1,443 (58%) and 38,218 to 18,622 (51%), respectively. The overall alarm burden was reduced at the 14-day interval after all interventions were implemented. Alarm outliers were observed with two patients triggering 54% and 32% of all alarm signals generated within a 24-hour period. Two-year follow up demonstrated a sustained 19% reduction in the total number of alarms per patient bed per day. No intervention-related adverse events occurred during the 4 month period following intervention implementation.

Conclusion: It is feasible to translate and maintain system-level interventions addressing alarm fatigue using an interdisciplinary team based approach. This is the first study reporting the translation and long-term sustainability of a system-level alarm reduction program into the practice setting. Our approach and findings may have potential application to other clinical settings. Additional research studies are needed to confirm the applicability and effects of system-level approaches in other patient populations and health care units.

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KENTUCKY RESEARCH POSTER FINALIST - MILLICENT HORN

Impact of Ga-68 DOTATATE Scan on Clinical Management of Neuroendocrine Tumor: A Single Center Review of 200 Patients

Authors: Aman Chauhan¹, Millicent Horn², Riham El-Khouli³, Timothy Waits³, Lowell Brian Anthony¹; , 1 Division of Medical Oncology, Markey Cancer Center, University of Kentucky Lexington, KY; 2 University of Kentucky, School of Medicine, 3 Department of Radiology, University of Kentucky. Lexington.

Introduction: On June 1, 2016, FDA approved use of Gallium 68 DOTATE scan for localization of somatostatin positive neuroendocrine tumors. Since the FDA approval, many questions regarding utility of Ga 68 DOTATATE in monitoring of the disease, effect of systemic somatostatin analog on quality of imaging and most importantly, whether Ga 68 DOTATATE scan alters clinical decision making remains to be answered. We review our single center experience with Ga DOTATATE scan post FDA approval.

Methods: Retrospective review of 200 patients who had undergone Ga-68 DOTATE scanning at Markey cancer center between Nov 2016 and Jan 2018.

Results: Of these 200 patients, 59.5% were females and the median age was 62 (30-84 years). The study cohort was comprised of following primary tumor sites: small bowel 37.5%, pancreas 18.5%, bronchial 14%, colon 3.5%, rectum 2%, appendix 1.5%, adrenal 0.5%, prostate 0.5%, others 3% and unknown primary 19%. Ga-68 DOTA scan influenced clinical decisions in 39% (n = 78) pts. Ga-68 DOTA scanning was able to locate primary tumors in 17 of 38 pts who were classified as NET of unknown primary based on CT imaging. Seventeen patients had comparative Ga-68 DOTA scans. Ten of 17 (58%) patients had discordant results between Ga-68 DOTA vs IV contrasted CT scan. Five progressed on CT but had stable disease or no evidence of disease on Ga-68 DOTA scan. Two demonstrated stable disease on CT but had progression on Ga-68 DOTA scanning. Subgroup analysis of mean SUV for hepatic metastatic lesions revealed 37.3 for G1 (n = 20) as compared to 32.3 for G2 (n = 37) and 17.46 for G3 (n = 4). Mean hepatic SUV of the hottest lesion in 96 patients was similar irrespective of exposure to SSA LAR. 31.3 vs 27.8 for SSA vs no SSA cohorts.

Conclusion: Ga-68 DOTA scanning impacted clinical decision making in 39% of NET pts (n = 200), identified the primary site in 38 pts and assisted with differentiating G3 NET from G1/G2 based on mean SUV in a subgroup analysis (n = 61). Serial Ga-68 DOTA monitoring disease progression in our subset analysis (n = 17) revealed a 58% discordancy between anatomical vs physiologic imaging. Systemic exposure to long acting SSA does not seem to impact quality of Ga-68 DOTA scan.

KENTUCKY RESEARCH POSTER FINALIST - COREY J KETCHEM

Novel drug combination against leukemia reduces AKT activity and enhances cell cytotoxicity of a Bcl-2 inhibitor

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Introduction: Evasion of apoptosis by leukemia is a mechanism of chemotherapeutic resistance that can occur via the Bcl-2 anti-apoptotic proteins. BH3 mimetics, including ABT-263, bind the pro-survival Bcl-2 proteins and promote the apoptotic signals. Combinatorial therapies with currently approved drugs is a practical approach to overcome resistance. Cellular and mitochondrial membrane ion channels are an interesting target, with roles in migration, proliferation, and apoptosis. We hypothesize that amiodarone will sensitize leukemia cells to the Bcl-2 inhibitor ABT263 when compared to either drug alone.

Methods: Based on a previously performed drug screen, compounds were chosen with a synergy score < -40 (more negative = more synergy). The membrane channel inhibitors amiodarone, amiloride, and amitriptyline were further studied. Drug effects on cell death in two leukemia cell lines (U937 & MV411) were assessed with flow cytometry and immunoblot. Mean values for each condition were plotted using GraphPad Prism, and 1-way analysis of variance with Tukey's test was used to determine statistical significance.

Results: Amiodarone, amiloride, and amitriptyline all reduced cell viability in a dose dependent manner. Amiodarone had the greatest cytotoxicity compared to the other compounds and was chosen for combination studies with ABT263. The proper concentrations for flow cytometry studies were established individually with dose responses. The drugs were then combined with flow cytometry studies showing enhanced apoptosis relative to either drug alone. The mechanism by which the drug pair has greater apoptotic induction is via amiodarone specific reduction in Akt phosphorylation. An increase in caspase 3 cleavage was also observed, indicating a greater initiation of apoptosis for the combination treatment.

Conclusion: There are several key mechanisms targeted by amiodarone that in combination with ABT263 increase apoptosis in leukemia. Szabó et al. have shown that the inhibition of the mitochondrial potassium channel Kv1.3 increases mitochondrial ROS release and functions in Bax-induced apoptosis in lymphocytes. In addition, amiodarone targets the PI3K/Akt pathway to reduce cell cycle regulation likely via mTOR inhibition. These data suggest that amiodarone sensitizes cells to Bcl-2 inhibitors through a novel reduction in p-AKT in leukemia, enhancing cytotoxicity. Further, these studies highlight the functional importance of potassium channels in lymphoid and myeloid cancer cells.

LIBYAN ARAB JAMAHIRIYA RESEARCH POSTER FINALIST - MUHAMMED ELFAITURI

Current Treatment Strategies for Morton's Neuroma: A Systemic Review and Meta-analysis

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Introduction: Morton's neuroma, or "Morton's digital neuralgia" is a painful condition of the foot resulting from entrapment of the common digital nerve under the overlying transverse metatarsal ligament. Our study aimed to recapitulate and analyze the findings from the literature to draw out a definite conclusion about the best treatment for Morton's neuroma.

Methods: A systematic search of 10 databases was performed to include randomized clinical trials (RCTs) that examine Morton's neuroma treatment, in terms of its safety and efficacy. The methodological quality of each RCT was assessed using the Cochrane Collaboration's tool. The study protocol has been registered in PROSPERO (CRD42018087535).

Results: We included 12 RCTs which assessed a wide range of treatments for this disease (5 studies for corticosteroid, 3 for surgical intervention, 2 for extracorporeal shockwave therapy (ESWT), and 1 for each of capsaicin and lidocaine). We noted that the groups treated with steroid injection did not decrease significantly in visual analog scale (VAS) mean pain score for the short term (3 months) when compared with local anesthetics [Standardized mean difference (95% Confidence Interval) = 2.43 (-2.60, 7.46), p= 0.34]. ESWT showed that the SMD of VAS pain score between shockwave therapy and sham group before 3 months follow up duration was 1.27(-0.69, 3.23) with a p-value (0.21). With surgical intervention techniques used, there was some controversy regarding different results as some studies showed higher satisfaction with no significant difference in restriction of daily activities and clinical outcome. Other treatment modalities such as lidocaine and capsaicin have variable results.

Conclusion: Surgical intervention, ESWT, and corticosteroids are among the various treatment modalities of Morton's neuroma. However, there is a limited knowledge and a small number of research studies investigating these different management techniques. Large-scale randomized studies are warranted to build conclusive evidence and standard therapy.

MARYLAND RESEARCH POSTER FINALIST - MATTHEW BARVO

Psychological Reasons Why College Students Avoid Healthcare

Authors: Matthew Barvo, MS1, & Brian Stone, Ph.D., TMSU School of Medicine & Boise State University

Introduction: College students in America suffer from medical issues ranging from sniffles to sexually transmitted diseases, yet they still attend class, complete homework, and take tests. This population may avoid healthcare for a variety of reasons that have yet to be examined by previous research. The consequences when students avoid healthcare not only affect the individual, but subject their classmates to transmissible infections. This study was an exploratory analysis to identify and understand the factors resulting in healthcare avoidance in college students.

Methods: 270 students from Boise State University, enrolled in Psychology 101, completed an anonymous computer-based survey consisting of 84 questions relating to healthcare usage and avoidance. The data was analyzed with chi-square and t-test, statistically significant results were subdivided by Insurance Coverage and Gender.

Results: *Insurance Trends:* Students with health insurance were significantly less apprehensive of medical care in general than students without health insurance ($P = 0.003$). However, students covered by their parents' health insurance were significantly more likely to prefer self-treatment of sadness and depression ($P = 0.027$), instead of seeking care from a primary care provider ($P = 0.027$) or a mental health counselor ($P = 0.001$). Students covered by their parents' insurance were more likely to avoid care from a primary care provider ($P = 0.015$) or a mental health counselor ($P < 0.001$) when facing debilitating stress.

Gender Trends: When asked how they would react to uncomfortable pimples on their genitals, male students were significantly more likely than female students to self-diagnose and treat this potential STD with online resources ($P = 0.026$). Male students also preferred self-treatment of sadness and depression ($P = 0.005$). Female students were particularly worried about their parents asking the details of their checkup, and were more likely to avoid care due to the potential embarrassment of someone they know seeing them walking into the clinic ($P = 0.034$).

Conclusion: This exploratory analysis uncovered several significant trends with regards to college students avoiding healthcare. These results may help medical clinics put together more effective advertisements that cater to college students, limiting the perceived barriers students face when seeking healthcare, and leading to enhanced public health on college campuses.

MARYLAND RESEARCH POSTER FINALIST - JENNIFER A WOODARD

Implementation of a Coordinated Plan for Chronic Opioid Therapy in the Primary Care Setting

Authors: Jennifer Woodard, BS, BA; Leigh Cervino; Stephanie C. Blease; Christopher Kearney, MD; Kathryn Walker, PharmD, BCPS, CPE

Introduction: Deaths from opioid overdose have increased dramatically in the past decade. Half of all dispensed opioid prescriptions are written by primary care clinicians.¹ To improve management of non-cancer chronic pain in adults in the primary care setting, the Centers for Disease Control (CDC) developed a clinical practice guideline in 2016.²

The aim of this study was to assess documentation practices of primary care clinicians before and after the implementation of a coordinated plan for chronic opioid therapy (COT) at 18 outpatient clinics.

Methods: This retrospective pre-post study included 18 primary care sites (9 control, 9 intervention) before and after the intervention. Twenty COT patients from each site (defined as receiving opioids ≥ 3 of 6 months) were randomly selected for inclusion. One visit for each patient was selected for review during the study timeframes for baseline (5/16-10/16) and post-implementation (11/16-5/17) periods. The data coded from the chart included 28 criteria based on CDC guidelines and included calculating morphine milligram equivalents (MME).

Results: A total of 599 patient charts were reviewed (baseline: 172 control, 166 intervention; post-intervention: 140 control, 121 intervention). There was no significant difference in average MME at baseline or post-intervention. Four encounters included a physician-documented MME. There was an increase in urine drug test screening in the intervention group compared to the control group. The number of patients receiving opioid prescriptions without an office visit decreased in both groups. The only statistically significant changes were small increases in the intervention clinics in the frequency of documentation of pain scores and functional assessments.

Conclusion: The implementation of CDC standards in the intervention clinics did not show a significant impact on physician documentation practices in the first 6 month phase. Given the small sample sizes, only large effects would have been detectable; smaller effects may have occurred undetected. Clinician education and improved integration of clinical decision support tools within the electronic medical record is needed to improve adherence to the new CDC guidelines for COT.

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MASSACHUSETTS POSTER FINALIST – RESEARCH - JASMINE Y GALE

The Impact of Music on Nociceptive Processing

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Introduction: Music has been shown to decrease pain and modulate affect. The precise mechanism in which music tempers pain is unknown, but modulation of temporal summation of pain, anxiety, depression, and catastrophizing may underlie the analgesic efficacy of music. In this investigation, we assessed the impact of a novel music intervention on the nociceptive processing of pain, using quantitative sensory testing (QST). We also examined the impact of the music intervention on anxiety and situational catastrophizing.

Methods: We enrolled 60 healthy volunteers over the age of 18 without a self-reported history of chronic opioid use or neuropathy. Participants were assessed for psychosocial traits such as anxiety, depression, and catastrophizing, using validated questionnaires. QST consisted of three parts: 1) investigation of pain sensitivity using pressure and pinprick stimuli, 2) temporal summation of pain (TSP) with a repeated pain stimulus, and 3) conditioned pain modulation (CPM) with a second painful stimulus. QST was performed in the absence and presence of the music intervention.

Results: We found an increase in pressure pain thresholds in both the forearm ($p=0.007$) and trapezius ($p=0.002$) with music, and a decrease in amount of pinprick pain ($p<0.001$) and TSP ($p=0.01$) with music. Interestingly, CPM was significantly diminished ($p<0.001$) in the music condition. No significant difference in anxiety or situational catastrophizing was observed with music. The degree of pain reduction (pressure pain tolerance) with music was negatively correlated to catastrophizing and depression scores.

Conclusion: Pain sensitivity, as measured by pressure pain thresholds and pinprick pain, was reduced with the music intervention. Additionally, TSP, a measure of central sensitization, was also lower with music. Those with higher baseline catastrophizing and depression scores did not have as great an analgesic impact of music. CPM was significantly decreased, although this may be due to an overall decrease in pressure pain. Although there was a trend toward decreased anxiety and situational catastrophizing in response to music, this was not significant. Overall, these data indicate music may modulate nociception, and future studies will determine their role as a potential adjunct in treating clinical pain.

MICHIGAN RESEARCH POSTER FINALIST - SUBHASH V EDUPUGANTI

A Quality Improvement Project to Increase Compliance with Diabetes Measures in an Academic Outpatient Setting

Authors: Subhash Edupuganti, Jordan Bushman MD, Rhyan Maditz DO, Pradeep Kaminoulu MD, Alexandra Halalau MD, FACP

Introduction: Diabetes is one of the most common chronic diseases in the United States, present in nearly 9.4% of the US population.¹ As part of internal medicine residency training, medical residents are often first-line primary care providers in residency clinics and thus have an important role in providing appropriate diabetes care for these patients. Consequently, American Diabetes Association (ADA) sets forth annual guidelines on preventative measures that can help prevent or delay the onset of more severe complications of diabetes mellitus.² However, previous studies describe suboptimal care amongst residents with regards to preventative care in diabetic patients, including at our own clinic prior to the onset of this study.³

The aim of our QI project is to improve diabetic care preventative measures, with HbA1c as our primary outcome and other core measures as secondary outcomes, to comply with the ADA recommendations in our resident clinic through the implementation of quality improvement interventions via PDSA (Plan-Do-Study-Act) cycles.

Methods: Our resident clinic consists of 76 residents working in 8 different teams at Beaumont Hospital – Royal Oak. In November 2016, baseline data was obtained on 538 patients with diabetes on core ADA measures (HbA1c, foot examinations, lipid panel, etc.). 5 teams developed a QI intervention plan to improve their diabetes care in the clinic and the remaining 3 teams served as controls. Within the next year, PDSA sessions took place every 3 months where teams analyzed their core measure results up to that date and brainstormed strategies to better implement their plans. In November 2017, post-intervention data was collected on the same diabetes core measures.

Results: With HbA1c as our primary outcome, there was paradoxically a slight increase in HbA1c levels in both intervention and control groups post-PDSA cycle (change in HbA1c was +0.09 in intervention, +0.32 in control groups, $p = 0.174$). With secondary outcomes, the changes in outcome measures were as follows: eye examinations (+5% in intervention vs. -7% in control, $p < 0.01$), foot examinations (+13% vs. +5%, $p = 0.09$), lipid panel (+7% vs. -5%, $p < 0.01$), microalbumin /creatinine ratio (+4% vs. +1%, $p = 0.03$), and HbA1c (+8% vs. +5%, $p = 0.24$).

Conclusion: While there was not an improvement in HbA1c values, there were significant improvements in the rates of ADA recommended examinations and laboratory tests performed by residents in the intervention groups. One resident team implemented an intervention involving protected half-day blocks for its residents to identify overdue examinations and consequently had the largest improvements in its quality indicators, thus serving as a potential intervention to replicate in future studies. Given our study results, we believe that quality improvement interventions can improve preventative care for patients with diabetes in residency clinics.

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MICHIGAN RESEARCH POSTER FINALIST - IRVIN C LIEN

Altering our Approach to Opioid Addiction at the Emergency Department and Implications in Other Medical Specialties

Authors: Lien, Irvin;Brody, Aaron;

Introduction: Opiate abuse has been destructive to individuals, families, and their communities. While attempts to educate physicians about the potential risks of opiate abuse have resulted in the drastic decrease in opioid prescriptions, the illegal use of opioids such as heroin and fentanyl have rapidly become an overwhelming issue. Interviewing patients struggling with substance abuse and allowing for open-ended responses can help determine treatment options patients are most receptive to, what impedes patients from obtaining optimal treatment, and which options should be the focus in the future.

Methods: To assess patients' attitude towards opioid addiction treatment, patients with a history of opiate abuse were interviewed during their assessment in the emergency department. A short interview adapted from the Treatment Option Study (TOP) was administered to patients to better understand their experience with opiate-used disorders and thoughts on ways to improve person-centered treatment. Our hypothesis is that the patients that have successfully overcome opiate addiction will recommend greater emphasis on referrals to be provided in the Emergency Department. In addition, those who have stopped addiction treatment or have not yet initiated addiction treatment will emphasize the importance to broadening availability of treatment options.

Results: 39 patients were interviewed and their responses were rated on a 7.0 scale. Based off the average likert scale ratings, a Narcan distribution program was rated the most appealing to the patients with a rating of 5.91 out of 7.00. A methadone/buprenorphine referral service closely followed at 5.88 out of 7.00. These results suggest that efforts should be placed in ensuring these particular resources are available to patients.

The open response portion of the survey indicated that the obstacles patients faced in treatment initiation and maintenance were due to difficulty with transportation or finding physicians that take their insurance.

Conclusion: Our study demonstrated that patients with a history of opioid abuse support for the expansion of resources at the time of discharge from the emergency department, particularly for the distribution of Narcan kits and a referral service for either a methadone or buprenorphine provider.

One issue with increasing referral services is that there is a lack of physicians trained to prescribe buprenorphine. Less than 3% of active physicians in Michigan are registered to prescribe buprenorphine and in reality this number is likely lower as only 75.5% of physicians who are registered to prescribe buprenorphine actually do this in their practice.

To combat this issue, medical students are working with their school to improve their medical school curriculum and implementing the buprenorphine waiver training as an option during their academic training. The goal is to educate a new generation of physicians, particularly primary care physician such as internal medicine doctors in, who are prepared to identify and treat opioid addiction both in-patient and outpatient.

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MICHIGAN RESEARCH POSTER FINALIST - DEREK WOLFE

Assessing Prescriber Perspectives on the New Michigan Opioid Prescribing Laws

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Introduction: In December 2017, the State of Michigan enacted a series of opioid prescribing laws to help curtail a tragic opioid crisis. The laws went into effect in 2018 and require prescribers (physicians, physician assistants, nurse practitioners, etc.) to have a bona fide relationship with their patients prior to prescribing opioids. In addition, prescribers must also receive informed consent from their patients prior to prescribing opioids and document informed consent on a government-created form. Further, prescribers must query the Michigan Automated Prescription System (MAPS) before prescribing a controlled substance, which include opioids, to their patients and prescribers are no longer allowed to prescribe greater than a 7-day supply for acute pain. Lastly, prescribers who treat a patient for an opioid overdose are mandated to provide the patient with information on addiction treatment. Given the new requirements placed onto prescribers, a survey was disseminated to prescribers to assess their perspective on how these prescribing laws will affect their medical practice.

Methods: After review from the local Institutional Review Board, an anonymous 11-question survey was distributed electronically via an online software (RedCap) to prescribers in Michigan through medical societies and affiliated healthcare systems. Prescribers were asked if opioid prescribing is part of their regular medical practice and questions regarding their knowledge, preparation, and perceptions of the new opioid prescribing laws. Interim survey results were collected and synthesized via RedCap.

Results: From July 9 to August 15, 2018, 173 prescribers completed the survey. Of the total number of responses, 87.2% believed the opioid crisis has impacted their practice and/or patient population. While 84.8% indicated being somewhat prepared to comply with the opioid prescribing laws, only 16.4% reported feeling extremely prepared. Furthermore, 58.1% of prescribers reported not receiving any training in their workplace regarding the new laws, while 94.2% believed that the new laws will reduce opioid prescribing. 70.9% reported that the consequences for not complying with the prescribing laws were not appropriate. Results from an optional commentary section in the survey indicate the respondents felt the consequences are overly punitive. Prescribers also commented on concerns about the burden of using MAPS and interference of government in prescriber autonomy.

Conclusion: With the overwhelming number of respondents reporting a belief that the laws will reduce opioid prescriptions, the laws will likely achieve the stated aims. The relevance of this study asserts itself in that it assessed the dissemination of vital information that seeks to address a public health issue observed with the opioid crisis. Based on the results and subjective comments obtained from this survey, engaging prescribers prior to mandated requirements may lead to more satisfactory outcomes. Ultimately, the emphasis of the new laws is to improve patient outcomes through effective coordination and management when controlled substances are prescribed.

MINNESOTA RESEARCH POSTER FINALIST - BRUCE GREGOIRE

Minnesota Physicians' Familiarity and Use of Provider Order for Life Sustaining Treatments (POLST)

Authors: Karly Boll, Paul Blake, Beret Fitzgerald, Bruce Gregoire, Jack Inglis, Dylan McCreary, Lisa Skarbakka, Becca Branum

Introduction: Provider Orders for Life-Sustaining Treatment (POLST) forms are a means of aligning end of life care with a patient's wishes to avoid unwanted and unnecessary medical intervention. The POLST system was implemented in Minnesota in 2010 as a portable directive that concisely conveys a patient's wishes for end of life treatments such as antibiotics, intubation, and artificially administered nutrition. Currently, however, there is no data on how the POLST system is being utilized and its impact on Minnesota medical care. The purpose of this study was to survey Minnesota physicians to determine the utilization, benefits, and concerns associated with the POLST form in Minnesota.

Methods: A total of 6,526 physicians identified from the Minnesota Medical Association's physician registry were given the opportunity to participate in the study. A survey was generated to determine familiarity, utilization, perceived benefits, and concerns with the POLST. Demographic variables for the physicians were also collected including specialty, practice location, and years since medical school graduation. Practice location was defined as Twin Cities, and non-Twin Cities. Results were analyzed using Student's T-test.

Results: A total of 656 physicians completed the survey (10%). There were 363 physicians (55%) who practice at least partially in the Twin Cities and 293 (45%) outside the Twin Cities. The most common specialties were family medicine (n=157, 24%) and internal medicine (n=127, 19%). Overall, 401 physicians (61%) were familiar with the POLST. There was no significant difference in familiarity between practice locations (n=222, 61% for Twin Cities versus n=179, 61% for non-Twin Cities, p=0.988). Of physicians who were familiar with the POLST, 295 (74%) use the POLST in their practice. The most commonly endorsed problems with the POLST were patients being unaware of the form (n=140, 47%) and patients not understanding the purpose of the form (n=127, 43%).

Conclusion: The results of this study suggest that physicians in Minnesota are equally familiar with the POLST in the Twin Cities and outside the Twin Cities. Many of the physicians who are aware of the form are using it in their practice. The most common concerns with the POLST were related to patient awareness surrounding the form, indicating a potential need for further public outreach and education about the POLST. This study is the first to report on the utilization, benefits, and concerns associated with the POLST form in Minnesota. These results will guide future interventions to improve the POLST as well as future studies to determine additional information surrounding POLST use in Minnesota.

MISSOURI RESEARCH POSTER FINALIST - ARA VARTANYAN

How to Sustain Mindful Lab Ordering Practices

Authors: Ara Vartanyan, Rachna Rawal, Paul Kunnath, Oluwasayo Adeyemo, Hala Saad, Alex Lane, Jennifer Schmidt

Introduction: Laboratory over-ordering is well recognized as a contributor to high cost, low-value care. Our project initially focused on mindful laboratory ordering practices through various resident educational initiatives. Resident-ordered labs decreased by 20% over 48 weeks. We then shifted our focus to other barriers identified by residents including attending physicians, the electronic medical record (EMR) and labs ordered by night float residents.

Methods: Subjects included resident and attending physicians on the inpatient Medicine service. Data included pre- and post-intervention surveys. For the 48 weeks prior to this study, residents received education on high-value concepts. For the first 16 weeks of this study, we focused on the attending physician as a barrier. Attendings received weekly emails from an attending project champion as well as monthly updates from the project team. The final 16 weeks were focused on the EMR and night float residents. The default selection for labs were changed from "daily" to a one-time draw. Additionally, night float residents were sent weekly emails reminding them to use mindful ordering.

Results: The 20% decrease in lab ordering was sustained over the 32 weeks of this project. Additionally, hepatic panels, serving as a balancing measure, did not change over the entire project (48 + 32 weeks) despite the decrease in CMPs. Utilization of the "daily" order decreased by 50%. While 40% of residents felt they were practicing more mindful lab ordering practices at 34 weeks, 85% of residents felt this at 82 weeks ($p < 0.05$). 60% of the residents self-reported ordering fewer labs with the EMR default change to a one-time draw. After 96 weeks, 75% of residents felt that attendings encouraged mindful lab ordering compared to 25% initially ($p < 0.05$). 70% felt that night float residents were ordering labs mindfully.

Conclusion: One of the strongest indicators of culture change is the perception of increased mindful lab ordering and increased attending encouragement. Residents have changed how they order labs given the decrease in "daily" order utilization. By addressing barriers to mindful lab ordering, we have demonstrated that high-value care initiatives are sustainable in training programs. We are implementing a formal high-value care curriculum to sustain this cultural change.

MISSISSIPPI RESEARCH POSTER FINALIST - BIJALBEN R PATEL

Soluble Guanylyl Cyclase Stimulators and Activators as a Potential Treatment Option for Preeclampsia

Authors: Bijalben R. Patel¹, Bhavisha A. Bakrania¹, Joey P. Granger²

Introduction: Preeclampsia (PE) is a pregnancy-specific disease characterized by maternal hypertension and endothelial dysfunction. PE is caused by impaired spiral artery remodeling which leads to poor perfusion of the placenta and placental ischemia. The ischemic placenta releases anti-angiogenic factors, such as sFlt-1, into the maternal circulation, which antagonizes the *angiogenic factors*- Placental Growth Factor (PlGF) and Vascular Endothelial Growth Factor (VEGF). This causes endothelial dysfunction and impairs nitric oxide (NO) signaling. In a normal pregnancy, NO would bind soluble guanylyl cyclase (sGC) which then increases cGMP levels leading to vasodilation, but in PE this signaling is reduced. sGC stimulators and activators are a novel class of drug that directly stimulate sGC despite low levels of NO; however, their potential benefits for preeclamptic patients have not been explored. Our preliminary data suggest that sGC modulators reduce hypertension in an animal model of PE, but the mechanisms are not known. Therefore, the purpose of this study was to test if the sGC stimulators (Riociguat, Sigma-Aldrich) and activators (Cinaciguat, Sigma-Aldrich) attenuate sFlt-1 and increase PlGF and VEGF production by the placenta.

Methods: On gestational day 14 (GD14), rats underwent Sham or Reduced Uterine Perfusion Pressure (RUPP) surgery. For placental villi studies, placentas were obtained from normal pregnant rats on GD19. Isolated placental villi were plated (1 per well) and coated with Matrix Matrigel Basement Membrane. The villi were treated with doses of sGC stimulator and activator (0.01 μ M, 0.02 μ M, 0.1 μ M, 0.2 μ M, 1 μ M, 10 μ M, 30 μ M) and then exposed to a hypoxic environment (1% oxygen) for 48 hours. The production of sFlt-1, PlGF, and VEGF was determined using an Enzyme-Linked Immunosorbent Assay kit.

Results: The sFlt-1 levels were significantly reduced in the sGC stimulators and sGC activators treatment groups. (Untreated, $n=16$, 5117 \pm 1313 pg/mL; 30 μ M sGC activator, $n=6$, 3811 \pm 712 pg/mL, $P<0.01$; 30 μ M sGC stimulator, $n=6$, 3975 \pm 621pg/mL, $P<0.01$).

The VEGF levels were significantly increased in the 10 μ M and 30 μ M sGC activator and stimulator treatment groups. (Untreated, $n=16$, 3099 \pm 400 pg/mL; 30 μ M sGC activator, $n=4$, 3952 \pm 503 pg/mL, $P<0.01$; 30 μ M sGC stimulator, $n=4$, 3871 \pm 897 pg/mL, $P<0.01$).

The PlGF levels did not significantly improve with the sGC activators and sGC stimulators treatment groups. (Untreated, $n=8$, 563 \pm 51pg/mL; 1 μ M sGC activator, $n=4$, 536 \pm 44pg/mL; 1 μ M sGC stimulator, $n=4$, 575.83 \pm 69pg/mL).

Conclusion: The data suggest that sGC modulators significantly attenuated the levels of sFlt-1, increased the levels of VEGF, but did not improve the levels of PlGF. However, since sGC modulators improved the sFlt-1/PlGF and sFlt-1/VEGF ratios, these drugs could improve endothelial integrity and reduce hypertension. This further supports the hypothesis that sGC stimulators and activators could be a promising treatment option for preeclamptic women.

MISSISSIPPI RESEARCH POSTER FINALIST - KELLY G WINDHAM

ANALYSIS OF RACIAL DISPARITIES IN UMMC PEDIATRIC CRITICAL CONGENITAL HEART DISEASE POPULATION

Authors: Kelly G. Windham, Camille C. Richards, Sara Kiparizoska, William F. Campbell, Frank Han, Michael E. Hall, Brian E. Kogon, Mary B. Taylor, Michael R. McMullan

Introduction: Congenital heart disease (CHD) is the most common birth defect and the leading cause of birth defect related deaths. Critical CHD (CCHD) requires intervention within the first year of life and is associated with increased risks for mortality and morbidity. The most prevalent CCHD diagnoses include: tetralogy of Fallot (TOF), d-transposition of the great vessels (TGA), hypoplastic left heart syndrome (HLHS), pulmonary atresia (PA), tricuspid atresia (TA), total anomalous pulmonary venous return (TAPVR), common truncus (CT). Previous investigations showed a similar overall prevalence of CHD in Mississippi between white and African American patients, but a substantially higher mortality rate in the African Americans. We hypothesized that the racial disparity in mortality rate was related to increased prevalence of CCHD in the African American patient population.

Methods: We retrospectively reviewed data from the University of Mississippi Medical Center's Research Data Warehouse using a patient cohort explorer (Epic QlikView) from 2013-17. Patients 17 years of age or younger with a CCHD diagnoses (n=2486) were included in the analysis. Statistical analysis was performed using SPSS software.

Results: Of the 847 patients with TOF (53% African American, 41% white), there were 28 deaths (64% African American, 18% white; $p < 0.05$). Of the 477 patients with TGA (33% African American, 58% white), there were 16 deaths (50% African American, 25% white; $p < 0.05$). Of the 421 patients with HLHS (41% African American, 54% white), there were 52 deaths (73% African American, 25% white; $p < 0.05$). Of the 254 patients with PA (61% African American, 19% white), there were 19 deaths (74% African American, 11% Caucasian; $p > 0.05$). Of the 242 patients with TA (67% African American, 27% white), there were 14 deaths (79% African American, 21% Caucasian; $p > 0.05$). Of the 143 patients with TAPVR (41% African American, 48% Caucasian), there were 24 deaths (67% African American, 25% Caucasian; $p > 0.05$). Of the 102 patients with CT (42% African American, 55% Caucasian), there were 11 deaths (36% African American, 45% Caucasian; $p > 0.05$).

Conclusion: Given the variability in prevalence of CCHD amongst whites and African Americans, increased complexity does not seem to account for the increased mortality in African American patients. That being said, increased mortality in the African American population translates into the CCHD patients, just as it did for the overall CHD population. Larger patient cohorts and additional risk factor analyses may be needed to identify the etiologies of the disparate African American mortality.

MISSOURI RESEARCH POSTER FINALIST - MENGOU ZHU

Mutant U2AF1(Q157) Expression Alters Pre-mRNA Splicing and Hematopoiesis

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Introduction: Myelodysplastic syndromes (MDS) are the most common myeloid malignancies among the elderly. Patients present with bone marrow (BM) failure manifested by low peripheral blood (PB) counts and are at increased risk of developing acute myeloid leukemia. Mutations of *U2AF1*, a gene that encodes a spliceosome protein, are identified in 11% of MDS patients. The two most common *U2AF1* mutants, S34F and Q157P, alter the splicing of two distinct sets of pre-mRNA targets and are hypothesized to affect MDS pathogenesis differently. While *U2AF1*(S34F) causes MDS-like phenotypes, such as reduced B-cell numbers, in mice, no such study has been performed for *U2AF1*(Q157P). We aim to study the hematopoietic phenotypes and alternative splicing associated with *U2AF1*(Q157P) *in vivo* using transgenic mice that express mutant *U2AF1*(Q157P).

Methods: Alternative splicing induced by *U2AF1*(Q157P) was analyzed with Nanostring on *U2AF1*(Q157P) and *U2AF1* wild-type (WT) murine BM. To study the hematopoietic cell-intrinsic effects of *U2AF1*(Q157P), we prepared non-competitive BM transplants to understand how *U2AF1*(Q157P) alters BM and PB lineages, and competitive transplants to examine stem cell function of *U2AF1*(Q157P) BM. For non-competitive transplants, *U2AF1*(Q157P)/rtTA or *U2AF1*(WT)/rtTA doubly-transgenic mouse BM was transplanted into lethally irradiated congenic wild-type mice. "Test" BM from *U2AF1*(Q157P)/rtTA or *U2AF1*(WT)/rtTA mice was mixed 1:1 with congenic "competitor" wild-type BM and transplanted into lethally irradiated congenic wild-type mice for competitive transplants. At 6-weeks post-transplant, *U2AF1* transgene expression was induced. Engraftment was assessed every 6-weeks by flow cytometric analysis of PB from transplanted mice. Mice were euthanized at 12- (non-competitive) and 24-weeks (competitive) post-transplant for flow cytometric analysis of BM hematopoietic stem and progenitor cell (HSPC) populations.

Results: Nanostring results indicated alternative splicing in *U2AF1*(Q157P) BM. In non-competitive transplants, PB counts and lineage distribution were similar for *U2AF1*(Q157) and *U2AF1*(WT) mice at 12-weeks. Notably, *U2AF1*(Q157P) mice did not have significantly reduced B-cells compared with *U2AF1*(WT) mice, unlike previously reported for *U2AF1*(S34F). Assessment of BM HSPC populations in non-competitive transplants revealed a 1.67-fold increase in common myeloid progenitors ($p<0.001$), a 0.76-fold reduction in granulocyte-monocyte progenitors ($p=0.005$) and 0.54-fold reduction in platelet-primed multipotent progenitors ($p<0.001$). In competitive transplants, *U2AF1*(Q157P) mice showed reduced engraftment of "test"-derived cells compared to *U2AF1*(WT) mice at 24-weeks in total PB (49.5% versus 71.7%, $p<0.001$), granulocytes, monocytes, B-cells, and T-cells. Additionally, HSPC populations were all significantly reduced in the BM of *U2AF1*(Q157P) competitive transplant mice. These observations indicate expanded progenitors but reduced stem cell function in *U2AF1*(Q157P) BM.

Conclusion: Mutant *U2AF1*(Q157P) causes alternative splicing in BM. Hematopoietic expression of *U2AF1*(Q157P) causes a multi-lineage competitive disadvantage of BM stem cells, similar to previous reports on *U2AF1*(S34F). However, PB counts and lineage distribution are not affected, indicating that the two common *U2AF1* mutations Q157P and S34F produce different hematopoietic phenotypes and may have different roles in MDS pathogenesis.

NEBRASKA RESEARCH POSTER FINALIST - JOSHUA LALLMAN

Turn on the RADEO: How to Reduce Adverse Events Related to Opioids in the Hospital

Authors: Joshua Lallman, Kristy Carlson PhD, Elizabeth Lyden MS, and Allison Ashford MD

Introduction: Inappropriate administration of opioids to hospitalized patients can lead to over-sedation, respiratory depression, and death. The “Reducing Adverse Drug Events related to Opioids”, or RADEO, implementation at Nebraska Medicine was initiated to make opioid administration safer and to reduce adverse drug events (ADEs) among hospitalized patients. One branch of this project included a two-part intervention to reduce inpatient ADEs. This intervention consisted of (1) a screening tool and (2) an educational pamphlet. All patients on the intervention units were screened and identified in Epic if they did not have a bowel movement in the previous 48 hours. Constipation is a common side effect of opioids, so identifying bowel dysfunction prior to and during opioid administration yields safer prescribing patterns. Additionally, patients administered opioids were provided with a pamphlet titled “Managing Pain while in the Hospital” and educated on the side-effects of opioids as well as the goals of pain control. The purpose of this study was to examine the role of the interventions in reducing adverse opioid-related drug events. A secondary outcome of this study was to identify characteristics that may predispose inpatients to ADEs.

Methods: A single institution case control study was implemented from January of 2017 to June of 2018. Three med-surg floors at Nebraska Medicine were enrolled due to similarities in their top 6 DRGs over the previous fiscal year. All patients who received their first opioid on their respective floor were eligible for this study. Each month, an Epic report was generated containing approximately 20 randomized patients from each floor giving a total population of 1,055 patients, 307 receiving the intervention. A chart review was conducted in order to identify if the patient had an ADE related to opioid use in the form of death, transfer to ICU, naloxone administration, rapid response team activation, constipation, or delirium. Potential risk factors for adverse opioid-related drug events were also collected and included chronic opioid use, kidney disease, and liver disease. Potential contributors to patient outcomes were compared via logistic regression and the full model significantly predicted the occurrence of ADEs (chi-square=58.419, df=6, $p < 0.0005$).

Results: The intervention group was associated with a decrease in the odds of ADE by a factor of 0.363 (95% CI 0.241 and 0.546). Baseline opioid use, as a risk factor, was associated with a decrease in the odds of ADE by a factor of 2.221 (95% CI 1.616 and 3.053).

Conclusion: These data demonstrate the potential utility of a succinct screening tool and educational pamphlet in reducing adverse opioid-related drug events in hospitalized patients. Further research could be done to specifically improve upon provider practice patterns in regard to the prescribing of opioids.

NEVADA RESEARCH POSTER FINALIST - KY RAYMOND

Antiproliferative Properties of Lichens *Parmelia vagans* and *Parmelia sulcata*

Authors: K. Raymond B.S. and V.A. Bondarenko, PhD

Introduction: Approximately, one quarter of all prescription drugs contain active ingredients of plant origins. Studies have shown that the secondary metabolites of lichen are unique and can exhibit antimicrobial activity. The purpose of this project is to analyze antiproliferative properties of the secondary metabolites of the lichens *Parmelia vagans* and *Parmelia sulcata* collected from the semi-deserts of Russia.

Methods: Various lichen extracts were prepared using different water sources or organic solvents. We assessed the antiproliferative activity against several human cancer cell lines; human hepatocellular carcinoma (Hep G2), human non-small cell lung cancer (NCI-H1299), and human mammary gland ductal carcinoma (T-47D). The same number of cells of different cell lines were plated into a 96-well plate and allowed to adhere overnight. The next day different dilutions of the lichen extracts were added to the adhered cells and the plate was placed in a CO² incubator for 72 hours. By the end of the incubation period, a picture of each well was taken to assess cell confluency. This was followed by a Resazurin assay to analyze the effect of the lichen extracts on cell growth and proliferation. After the Resazurin assay, the cells in each well were treated with trypsin, suspended in growth medium, and were counted using the Bio-Rad cell counter to evaluate the percent of live cells.

Results: Our experimental data from the cell viability assay and the live cells count indicate that bottled water and ethyl acetate extracts of *P. vagans* and *P. sulcata* significantly suppress (30% - 60%) the growth of human mammary gland ductal carcinoma and human non-small cell lung carcinoma. We also found that cancer cells treated by the lichen extracts results in their morphological changes that resemble an activation of apoptosis.

Conclusion: Our findings indicate that these lichen species produce secondary metabolites that slow cancer cells growth and proliferation. Future experiments will be focused on isolation and characterization of the compounds from *P. vagans* and *P. sulcata* crude extracts that are responsible for the inhibition of cancer cells growth. Another important aspect of the future research is to identify the cellular target(s) of the antiproliferative compound(s) and its molecular mechanism of action. In summary, the lichen's secondary metabolites may hold a vast medicinal potential and could be a viable novel source of anticancer drugs.

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NEW JERSEY RESEARCH POSTER FINALIST - JESSICA ORIBABOR

Care Coordination: Scalable Student-led Strategies to Address Social Determinants of Health in the Greater Camden Region

Authors: Jessica W. Oribabor, Dr. Anjali Desai and Dr. Behjath Jafry

Introduction: Since the inception of the Department of Health and Human Services' Healthy People 2020 initiative, there has been a strong emphasis to understand social determinants of health that negatively impact clinical outcomes and promote local partnerships to address these barriers to care. Student-run free clinics (SRFC) serve a unique role to not only offer primary care services to the medically uninsured, who are more vulnerable to such barriers, but also be a local community partner. The Cooper Rowan Clinic (CRC) in Camden, NJ offers this assistance through Care Coordination (CC), a student-led social work program. As the program's popularity grew, CC faced a large administrative burden due to its paper-based records and was without a formal process to track patient outcomes over time. Therefore, the primary objective of this project was to implement a novel social work model based on a free, scalable I.T. interface in RedCap. Through RedCap, a centralized online database was created to facilitate the evaluation of patient social needs and provide new insight into the patient population it serves.

Methods: From January 2018 to August 2018, all CRC patients were offered an intake survey based on common social needs before each clinical visit. Medical student volunteers, who served the role of social workers, reviewed completed surveys, and made appropriate recommendations based on their responses. Intake surveys were entered into an expanded version in RedCap at the end of each patient encounter. Additional surveys, since the inception of the CC program in September 2015 to December 2017 were entered retrospectively prior to the start of this project in 2018. The online intake survey is composed of an initial visit form, the first consultation with the CC program, and several subsequent follow up visit forms, for all other visits. A separate section on the follow up visit form was programmed to evaluate the quality of the recommendations made at the previous visit and assess patient experience. These forms collectively created a centralized database of all patient self-reported social needs, resources distributed, and patient feedback.

Results: During the study period, there were 500 total Care Coordination encounters with 282 unique patients. There was an average age of 47.3 and 55.0% Female, 61.3% Hispanic, 9.6% African-American, and 52% were from the city of Camden. The most frequently self-reported social needs were Medication Affordability, Dental Care, Health Insurance Enrollment, and Transportation.

Conclusion: Innovative SRFC social work services are necessary to provide comprehensive care to vulnerable and uninsured patient populations. RedCap is a free, and scalable I.T. solution to track and analyze social determinants of health that disproportionately affect these patient populations. The findings from this project propose to demonstrate an efficient model of student-led social work care and guidelines for the implementation of similar programs at various SRFC nationwide.

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NEW MEXICO RESEARCH POSTER FINALIST - AMANDA COLLAR

Mapping the human antibody response elicited in response to natural urogenital *Chlamydia trachomatis* infection

Authors: Amanda L. Collar, Susan B. Core, Alexandria Linville, William Geisler, David Peabody, Bryce Chackerian, Kathryn M. Fietze.

Introduction: *Chlamydia trachomatis* (Ct) is the most common bacterial STI in the US and can lead to pelvic inflammatory disease and infertility in women. Despite the high prevalence and associated morbidity of Ct infections, there is currently no licensed vaccine. Although interferon- γ secreting CD4⁺ T cells have been implicated as important mediators of Ct infection resolution, antibodies may also have an important role in protection or clearance of infection. The VD4 serovar conserved region of the major outer membrane protein (MOMP) is a common target for Ct vaccine development, including a vaccine candidate currently in phase 1 clinical trials. However, the specificity of antibodies elicited in response to infection to MOMP and other peptide epitopes, and the role of these antibodies in protection from re-infection is not well understood. Therefore, our overall goal is to identify the specificity of antibody responses to Ct that are associated with protection.

Methods: We used pathogen-specific deep sequence-coupled biopanning, which allows for the characterization of protein epitopes recognized by serum IgG antibodies produced in response to natural human infection. For this purpose, an antigen fragment library was created containing 24 Ct antigens that are targets of antibodies in either humans and/or animal models. We investigated the Ct-specific antibody responses in sera from female patients who did or did not experience re-infection with Ct at 3-months post-treatment of initial infection. Additionally, peptide-bait ELISAs were performed to further confirm deep sequence-coupled biopanning results.

Results: We identified several regions of the MOMP that were more commonly selected by females who did not experience re-infection. We also found the conserved VD4 region of MOMP to be commonly selected by patients regardless of their re-infection status via both deep sequence-coupled biopanning and peptide-bait ELISA. Additionally, we identified epitopes of interest from other membrane proteins.

Conclusion: The VD4 region of MOMP has been targeted by many groups as a potential vaccine target due to its conserved nature and the ability of humans to naturally produce antibodies to this target. However, our data shows that a majority of patients produce antibodies to this region and it may not be associated with protection. Additionally, we identified epitopes that may be of interest for future studies. Together, this work could have implications for future Ct vaccine efforts.

NEW YORK RESEARCH POSTER FINALIST - ELLIOT KLEIN

Levels of Chlamydia pneumoniae Immunoglobulin E antibody in asthmatic compared with non-asthmatic patients

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Introduction: The relationship between asthmatics and susceptibility to particular respiratory pathogens has been previously explored. Chlamydia pneumoniae is an obligate intracellular bacterium that causes respiratory infection in adults and children. There is evidence for an association between atypical bacterial pathogens (C. pneumoniae, M. pneumoniae) and asthma pathogenesis, as well as production of immunoglobulin (Ig) E responses in vitro.^{1,2} Previous studies in our laboratory demonstrated the presence of anti-C. pneumoniae IgE antibodies (Abs) by immunoblotting in children with culture-confirmed C. pneumoniae infection (pneumonia and asthma) who were wheezing.³ We sought to determine whether past C. pneumoniae infection triggers production of C. pneumoniae-specific IgE Abs in adult subjects with and without asthma, who had positive C. pneumoniae-IgG titers, indicating a past infection.

Methods: Total serum IgE levels and C. pneumoniae IgE Ab responses were studied in adult asthmatic (N=22) and non-asthmatic (N=22) subjects by ELISA. Blood was obtained from subjects in a primary care setting. Data are reported as IU/mL, and mean optical density (OD) values, respectively. Inclusion criteria included positive C. susceptibility IgG titers.

Results: Total serum IgE levels were similar in asthmatics compared with non-asthmatic subjects (186+ 159 vs. 170 + 142; P= 0.720). However, C. pneumoniae IgE Ab levels were significantly higher in asthmatic patients compared with non-asthmatic subjects (1.015 + 0.305 vs. 0.39 + 0.340; P<0.001). No significant association was found between total serum IgE levels and C. pneumoniae IgE Ab levels (R= -0.004, P=0.981).

Conclusion: These findings indicate that C. pneumoniae infection may trigger IgE-specific responses in asthmatics. C. pneumoniae IgE antibodies produced by chronic infection may also contribute to asthma pathogenesis. Additionally, reexposure or reinfection in those with a prior C. pneumoniae infection may lead to exacerbation of asthma symptoms. Further study directions may address quantifying IgE levels in asthmatics to determine the relationship between levels of immunoglobulins and asthmatic response. Addressing the relationship between C. pneumoniae and asthmatic reactions may help target treatment of at-risk patients and reduce health care costs, hospitalization, and mortality.

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NEW YORK RESEARCH POSTER FINALIST - SHIRLEY WU

Trends in Hepatocellular Carcinoma Risk Factors and Diagnoses among Chronic Hepatitis B Patients at a Community Health Center in New York City, 2007-2017

Authors: Shirley Wu, Janice Lyu, Amy Shen Tang

Introduction: Hepatitis B virus (HBV) is the leading cause of hepatocellular carcinoma (HCC) globally with HBV and HCC incidence rising in the United States. There are several known host, viral, and environmental risk factors associated with HCC development. We aimed to assess trends in HCC risk factors and diagnoses among chronic hepatitis B (CHB) patients at a community health center in New York City.

Methods: We performed a retrospective chart review of chronic HBV patients diagnosed with HCC from 2007 to 2017 based on ICD codes, and described trends in HCC diagnoses among chronic HBV patients seen at the health center. Patients with HCC prior to establishing care were excluded from analysis. We obtained demographic and clinical data such as age, sex, race, comorbidities, alpha-fetoprotein (AFP) level, HBV viral load, and prior HCC surveillance and antiviral therapy from medical records and performed descriptive analysis.

Results: From 2007 to 2017, 7426 patients were seen for HBV care of which 44 were diagnosed with HCC. Annual HCC diagnoses doubled from roughly 1 in 1000 to 1 in 500 persons from 2007 to 2017. Of these 44 patients, 39 (88.6%) were male, 44 (100%) were Asian, and 41 (93.2%) were from China. The age range at HCC diagnoses was 29 to 78 years old with 38 (88.6%) \geq 40 years old. The average BMI was 24.6 with 4 (9.1%) obese, 8 (18.2%) had diabetes mellitus, 22 (50%) had a smoking history, and 9 (20.5%) had history of alcohol use. Only 11 (25.0%) had a family history of HCC and none had HCV or HIV co-infection. At diagnosis, 33 (75.0%) were asymptomatic, 20 (45.5%) had a normal serum AFP, and 26 (59.1%) had no cirrhosis. 25 (56.8%) patients had history of antiviral use, and of those, 17 had an undetectable viral load within one year prior to diagnosis. The average length of HBV care was 4.13 years with 34 (73.0%) patients receiving care for more than one year. Lastly, 20 (45.5%) patients received at least annual liver ultrasound surveillance, with 2 (4.5%) patients receiving biannual ultrasound surveillance leading up to HCC diagnosis.

Conclusion: We found a two-fold increase in annual HCC diagnoses among patients with CHB at a community health center in NYC from 2007 to 2017. The majority of CHB patients with HCC were men \geq 40 years old without cirrhosis. Many lacked common risk factors such as alcohol use, obesity, diabetes, concurrent viral infections, or family history of HCC. Only 4.5% received biannual ultrasound for HCC surveillance. Further, nearly half presented with normal AFP at the time of HCC diagnosis. Our findings highlight the importance of routine HCC ultrasound surveillance in CHB patients with or without cirrhosis or antiviral treatment, especially Asian men over 40 years old.

NORTH CAROLINA RESEARCH POSTER FINALIST - CHRISTELLE TAN

Health Behavior Outcomes of Patients Utilizing the Fresh Produce Program.

Authors: Christelle Tan, Jackée Okoli, Julian Xie, Peter Callejo-Black, Spencer Chang, Janice Wong, Elana Horwitz, Willis Wong, Sarah Armstrong, Lawrence Greenblatt.

Introduction: Obesity, diabetes, and heart disease occur at a higher frequency in low-income communities for a variety of reasons including lack of access to and inability to afford healthy foods^[1] It is important that clinics address these upstream factors in order to keep their patients healthy. The Fresh Produce Program (FPP) was launched in August 2017 and provides packages of produce and education materials to patients experiencing food insecurity. These patients are referred to the program by healthcare providers.

Methods: Patients were surveyed at baseline and at one month and six month intervals when they came into clinic to pick up their bag of food. Surveys asked about demographics, food security, food intake, cooking habits and produce bag utilization. We also used one distribution day to ask patients to participate in an interview to collect qualitative data regarding health behaviors, diet, and feedback about the program. In addition, we extracted height, weight, HbA1c and the dates recorded from the most recent visit in the medical record. Pre/Post-T-tests were used to analyze data on patients who received 5 or more bags of produce from the program.

Results: Since launching in August 2017, the FPP has distributed 493 bags of produce to 187 patients over the course of 25 distribution days. The population served was 69% female, 77% Black/African American, 82% earning less than \$25,000 in the past year, and 78% with a high school degree or less education. The majority of patients served only receive one bag (93 patients). 28 patients received 5 or more bags. Of the 28 patients who received 5 or more bags, 25 completed a survey. There were no statistically significant changes pre/post in servings of vegetables patients report eating, meals cooked at home, or subjective health ratings. However, when asked, 70% of the patients report eating more vegetables than before joining the program, 76% report feeling healthier since joining the program, and 90% report cooking more since joining the program. Also, while there was no statically significant difference pre/post in food security scores, 59% of the patients had a food security score lower than at baseline (with lower scores indicating lower levels of food insecurity). There was no statistically significant change in BMI or HbA1c at 6 months or 12 months.

Conclusion: This study is limited by a small sample size, but the results show that consistent distribution of produce has the potential to improve health behaviors among patients experiencing food insecurity, while also reducing the burden of food insecurity patients may experience.

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NORTH DAKOTA RESEARCH POSTER FINALIST - C LEIGH MOYER

Impact of Distance on the Presentation, Treatment, and Outcomes of Lung Cancer Patients in the Northern Plains

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Introduction: Rural communities bear a disproportionate burden of preventable cancers and suffer from greater overall cancer mortality. Existing literature is mixed on the influence of rurality on lung cancer presentation and management. The purpose of our study is to examine the impact of distance to a treatment center on the presentation, treatment, and outcomes of lung cancer in North Dakota and Minnesota.

Methods: We performed a retrospective medical records review of patients newly diagnosed with lung cancer between January 1, 2007 and December 31, 2016 at Altru Hospital in Grand Forks, ND. Travel distance was defined as distance from the patient's primary residence to the treating cancer center using complete street addresses and the fastest road-travel route mapped on Google maps.

SPSS 24.0 for Windows was used to analyze demographic and clinical characteristics of patients. Chi-square tests or Fisher's exact tests were performed to determine which categories were significantly different from one another. All p-values were two-sided and p-value < 0.05 was considered significant. Institutional Review Board approval was obtained from the Altru Health System and the University of North Dakota.

Results: A total of 163 patients with non-small cell lung cancer and no previous history of cancer were included. The average age at diagnosis was 67.5±10.6 years, 28% of the patients lived in areas designated as completely rural, and 52% of patients had early stage disease. The average patient traveled 48.5±50 miles to the treating cancer center; with 41% traveling over 50 miles and 15% traveling over 100 miles. Bivariate analysis revealed no association between travel distance and patient risk factors, presentation, or outcomes. Surgical treatment was not associated with travel distance (p-value = 0.772), but both chemotherapy (p-value = 0.004) and radiation therapy (p-value = 0.038) were significantly associated with travel distance. Only 20% of patients living >100 miles from the treating cancer center received radiation therapy, compared with 54% of those living ≤ 10 miles.

Conclusion: We found that patients living the farthest from the treatment center were significantly less likely to receive chemotherapy or radiation therapy. Further research into factors that may help patients access and complete all the treatment modalities is warranted.

NORTH DAKOTA RESEARCH POSTER FINALIST - ALESSANDRA SPAGNOLIA

Endometriosis in the Northern Great Plains: A Comparison of White and Native-American Women

Authors: Alessandra Spagnolia, MS³,¹ James R Beal, PhD,² Abe E Sahmoun, PhD³, ¹ University of North Dakota School of Medicine, 1301 North Columbia Road, Grand Forks, ND 58202-9037, ² University of North Dakota School of Medicine, Department of Family and Community Medicine, 1301 North Columbia Road, Grand Forks, ND 58202-9037, ³ University of North Dakota School of Medicine, Department of Internal Medicine, 1919 Elm Street North, Fargo, ND 58102-9037

Introduction: Endometriosis represents a significant health problem for women of reproductive age. It often presents as infertility or continued pelvic pain despite treatment with analgesics and cyclic oral contraceptive pills. The association between the stage of disease, the symptoms severity, the effect on fertility, the type of treatment received, and the outcomes in Native-American (NA) and White women have not been investigated.

Methods: A retrospective medical chart review was conducted of women diagnosed with endometriosis from January 1, 2012 to December 31, 2016 at Sanford Health System, North Dakota. Demographic data and clinical characteristics of women diagnosed with endometriosis were abstracted. Continued pain was defined as any return visit for pain that had been previously documented and attributed to endometriosis.

We used SAS v.9.4 to analyze demographic and clinical data. Chi-square tests were performed to determine which categories were significantly different from one another, and t-test were used to compare continuous variables. All *P*-values were two-sided, and *p*-values < 0.05 were considered significant. Institutional Review Board approval was obtained from the Sanford Health System and the University of North Dakota.

Results: Data for 110 women diagnosed with endometriosis was analyzed. 55 (50%) self-identified as NA. The median [IQR] age at diagnosis was not different between NA and White women (26 [22-33] vs. 29 [26-37]; *P*-value=0.15). White women were significantly more likely to have private insurance than NA women (80% vs. 40%; *P*-value=0.00). Symptoms at first visit were not significantly different between White and NA women (*P*-value=0.14). Pelvic pain was the most common symptom at presentation for White and NA women (78% vs. 76%). Dysmenorrhea was slightly, but not significantly more prevalent among White than NA women (46% vs. 33%), and abdominal pain was slightly higher among NA than White women (46% vs. 20%). The majority of women were diagnosed by laparoscopy (69% vs. 71%) for white and NA respectively. NA women were significantly more likely to have had hysterectomy performed than White women (47% vs. 42%; *P*-value=0.01). White women were significantly more likely to experience reduction or cessation of pain than NA women (56% vs. 29%; *P*-value=0.00).

Conclusion: Native American women diagnosed with endometriosis were more likely to undergo a hysterectomy and less likely to experience reduction or cessation of pain. Future studies with a larger sample size and more comprehensive measurement of outcomes are needed to further investigate the discrepancy in treatment and in outcomes.

ONTARIO RESEARCH POSTER FINALIST - DANIEL KAPUSTIN

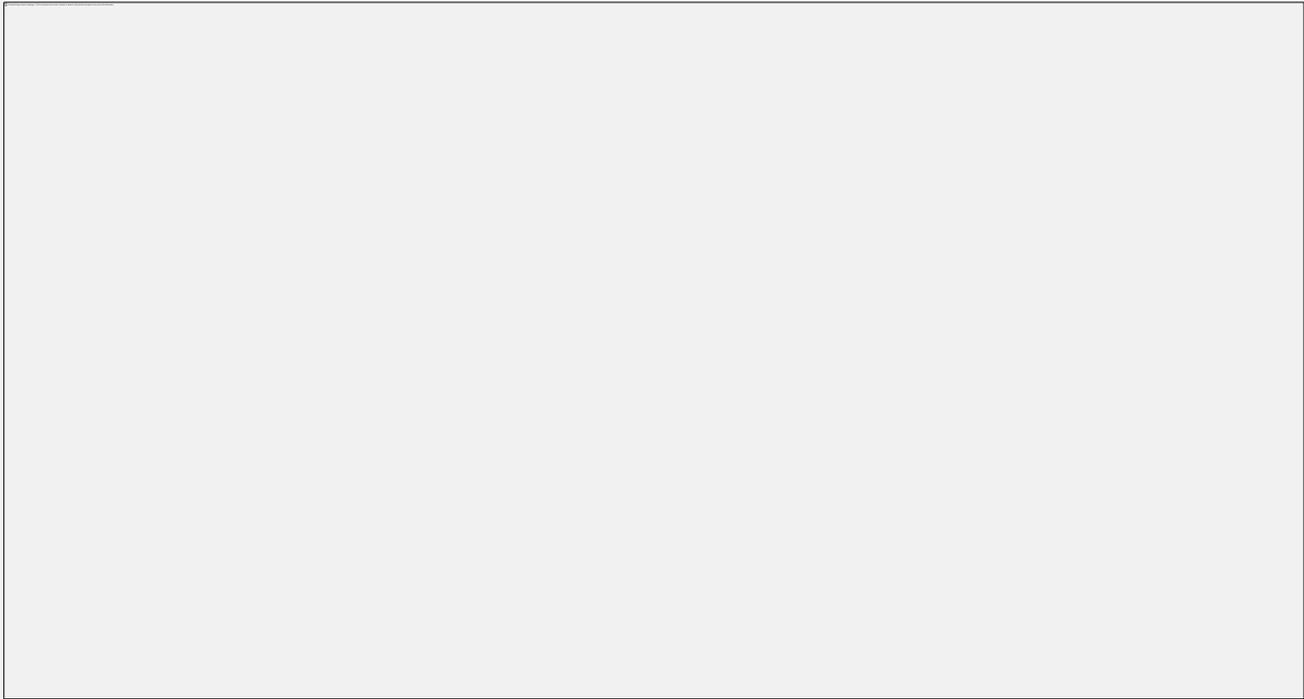
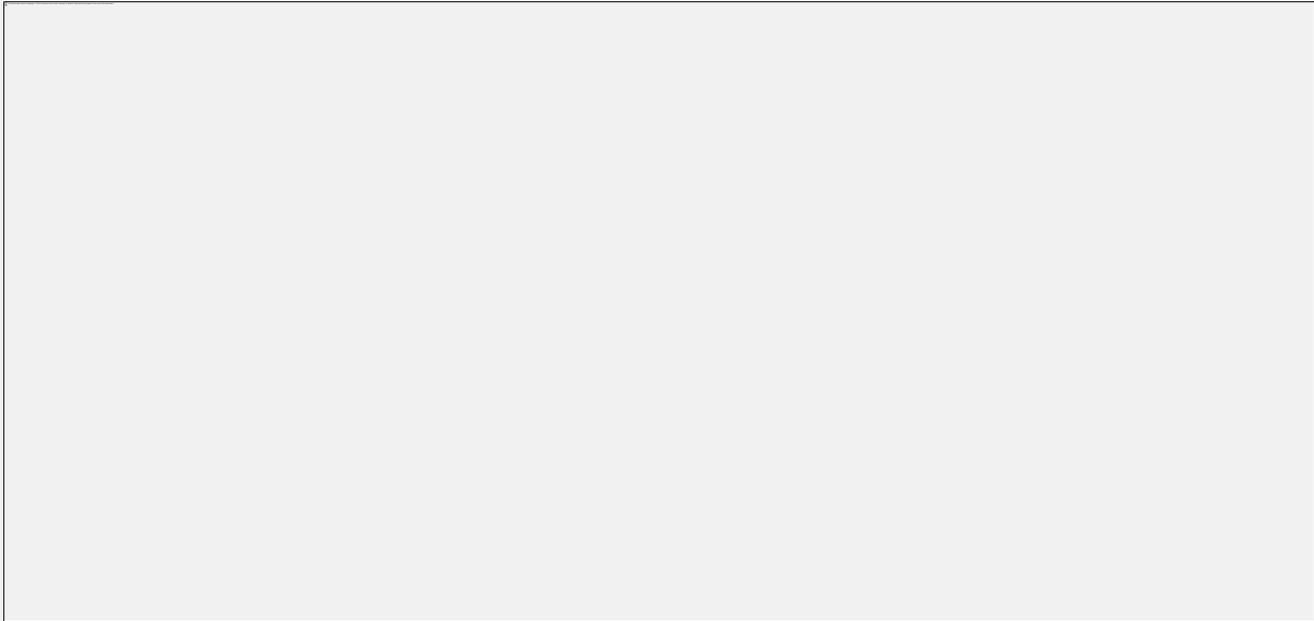
Lung Impedance: A Novel Technique to Assess the Clinical Status of Heart Failure Patients

Authors: Daniel Kapustin¹, Kosalan Akilan¹, Simcha Meisel², Michael Kleiner Shochat², ¹University of Toronto Faculty of Medicine, Toronto, Canada, ²Hillel Yaffe Medical Center, Hadera, Rappaport School of Medicine, Technion, Haifa, Israel University

Introduction: Heart Failure (HF) is a clinical syndrome resulting from heart ventricular dysfunction, and is traditionally classified as HF with reduced (HFrEF) or preserved (HFpEF) left ventricular ejection fraction (LVEF). N-terminal pro-brain natriuretic peptide (NT-proBNP), a cardiac hormone secreted during myocardial stretch, is widely used as a marker of HF severity and prognosis. Using a new device, we have recently demonstrated that lung impedance (LI), a marker of pulmonary congestion, is also strongly related to patient outcomes in HFrEF¹. The aim of this study was to assess whether this new biomarker offers improved predictive utility in monitoring patient clinical status by comparing correlations between both NT-proBNP and LI with New York Heart Association (NYHA) class in patients with either HFpEF and HFrEF.

Methods: This data is a sub-analysis of the data previously collected in the IMPEDANCE HF-reduced, and the currently ongoing IMPEDANCE HF-preserved trials. In both studies, all patients were randomized to receive Lung Impedance-guided therapy or standard therapy for heart failure. Results of the IMPEDANCE HF-reduced trial have already been published¹, and the IMPEDANCE HF-preserved trial is ongoing. The sample size used in our analysis included 285 patients with HFrEF and 67 patients with HFpEF from 2 medical centers. Patient data regarding NYHA class, NT-proBNP, and lung impedance (LI) was collected simultaneously during the initial study entrance visit, monthly outpatient clinic visits, and during hospitalizations for HF. Using a new, non-invasive surface electrode device, LI was assessed to evaluate the extent of patient pulmonary congestion. When pulmonary fluid content exceeds a patient's "dry" baseline, the electrical resistance of the lung tissue falls and LI values are lower than baseline LI. Baseline LI (BLI) for each patient was calculated during study entry and was used to determine the extent of current pulmonary congestion, the $\Delta\text{LIR} = [(\text{current LI} / \text{BLI}) - 1] \times 100\%$. The average ΔLIR over follow-up was thus used to assess pulmonary fluid overload and provide a measure of longstanding HF clinical severity.

Results: Patient demographics, echocardiographic parameters, and average LI over follow-up are presented in table 1. A total of 615 LI, NT-proBNP, and NYHA measurements were obtained in the HFpEF group and 18,496 were obtained in the HFrEF group. Among HFrEF patients, increased NYHA class was associated with significantly increased serum NT Pro-BNP and significant decreases in measured ΔLIR (Figure 1a and 1b). In the HFpEF group, patients presenting with NYHA class IV demonstrated increased serum NT-ProBNP, whereas patients with both NYHA classes III and IV showed decreased ΔLIR (Figure 2a and 2b).



Conclusion: Our data demonstrates that NT pro-BNP and LI are efficacious biomarkers for monitoring patient functional status in HFrEF and HFpEF patients. Among HFpEF patients, LI appears to be better suited in distinguishing between NYHA class III and IV patients.

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OREGON RESEARCH POSTER FINALIST - PATRICK STAUFFER

The use of Microbial Flow Cytometry to analyze the Intestinal Microbiota.

Authors: Patrick Stauffer¹; Mark Klick¹, PhD; Tammy Martin¹, PhD; Sarah Diamond², MD; James Rosenbaum^{1,3,4}, MD; Mark Asquith¹, PhD. ¹Division of Arthritis and Rheumatic Disease, Dept. of Medicine, OHSU, Portland, OR ²Division of Gastroenterology and Hepatology, OHSU, Portland, OR ³Casey Eye Institute and Dept. of Ophthalmology, OHSU, Portland, OR ⁴Legacy Devers Eye Institute, Portland, OR

Introduction: The role of the gut microbiome in the pathogenesis of autoimmune disorders such as Ankylosing Spondylitis (AS) has been well-established through means of describing gross microbial community dysbiosis between healthy controls.¹ However specific mechanisms of how pathogenic bacteria cause disease progression in AS have escaped current research despite the strong genetic association with expression of HLA-B27. We use flow cytometry to interrogate the composition and host immune response to the microbiota using two methods: Quantitative Microbial profiling (QMP), where we couple flow cytometric microbe counts with 16S rRNA sequencing² and IgA-SEQ in which we flow sort and sequence IgA coated bacteria.

Methods: Feces of healthy controls (n = 23) and AS patients (n = 24) were subjected to QMP through the combination of microbial flow cytometry and 16s rRNA sequencing. To uncover mechanisms through which major genetic risk factor HLA-B27 might contribute to AS-associated dysbiosis we subsequently compared the total frequency of IgA coated bacteria in feces of healthy individuals separated on the basis of HLA-B27 expression (n = 107 total samples, 12 of which were HLA-B27 positive). Furthermore, a subset of healthy HLA-B27 positive or negative samples were subject to IgA-SEQ (n = 12-13/group) in which IgA-coated bacteria are sorted and sequenced to identify targets of the intestinal IgA response and more broadly the impact of HLA-B27 expression on the microbiota-specific IgA repertoire. The data was analyzed using the *DADA2* pipeline implemented in R.

Results: For the first time, QMP methods revealed striking quantitative microbial differences between AS patients and healthy controls, underpinned by a dramatic near log-fold decrease in total microbial concentration as compared to healthy controls ($p < 0.01$). In healthy individuals, we observed that carriage of HLA-B27 was sufficient to impart an increased IgA response to the intestinal microbiota (frequency of IgA positive bacteria) and an altered microbiota-specific IgA repertoire (as determined by IgA-SEQ).

Conclusion: Through use of QMP we identify a number of novel quantitative differences to the composition of the intestinal microbiota in AS. We also propose that a role of HLA-B27 in AS disease pathogenesis is to drive changes in the microbiota by altering the magnitude and repertoire of the intestinal IgA response.

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OREGON RESEARCH POSTER FINALIST - CHRISTIAN LINDNER

Incidence and outcome of bacteremia during acute graft-versus-host disease involving the gastrointestinal tract following hematopoietic stem cell transplant

Authors: Christian Lindner, Jenna Petersen MD, Morgan Hakki MD

Introduction: Acute graft-versus-host disease (aGVHD) involving the gastrointestinal (GI) tract is a complication of allogeneic hematopoietic stem cell transplant (HSCT). The risk of bacteremic events after onset of aGVHD may be increased due to both mucosal disruption of the GI tract and augmented immune suppression required for aGVHD treatment. However, data pertaining to the incidence and outcome of bacteremic events in this specific setting is not well reported. The purpose of this study is to describe the incidence of bacteremic events, causative organisms, and infection attributable mortality in HSCT recipients with GI tract aGVHD.

Methods: Adult allogeneic HSCT recipients with grades 2-4 GI aGVHD occurring between 2009-2017 at Oregon Health and Sciences University (OHSU) were analyzed. Patient characteristics including grade and date of onset of GI aGVHD, age, sex, underlying diagnosis, date of death (if applicable), and source of cells used for HSCT were obtained from OHSU's HSCT registry. Bacteremic events and the causative organisms were found by review of the electronic medical record (EMR); only those occurring within 30 days of onset of aGVHD were included. Infection-attributable mortality was defined as death within 7 days of a bacteremic event. 60 day survival after aGVHD onset were compared between bacteremic and non-bacteremic patients. p-values obtained using fishers exact t-test. Kaplan-meier survival curve created using SPSS, overall comparison using Log Rank test.

Results: 159 patients were found to have grades 2-4 GI aGVHD; 56 had grade 2, 45 grade 3, and 58 grade 4. 102 patients were male and 57 female, with a median age of 59 years (range 21-81), The most common diagnosis before allogeneic HSCT was AML (N=62), 63 patients (39.6%) developed bacteremia after onset of GVHD. Bacteremic events occurred in 14.3% of patients with grade 2, 17.5% with grade 3, and 52.2% of patients with grade 4 GVHD (P=.0001 grade 4 vs. 3, P=.0014 for grade 4 vs 2, P=.77 for grade 3 vs 2). Of the 44 organisms cultured from bacteremic patients, 23 (52.3%) were gram positive, and 21 (47.7%) were gram negative. Infection attributable mortality for all bacteremic patients was 15.1% and was not significantly different between grades 2-4 GVHD. Cumulative survival at 60 days after onset of aGVHD was 55.6% for bacteremic and 72.4% for non bacteremic patients (p=.041).

Conclusion: Bacteremia with both gram positive and gram negative organisms is a common complication of GI aGVHD and disproportionately affects those with grade 4 aGVHD. Infection-attributable mortality is significant and overall long-term survival is reduced among bacteremic patients. Further studies designed to reduce the morbidity and mortality of bacteremia in this setting are needed.

OREGON RESEARCH POSTER FINALIST - HANNAH JACOB

Practices, Attitudes, and Barriers Faced by Internists and Pediatricians in Transitioning Pediatric Patients to Adult Medicine

Authors: Hannah Jacob, BS, MS*; Kayla Erspamer, BA*; Reem Hasan, MD PhD; * Contributed equally to this work

Introduction: Continuity of care can be disrupted as young adults transition from their pediatric care provider to adult primary care, increasing poor outcomes. Standardized transition programs exist to ease this transition resulting in improved adherence to care. The purpose of this study is to examine perspectives of clinicians at an academic medical center regarding current practices, knowledge, and comfort in transitioning young adult patients to adult care.

Methods: Residents, fellows, faculty members, and advanced practice providers in the Departments of Internal Medicine and Pediatrics were invited to participate in emailed surveys (136 respondents). Responses were analyzed using descriptive statistics and calculation of proportions. IRB approval was obtained.

Results: Pediatricians (94%) and internists (80%) were receptive to development of a standardized transition program. Only 33% of pediatricians began discussing transition with pediatric patients prior to age 17. 96% of internists reported no formal training related to the management of young adults with complex medical conditions or general transition care, and only 44% felt comfortable managing a young adult patient in their practice. Commonly cited challenges included uncertainty about management of a childhood condition and patients' lack of knowledge about their own condition.

Conclusion: Both pediatric and adult providers agree on the importance of developing a standardized system to ensure continuity of care for young adult patients. A lack of knowledge and training, as well as low patient self-management skills are barriers to transitioning young adult patients, especially those with complex medical conditions. Providing accessible training opportunities, developing structured programs involving all members of the interprofessional team, and optimizing use of electronic health records as part of a formal young adult transition program are feasible and measurable interventions indicated by the results of this study.

OREGON RESEARCH POSTER FINALIST - JOEY PRYOR

Asian Americans are at greater risk of new onset diabetes after transplantation

Authors: Joseph B Pryor, Ali J Olyaei PharmD, Joseph B Lockridge MD, Douglas J Norman MD

Introduction: New onset diabetes after transplantation (NODAT) affects up to 30% of non-diabetic renal transplant recipients within the first year of transplantation. While common, NODAT affects a myriad of target systems including cardiovascular, infectious, endocrine, neurologic, and the allograft itself. Though many studies have investigated the rates of NODAT among self-identified ethnicities, few have revealed potential interventions to avoid NODAT.

Methods: This was a single center, retrospective, investigator initiated study to determine the rates of NODAT among self-identified ethnicities of 304 non-diabetic kidney transplant recipients. Patients received antibody induction therapy based on immunologic risk with either basiliximab, alemtuzumab, or thymoglobulin. Maintenance therapy included tacrolimus, mycophenolate and prednisone. Patients on basiliximab and greater than 70 kg received 30 mg oral prednisone daily while patients on alemtuzumab, thymoglobulin and basiliximab and less than 70 kg received 20 mg oral prednisone daily. This was administered as a fixed dose at time of discharge with prolonged scheduled taper. The study was approved by the Institutional Review Board (STUDY00018900).

Results: Among the 304 individuals, 43 (15%) recipients developed NODAT. A higher incidence of NODAT was observed among Asian Americans (21.2%) relative to non-Asian Americans (15%). As a cohort, comparing those who developed NODAT to those who did not develop NODAT, there was no difference in weight and BMI of recipients. When subgroup analysis was performed, Asian Americans had significantly lower weights and BMI but higher incidence of NODAT ($p=0.01$). Furthermore, Asian Americans who developed NODAT had lower BMIs than Asian Americans who did not develop NODAT ($p=0.015$). When assessing dosage of prednisone received post-transplantation, Asian Americans received significantly lower dosage (mg), but when corrected for weight (mg/kg) were found to have received statistically significant more weight-based prednisone mg/kg ($p=0.008$). In addition, Asian Americans who developed NODAT received statistically more weight and BMI corrected prednisone (mg/kg and mg/kg/m²) than those Asian Americans who did not develop NODAT ($p=0.0380$). Among those who developed NODAT, there was no increased risk of rejection.

Conclusion: In conclusion, Asian Americans were found to have higher rates of NODAT and receive more weight-based prednisone relative to non-Asian Americans. Many studies have focused on lifestyle, metabolic and genetic susceptibility, but none have identified mg/kg dosing of prednisone as an iatrogenic cause to NODAT. Prednisone dosing ranged from 0.30-0.40 mg/kg and provided adequate immunosuppression without increased risk of acute rejection. Our study suggest against using >0.4 mg/kg of prednisone for immunologically low risk renal transplant recipients. This is of particular importance among the Asian American population given their demonstrated rates of NODAT and calls to question the role of fixed dosing versus weight-based dosing in transplant recipients.

PENNSYLVANIA RESEARCH POSTER FINALIST - SUSHEEL KHETARPAL

“Mechanisms of PD-1 and TIM-3 Crosstalk of Regulatory T Cells within Head and Neck Squamous Cell Carcinoma (HNSCC)”

Authors: Susheel K. Khetarpal, Amber G. Huang, Ned Mitrovich Jr., Elizabeth L. McMichael, Lawrence P. Kane, and Robert L. Ferris.

Introduction: Cancer escapes and manipulates the immune system by promoting T cell exhaustion and recruiting suppressive regulatory T cells (Tregs) to the tumor site. In HNSCC, Tregs express the well-known immune checkpoint receptor Programmed Cell Death Receptor (PD)-1, which is reported to mark “exhausted” Tregs with lower suppressive function. T cell immunoglobulin mucin (TIM)-3, a co-inhibitory/checkpoint receptor target, is also expressed by a sizeable fraction of tumor infiltrating Tregs, but the functional status of TIM-3⁺Tregs remains unclear. Given the interest in suppressing Tregs in HNSCC, elucidating and selectively undermining the molecular pathways behind PD-1 and TIM-3 cross-talk in intratumoral Tregs is essential for bettering HNSCC immunotherapy.

Methods: We have shown previously that intratumoral Tregs treated with IFN γ become dysfunctional and this IFN γ -mediated dysfunction is required for Treg response to *nivolumab* (anti-PD-1 immunotherapy). These data suggest that IFN γ can promote Treg dysfunction, but any resulting changes in TIM-3 expression have yet to be determined. Here, we ascertained whether IFN γ treated intratumoral Tregs leads to decreased TIM-3 expression, and consequently greater Treg dysfunction and improved anti-tumor outcomes in HNSCC.

A murine HNSCC tumor model was implanted in *WT* and *IFN γ R^{-/-}Foxp3 Cre-YFP* mice, immunocompetent mice with Tregs expressing and lacking the IFN γ receptor, respectively. These mice were used to create four groups: (1) *WT* mice treated with IgG (isotype control), (2) *WT* mice treated with *nivolumab*, (3) *IFN γ R^{-/-}Foxp3Cre-YFP* mice treated with IgG, and (4) *IFN γ R^{-/-}Foxp3Cre-YFP* mice treated with *nivolumab*. CD4⁺CD25^{high}Treg and CD8⁺T cells were sorted from the freshly excised HNSCC tumors of these mice. We then used a transwell assay to ascertain whether IFN γ reduced TIM-3 expression in Tregs. CD8⁺T cells and Tregs were plated in different compartments and separated by a 0.3 μ m pore filled membrane. After stimulating CD8⁺T cells to secrete IFN γ for 48 hours, TIM-3 expression of Tregs in the opposing compartment was measured using flow cytometry.

Results: Exogenous IFN- γ treatment could partially reverse the suppressive function of TIM-3⁺tumor infiltrating Treg. Anti-PD-1 immunotherapy downregulated TIM-3 expression on Tregs isolated from murine HNSCC tumors, and this treatment reversed the suppressive function of HNSCC TIL Treg. In the murine transwell assay, *IFN γ R^{-/-}*Tregs did not display a change in TIM-3 expression with anti-PD-1 treatment, whereas WT Tregs showed a downregulation of TIM-3 following anti-PD-1 treatment.

Conclusion: TIM-3⁺ Treg are functionally and phenotypically distinct in HNSCC TIL and are highly effective at inhibiting T cell proliferation despite high PD-1 expression. IFN- γ induced by anti-PD-1 immunotherapy may be beneficial by reversing TIM-3⁺ Treg suppression.

PENNSYLVANIA RESEARCH POSTER FINALIST - ACE ISIDRO

Program participation and policy evaluation without administrative data: Is homemade really better?

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Introduction: Medicare recently announced an increased focus on physician leadership in alternative payment models (APMs) moving forward. In 2013, the Centers for Medicare and Medicaid Services (CMS) expanded its bundled payment APM nationally through its Bundled Payment for Care Improvement (BPCI) Initiative. Although the impact at participating hospitals has been measured, evaluation of effects at participating physician practices has been delayed. One important reason was an initial lack of publicly available lists of participating physicians. We examined the accuracy of identifying BPCI physicians using non-CMS data because many such evaluations comparing to recent CMS-released lists are likely underway.

Methods: We identified National Provider Identifiers (NPI) for individual physicians participating in phase 2 of BPCI model 2 through a physician group practice (PGP). We used the SK&A office-based physician dataset, NPI registry, and manual website searches to collect physician NPIs, assigning them to PGPs based on organization name and address to create the "Other Data Source List" (referred to as "ODSL"). CMS subsequently made lists (referred to as "CMS List") of participating physicians available for 2015 and 2016; comparing allowed assessment of ODSL. We restricted both lists to PGPs participating in the largest single episode (major joint replacement of the lower extremity), linking data to SK&A to compare physician characteristics. We performed chi-squared tests to determine whether ODSL-identified physicians differed meaningfully from those in the CMS List.

Results: ODSL included 8,757 physicians, while the CMS List included 11,758 physicians. ODSL contained 46.4% (5,456/11,758) of physicians in the CMS List, and 62.3% (5,456/8,757) of ODSL physicians were actually in BPCI. Chi-squared tests performed by specialty, geographic region, and PGP size all rejected equivalence of the ODS and CMS lists ($p < 0.001$). On average, 70.9% (range 0-100%) of CMS-identified physicians in each specialty, 22.0% of CMS-identified orthopedic surgeons, and 33.3% of CMS-identified physical medicine/rehab specialists were missing from ODSL; 47.3% (0-100%) of ODSL-identified physicians in each specialty and 42.5% of ODSL-identified internists were missing in the CMS List. 61.0% (20-100%) and 53.8% (49.3-59.6%) of CMS-identified physicians in each state and region (Northeast, Midwest, South, West), respectively, were missing in ODSL; 42.6% (3.4-100%) and 44.4% (32.2-53.3%) of ODSL-identified physicians in each state and region, respectively, were missing in the CMS List. 49% (10-88%), 27% (0-92%), and 14% (0-93%) of CMS identified physicians in large (50+ physicians), medium (10-49), and small PGPs (<10), respectively, were missing in ODSL. However, 22%, 53%, and 74% (each 0-100%) of ODSL physicians in large, medium, and small PGPs, respectively, were missing in the CMS List.

Conclusion: ODSL had significant limitations in identifying participating BPCI physicians and was statistically different from CMS List. Policy evaluations using physicians identified from non-CMS data may have a large degree of inaccuracy

PENNSYLVANIA RESEARCH POSTER FINALIST - BRENDA FRENCH

Tumor size, FNA score, and molecular profile as predictive markers for pre-operative differentiation between encapsulated follicular variant of papillary thyroid carcinoma and noninvasive follicular thyroid neoplasm with papillary-like nuclear features

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Introduction: The incidence of papillary thyroid carcinoma (PTC) has been increasing in recent years. One of the most common variants of PTC is encapsulated follicular variant (EFVPTC). Invasive EFVPTC has a markedly elevated risk of recurrence and metastasis when compared to non-invasive EFVPTC due to tumor cell infiltration of either the tumor capsule or vasculature, allowing for distant metastasis to take place. The higher risk of adverse outcomes associated with invasive EFVPTC makes aggressive follow up and treatment of these tumors imperative. Conversely, a new entity called noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) was introduced in 2016 as a distinct subset of non-invasive EFVPTC lesions which show extremely indolent behavior, so that a lobectomy alone is considered curative for these lesions. The diagnoses of EFVPTC and NIFTP are made definitively by a pathologist after removal of thyroid tissue, but there are pre-operative findings which may suggest the invasive nature of a thyroid nodule.

Methods: Data including tumor size, FNA results, and molecular testing were obtained from 54 EFVPTC and 39 NIFTP lesions diagnosed at our institution between 2016 and 2018.

Results: Upon retrospective review, we found that invasive EFVPTC were significantly larger ($p=0.001$) and had a significantly higher Bethesda cytology scores ($p=0.01$) than non-invasive EFVPTC and NIFTP. However, the average tumor size of invasive EFVPTC (2.55 cm +/- 1.912 cm) was still well below that of the accepted threshold for definitive surgical management at 4 cm in the setting of ambiguous FNA results. Interestingly, in all NIFTP lesions with mutations detected by molecular analysis of the cytology specimen, 100% of the mutations were in the RAS gene family ($n= 10$ with NRAS Q61R mutation, $n= 1$ with HRAS Q61R mutation), while both non-invasive and invasive EFVPTC lesions showed a more even distribution between mutations in RAS and BRAF genes ($n= 3$ with NRAS Q61R mutation, $n= 1$ with HRAS Q61R mutation, $n=2$ with BRAF V600E mutation, $n= 3$ with BRAF K601E mutation).

Conclusion: These findings suggest that when evaluating a thyroid nodule, tumor size >2 cm coupled with a Bethesda score >2 on FNA should prompt a physician to consider a surgical approach rather than watchful waiting given the propensity of these two combined features to be highly associated with more invasive lesions. Additionally, the difference in the molecular profile between NIFTP and EFVPTC lesions corroborates the hypothesis that NIFTP is a biologically distinct entity from EFVPTC and emphasizes the need to correctly identify NIFTP, as its course and metastatic potential to date has been proven to be more indolent than EFVPTC.

PENNSYLVANIA RESEARCH POSTER FINALIST - MARC INCITTI

Methylene Blue as a Rescue Therapy in the Treatment of Pressor-resistant Distributive Shock

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Introduction: Seen by most premedical students in the blue bottle experiment, methylene blue is not just a popular teaching prop to demonstrate reduction-oxidation reactions. As a purely synthetic medication, methylene blue has been used almost exclusively in the operating room and the emergency room for identification of urinary tract structures during surgery and as a reducing agent in cases of methemoglobinemia, respectively. Therapeutic use of methylene blue for circulatory shock has been studied in few small randomized controlled trials and case series with consistent reduction of pressor requirements in septic and anaphylactic shocks, but no mortality benefit had been documented. The efficacy of methylene blue for circulatory shock has not been evaluated in the intensive care unit. Methylene blue's proposed mechanism during distributive shock is through the inhibition of both nitric oxide (NO) synthesis and cGMP synthesis. Recall that cGMP lowers intracellular calcium concentration in smooth muscle by shifting calcium ions into the sarcoplasmic reticulum. Nitric oxide can upregulate guanylyl cyclase, the enzyme responsible for converting GMP to cGMP. By blocking the action of both NO and guanylyl cyclase, the increased cytoplasmic calcium concentration promotes vasculature smooth muscle contraction. Another mechanism may be through the inhibition of catecholamine-*O*-methyltransferase which is responsible for the degradation of intrinsic and extrinsic catecholamines, thereby maintaining vascular tone.

Methods: We retrospectively evaluated patients with a diagnosis of septic shock who received intravenous methylene blue for recalcitrant hypotension. With a mean arterial pressure less than 65 mm Hg, hypotension secondary to distributive shock was resistant to vasopressors in the patients studied. Methylene blue was started at a bolus of 2 mg/kg IV bolus followed by 2 mg/kg/hr for 4 hours followed by 1 mg/kg/hr for 4 hours followed by 0.5 mg/kg/hr for 4 hours and then stopped. Statistical analysis was performed using the paired, two sample t-test, or Wilcoxon signed rank test where appropriate.

Results: We included eleven patients with a mean admitting APACHE II ("Acute Physiology And Chronic Health Evaluation II") score of 24.8. Following one hour of methylene blue administration, there was a statistically significant increase in mean arterial pressures from 73.2 (\pm 11.9) mmHg to 84.5 (\pm 20.5) mmHg, ($P < 0.05$).

Conclusion: Methylene blue may be useful as an adjunct therapy in patients with septic shock, resistant to standard treatment including vasopressors and adequate fluid resuscitation. The next frontier for methylene blue research should be in the intensive care unit. Larger patient samples, as well as controls, will be needed to further validate efficacy and determine if a prognostic benefit exists.

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PENNSYLVANIA RESEARCH POSTER FINALIST - JOEY JUNARTA

Endothelial Dysfunction and Blood Biomarkers in Kidney Transplant Patients

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Introduction: Cardiovascular events are the commonest cause of mortality and morbidity in kidney transplant patients (KTxPs); endothelial dysfunction and consequent atherosclerosis may play a role. There is a poor understanding of how endothelial function changes with time in KTxPs and effect of novel biomarkers are unknown.

Methods: Brachial artery flow-mediated dilation (FMD) and nitroglycerin-mediated dilation (NMD) were assessed in 18 KTxPs and 17 controls at baseline and 3-6 months after. Blood biomarkers were assessed using Luminex technology multiplex assay. All subjects were recruited after written consent and all measurements were done in our vascular laboratory under standard conditions.

Results: The median time since transplantation was 86 months (interquartile range 123 months). There were more dyslipidaemics in KTxPs compared to controls (10 vs. 3; $P=0.02$), and eGFR was lower (67.61 ± 20.25 vs. 97.59 ± 15.59 ; $P<0.01$). There was no difference in age (51.28 ± 13.29 vs. 45.82 ± 10.85 ; $P=0.19$), body mass index (25.56 ± 5.18 vs. 24.59 ± 2.59 ; $P=0.49$), diabetes status (3 vs. 0; $P=0.08$), systolic blood pressure (131.94 ± 11.79 vs. 125.53 ± 12.39 mmHg; $P=0.13$), diastolic blood pressure (82.17 ± 9.22 vs. 77.24 ± 7.61 mmHg; $P=0.10$) and vitamin D (57.56 ± 25.21 vs. 43.65 ± 22.03 nmol/L; $P=0.09$).

Fibroblast growth factor 23 (FGF-23) was higher (145.91 ± 176.79 vs. 35.78 ± 58.32 pg/ml; $P=0.02$) in KTxPs, matrix metalloproteinase 2 (MMP-2) was numerically higher (744.38 ± 578.26 vs. 552.93 ± 363.32 pg/ml; $P=0.25$), but statistically not significant. Baseline FGF-23 correlated with MMP-2 ($r = 0.52$; $P=0.03$).

No significant difference existed in vascular markers between KTxPs and controls at baseline: FMD (4.34 ± 3.45 vs. 4.63 ± 3.02 %; $P=0.79$), NMD (15.15 ± 6.08 vs. 16.00 ± 5.47 %; $P=0.67$). Markers did not change in controls upon follow-up. In KTxPs, FMD decreased (-1.52 ± 2.74 %; $P=0.03$).

Conclusion: Endothelial dysfunction worsened in stable KTxPs upon long-term follow-up. FGF-23 and MMP-2 may contribute to elevated cardiovascular risk by adversely affecting endothelial function in KTxPs.

PENNSYLVANIA RESEARCH POSTER FINALIST - LOUIS J LEVINE

What is the quality of online information on Irritable Bowel Syndrome (IBS)?

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Introduction: Irritable Bowel Syndrome (IBS) patients frequently have difficulty understanding the disease process due to its complexity and lack of definitive testing. This may lead patients to rely on web-based information, but online resources have not been adequately studied for their overall quality of information. The aim of this study was to identify the most commonly viewed IBS online resources and assess their validity, readability, and content so that providers can communicate the best quality patient education materials.

Methods: 50 adult non-patients, non-healthcare workers were asked to search "irritable bowel syndrome" on an online search engine and report the first page of results. Each website was ranked based on frequency of appearance and the top 11 websites were individually scored for validity, readability, and content by three investigators. Validity was measured by the commonly used DISCERN (maximum score 5) and HON (Health on the Net) tools. Readability of the page was measured via Flesch Reading Ease (maximum score 121.22) and Flesch-Kincaid Grade Level scales. Content was measured by a rubric consisting of terms developed by three IBS specialists pertaining to diagnosis, etiology, signs and symptoms, and treatment for IBS (maximum score 66).

Results: Participant demographics: 25 were <30 years old; 3 were 30-50; 22 were >50. 7 resided outside the U.S. 7 had previously searched IBS. The results showed that the most commonly viewed websites on a search for IBS included: Wikipedia, Medicinenet, WebMD, MayoClinic, MedlinePlus, NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases), Emedicinehealth, Dr.Axe, The Atlantic, Health.com, FASCRS (in that order). The Atlantic and MedlinePlus were not scored because they were an editorial and a reference guide, respectively. For validity, four sites were certified by HON as indicated by a visible emblem. No source scored a 5 on DISCERN primarily due to lack of details of support and information. For readability, WebMD and NIDDK scored highest with >60 on the Flesch Reading Ease Score ("Standard"); MayoClinic scored 51 ("Fairly difficult"); all other sites scored as "Difficult" (30-49) or "Confusing" (<29). Only WebMD and NIDDK were written at an appropriate grade level for patient resources (6-8th Grade). For content, only 5 sites scored >45 (NIDDK, Wikipedia, Medicinenet, Emedicinehealth, MayoClinic). There was no correlation between readability and content (correlation coefficient 0.13).

Conclusion: The majority of online resources that appear on a search for IBS have poor readability, particularly Wikipedia. Despite its high content score, Wikipedia is not recommended as an educational source for patients due to the advanced grade level required to comprehend the information. The website that had both high readability and content was NIDDK. These data suggest that healthcare providers should take an active role in directing patients to online resources that have pertinent disease information written in a simplified format. Doing so may help patients better understand their diagnosis of IBS.

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PENNSYLVANIA RESEARCH POSTER FINALIST - CHRISTY M LUCAS

"You don't have to be dying to do comfort measures": Patients' and Physicians' Perceptions of Inpatient Attire

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Introduction: Use of the patient gown has persisted for centuries. The admission process initiates the transformative act of gowning, changing a person into a patient with the one-size-fits-all gown diminishing identity, individuality, and agency. Even with a shift toward patient-centered care and evidence-based medicine, changes to the gown have been neglected due to tradition and lack of research. Patients are vulnerable to loss of dignity in hospitals, but what is less known is that wellbeing can be impacted by wearing the current gown. Providers can also react negatively to seeing patients in standard hospital attire. The purpose of this study was to explore how patients and physicians perceive the function and impact of the patient gown.

Methods: Patients (5 women, 5 men) and physicians with an inpatient and outpatient practice (6 women, 4 men) at an academic medical center participated in standardized 1:1 interviews that explored the impact of gowning. Perceptions about health status, meaning of the gown, reasons for its use, and barriers to change were asked. Interview transcripts were analyzed using an iterative process to identify themes within and between participants. Themes were then grouped into separate categories for each group and consensus on gowning reached.

Results: Patients agreed gowns were made for easy-access, and the majority described having to wear them negatively, focusing on discomfort and vulnerability. A few patients found the gowns comfortable and practical, but most wished they could have their own clothes, believing, as did the physicians, that they had no choice. Physicians echoed many of the other patient perceptions, focusing on the gown's negative appearance and its role in diminishing patient-autonomy. Select patients and physicians agreed gowns could have a therapeutic role as a physical manifestation of getting help with returning to health. Physicians viewed patients in gowns as sicker, resigned, and dependent, and patients wearing clothing as healthier, hopeful, and "on their way out the door."

Conclusion: Studies which emphasize redesign efforts are vital to improving the patient gown. Patients and physicians believe gowns need upgraded, and that doing so could enhance wellbeing, but myths about its use persist. Participants highlighted the need for an evidence-based patient gown re-design and sketched proposed modifications. A surgeon noted, "When you are a patient you expect to wear [a gown] and you can't imagine wearing anything else. That's their uniform...It's a demeaning uniform compared to everybody else's. Yeah, it may be functional to somebody, but there are other functional pieces of clothing that could be given to patients." A cancer-patient affirmed, "You lose your dignity anyway when you go to the hospital, but if there's just this little bit of something somebody can do...Comfort measures is 'let them have a pair of pajamas.'"

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PENNSYLVANIA RESEARCH POSTER FINALIST - REBECCA NOSAL

Methionine Deprivation Induced Effects on the Growth of Colon Cancer Cells and Baby Hamster Kidney Cells

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Introduction, Methionine is a key nutrient required for the synthesis of S-adenosylmethionine (SAM); SAM is the universal methyl group donor. It is known that in colon cancer cells, the promoter/CpG islands of the repair genes, such as LIG4, are hypermethylated. This causes uncontrolled proliferation and division of tumor cells, perhaps a primitive cell survival mechanism. Methionine gamma lyase deaminase (Mgld) is an enzyme that degrades methionine into alpha-ketobutyrate and methylthiol.

Methods: In this study, the Mgld gene was cloned into vectors that expressed Mgld either in the cytosol or the nucleus. The colon cancer cell line of interest (T84, ATCC® CCL-248™) and Baby Hamster Kidney Cells (BHK-21) were transfected with vectors containing Mgld.

Results: The T84 cells experience more cell death when Mgld is expressed in the nucleus as opposed to the BHK cells. In contrast, BHK experience more cell death when Mgld is expressed in the cytosol compared to T84. Both of these phenomena are reversed in the presence of Proparglycine (Pgly), an Mgld inhibitor.

Conclusion: Although overall hypomethylation typically activates gene expression and induces cell division in normal cells, we observed the opposite effect, since perhaps active DNA repair genes, induce death in cancer cells. In the cytoplasm, methionine is required for the synthesis of cysteine; cysteine in turn is required for glutathione (cells redox agent). Both cysteine and methionine are required for protein synthesis. Therefore, cytosolic dwindling of methionine will hamper protein synthesis and it should, in general, affect the growth of Mgld treated cells when compared to controlled cells. The cytosolic treatment of Mgld in the BHK cells caused cell death, whereas the nuclear treatment of Mgld in the T84 cells caused cell death. The addition of Pgly alone or in combination with the cytosolic vector increased proliferation in both cell lines, while the addition of Pgly to the nuclear vector only increased growth in the T84 cells. We conclude that the methylation status of each cancer cell type might be different and it uniquely affects their respective growths and/or proliferation. In addition, we suspect that the hypomethylation of specific DNA repair genes might trigger an apoptotic pathway resulting in T-84 cell death, a hypothesis that needs to be tested by whole genome methylation analysis.

PENNSYLVANIA RESEARCH POSTER FINALIST - ABIGAIL SCHMUCKER

Emergency Medicine Palliative Care Access (EMPallA): Preliminary Data from a Multi-Center Randomized Controlled Trial

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Introduction: Emergency department (ED)-initiated palliative care has been shown to improve patient-centered outcomes in older adults with serious, life-limiting illnesses. However, the optimal modality for providing such interventions is unknown. This study aims to compare nurse-led telephonic case management to specialty outpatient palliative care for older adults with serious, life-limiting illness on: 1) quality of life in patients; 2) healthcare utilization; 3) loneliness and symptom burden; and 4) caregiver strain, caregiver quality of life, and bereavement.

Methods: A pragmatic, multi-center, parallel, two-arm randomized controlled trial is being conducted in ED patients with serious illnesses to compare the effectiveness of two established models of palliative care: nurse-led telephonic case management and specialty, outpatient palliative care. Over the course of 3 years, 1350 patients aged 50+ years and 675 of their informal caregivers will be enrolled across nine EDs. Eligible patients: 1) have advanced cancer (metastatic solid tumor) or end-stage organ failure (New York Heart Association Class III or IV heart failure, end stage renal disease with glomerular filtration rate <15ml/min/m², or Global Initiative for Chronic Obstructive Lung Disease Stage III, IV, or oxygen-dependent Chronic Obstructive Pulmonary Disease); 2) speak English or Spanish; 3) are scheduled for ED discharge or observation status; 4) reside locally; 5) have a working telephone; and 6) are insured. Patients are excluded if they: 1) have dementia; 2) have received hospice care or two or more palliative care visits in the last 6 months; or 3) reside in a long-term care facility. Patient level block randomization is used, stratified by ED site and disease type. Research staff performing outcome assessments are blinded. Effectiveness will be compared by measuring the impact of each intervention on the specified outcomes. The primary analysis will be based on intention-to-treat.

Results: Between April 16th and October 16th, 2018, 138 patients and 44 caregivers have been enrolled. The average patient age is 69 years, 55% are female, and 55% are white. Advanced cancer is the most prevalent (48%), followed by heart failure (24%), chronic obstructive pulmonary disease (23%), and end stage renal disease (15%). The mean baseline Functional Assessment of Cancer Therapy – General (FACT-G) score is 64, which correlates with a t-score of 41.1 compared to the United States (US) adult population. Enrolled patients are actively receiving study interventions.

Conclusion: Patient quality of life at enrollment, based on the FACT-G, is below the US population average. Once patient enrollment is complete, it will be possible to compare the impact of interventions on quality of life and other outcomes.

References

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DISCLAIMER

All statements in this report, including its findings and conclusions, are solely those of the authors and do not necessarily represent the views of the Patient-Centered Outcomes Research Institute (PCORI), its Board of Governors or Methodology Committee.

PENNSYLVANIA RESEARCH POSTER FINALIST - SITARA SOUNDARARAJAN

Association Between Overall Maternal Health Status and Family Resilience: Results from a National Survey

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Introduction: The relationship between maternal health and health outcome of offspring has been studied extensively. However, there is sparse data available regarding the association between overall maternal health and the health, functionality, and productivity of the *family* unit. More specifically, measures such as family resilience in the context of maternal health are not well understood. The objective of this study was to determine if overall maternal health status is associated with family resilience.

Methods: We analyzed data from the 2016 National Survey of Children's Health (NSCH), the only national survey assessing the health of children ages 0-17 in the United States. The independent variable in this study was overall physical and mental maternal health status. The main outcome of interest was presence of family resilience. Other outcomes of interest for this study included parental aggravation and adverse childhood experiences. We estimated the association between maternal health status and family resilience with a multivariate logistic regression model, adjusting for the following covariates: current health insurance status, family structure of child's household, child race, highest education of adult in household, income level, and primary household language.

Results: Compared to mothers whose physical and mental health are not excellent or very good, mothers who had an excellent or very good physical and mental health statuses have families that showed significantly better adjusted rates for family resilience measures. Results suggest that mothers with excellent or very good physical and mental health statuses have higher odds of having families that exhibit resilience [adjusted odds ratio (AOR) 2.790, CI [2.409, 3.231]], compared to mothers whose physical and mental health are not excellent or very good. Controlling for protective factors (e.g. supportive neighborhoods, emotional help with parenting) did not change the significance of the results [adjusted odds ratio (AOR) 2.617, CI [2.245, 3.051]]. Parental aggravation and adverse childhood experiences were also identified as possible mediators of the relationship between overall maternal health status and family resilience.

Conclusion: The study's results indicate that improved maternal health status is associated with higher odds of family resilience, even after adjusting for potential confounders. These findings suggest that overall maternal health may have a unique role in shaping the way families respond to adversity. Interventions addressing the health of our nation's mothers may have potential in improving the manner in which US families withstand and rebound from adversity.

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PUERTO RICO RESEARCH POSTER FINALIST - REINALDO COLON MORILLO

Peritonitis After a Natural Disaster in Patients with Peritoneal Dialysis

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Introduction: In September 2017, Puerto Rico was hit by Hurricane Maria that left much of the island without electrical power or potable water for months, placing peritoneal dialysis patients in an extremely unsafe situation. Peritonitis is the principal infectious complication in peritoneal dialysis patients and contributes to overall morbidity and mortality. The main objective of this research was determine the incidence rate of peritonitis in peritoneal dialysis patients after Hurricanes Irma and Maria and assess any risk factors associated for it.

Methods: Retrospective cohort study from September 2017 until December 2017 of peritoneal dialysis patients. The data was collected from Atlantis HealthCare Group dialysis center in Ponce, Puerto Rico. Patients were also surveyed about the type of peritoneal dialysis performed after Hurricane Maria, the presence or lack of potable water and electrical power, structural damage (to their homes), and co-morbidities. All of the patients (No. 33) under peritoneal dialysis treatment at Atlantis HealthCare Group dialysis center from September 2017 until December 2017. The main outcome and measures of this research were to assess relative risk and hazard ratio of possible risk factors causing peritonitis in peritoneal dialysis patients after Hurricane Maria. The hypothesis being tested was formulated during data collection.

Results: The incidence rate of peritonitis was 24.20% with a fatality rate of 25.00%. Patients undergoing continuous ambulatory peritoneal dialysis (CAPD) had 14 times the incidence of peritonitis compared to those undergoing continuous cyclic peritoneal dialysis (CCPD); patients without potable water had 6 times the incidence (95% CI: 1.43 to 25.00). Furthermore, the hazard ratio for CAPD was 11.82% (95% CI: 1.24 to 100.71).

Conclusion: This study suggests there is an individual association between CAPD and developing peritonitis. There was no other individual factor with this association, although persons who lacked potable water demonstrated increased tendency towards peritonitis, with six times more probability of suffering from it. Understanding the effects of Hurricane Maria on the PD population will provide critical information to those involved in preparing for natural disasters.

SOUTH CAROLINA RESEARCH POSTER FINALIST - JULIE COURSEN

The Outpatient Parenteral Antibiotic Therapy (OPAT) Experience in a Referral Hospital in South Carolina

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Introduction: Several studies have established OPAT as an alternative to prolonged inpatient stays to reduce healthcare expenditure, decrease hospital admission times, and increase patient satisfaction. However, studies have also shown significant adverse events occurring while receiving treatment outpatient. Better understanding the factors related to unfavorable outcomes as well as successful treatment will help us optimize the OPAT experience for our patients.

Methods: We collected retrospective data through electronic medical record review on all patients discharged on IV antibiotics whose OPAT was managed by the infectious disease specialists at Greenville Health System between 1/1/17 and 6/30/17. Variables collected included demographics, insurance status, indications for antibiotics, antibiotic chosen, location of antibiotic delivery (home vs infusion center), organisms being targeted, and duration of antibiotics. We collected data on medication changes during treatment, reasons for medication change, hospital readmission rates, complications of picc lines, c.diff, and relapses of infection within 6 months.

Results: There were a total of 336 individual patients discharged on OPAT during the 6 month period. Bacteremia (25.4%), osteomyelitis (14.9%), and diabetic foot infections (12.8%) were the most common indications for OPAT with MSSA being the most common organism targeted (22.5%). 11% of patients had a medication change during their treatment course. The most common reasons were nausea/malaise (26%) and AKI (26%). Our hospital re-admission rate was 8.7%. Statistical analysis of the data indicated that home infusion was significantly more likely to result in re-admission compared to the infusion center ($p=0.02$). Also receiving antibiotics for osteomyelitis was more likely to result in re-admission compared to other diagnoses ($p=0.048$).

Conclusion: Our data indicates that self-administration of antibiotics at home results in higher re-admission rates compared to administration at infusion centers. Factors that may contribute to this difference such as compliance, co-morbidities, or frequency of nurse assessments warrant further exploration to optimize the safety of OPAT, especially in rural South Carolina.

SOUTH DAKOTA RESEARCH POSTER FINALIST - CORY R HEWITT

Inactivation of Zika virus with retention of unmodified envelope proteins

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Introduction: Zika virus (ZIKV) is an arbovirus (*Flaviviridae* family), transmitted by the *Aedes* species of mosquito. As of June 15, 2017, there have been 779,216 suspected or confirmed cases, with the bulk of these cases coming from the Brazil region. ZIKV can be transmitted through sexual contact, maternal-fetal transmission, and likely through blood transfusions. ZIKV has been linked to cases of microcephaly and brain defects in infants, Guillain-Barre syndrome, myocarditis, and other various neurologic and blood complications. The aim of this study is to evaluate the utility and effectiveness of using β -cyclodextrin (β CD) to inactivate ZIKV, with hopes of producing a highly immunogenic viral particle with no infective potential.

Methods: ZIKV was propagated in VERO cells. ZIKV was then subjected to inactivation using 200mM β CD. Western Blot, RT-PCR, and Immunofluorescence assays were used to assess the β CD-inactivated ZIKV and compare with active ZIKV. Transmission electron microscopy (TEM) was used to evaluate the viral envelope of both active and β CD-inactivated ZIKV for variation in structural integrity.

Results: A quantitative RT-PCR assay used to measure ZIKV RNA revealed a significant reduction in the amount of ZIKV RNA in β CD-inactivated virus samples. Despite this, Western blot assays using ZIKV Envelope antibodies showed retention of viral envelope protein integrity. Immunofluorescence assays using ZIKV Envelope antibodies demonstrated that the infectivity of β CD-inactivated ZIKV was negligible in cell culture, as evidenced by imaging. TEM images of individual β CD-inactivated ZIKV virions were consistent with prior observations of inactivated viruses. Further data are to be collected and analyzed as the study progresses.

Conclusion: Preliminary assessment demonstrates that β CD inactivates ZIKV without any apparent effects on the immunogenic proteins present on the surface of the virus. These results will provide essential information for pre-clinical vaccination studies in small animals.

TENNESSEE RESEARCH POSTER FINALIST - SARAH HARIRFOROOSH

The Differentiation of Patient-Derived and Commercially Available Human Adipose-Derived Stem Cells into a Neural Lineage Induced by Isobutylmethylxanthine and Dibutyryl Cyclic AMP

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Introduction: Adult stem cells have been widely utilized in a regenerative capacity due to their low immunogenicity and ability to differentiate into several lineages of mesenchymal origin, including neural [1]. Specifically, mesenchymal stem cells derived from human adipose tissue pose the benefits of their acquirement through a minimally invasive procedure of liposuction. Human adipose-derived stem cells (hADSCs) can additionally be expanded in large quantities in vitro, distinguishing the cells as a basis for research and increasing their therapeutic potential. There have been various conditions used to induce the cells into a neural lineage, including utilizing epidermal growth factor (EGF) and basic fibroblast growth factor (FGF), B-mercaptoethanol with Dulbecco's modified Eagle's medium (DMEM), dibutyryl cyclic AMP (dbcAMP) and isobutylmethylxanthine (IBMX) [2]. This study investigated differences in temporal expression of neural cell markers between patient-derived and commercially available stem cells with induction by IBMX and dbcAMP to assess the potential utilization of patient-derived stem cells as a novel treatment for peripheral nerve injuries in the future.

Methods: Human adipose tissue was obtained from two patients undergoing panniculectomies and Human Adipose-Derived Mesenchymal Stem Cells were purchased from American Type Culture Collection (ATCC). Cells from these sources were induced into a neural lineage in complete growth media with four different concentrations of IBMX and dbcAMP for 24 hours and 6 days. After an optimal concentration of IBMX and dbcAMP was obtained, a 12-day time course was completed to assess for differences in the expression levels (determined by immunofluorescence) of the neural cell markers Vimentin, Glial Fibrillary Acidic Protein (GFAP) and a calcium binding protein B (S100 β) between the patient-derived and ATCC cells [3,4]. In addition, cell polarity percentage analysis was performed on patient-derived and ATCC stem cells in comparison to uninduced control cells.

Results: A stronger fluorescence for GFAP and S100 β and a more diverse morphology was observed in Vimentin stained cells at the concentration of 0.75mM IBMX/1.0mM dbcAMP compared to three other tested concentrations. Patient-derived and ATCC cells showed expression of S100 β by 9 hours with a decreased intensity of S100 β starting at 6 days. Additionally, patient-derived cells induced with IBMX and dbcAMP were slightly positive for GFAP, but not ATCC cells, starting at 3 days and 6 days. Moreover, the combination of IBMX and dbcAMP induced one of the patient-derived ADSCs to project more extensions compared to uninduced control cells at 6 days post-induction.

Conclusion: With the differences in expression of the neural cell markers S100 β and GFAP observed between patient-derived and commercially available hADSCs, this data suggests that patient-derived hADSCs are a

better source to study the differentiation of stem cells into neural-like cells compared to ATCC cells. Future work will include additional patient-derived hADSCs to confirm the results of this study.

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TEXS RESEARCH POSTER FINALIST - MICHAEL LAPELUSA

How Does Race and Gender Affect the Risk of Anemia in a Cohort of Predominantly Hispanic Heart Failure (HF) Patients Seen in a Community Hospital in the Rio Grande Valley (RGV)

Authors: Michael LaPelusa MS3, Andrea M Cordero-Reyes MD, Francisco Avellan MD, Daniella Concha MS3, Laura Garcia MD, FACP, James Hanley MD, MACP

Introduction: Anemia in patients with heart failure (HF) is common. Data reported shows a variable prevalence ranging from 10-40%. Additionally, it has also been demonstrated that it is associated with poor outcomes. Multiple risk factors have been shown to contribute to the presence of anemia in HF patients. The population of the Rio Grande Valley (RGV) is unique in the fact that it is composed mostly of Hispanics (87%) with high obesity rates and multi-morbidities. We were interested in determining the risk factors for anemia in HF patients in our population in the lower RGV.

Methods: We performed a retrospective chart review of patients admitted with a diagnosis of HF (Heart Failure with Preserved Ejection Fraction HFpEF, Heart Failure with Reduced Ejection Fraction HFrEF or combined) during the year 2017 to our community hospital. Patients' charts were reviewed for multi-morbidities, laboratory data, and anemia treatments. Outcomes were assessed as readmissions and death within 1 year from index admission. Definitions were used according to preestablished guidelines. Statistical analysis was done using Minitab software and univariate and multivariate logistic regression analysis.

Results: A total of 320 patients were evaluated. The average age was 71 ± 14 , 121 (38%) were female, 229 (72%) were Hispanics, and average BMI was 31 ± 7 . 118 (37%) patients had HFrEF and 102 (32%) had HFpEF. 218 (68%) had coronary artery disease, 280 (88%) hypertension, 188 (59%) diabetes mellitus, 149 (47%) chronic kidney disease, and 102 (32%) atrial fibrillation. Of 320 patients that were evaluated, 185 (58%) had anemia with a mean hemoglobin level of 10 ± 1 mg/dl.

The major risk factors for anemia in our patient population were Hispanic race with an odds ratio (OR) of 1.8 (CI 1.01-2.3) p-value 0.03, HFpEF with an OR 1.6 (CI 1.2-2.6) p-value 0.04, female gender OR 2.3 (1.42-3.74) p-value 0.0007, and CKD with an OR 2.6 (CI 1.6-3.0) p-value 0.001 - all adjusted to age. Obesity and its different classifications was not a risk factor for anemia. Mortality and readmission rates were higher in patients with anemia (5.4% vs 2.9% and 34% vs 31% respectively).

Conclusion: We found that women were more likely to have anemia than men, confirming previous observations. Additionally, Hispanics were more likely than non-Hispanics to have anemia, which has been suggested in previous studies. This probably accounts for the high prevalence of anemia in our patient population. We had anticipated that obesity would be a risk factor, but thorough analysis of the data could not detect any increase in anemia no matter the degree of obesity. We believe that further studies are warranted to evaluate this subset of HF patients since they are at higher risk of worse outcomes.

TEXAS RESEARCH POSTER FINALIST - KAYLYN SNOOK

The influence of a faith based medical school on the uptake of HPV vaccination in a school district environment.

Authors: Dr. Anil Mangla- public health director, Kaylyn Snook- second year medical student

Introduction: The purpose of this assessment is to analyze the rates of HPV vaccine coverage in the past decade at Southside High School, Southwest High School, and Harlandale High School in San Antonio, Texas. We will compare rates at the South San Antonio school districts where University of the Incarnate Word School of Osteopathic Medicine (UIWSOM) implemented vaccine drives. A second concurrent analysis would be completed by comparing vaccine coverage in North San Antonio (higher income households) which would provide data about how the South and North San Antonio differentiate with the UIWSOM vaccine campaign.

Methods: This study analysis will be carried out at UIWSOM's campus and surveys will be collected at the Southside, Southwest, and Harlandale high schools. Data on HPV vaccination coverage will be provided by MetroHealth and the San Antonio Immunization Registry. All data that will be accessed will be de-identified and at a zip code level. Subjects will include high school students from Southside, Southwest, and Harlandale high schools. Subjects will be completely voluntary, and no data collected will be identifiable. Exclusion criteria are students that haven't been attending one of these three schools for the past two years. If under the age of 18 parental consent forms must be signed to participate. These surveys will be completed through administration from faculty of each school district.

Data analysis will be conducted at UIWSOM campus and using STATA within the public health department our epidemiologist will use a variety of biostatistical testing including student T-test, ANOVA's, and HEAT maps to demonstrate the effectiveness of this evaluation within district three, South San Antonio.

Results: Preliminary data that has been published in the Rivard Report for 2017 and 2018. In 2018, UIWSOM students and faculty administered 591 vaccines to 284 youth at four vaccination events at Southside and Southwest independent school districts. Of the vaccinations administered, 165 were HPV. Parental refusal rate was an astoundingly low 3 percent, compared to the 87 percent cited in traditional public and private clinical settings.¹

This was a very effective intraprofessional collaboration between medical, pharmacy, and nursing students and the community partners being the school districts. Our results for the current study demonstrating the efficiency and efficacy of vaccine rates within the Southside and the Northside are being analyzed.

Conclusion: The high rates of HPV vaccination rates achieved at the UIWSOM clinics can be attributed to the time students and teachers spend answering parents and children's questions that might otherwise not be addressed. Countering controversy and mistrust that follow the HPV vaccine. UIWSOM being a faith based medical school provides the space for patients to receive the necessary vaccinations free of charge while gaining an understanding of why they are recommended in a faith based setting.

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TEXAS RESEARCH POSTER FINALIST - CORY WILSON

Altered Expression of Developmental Gene *Sine Oculis Homeobox Homolog 1 (Six1)* in Idiopathic Pulmonary Fibrosis

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Introduction: Idiopathic pulmonary fibrosis (IPF) is a spontaneously occurring chronic and irreversible lung disease. Treatment for IPF is extremely limited, eventually leading to the need for lung transplantation. The pathophysiology of lung fibrosis is not fully understood, but it is hypothesized to be driven by the loss of alveolar epithelial cell integrity, specifically the type II epithelial cells (AECII), that leads to altered repair and fibroproliferative injury. Recapitulation of developmental genes, like Sonic hedgehog (Shh), have been reported to play a role in the development of IPF, however the role these genes play in IPF is poorly understood.

In this project we have looked at the developmental gene *Sine Oculis Homeobox Homolog 1 (Six1)*. *Six1* is a transcription factor that is only normally expressed *in utero* and is essential for normal lung development and has also been shown to be aberrantly expressed in lung and breast cancer. We have preliminary data that demonstrate increased *Six1* expression in the AECII of IPF patients with the hypothesis that increased *Six1* expression levels in AECII modulates *Shh* expression to promote aberrant repair processes that contribute to lung fibrosis.

Methods: In order to study the role of *Six1* in the epithelium, we utilized transgenic mice lacking *Six1* in surfactant protein C (SPC) Cre expressing cells that target type II lung epithelial cells; termed *Six1^{f/f} SPC Cre*. These mice were exposed to a chronic model of fibrosis using bleomycin (BLM) 0.035 U/g, intraperitoneal (IP) injections twice weekly for 4 weeks or PBS (control). Flash frozen and paraffin-embedded (FFPE) lung tissue was collected after surgery. Immunohistochemistry and histological analysis were performed to evaluate and identify markers of fibrosis. *In vivo* lung mechanics studies were performed using the forced oscillation technique using the Flexivent. Using human explant tissue from IPF patients, along with COPD patients and healthy controls, RT-qPCR and Western blots were performed to evaluate the expression profiles of *Six1* in human disease.

Results: We demonstrate a significant reduction in fibrosis in *Six1^{f/f} SPC Cre* mice when compared to the control SPC Cre mice. These are consistent with improved *in vivo* lung function measured using the Flexivent, including increased static compliance and lowered tissue resistance in the *Six1^{f/f} SPC Cre* mice compared to SPC Cre controls. We demonstrate a reduction in fibrosis and improved lung function in the *Six1^{f/f} SPC Cre* mice when treated with delayed tamoxifen on day 15 after fibrosis has been established. The human IPF samples showed an increase in *Six1* protein expression and transcript levels compared to both COPD and control samples.

Conclusion: These observations suggest that the developmental gene *Six1* could play a novel role in the pathogenesis of pulmonary fibrosis and could provide a unique drug target for future development.

TEXAS RESEARCH POSTER FINALIST - JAKE B WILSON

Specific Neuroanatomical Abnormalities Identified in Cyclic Vomiting Syndrome Based on Brain MRI Analysis

Authors: Jake Wilson, Hugo Sandoval, Marisol Ramirez, Irene Sarosiek, Jose Gavito-Higuera, Carola Mullins, Tyler Davis, Richard W. McCallum, Roshni Mandania, Osagie Usen

Introduction: Cyclic vomiting syndrome (CVS) in adults is a disorder characterized by recurrent abrupt bouts of nausea, vomiting, and abdominal pain separated by variable symptom-free periods that may last from days to months. Major etiological factors established by previous studies include migraine, stress, and marijuana usage. A dysregulation of central nervous system (CNS) pathways and neuroendocrine mediators may play a role in pathophysiology. Despite the potential role for CNS contributions to CVS, literature regarding CNS neurobiological differences that occur with CVS is limited. The current study investigated whether there are CNS neuroanatomical differences in acutely symptomatic CVS patients during relapse compared to controls using brain magnetic resonance imaging (MRI).

Methods: 23 CVS patients were enrolled and 20 healthy controls were matched based on age and gender. CVS patients were scanned during an acutely symptomatic episode. Risk factors identified in CVS patients included 14 with migraines, 14 with high levels of stress, 10 with chronic marijuana use, and 6 with all 3 risk factors. High-resolution anatomical Magnetization-Prepared Rapid Gradient-Echo (MP-RAGE) images were obtained in each participant. MP-RAGE is a radiology sequence for structural brain imaging that captures high tissue contrast and provides high spatial resolution. Images were preprocessed using standard pipelines in FreeSurfer and tested for differences in cortical thickness and subcortical volume between CVS subjects and healthy controls. Surface-based results were thresholded and corrected for multiple comparisons using Monte Carlo simulation.

Results: Surface-based cortical thickness analysis revealed that CVS patients had significantly lower cortical thickness in bilateral precuneus (left: $p = .001$; right: $p = .0002$), left superior frontal gyrus ($p = .008$), and right precentral gyrus ($p = .0084$) than healthy controls. No cortical differences were found between marijuana and non-marijuana subgroups of CVS patients. Subcortical results identified reduced cortical volumes in non-marijuana using CVS patients in bilateral hippocampus (left: $p = .002$; right: $p = .001$) and amygdala (left: $p = .023$; right: $p = .038$). The marijuana subgroup had significantly greater cortical volumes in bilateral putamen (left: $p = .05$; right: $p = .03$) and pallidum (left: $p = .004$; right: $p = .01$) relative to non-marijuana CVS patients.

Conclusion: Symptomatic CVS patients had cortical thinning relative to healthy controls in the precuneus and caudal regions of prefrontal cortex. Non-marijuana CVS subgroup had significantly lower subcortical volume measures in the amygdala and hippocampus vs. healthy controls. Marijuana subgroup were similar to controls and had greater basal ganglion cortical volumes consistent with increased dopaminergic stimulation. The precuneus is involved in visuo-spatial, vestibular processing and self-awareness, which suggests a potential sensory-integration or vestibular basis for CVS. The amygdala and hippocampus are involved in processing pain, emotion, and stress which are relevant to CVS risk factors. Marijuana subgroup findings may differentiate marijuana associated CVS from other etiologies. Our results provide possible novel brain MRI evidence for a CNS neuroanatomical basis of CVS with potential implications for targeting future therapy.

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WEST VIRGINIA RESEARCH POSTER FINALIST - DYLAN WEAVER

The Role of Text Message Reminders in Adherence to Bowel Preparation in Outpatient Colonoscopies - A Preliminary Abstract

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Introduction: Bowel preparation prior to colonoscopy is essential in achieving proper diagnostic quality of the procedure. Poor preparation can lead to missed lesions, increased time per procedure, and repeat procedures. Using text messages as a reminder should improve the quality of a bowel preparation in patients receiving outpatient procedures. The study aims to gather patients receiving outpatient colonoscopies and to use the Boston Bowel Preparation Score to grade the quality of colonoscopies. We expect to see statistical evidence of improvement in bowel preparation in patients receiving text message reminders.

Methods: Patients were consented in outpatient clinics and then placed in either a text messaging group or in a control group. Patients in the text messaging group received 5 text message reminders prior to their procedure. These text messages reminded patients to fill their prescriptions, start a clear liquid diet, take Dulcolax tablets, mix the preparation solution, and to stop eating. Patients were assigned a numerical value for the quality of the bowel preparation at the time of their procedure using the Boston Bowel Preparation score.

Results: Through 30 patients, there is not yet statistical significance in receiving bowel preparation reminders. Mean score in the text message reminders group is 7.00, while mean score in the control group is 6.79. There was no statistical significance for this in a Mann-Whitney test at this time. With more patient enrollment, the gap in the mean is expected to increase, giving statistical significance to this test.

Conclusion: The patient population for this study was limited which factored in to the lack of statistical significance. There was, however, a raw mean score increase in quality in patients who received text message reminders prior to their procedure. With this information, we believe that with a larger sample size, there might be a statistically significant correlation between patient bowel preparation quality and the use of text message reminders. There might also be improvement in the time of procedure and a decrease in the number of repeat procedures required, which will improve patient care. Future studies should be performed with a larger sample size to prove this.

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MEDICAL STUDENT CLINICAL VIGNETTE PODIUM PRESENTATIONS

COLORADO CLINICAL VIGNETTE PODIUM PRESENTATION - PRIYA CHOPRA

A Great Imitator of Positional Vertigo

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Introduction: Vertigo with associated falls is a frequent cause of admission in elderly patients. We present the case of a patient in which a systematic approach will reveal common and less common causes of falls.

Case Presentation: A 73-year-old woman presented after a fall at home resulting in a forehead hematoma in the setting of a four-month history of progressive dizziness and recurrent falls. She described the dizziness as “room spinning” exacerbated by changes in position; she also had a two-year history of right-sided tinnitus and progressive hearing loss. Her past medical history was notable for atrial fibrillation, type 2 diabetes mellitus with peripheral neuropathy, and hypertension. Medications included warfarin, NPH insulin, lisinopril, metoprolol, baclofen, tizanidine, and hydrocodone. Vital signs including orthostatics were normal. Cardiopulmonary exam was normal. Neurologic examination showed terminal dysmetria and deficits in bilateral lower extremity proprioception. Hemoglobin, glucose, troponin, TSH, B12, and HIV were all normal, and her INR was therapeutic. ECG showed sinus rhythm, and interrogation of the patient’s loop recorder placed for her falls was unremarkable. CT and MRI of the brain were unremarkable. A prior audiometry report showed isolated right-sided neurosensory hearing loss. *Treponemal pallidum* antibody was positive, with subsequently positive RPR at 1:2 and a positive confirmatory FTA-ABS. Cerebrospinal fluid (CSF) protein was elevated at 58, and CSF VDRL was non-reactive. As she had a negative RPR 11 years prior and scored 18/25 on a partially completed Mini-Mental State Examination, the patient was treated for neurosyphilis with continuous penicillin G infusion for 14 days with improvement in her vertigo and tinnitus but not hearing.

Discussion: Over 800,000 patients are hospitalized each year due to falls, and the possible etiologies of recurrent falls are numerous. Our patient had several potential causes for her falls, and many of which were systemically excluded from the differential, but her neurologic and vestibular symptoms gave concern for neuro and oto-syphilis.

Syphilis can present with both hearing loss and vertigo. This occurs when *T. pallidum* invades the cochleovestibular system resulting in otosyphilis, or the cerebrospinal fluid (CSF) resulting in neurosyphilis. In neurosyphilis, extra-otic symptoms such as impaired proprioception, stroke, and dementia may also be present. To differentiate neurosyphilis from otosyphilis, a lumbar puncture should be performed. Making this distinction is important, as the treatment may differ. The literature currently suggests intravenous penicillin G treatment for neurosyphilis; however, there is controversy regarding treatment for otosyphilis. Some studies suggest that three doses of intramuscular penicillin is sufficient, while other experts recommend the same treatment as neurosyphilis due to concerns of incomplete eradication.

This case exemplifies the importance of a thorough diagnostic evaluation after recurrent falls and peripheral vertigo, including ruling out “the great imitator.”

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ILLINOIS CLINICAL VIGNETTE PODIUM PRESENTATION - JEAN ALYXA VENDIOLA

Patient with seizure disorder complicated by lamotrigine-associated hemophagocytic lymphohistiocytosis

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Introduction: Hemophagocytic lymphohistiocytosis (HLH) is a rare and potentially life-threatening disease characterized by a severe inflammatory reaction. HLH is thought to be a disorder of cytotoxic cells which causes a proliferation of histiocytes that precipitate a cytokine storm. Patients typically present with fever and rash and if not recognized and treated promptly may develop hematologic and multi-organ dysfunction. Lamotrigine-associated HLH is a poorly understood process with only 2 cases of FDA reported and confirmed lamotrigine-associated HLH in the United States. In this case, we present a patient with confirmed HLH who initially presented to our hospital for seizure.

Case Presentation: A 40-year-old male with a history of seizure disorder presented as a transfer from an outside hospital following a witnessed seizure. At the outside hospital, the patient had a fever, white blood cell count of 1.6 thousand/mcL, platelet count of 77 thousand/mcL and physical examination at that time showed a rash. CT of the abdomen revealed splenomegaly. After transfer to our hospital, the patient continued to have elevated temperatures and laboratory studies revealed bicytopenia and elevated liver enzymes. Skin examination revealed a blanching macular non-raised erythematous rash on the upper body without skin sloughing. There was an initial concern for Steven-Johnson Syndrome and HLH as the patient was recently started on lamotrigine 3 weeks earlier and due to developing cases that showed a relationship between lamotrigine and HLH. Measured ferritin levels were elevated at 35,335 ng/mL. Lamotrigine was discontinued, and the patient started levetiracetam to control seizures. Bone marrow biopsy showed mildly hypercellular bone marrow with myeloid and megakaryocytic hyperplasia, increased histiocytosis showing hemophagocytosis, and increased CD3 positive small lymphocytes supportive of HLH. The significance of the increase in CD3 was unclear. Soluble CD5 was 10,680 pg/mL. The presentation of fever, splenomegaly, bicytopenias, hyperferritinemia, high soluble CD5, and hemophagocytosis on bone marrow biopsy fulfilled 6 out of 8 of the HLH-2004 criteria. The patient began induction therapy of etoposide and dexamethasone and was given cefepime for treatment of his neutropenic fever. He was discharged after the 5th dose of etoposide and dexamethasone after his counts improved and ferritin decreased to 1,688 ng/mL. The patient was also discharged with a new prescription of lacosamide to control his seizure disorder given his significant reaction to lamotrigine.

Discussion: The presentation of HLH can be nonspecific given overlap with other serious and more common conditions such as sepsis. Early diagnosis requires a thorough history and physical that evaluates any changes to a patient's medication regimen. One other patient with reported lamotrigine-associated HLH was also treated with etoposide and dexamethasone. To our knowledge this is the first diagnosed case of lamotrigine-associated HLH in an adult patient with seizure disorder.

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INDIANA CLINICAL VIGNETTE PODIUM PRESENTATION - ADEEL SATTAR CHAUDHRY

Benign meningioma with pulmonary metastasis: a rare presentation.

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Introduction: Meningiomas are the most common primary brain tumor and are usually benign; up to 9% have atypical or malignant histological features. Meningiomas are classified according to World Health Organization (WHO) morphologic criteria into three grades- benign (grade I), atypical (grade II), and malignant (grade III). The WHO grading system correlates with outcome. Only 0.1% of all meningiomas demonstrate metastases, and, of these cases, almost all are WHO grade II or III and/or develop metastasis at time of tumor recurrence. We describe a rare case of a patient with WHO grade I meningioma with pulmonary metastases discovered at the time of intracranial meningioma diagnosis.

Case Presentation: A 68-year-old Caucasian man with an unremarkable past medical history initially presented with left-sided weakness and left-sided visual field deficit. Magnetic resonance imaging (MRI), ordered due to concern for a cerebrovascular accident (CVA), noted a right temporal infarct, and MRI of the brain noted a homogeneously enhancing skull base tumor with lytic erosion of the skull, epidural extension, and posterior occlusion of the sagittal sinus. Subsequent CT chest and abdominal scans showed multiple pulmonary and spinal lesions. Simultaneous discovery of the intracranial mass, lung, and spine lesions led to suspicion of metastatic cancer. Positron emission tomography (PET) scan was unremarkable. Biopsy of a pulmonary nodule showed meningeal cells positive for progesterone receptor, with a differential of pulmonary meningothelial nodule and metastatic meningioma. The patient then underwent surgical resection of the intracranial mass. Pathology revealed meningeal cells positive for progesterone receptor, with same immunophenotype and morphology as the lung nodule. Secondary pathological review of the brain tumor confirmed a WHO grade I meningioma (transitional type) with a Ki67 index around 5%. There was no necrosis, patternless growth, or brain invasion that would qualify the tumor for a higher WHO grade. Spinal biopsies of T9 and T12 lesions revealed benign hemangiomas. Molecular sequencing of the tumor revealed heterozygosity of NF2 and overexpression of AR, EGFR, and MET genes for his benign histology.

Discussion: We describe a rare case of metastatic benign meningioma, with pulmonary metastasis identified at time of intracranial meningioma diagnosis. Metastatic meningioma should be considered in a patient with intracranial imaging consistent with meningioma with simultaneous pulmonary nodules. Lung metastases are the most common extracranial site of metastasis from meningioma, accounting for 60% of cases. Complete surgical resection of the tumor is the preferred management for large or symptomatic tumors. Adjuvant radiation therapy is recommended to improve local control in patients with subtotal tumor resection in poorly accessible areas, such as the skull base mainly for grade 2 and 3 meningiomas. Resection or radiating the recurrences has been the standard of care. Data are lacking on systemic treatments in regards of metastatic disease, particularly among patients with WHO grade I tumors.

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OHIO CLINICAL VIGNETTE PODIUM PRESENTATION - ALEXANDER BOSCIA

A Sweet Success: Osmotic Reduction of Prolapsed Stoma Using Table Sugar

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Introduction: Stomal prolapse is a common late complication of stoma creation with variable incidence depending on bowel location, creation technique, disease process, or emergent vs elective creation¹. Loop ileostomy is associated with the lowest incidence of prolapse at approximately 2%². Risk factors include large abdominal-wall openings, inadequate bowel fixation to the abdominal wall during surgery, increased abdominal pressure, lack of fascial support, obesity, pregnancy, and poor muscle tone³. Although functionally benign and painless in most cases, rare complications of prolonged mucosal exposure include ulceration, bleeding and incarceration¹. Each year, approximately 120,000 patients undergo ostomy surgery with up to 1 million patients with current temporary or permanent stomas⁴. It is therefore extremely common for a general internist to be faced with the care of an ostomate. Knowledge of the management of common stomal complications is essential in providing patients effective, high-value care and potentially avoiding of the need for surgery as demonstrated in this case.

Case Presentation: A 30 year old patient hospitalized for management of a Crohn flare complicated by perianal fistulas, status-post loop ileostomy 8 months earlier developed recurrent stomal prolapses to approximately 8 centimeters beginning the third day of hospitalization. Patient was nonchalant about the event and reported that the stoma would prolapse and reduce spontaneously every now and then since the birth of her second child by Caesarean section. The patient also reported being under a significant amount of stress as a result of her chronic condition and believed that might be associated with the prolapse. Manual reduction of the initial prolapse was attempted multiple times and failed. Patient reported a significant amount of pain at the site of prolapse with each attempt at manual reduction. Visual inspection of the stoma revealed no signs of incarceration and stoma functioned appropriately in its prolapsed state. The patient remarked off-hand that the last time an irreducible prolapse occurred, her surgeon recommended putting table sugar on it. A brief search of the literature revealed few case studies supporting the use of table sugar in the reduction of stomal prolapse. Application of approximately 50 packets of granulated table sugar from the hospital cafeteria to the stoma resulted in an immediate (within minutes), observable shrinkage and desiccation of the stoma followed by successful manual reduction.

Discussion: Five case studies have shown success with osmotic reduction of stomal prolapse using table sugar each of which describe almost identical scenarios of prolapses irreducible to manual reduction that either reduced spontaneously or were amenable to manual reduction following application of significant quantities of table sugar (several spoonfuls)⁵⁻⁹. This seemingly well-kept secret requires wider dissemination in the field of general medicine as an additional conservative measure for treating prolapsed stomas in an effort to avoid surgical correction.

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TEXAS CLINICAL VIGNETTE PODIUM PRESENTATION - AYDIN ZAHEDIVASH

Castleman Disease: The Confounding Role of Immune Dysregulation in the Setting of Chronic Disease

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Introduction: Multicentric Castleman Disease (MCD) is a systemic disease characterized by angiofollicular lymph node hyperplasia often associated with human herpes virus 8 (HHV8) and human immunodeficiency virus (HIV). We demonstrate a case of idiopathic MCD and hypothesize that the etiology may be due to immune dysregulation triggered by uncontrolled diabetes mellitus rather than the common viral coinfections.

Case Presentation: A 33-year-old man with history of hypertension, asthma, and uncontrolled type 2 diabetes mellitus presented with wheezing for 1 month with only mild improvement when using his albuterol inhaler. He reported night sweats and productive cough with brown and green sputum and occasional bloody streaks for one month accompanied by a 100-pound weight loss over the past year. He denied tobacco use, sick contacts, recent viral illness, and recent travel. He is a carpenter by trade and has no pets. The physical examination showed vital signs that were within normal limits, moderate expiratory wheezing throughout lung fields, and painless submental, bilateral submandibular, bilateral femoral, bilateral axillary, and left epitrochlear lymphadenopathies, averaging 2-3 cm in size with no hepatosplenomegaly. A chest x-ray showed bilateral reticulonodular infiltrates, but no consolidation. Routine bacterial, AFB, and fungal cultures were negative as were HHV8 and HIV viral serologies. Glucose level on admission was 685 mg/dL and his HbA1C was greater than 14%.

The patient had significant improvement in his wheezing after receiving an empiric course with azithromycin-ceftriaxone and was able to walk for 5-10 minutes without shortness of breath. However, physical exam revealed only a mild regression of the diffuse lymphadenopathy and chest x-ray showed only mild regression of the bilateral reticulonodular infiltrates. The patient underwent a femoral lymph node biopsy given the persistent lymphadenopathy and radiological findings. Pathology results revealed Castleman Disease, vascular/hyaline type.

Discussion: This patient's case demonstrates an unusual presentation of MCD, considering the younger age of diagnosis and the absence of the common viral coinfections present in over 50% of cases. Cases of MCD without HHV8 and HIV coinfection are generally deemed to be idiopathic [1][2]. In addition to its association with HHV8 and HIV however, MCD has been associated more broadly with immune dysregulation [1][2]. Pertinent to this patient, it has been seen that hyperglycemia can alter various aspects of the immune response, in some cases interrupting antigen recognition pathways which can lead to a proinflammatory state [3], predisposing to MCD [1][2]. Additionally, the increased angiogenesis in chronic states of hyperglycemia further predisposes patients to MCD. This patient's young age in conjunction with uncontrolled blood glucose levels point to a possible link between MCD and the immune system dysregulation seen in uncontrolled diabetes mellitus, providing motivation for further investigation of the association in patients with a younger age at diagnosis.

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MEDICAL STUDENT CLINICAL VIGNETTE POSTER FINALISTS

ARIZONA CLINICAL VIGNETTE POSTER FINALIST - DINA JABER

A Rare Case of Pituitary Adenoma: The Mysterious Crooke's Cell Adenoma

Authors: Dina Jaber MS3, Jessica Padniewski MS4, Russell Pluhm MS4, Dr. Kartoumah MD, and Dr. Horani MD

Introduction: Cushing's disease is defined by excess cortisol and can be caused by endocrinologically functional, adrenocorticotrophic hormone (ACTH)-producing pituitary corticotroph adenomas[1]. Excess cortisol leads to a cytoplasmic accumulation of cytokeratin filaments and hyalinization which characterizes Crooke cell tumors, a rare variant of corticotroph adenoma[2]. Crooke's cell tumors are very rare (largest case series of 36) reported by George et al., aggressive, and prone to recurrence after resection which makes identification and distinction from other adenomas crucial[2].

Case Presentation: A 42-year-old Caucasian male, with a history of obesity, HTN, DM2, and refractory hypokalemia presented to the hospital as a direct admit with symptoms of headache, eye pressure, pedal edema, and weight gain for 4 weeks. Despite interventions, his symptoms didn't improve and suspicion for Cushing's syndrome increased.

The patient had a cushingoid appearance with positive parinaud sign (limited upward eye deviation) both suggestive of possible pituitary mass. CT head revealed a 1.2cm right pituitary macroadenoma with remodeling of sella turcica. Random cortisol 39.6 and ACTH 140. Low and high dose dexamethasone suppression test failed to suppress cortisol levels which suggested ectopic hypercortisolism. Inferior petrosal sinus sampling confirmed right sided pituitary Cushing's as the source of hypercortisolemia. The patient underwent endoscopic endonasal transsphenoidal (EET) resection of pituitary macroadenoma with limited visualization secondary to cavernous sinus bleeding. Initially postoperative cortisol levels decreased but then started to rise increasing suspicion for residual sellar tumor. The patient underwent repeat EET resection after which cortisol levels dropped and reached a nadir of 3.0 with ACTH 13. Pathology results revealed Crooke cell variant adenoma.

Discussion: Crooke's cell tumors are a rare variant of pituitary adenoma and are important to distinguish from other adenomas due to their unique cellular behavior. The cause of hyalinization within these tumors is unknown. It is also unclear as to why this hyalinization results in increased ACTH production as hyalinization typically results in loss of function[3]. These tumors are also very aggressive and prone to recurrence even after resection. Some patients with Cushing's syndrome and macroadenoma may fail high dose dexamethasone suppression testing and behave as ectopic Cushing's syndrome[4]. If patients with evidence of pituitary tumor fail dexamethasone suppression test it is important for clinicians to maintain suspicion of aggressive tumor variants such as Crooke's tumor which require close follow up and management including possible radiation therapy[5]. In conclusion, this case highlights a Cushing's syndrome caused by a rare variant of pituitary adenoma, a Crooke's variant tumor.

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ARIZONA CLINICAL VIGNETTE POSTER FINALIST - NOBEL NGUYEN

Reduced pain and increase in quality of life with cyclic pamidronate therapy for Adults with Osteogenesis Imperfecta Type III, A Case Presentation.

Authors: Nobel Nguyen OMS I, Rupashree Mandala OMS II, Talal Dajani, MD, A.T. Still University School of Osteopathic Medicine

Introduction: As a heritable bone disease, Osteogenesis Imperfecta (OI) is caused by a defect in type 1 collagen, and can lead to severe bone fragility, lifelong debilitation, and disability². OI type III is associated with severe osteoporosis, recurrent and pathological fractures². Bisphosphonate drug class is used as an off-label for the treatment of both children and adults living with OI. We describe a case of an adult woman with OI type III treated successfully with cyclic pamidronate infusions over eight years.

Case Presentation: AL is a 48-year old female with OI type III who presented to endocrinology clinic with severe chronic pain and recurrent fractures. Initial evaluation revealed 10 fractures at birth, over 150 fractures documented lifelong, and 44 orthopedic surgeries. To manage her pain level to 3/10, AL required daily propoxyphene (50 mg daily), acetaminophen with codeine as needed. AL rated quality-of-life, 3/10, due to chronic pain and immobility. AL started treatment with pamidronate 60 mg IV every 90 days. During initial infusion, she noted severe muscle aches and was diagnosed with hungry bone syndrome. This was resolved with supplements of vitamin D (Cholecalciferol 50,000 IU weekly orally) and Calcium 600mg oral tablet. Six months later, the dosage of pamidronate was titrated to 75 mg IV every 10 weeks. After 5 infusions (over 12 months), AL developed complete resolution of fracture. She reported an increased her quality of life score from 3/10 to 9/10. Calcium level throughout her treatment ranged between 9.0-11.1. Two years into the treatment, patient experienced a major fall on the outstretched hand but did not sustain any fractures and bone density T score increased from -4.8 to -3.4 SD.

Discussion: Current management of OI includes fracture care, physical therapy, safe exercise, bone building activities within capacity, self-care with lifestyle modification, and surgery as needed. Both oral and intravenous bisphosphates have been used off-label to increase bone density in OI^{1,4}. Dosing protocols are present only in pediatrics. Montreal Shriners cyclic protocol for Children dosing for pamidronate is 1.1 mg/kg body weight every three months³. Previous studies of adults in OI have been small and have had inconsistent results³. Eight years after treatment, AL has not experienced any fractures. A possible side effect from bisphosphonate treatment to consider is osteonecrosis of the jaw and guidelines have suggested conducting a dental examination before starting bisphosphonate treatment⁵. Based on this case, and with the lack of contraindications, a trial of cyclical bisphosphonate therapy can improve pain and quality of life in adults living with OI. This case highlights the effectiveness of an individualized plan with dose titration and follows up of health quality, fracture rate, and bone density results. Further investigations are needed for dose and duration of therapy delineation in adults with OI.

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ARKANSAS CLINICAL VIGNETTE POSTER FINALIST - SAAD O. ATIQ

Rare Presentation of Facial Condyloma Lata in Secondary Syphilis

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Introduction: Syphilis is a common sexually transmitted infection caused by *Treponema pallidum*, with nearly twelve million individuals infected globally each year. Primary syphilis causes painless chancres at the site of inoculation. If left untreated, it can progress to secondary syphilis with a disseminated, symmetrically distributed maculopapular rash typically involving palms and soles, and tertiary syphilis with neurological or cardiovascular involvement. Approximately 30% of secondary syphilis patients will have wart-like genital lesions known as condyloma lata. However, extra-genital condyloma lata has rarely been reported.

Case Presentation: A 53 year-old male with HIV and history of cutaneous and colonic Kaposi's sarcoma status post chemotherapy presented to clinic with new oral and facial lesions. He is on antiretroviral therapy with CD4 278/15% and undetectable viral load one month prior to presentation. He conferred the oral lesions were painful, and the facial lesions were pruritic and humiliating. Social history was significant for high-risk sexual behavior. On physical exam, he was afebrile, alert, and oriented. Skin exam revealed well-defined, verrucous, hyperkeratotic papules on his face consistent with extra-genital condyloma lata, in addition to maculopapular palmar and plantar lesions. He also had multiple mucous patches within the oral mucosa. His rapid plasma reagin (RPR) titer was 1:128. He was subsequently treated for secondary syphilis with 2.4 MU penicillin-G benzathine via intramuscular injection once. His lesions completely resolved before he returned for follow-up one month later.

Discussion: Secondary syphilis presents four to eight weeks after resolution of the primary chancre if untreated. While secondary syphilis typically presents with a maculopapular rash involving the palms and soles, other manifestations such as papular skin findings and mucosal lesions rarely can be seen. Atypical presentations of syphilis are more common in immunocompromised patients, as described in this case. Syphilis incidence is noted to be higher in HIV patients, at a frequency of 8 infections per 100 person-years, versus 2.8 per 100 person-years in immunocompetent individuals. Herein, we report an atypical presentation of secondary syphilis in an HIV patient, with extra-genital condyloma lata on the face and mucous patches within the oral mucosa. Unfortunately, this patient was seen by three treatment teams before the appropriate diagnosis was made, highlighting how atypical presentations of syphilis can easily be overlooked. Untreated syphilis can result in progression of disease with serious health implications. Therefore, it is important to add secondary syphilis to the differential diagnosis when evaluating an immunocompromised patient presenting with atypical cutaneous and oral lesions.

ARKANSAS CLINICAL VIGNETTE POSTER FINALIST - SHIL PUNATAR

An Unusual presentation of HTLV-1 positive ATLL with Bilateral Ovarian Masses.

Authors: Shil Punatar, OMS3, NYITCOM at Arkansas State University. Amitkumar Mehta, MD, Assistant professor, UAB Comprehensive Cancer Center, Division of Hematology and Oncology.

Introduction: Adult T-Cell Lymphoma (ATLL) is a rare and aggressive lymphoma caused by Human T-lymphotropic Virus-1 (HTLV-1). Despite HTLV being the first retrovirus discovered, rarity and rapidity of progression of ATLL leaves many unanswered questions. Here we give a unique case of ATLL presenting with bilateral ovarian masses.

Case Presentation: A 35-year-old African American female with no significant past medical history began developing pain, stiffness, and paresthesias of upper and lower extremities, leading to being wheelchair bound. Her peripheral blood smear showed leukocytosis, lymphocytosis, anemia and mild thrombocytopenia. Peripheral blood smear showed classic "clover leaf cells". She underwent diagnostic bone marrow aspiration and biopsy which was consistent with ATLL. Subsequently, HTLV-1 immunoglobulins and PCR positivity confirmed diagnosis of ATLL. Her imaging studies showed no nodal involvement but diffuse skeletal involvement. She was initially started on zidovudine and interferon with no symptom resolution.

While on therapy for one month, her symptoms worsened, including bilateral flank pain, subcutaneous low back nodules, headache, and dependence for activities of daily living. CT scans demonstrated right ovary measuring 10cm and left measuring 8.3cm with left hydroureteronephrosis, with lytic lesions of osseous structures including bilateral proximal femurs. Brain MRI showed a 2.8cm intraosseous enhancing lesion in the left occipital bone. Subcutaneous nodule biopsy demonstrated atypical lymphoid infiltrates, and irregular lymphocytes with occasional anaplastic morphology. Further cluster of differentiation studies were consistent with a diagnosis of ATLL. The patient was started on chemotherapy with CHOP (cyclophosphamide, doxorubicin, vincristine, prednisolone) therapy with etoposide. She is currently undergoing chemotherapy with improvement in her symptoms.

Discussion: HTLV-1 has been considered the most oncogenic human pathogen, with many mechanisms elucidated of its infection of T-cells^[1]. HTLV-1 varies little in sequence from HIV, and despite differences in clinical presentation of asymptomatic state and ATLL, the genotype remains the same. Our case provides insight into the mechanism of oncogenicity of HTLV, but also the proposed differences in host innate and adaptive immunity leading to various disease states.

Endemic to southwestern Japan, and sub-Saharan Africa, HTLV-1 transmission has been studied through mother to child, sexual, and blood product transfusion, leaving our patient's acquisition a mystery^[2]. Estimates indicate 5-10 million HTLV-1 affected individuals of which below 5% develop ATLL, with 4-5 decades between infectivity and disease^[2,3]. Typically characterized with blood, bone marrow, and brain involvement, with lytic lesions and hypercalcemia, this patient had a rare presentation. Unfortunately, ATLL usually carries an aggressive course and is associated with poor outcomes.

This case presents a rare ATLL with unique symptomatology, from an infection outside of endemic regions. Alongside clinical presentation, this case emphasizes the importance of understanding virulence patterns and host immunity to determine host outcomes.

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CARIBBEAN CLINICAL VIGNETTE POSTER FINALIST - HIRAN PATEL

Intractable Nocturnal Hypoglycemia as sentinel symptom of Hepatocellular Carcinoma

Authors: Hiran Patel¹, Matthew Norris², ¹ American University of Antigua, School of Medicine, St. John, Antigua, ² Department of Medicine, Overlook Medical Center, Summit, NJ

Introduction: Hepatocellular carcinoma (HCC) is a primary liver cancer that arises from hepatocytes in cirrhotic liver disease. Fasting Hypoglycemia has been reported to occur in 4%-27% patients with Hepatic Carcinoma. There are two types of hypoglycemia associated with HCC. Type A hypoglycemia is normally found in the later stages of the disease and is caused by the destruction of hepatocytes which destroy the enzymes along with transcription factors that encode the enzymes necessary for gluconeogenesis and glycogenolysis. Type B hypoglycemia manifests early in slow-growing tumors due to overproduction of incomplete IGF-1/IGF-2 by tumor cells. When excluding cases of glucose overcorrection in diabetic patients, hypoglycemia is an uncommon finding in the emergency department and rarely turns out to be the sentinel symptom of hepatocellular carcinoma. The following case identifies a case of nocturnal hypoglycemia that revealed hepatitis C and hepatocellular carcinoma.

Case Presentation: The patient was an 87-year-old male with Parkinson's dementia found unresponsive at home with undetectable glucose levels. Upon administration of D50 by emergency services the patient became responsive with a glucose reading in the 200s. When he arrived at the emergency department, he was afebrile with stable vitals. The patient was a poor historian due to dementia and therefore the family was the primary source of information. The family stated they observed a progressive mental decline with rapid muscle wasting over 6 weeks. They reported no history of hepatitis, cancer, diabetes, or use of glucose-lowering agents. While in the emergency department the patient again became unresponsive and was found to have a glucose reading of 37. D50 was administered for the second time and the patient regained consciousness. While investigating the possibility of an occult infection, a CT of the abdomen showed an enlarged, ill-defined hepatic mass >13cm and his serum alpha-fetoprotein level was greater than 1000. He again became unresponsive and found hypoglycemic while on D10 at 50ml/hour. The patient required D10 at 100ml/hour to prevent hypoglycemia throughout his hospitalization and was diagnosed as having chronic hepatitis C as the cause of his hepatocellular carcinoma. His mental status improved during this time allowing for a goal of care discussion. The patient was discharged with plans for home hospice.

Discussion: It is rare for a patient receiving regular medical care to not only present with chronic hepatitis C but also with end-stage hepatocellular carcinoma. The reason for his hypoglycemia was considered to be type A as he suffered from chronic cirrhosis with a primary liver tumor that exerted a significant mass effect. When such cases presented, regardless of etiology physicians should monitor blood glucose frequently, avoid blood sugars below 65 mg/dl, avoid HbA1c in non-diabetic ranges, and more importantly continue patient education on neuroglycopenic symptoms.

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CALIFORNIA CLINICAL VIGNETTE POSTER FINALIST - HEMANTH GARAPATI

More Than Meets the Eye

Authors: Hemanth Garapati BA, Patrick Deligero MD, Youning Zhang MD, Douglass Hutcheon MD

Introduction: Isolated ocular syphilis is a rare cause of visual disturbance among HIV-uninfected patients. Given the increasing rate of syphilis in the US and the morbidity associated with untreated syphilis, clinicians should remain cognizant of the signs and symptoms of ocular syphilis in order to prevent delay in treatment.

Case Presentation: A 24-year old woman presented to the emergency department with three days of decreased vision after she sustained blunt trauma to her face during a physical altercation. Social history was notable for methamphetamine use and unprotected sexual activity with multiple partners. Physical exam demonstrated right-sided periorbital swelling and tenderness, pupils were equal, round, and reactive to light, with no conjunctival injection, neck stiffness, rash, or difficulty ambulating. Labs were notable for white blood cell count $13.2 \times 10^9/L$, urine toxicology positive for amphetamines, and a negative HIV screen.

A maxillofacial CT showed right preseptal cellulitis with a small abscess. Wound cultures from an incision and drainage grew MRSA sensitive to TMP/SMX, which began resulting in improved periorbital swelling and decreased pain. Despite this improvement, the patient continued to complain of decreased visual acuity in her right eye that eventually progressed to both eyes on hospital day four. Ophthalmology was consulted and a dilated fundoscopic exam revealed bilateral, asymmetric optic disc swelling and optic papillitis. An orbital MRI revealed bilateral optic neuritis. A lumbar puncture was subsequently performed that revealed an opening pressure of 14 cmH₂O, glucose 51 mg/dL, protein 43 mg/dL, nucleated cell count 2 cells/cumm, and a non-reactive VDRL. Serum studies demonstrated an RPR titer 1:128, reactive T. pallidum antibody, and reactive FTA-ABS, leading to the diagnosis of isolated ocular syphilis. The patient was started on aqueous penicillin G at 4 million units IV q4h for 10 days and penicillin G benzathine 2.4 million units IM weekly for 3 weeks. The patient completed three days of treatment with improved symptoms before leaving the hospital against medical advice.

Discussion: Isolated ocular syphilis is an uncommon presentation of neurosyphilis, especially among HIV-negative patients. Although classically associated with syphilitic meningitis, ocular syphilis can present independently during any stage of syphilis. Ocular syphilis most commonly presents as posterior uveitis and panuveitis. The most common presenting symptoms include diminished visual acuity, eye redness, and blurry vision.

Ocular syphilis can develop occultly as was seen in our patient, whose diminished visual acuity was initially attributed to her recent trauma. Regardless of the HIV status, ocular syphilis should be suspected in any patient at risk for syphilis with visual complaints since early diagnosis and treatment lead to decreased complications such as ocular hypertension, macular edema, and vision loss. The treatment for neurosyphilis and ocular syphilis is 18-24 million units of Penicillin G daily for 10-14 days.

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CALIFORNIA CLINICAL VIGNETTE POSTER FINALIST - GREG KOJAYAN

What a Twist! Complete Bowel Obstruction Due to an End-Ileostomy in Untreated Crohn's

Authors: Greg Kojayan, MS3, Alexander Abadir, MD, Bindu Swaroop, MD

Introduction: Crohn's disease can affect any part of the gastrointestinal tract. Choice of treatment, namely medical or surgical, is based on pharmacological responsiveness or whether mechanical obstruction is present. Surgical treatment options include colonic resection which may require creation of an ostomy. However, progression of the disease and complications such as mechanical obstruction, ileus, complete structuring, or even fistula formation may still occur.

Case Presentation: A 24-year-old Crohn's disease patient with previous proctocolectomy and end ileostomy presented with a one-day history of sharp right lower abdominal pain, nausea, and lack of ileostomy output. The patient reported that the pain she was having was similar to previous Crohn's flares. She was diagnosed with the disease 8 years prior and has been symptom free since her resection a year ago. Vital signs were unremarkable, and physical exam was notable for a friable, erythematous stoma with frank red blood in the ileostomy bag. On digital exam, the area of stenosis was felt by finger insertion, subsequently causing a release of flatulence without stool. A CT of the abdomen showed dilatation and fecalization of the distal ileum without evidence of stricture or volvulus. Initial laboratory studies were significant for acute on chronic anemia, mildly elevated ESR of 22, and normal CRP. On day 1 of hospitalization, surgical services reported no evidence of mechanical obstruction and advised medical management of a suspected Crohn's flare. The patient was started on high dose IV corticosteroids and antibiotics but did not have symptomatic improvement. Radiographically, there was worsening of the gastrointestinal obstruction and gaseous dilation of the entire tract. Due to significant perforation risk with performing ileoscopy, the decision was made to undergo laparoscopic exploration and stomal revision. Intra-operative evaluation showed the ileum twisting around the itself at the site of the stoma. Following successful revision and resection, gaseous output was immediately noted, resolving the ileus, and by post-op day one, stool passage resumed. By post-op day three, the patient was discharged home with no pain and a functioning revised ileostomy.

Discussion: This case demonstrates distal ileum twisting as the unusual etiology of mechanical small bowel obstruction in a patient with ileostomy and Crohn's disease. Her acute presentation, history, physical exam, and imaging suggested either mechanical or inflammatory causes. A mechanical source was suspected only after treatment for acute Crohn's flare failed to improve her symptoms. Twisting of an end-ileostomy is a rare cause of mechanical bowel obstruction, with only 6 cases reported in the literature 1,2. Bowel twisting should be considered when Crohn's patients with ileostomies present with abdominal pain and bowel obstruction.

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CALIFORNIA CLINICAL VIGNETTE POSTER FINALIST - ALISHA OTHIENO

Follow the Yellow BRIC Road

Authors: Alisha Othieno, Janelle Vu Pugashetti, M.D., Eric Signoff, M.D. University of California, Davis

Introduction: Causes of unconjugated hyperbilirubinemia include bilirubin overproduction, reduced uptake of bilirubin, or a conjugation defect, while causes of conjugated hyperbilirubinemia include biliary obstruction, hepatic injury, or intrahepatic cholestasis. This is a case of mixed hyperbilirubinemia likely due to a rare genetic cholestatic liver disorder.

Case Presentation: A 24-year-old Korean man with no past medical history presented with two weeks of jaundice and pruritus. He endorsed multiple similar self-resolving episodes of jaundice and pruritus starting in childhood. Family history was notable for a liver disease in his mother, but was unable to provide further detail. Physical examination was notable for scleral icterus, jaundiced skin, and diffuse excoriations. Labs revealed elevated bilirubin with total bilirubin of 16 mg/dL and a direct bilirubin of 9.1 mg/dL, bile acid of 100 μ mol/L, elevated alkaline phosphatase to 173 IU/L, and normal serum GGT. Autoimmune serology was negative for ANA, AMA, and myeloperoxidase (MPO) IgG antibody. Abdominal ultrasound was significant for 0.9-cm hemangioma, and was otherwise normal. MRCP was unremarkable. Liver biopsy revealed perivenular bland cholestasis and perisinusoidal/pericellular fibrosis. Genetic testing was completed, which was notable for genetic variants of uncertain significance. However, this test did not cover gene mapping for Benign Recurrent Intrahepatic Cholestasis (BRIC). The patient was treated with cholestyramine and ursodiol with relief of his pruritus and was referred for outpatient hepatology follow-up.

Discussion: Mixed hyperbilirubinemia was diagnosed based on elevated total and direct bilirubin and alkaline phosphatase. The following etiologies were considered but deemed unlikely: hemolysis (normal LDH, haptoglobin, and reticulocyte count), infectious etiology (normal transaminases, negative hepatitis panel), and autoimmune pathologies, such as primary sclerosing cholangitis and primary biliary cholangitis (negative ANA/AMA, MPO, and MRCP).

Based on this negative workup combined with genetic variants, the most likely diagnosis is BRIC. BRIC is an autosomal recessive genetic disorder that causes the affected individual to experience recurrent cholestatic episodes, without permanent hepatic injury. It is clinically diagnosed by at least two episodes of jaundice associated with severe pruritus and asymptomatic intervals lasting for several months or years, absence of any known etiology for cholestasis, signs of cholestasis indicated by laboratory tests contrasted with normal MRCP/ ERCP; and bile plugs within the ducts as seen by liver histology. Genetic testing can reveal mutations of ATP8B1 on chromosome 18q21 (BRIC1) or ABCB11 on chromosome 2q24 (BRIC2), for confirmatory diagnosis. BRIC does not usually cause cirrhosis, but monitoring disease progression is advised since BRIC can precede more severe diseases. Although there is no cure for BRIC, management of pruritic symptoms with ursodiol, cholestyramine, or rifampin is recommended. Diagnosis of BRIC and other inherited liver diseases is important to guide management, decrease the rate of cirrhosis development and malignancy, and aid in family planning.

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CALIFORNIA CLINICAL VIGNETTE POSTER FINALIST - KATHRYN LEWIS

A case of tick-borne paralysis in a traveling patient

Authors: Kathryn Lewis, BS, Mehul Patel, MD, Naveen Jayakumar, MD

Introduction: Tick paralysis is a rare cause of paralysis in the general population. The purpose of this clinical vignette is to broaden our differential diagnosis for ataxia and explore a rare presentation of paralysis.

Case Presentation: An 88 year old male with dementia, dyslipidemia, and status-post cochlear implantation presented to a community hospital after new onset gait instability. The patient was on a road trip from Wisconsin when he developed an inability to walk at dinner after arriving in the Coachella Valley. The patient was unable to ambulate and experienced worsening instability in his trunk. History was negative for atrial fibrillation, transient ischemic attacks, and strokes. Given progressive truncal ataxia, patient was admitted for suspected cerebellar stroke.

On exam, patient was alert and oriented to person, place, and time without sensory or cranial nerve deficits. Strength was 5/5 in all limbs, and exam was remarkable for ataxia of the trunk with instable gait. CT revealed stable age-related atrophy without evidence of acute ischemia or hemorrhage. Complete evaluation for cerebellar stroke was limited as MRI could not be done due to cochlear implantation.

Three days into admission, a tick was found on the left lateral chest wall with surrounding ecchymosis during bathing. Upon further questioning, the patient reported hotel stays and visiting national parks throughout his travels. He denied animal exposures, camping, and use of insect repellent. Following tick removal, truncal ataxia dramatically improved. Patient worked with physical therapy for an additional two days and was discharged without ataxia.

Discussion: Tick paralysis is a rare condition caused by the release of neurotoxins by female *Dermacentor* ticks in the United States. Most cases are reported from April to June in the Rocky Mountains and Pacific Northwest. Classically, paralysis is preceded by a nonspecific prodromal phase marked by fatigue, fever, and generalized weakness. Paralysis develops 4-7 days after the bite, known as the neurotoxic phase. While most patients present with ascending paralysis, other presentations include ophthalmoplegia and quadriplegia. Full recovery of paralysis has been reported within 24-48 hours of tick removal¹.

This case highlights a unique presentation of tick paralysis as the patient presented with truncal ataxia, without evidence of ascending paralysis or other findings on exam. The patient denied previous fever or fatigue, which would be consistent with a prodromal phase. Additionally, the age of diagnosis of tick paralysis is unusual as most patients are young girls with bites along the hairline and neck.

With a presentation of ascending paralysis, tick paralysis is often misdiagnosed as Guillain-Barre Syndrome². Less frequent misdiagnoses include botulism, encephalomyelitis, and stroke². This case further illustrates the importance of establishing and considering a broad differential diagnosis for better management and treatment of patients, while also reducing health care costs.

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CALIFORNIA CLINICAL VIGNETTE POSTER FINALIST - LAUREN ALDERETTE

In Newly Diagnosed HIV, Expect the Unexpected: A Case of Simultaneous Varicella Encephalitis and Neurosyphilis

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Introduction: Varicella zoster virus (VZV) encephalitis in the immunocompromised can present with cerebrovasculopathy and aseptic meningitis. Neurosyphilis in the immunocompromised can present with fulminant or aseptic meningitis, cranial nerve deficits, ophthalmic dysfunction, or meningovascularitis. Of note, syphilis incidence has been rapidly increasing in the U.S. since 2000. This is a case of concurrent VZV encephalitis and neurosyphilis infections in a patient newly diagnosed with human immunodeficiency virus (HIV).

Case Presentation: A 66-year-old male living in both northern Mexico and California presented to the emergency department with 1-month fatigue, 1-week altered mental status, headaches, and diplopia. Initial exam was remarkable for altered mental status, left ptosis, bilateral exotropia, minimally reactive pupils, anisocoria, and meningismus. On hospital day (HD) 1, HIV infection was confirmed (CD4 183, viral load 1.65 million). Computed tomography (CT) head on HD 2 demonstrated diffuse leptomeningeal enhancement and lobar hypodensities consistent with meningoencephalitis. Lumbar puncture revealed white blood cells $490/\text{mm}^3$ (61% lymphocytes), red blood cells $360/\text{mm}^3$, protein exceeding 600mg/dl, and normal opening pressure. Cerebrospinal fluid (CSF) was sent for numerous studies as he continued empiric ampicillin, ceftriaxone, vancomycin, acyclovir, amphotericin-B, and flucytosine. Within hours, CSF polymerase chain reaction (PCR) returned positive for VZV. The other 13 common bacteria, yeast, and viruses on the hospital's standard meningitis/encephalitis CSF PCR panel resulted negative. Pending gram stain results, there was concern for concomitant tuberculosis or fungal infections given his immunocompromised state and subacute presentation. Tuberculosis therapy was initiated empirically. His mental status continued to decline. On HD 6, CSF Venereal Disease Research Laboratory (VDRL) titer returned positive at 1:16 suggesting neurosyphilis and intravenous penicillin-G was initiated. In subsequent discussions, family disclosed his recent high-risk sexual history. For 48 hours his mental status improved with the ability to say 3 words with orientation to name. Magnetic resonance imaging on HD 8 showed meningovascularitis, leptomeningeal changes involving cranial nerves 5, 7, and 8, and basilar white matter changes. His neurologic state acutely worsened on HD 9 requiring emergent intubation. CT head showed a new intraparenchymal, interventricular hemorrhage with a 4mm midline shift. After discussions with his family, he was transitioned to comfort care and expired on HD 10.

Discussion: This case of two concomitant acute and severe infections in the context of newly diagnosed HIV highlights the challenge in managing the acutely ill immunocompromised patient. Risk for multiple, severe opportunistic infections makes empiric medical management, broad antimicrobials, and diverse diagnostics necessary. While this patient was empirically treated for numerous infections with wide bacterial, viral, and fungal coverage, it is important to reevaluate the extent of empiric therapy in such patients. Those newly diagnosed with HIV/AIDS, the immunocompromised, or those with high-risk sexual histories exhibiting acute neurologic changes may benefit from empiric neurosyphilis therapy. In this case, empiric penicillin-G could have been considered earlier given delayed CSF VDRL results, the variable sensitivity of CSF VDRL and neurosyphilis diagnostics in the immunocompromised, and the increasing syphilis incidence among high-risk populations.

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CONNECTICUT CLINICAL VIGNETTE POSTER FINALIST - PRERAK JUTHANI

Hepatocellular Carcinoma in a Patient Severely Exposed to the Fumes of the World Trade Center Attacks

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Introduction: Hepatocellular carcinoma (HCC) develops when hepatocytes amass mutations that lead them to divide at high, unregulated rates. A significant risk factor for HCC includes previous infection with Hepatitis C virus (HCV) as this leads to a chronic inflammatory state in the liver. Another risk factor for HCC includes exposure to carcinogens like asbestos and lead. It has been well established that the attacks on the World Trade Center (WTC) on 09/11/2001 exposed hundreds of thousands of people to many of these carcinogens [1]. In this case study, we discuss a survivor of 9/11 with a past medical history (PMH) of HCV that was diagnosed with HCC.

Case Presentation: A 58-year-old Puerto Rican former construction worker who had been exposed to asbestos during the WTC attacks presented to the hospital with a two-month history of worsening abdominal pain. His PMH was significant for alcohol and tobacco abuse, as well as infection with HCV, which was diagnosed and treated in Puerto Rico 8 years ago and for which his repeat PCR this admission was negative. The patient was afebrile and cachectic. Over the last two weeks, the patient experienced a 15-pound weight loss as well as night sweats, nausea without emesis, and intermittent diarrhea. His exam was notable for jaundice, scleral icterus, and RUQ pain. Patient's labs revealed: elevated total-bilirubin (29.4 mg/dl), elevated direct-bilirubin (27.1 mg/dl), elevated alkaline phosphatase (472 U/L), elevated ALT (151 U/L), and elevated AST (215 U/L). On CT (A/P), it was found that the patient had poorly defined, infiltrative masses within the liver causing bilateral biliary duct dilatation. Patient was referred to interventional radiology for bilateral biliary drain placement and liver mass biopsy, which revealed undifferentiated, multi-focal HCC. A goals of care conversation was held with him in which he changed his code status to DNR/DNI, and he decided to pursue home-hospice care.

Discussion: The diagnosis of HCC in our patient represents the intersection of two unique risk factors: carcinogen exposure from the WTC attacks and his previous history of HCV. Our patient's exposure to carcinogens during the WTC attacks placed him at an increased risk for HCC; from there, his history of alcohol abuse and HCV infection intensified his already increased risk and ultimately culminated in his HCC diagnosis.

This case signifies that now is the time at which we should start to investigate the long-term health effects of the WTC attacks. Previous studies have already confirmed a link between the WTC attacks and short and medium-term health effects, such as PTSD and asthma [2]. However, there is very little documentation regarding associations between WTC attacks and long-term sequelae like cancer simply because of the long latency-period of these conditions. Moving forward, clinicians should remain cognizant of patients who were exposed to the fumes of the WTC attacks and consider the implications that exposure may have on potential diagnoses.

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CONNECTICUT CLINICAL VIGNETTE POSTER FINALIST - MOHANED SERDAH

Scurvy Mimicking IgA Vasculitis

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Introduction: Scurvy is an uncommon nutritional deficiency in developed countries, characterized by symptoms of follicular hyperkeratosis, gingivitis, ecchymosis, anemia, and impaired wound healing. The rarity of this disease in the United States makes it difficult to diagnose in patients presenting with non-specific symptoms, and can present as a pseudo-vasculitis¹.

Case Presentation: A 54-year-old male with a history of depression presented to the hospital with a 2-month history of progressive generalized weakness, poor appetite, 10-pound weight loss, loose stools, knee arthralgia, as well as recent onset dyspnea and productive cough. 3 weeks prior to admission, he also developed a painless erythematous rash on his lower/upper extremities, abdomen, and intermittent epistaxis. He was single, recently homeless, and previously drank alcohol heavily.

Initial examination revealed fever, hypotension, withdrawn affect, decreased inspiratory effort, decreased motor strength in all extremities, and diffuse petechiae and purpuric rash on all extremities and abdomen, and a large ecchymotic area on his medial thighs and gluteal area. Initial laboratory workup revealed hyponatremia, granulocytosis, elevated INR, and elevated inflammatory markers. A chest CT scan showed a reticular infiltrate in the right lower lobe. He was admitted for treatment of community-acquired pneumonia, hyponatremia secondary to poor oral intake, malnutrition, and suspected IgA vasculitis. Further workup showed no evidence of viral hepatitis, HIV, or vasculitis with normal complement levels, rheumatoid factor, ds-DNA, ANA, and ANCA levels. A skin biopsy revealed hyperkeratosis, non-specific perivascular lymphocytic infiltrates, and red blood cell extravasation, and was not consistent with vasculitis. There was no evidence of IgG, IgM, IgA, C3, or fibrinogen deposition on immunofluorescence. After ruling out adrenal insufficiency for persistent hypotension requiring fluid resuscitation, empiric treatment with prednisone was started.

His rash and strength gradually improved during his 11-day hospitalization with fluids, electrolyte repletion, dietary supplements, and physical therapy. He was discharged with outpatient rheumatology follow up with an unclear diagnosis for his rash and weakness. Due to his poor nutritional status and verified history of not eating fruits, a vitamin C level was ordered prior to discharge, and was found to be critically low at <0.1 mg/dL (0.2-2.1). The final diagnosis was scurvy.

Discussion: This case illustrates an approach to diagnostic uncertainty, the value of a thorough history, and the importance of maintaining an evolving differential diagnosis. Although scurvy is rare in the United States, timely diagnosis is important in order to prevent serious health complications including death from vascular collapse due to vitamin C's role as a cofactor in catecholamine synthesis, infections, and hemorrhage from vascular fragility due to impaired collagen production^{2,3}. In our case, the patient's vitamin C deficiency explained his skin findings, profound weakness, personality change, hypotension, and immune-compromised state. Prompt recognition and treatment of this vitamin C deficiency leads to complete recovery within months⁴.

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DELAWARE CLINICAL VIGNETTE POSTER FINALIST - NATHANIEL ROSAL

Bypassing Beta-Blockade

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Introduction: Hyperinsulinemic-Euglycemic therapy (HIET) for beta-blocker overdose is characterized by non-catecholamine mediated positive inotropy, increased cell glucose transport in myocardial cells, and systemic vasodilation resulting in increased cardiac output. Case reports with positive outcomes are the primary source of reliance for use of this practice. Comparative trials with other methods of treatment, namely glucagon and intralipid therapy, are unfortunately limited.

Case Presentation: A 76 year old female with a history of bipolar depression and hypertension presented to our Medical Intensive Care Unit as a transfer from an outside hospital for management of intentional polysubstance overdose. The patient originally presented to this outside hospital awake and coherent, admitting to ingesting at least 100 tablets metoprolol succinate, as well as some tablets of losartan and duloxetine. Unfortunately, quantifying the specific amount of each ingested medication was not possible, as the patient rapidly progressed to severe bradycardia, hypotension, and stupor. Per the family, the patient was also prescribed amlodipine and isosorbide mononitrate, and it was unclear if these medications were ingested as well. The patient was treated with IV calcium, intralipid therapy, glucagon infusion, and HIET. The decision was made for transfer to our tertiary center given the possibility of requiring Extracorporeal Membrane Oxygenation (ECMO), although this ultimately did not occur. Upon arrival, she was intubated and placed on epinephrine and norepinephrine for hemodynamic and cardiac support. Glucagon was discontinued with the intention of treating primarily with HIET and hemodynamic supportive care. An insulin infusion was started and titrated to 120 units/hr with a dextrose infusion at 150cc/hr. The insulin dose reached a maximum of 160 units/hr by hospital day one before ultimately being discontinued on hospital day two. The epinephrine infusion remained for both cardiac and peripheral vascular support until hospital day four. The norepinephrine infusion remained for peripheral vascular support until hospital day six. The patient was extubated and transferred to a step down unit by hospital day seven.

Discussion: A literature review published in August 2018 in *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy* investigated cases dating back to 1997. There are no current standard of practice dosing guidelines for HIET; the most common dosing method being a regular insulin bolus dose of 1 unit/kg followed by an infusion of 0.5 - 1 unit/kg/hr. Though some cases report reaching an infusion rate of 10 units/kg/hr. Success rates of HIET in conjunction with hemodynamic support were found to be 80.4% to 100%. This case presented additional evidence. Of note, blood glucose and total volume are parameters that must be closely monitored. Concomitant dextrose infusions and glucose checks were required to prevent periods of symptomatic hypoglycemia. Frequent diuresis was required towards the latter end of our patient's hospital course to achieve euvolemia. Nonetheless, HIET is a promising method for beta-blocker toxicity.

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DELAWARE CLINICAL VIGNETTE POSTER FINALIS - SYDNEY HUERBIN

ITP as cause of spontaneous epistaxis in very elderly patient on a DOAC.

Author: Sydney Huerbin

Introduction: Although less commonly seen in elderly patients, immune thrombocytic purpura (ITP) is associated with worse outcomes in elderly patients compared to the pediatric and young adult populations. Furthermore, bleeding events in elderly patients are often the result of anticoagulant therapy or NSAID use and abuse. Specifically, epistaxis is the most common adverse bleeding event reported for direct-acting oral anticoagulants (DOACs). Therefore, when a patient prescribed DOACs presents with a spontaneous bleeding event, concern for supratherapeutic anticoagulation is appropriate. However, the following case demonstrates ITP as cause of spontaneous bleeding in an elderly patient prescribed apixaban.

Case Presentation: An 86 year old female presented to the emergency department with a 3 day history of intermittent epistaxis. Her current episode has not been responsive to holding pressure and lasted several hours. She denied any history of gum bleeding, hematemesis, hemoptysis, melena, hematochezia or hematuria. She denies any recent flu-like illness or upper respiratory infections. Recent history is only notable for a bee sting one week prior.

Her prior medical history included paroxysmal atrial fibrillation, rate controlled with metoprolol and anticoagulated with apixiban. Additional medical history included glaucoma, hypertension and hypothyroidism.

Upon examination, she was found to have continued epistaxis. Further examination revealed pallor, an irregularly irregular rhythm, bilateral lower extremity petechiae and petechiae on her oral mucosa. Her laboratory studies on admission were notable for Hb 12 g/dL and platelets $4 \times 10^9/L$.

She was admitted to the hospital for continued supportive measures and evaluation of her severe thrombocytopenia. Her platelets were refractory to transfusion, and she was started on IVIG at 1g/kg for 2 days and high-dose prednisone at 1 mg/kg for suspected ITP. Her platelets improved to 36 after IVIG therapy; however, her platelets remained at 17 for multiple days prompting treatment with rituximab. Eventually with rituximab therapy her platelets were stable enough to allow for discharge.

Discussion: Elderly patients on anticoagulation are at increased risk for bleeding events. Of note, research into the value of anticoagulation of the very elderly population has found that the risk of bleeding from anticoagulation is outweighed by the decrease in thromboembolic events. However, it is still easy to attribute recurrent epistaxis in an elderly patient to her oral anticoagulation regimen.

This case highlights another potential cause for a bleeding event in an elderly patient: ITP. It was suggested from her petechiae and low platelets that ITP was the cause of her bleeding as DOACs do not traditionally lower platelet counts. The only outlying information for this case was her recent history of a bee sting, where bee venom has been suggested to cause ITP.

This case demonstrates the importance of a broad differential when evaluating bleeding events in elderly patients and how the very elderly population is at risk for ITP.

DELAWARE CLINICAL VIGNETTE POSTER FINALIST - TINA ROY

Water diet & Hydrochlorothiazide: A Recipe for Hyponatremia

Authors: Tina Roy B.S., Robert DeGrazia Jr. M.D., Neal Das D.O.

Introduction: Hyponatremia is a potentially life-threatening condition which needs meticulous treatment. Thus, it's important to be aware of risk factors for hyponatremia to identify those susceptible. We present a case to illustrate the risks of a water diet particularly in the context of hydrochlorothiazide use.

Case Presentation: A 41 year old woman with a history of hypertension consulted a telemedicine physician because of recent onset of lightheadedness and persistent hypotension on her own home blood pressure machine. The patient explained that for the past seven weeks, she was following a water only diet. The physician discontinued her hydrochlorothiazide and asked the patient to have labs drawn. Her sodium level was found to be 120 meq/L and she was advised to go to the Emergency Department (ED). In the ED, she further indicated increased fatigue, positive orthostatics and a 30 pound weight loss. She was put on a regular diet and a water restriction of 1 liter per day. The sodium level was checked every four hours and increased appropriately 4-6 meq/L over the next three days correcting to 135 meq/L. The patient's symptoms resolved and she made a full recovery. Prior to discharge the patient was counseled to never use hydrochlorothiazide diuretics again.

Discussion: This case demonstrates the risks of a water-only fast diet further complicated by concurrent thiazide diuretic use. As this case illustrates, water only diets can cause many symptoms including orthostatic hypotension, headache, and fatigue. Typically, water only dieting does not cause hyponatremia due to the body's ability to regulate solute concentration with increased water consumption. However, with certain concurrent exposures, particularly medications, hyponatremia can occur. One study suggests that medically supervised water diets may be safe and benign, however, the majority of water diets are unsupervised and unregulated. Patients may be on simultaneous hyponatremia inducing medications, such as antibiotics, antidepressants, and antidiabetic medication.

Thiazide induced hyponatremia is a common cause of hyponatremia. Commonly used for blood pressure control, thiazides work by blocking a sodium chloride cotransporter in the distal convoluted tubule which is responsible for 5-7% of renal sodium reabsorption. Various factors such as older age, low body weight, and female sex put patients at risk for thiazide induced hyponatremia. For this patient, concurrent water diet was a risk factor for hyponatremia. These patients require careful monitoring to observe for signs and symptoms of hyponatremia. Additionally, they require careful monitoring during treatment to avoid complications associated with overcorrection. As illustrated in this case, it is important to be aware of risk factors for hyponatremia to identify those susceptible.

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FLORIDA CLINICAL VIGNETTE POSTER FINALIST - PUJA PATEL

“Ur-ine” Trouble - A case of amyloidosis mimicking bladder cancer

Authors: Puja Patel, OMS-III, Nova Southeastern University, Kiran C. Patel College of Osteopathic Medicine, Mohammad Pourmandi, OMS-III, Nova Southeastern University, Kiran C. Patel College of Osteopathic Medicine, Jeffrey S. Lombard, D.O., Urology, Largo Medical Center, Florida

Introduction: Amyloidosis is a disease process characterized by extracellular deposition of amyloid protein within tissues, which can eventually lead to symptomatic dysfunction. Primary and localized bladder amyloidosis is a rare clinical entity, with only about 200 cases reported. Bladder amyloidosis can often mimic bladder neoplasia, making it difficult to diagnose. It can present with similar symptoms, including hematuria and irritative urinary symptoms. It is imperative to understand the clinical presentation of this condition because primary amyloidosis affecting the bladder can be mistaken for malignancy based on its appearance on cystoscopy and imaging, leading to a misdiagnosis.

Case Presentation: A 75 year old male with a past medical history of overactive bladder and hypertension, presented to the clinic for gross painless hematuria for approximately one week. The patient also complained of urinary urgency and frequency; he denied any fevers, chills, or flank pain. The results of a urinalysis were positive for occult blood and negative for an infection. The patient had a subsequent cystoscopy done in the office, which revealed a very erythematous, bullous bladder mucosa, very suspicious, but not definitive for any malignancy. Cytology analysis using fluorescence in situ hybridization (FISH) of cells recovered from a urine sample indicated a positive result for chromosomal abnormalities associated with bladder cancer. A CT urogram showed progressive bladder wall thickening and irregular polypoid contours. It could not however differentiate between an inflammatory process and transitional cell carcinoma. It was recommended the patient have biopsies from the bladder collected and evaluated. The patient underwent cystoscopy and transurethral resection of the bladder tissue. The urethra showed no strictures and a very small nonobstructing prostate was noted. The entire bladder wall except for part of the right lateral wall and dome was engulfed with very bullous, erythematous, and edematous mucosa, clinically suggesting possible malignancy. The ureteral orifices were surrounded by the edema, warranting bilateral retrogrades, which were negative for any obstruction or filling defects. Deep resection biopsies were taken from the left lateral wall, posterior wall, and the floor of the bladder, where most of the lesions were. They revealed positive apple-green birefringence with Congo red immunostaining upon polarization. Amyloid deposition was found in the subepithelial connective tissue, lamina propria, consistent with the diagnosis of amyloidosis. Associated acute hemorrhagic and eosinophilic cystitis was also found. Reactive changes included hemorrhage, edema, and inflammation of the bladder wall. Furthermore, there was no evidence of malignancy.

Discussion: While primary amyloidosis of the bladder is a rare occurrence, its signs and symptoms can often mimic bladder cancer, and laboratory results and imaging can often be misleading. Therefore, it should be considered as a differential diagnosis when suspecting painless hematuria to be a sign of bladder malignancy.

FLORIDA CLINICAL VIGNETTE POSTER FINALIST - KATE YOUNG

LUNG CARCINOMA PRESENTING AS SUPERIOR VENA CAVA SYNDROME, BURNT AND TWICE REBORN AS ADRENAL AND FACIAL TUMORS.

Authors: Kate Young, Ross University School of Medicine, Miramar, FL; Francisco Belette, MD, United Oncology Medical Associates of Florida, Miami, FL; Eitan Friedman, MD, United Oncology Medical Associates of Florida, Miami, FL.

Introduction: Eighty-five percent of all lung cancers are Non-Small-Cell Lung Carcinoma (NSCLC) with common sites of metastasis to adrenals and liver. Onset is insidious, and 75% of patients have either regional or distant metastases at initial presentation. The 5-year relative survival rate is 4.5% with a distantly spread disease (based on 2013-2017 studies). Here we present a unique case of 9-year survival with NSCLC initially presenting as a Superior Vena Cava Syndrome (SVCS) and reoccurring with adrenal, bone, and CNS lesions.

Case Presentation: The patient is a 59-year-old Caucasian male with no significant past medical, social, or family history who presented with dyspnea, chest pain, neck swelling, and venous congestion consistent with SVCS in 2010 (at age of 50). He was diagnosed with NSCLC, adenocarcinoma type that was negative for ALK/KRAS/EGFR/BRAF mutations. He underwent chemo (Cisplatin/Pacitaxel) and radiotherapy with complete response. In 2015, a symptomatic isolated left adrenal mass was discovered, resected, and treated with radiotherapy with complete resolution of symptoms. Mass was positive for TTF confirming pulmonary metastasis. In 2017, patient came in with left CN VII neuropathy, shooting pains, sinus headaches, eyelid concerns, but MRI's of the brain and PET CT came back negative for cancer. Patient underwent multiple sinus drainage and eyelid closure surgeries. University of Miami Neurology ordered a 'Neocomplete Paraneoplastic Evaluation with recombx' MRI of base of the skull. Subsequent PET CT showed metabolically active tumoral activity in middle cranial fossa, parotids, and osseous disease with spinal nerve involvement at T6. Left-sided craniotomy revealed a metastatic poorly differentiated adenocarcinoma that extended through foramen ovale/rotundum to the infratemporal fossa and caused left-sided facial paralysis, hearing loss, numbness in CN V2/V3 distribution. On October 2018 exam, patient appeared well nourished, able to close his left eye, cognitively intact but with impaired motor aspect of speech and facial expression. Traces of dried blood in the ear, a well healed 10cm scar on left face and neck, and prominent bilateral tortuous chest thoracic veins were observed. Patient reported left-sided facial numbness and diminished hearing but denied any pain.

Discussion: The patient has experienced several recurrences of disease on standard protocols and is not a candidate for targeted molecular therapies based on ALK/KRAS/EGFR/BRAF testing. Therefore, an additional genetic profiling (PDL1/MSI/MMR) and an immunotherapy trial is suggested as the next step at this time.

The natural history of this patient's disease is remarkable in terms of metastatic sites, paraneoplastic manifestations, and a substantially prolonged lifespan. Is there anything in this patient's metabolic or genetic blueprint that gave him this survival advantage that we can synthesize? More studies of similar cases are needed and will surely advance our understanding of the tumor genetics and immunotherapy allowing greater benefits to future patients.

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GEORGIA CLINICAL VIGNETTE POSTER FINALIST - ERICA SHELINE

MDA-5 Positive Dermatomyositis with Rapidly Progressive Interstitial Lung Disease

Authors: Erica Sheline, Emory School of Medicine, Jeeyon Rim, MD, Emory University Internal Medicine Residency, Meredith Greer, MD, Emory University Pulmonary and Critical Care Fellowship, Mohammed Ahmed, Oakland University William Beaumont School of Medicine, Manasi Tannu, MD, Emory University Internal Medicine Residency

Introduction: Dermatomyositis (DM) is a systemic inflammatory disease that affects skin, muscle and lung tissue to varying degrees.^{1,2} The Bohan and Peter criteria from 1975 remains the diagnostic standard.^{4,5} It entails a combination of clinical evidence of myopathy and dermatosis, elevated lab levels of inflammatory auto-antibodies, microscopic evidence of inflammation on muscle biopsy, and electromyographic data.³ Auto-antibodies against anti-melanoma differentiation-associated protein 5 (MDA5) are linked with the unfavorable lung variant of DM which presents with rapidly progressive Interstitial Lung Disease (RP-ILD), more severe dermatosis, and mild myopathy.^{1,2,4}

Case Presentation: A 44- year- old African American male with no past medical history presented to the Emergency Room for worsening fatigue and dyspnea along with excruciating pain in his fingers, hands, wrists, and shoulders over the past four months. He also endorsed intermittent fevers and chills.

On exam, there was no evidence of synovitis. His palms had multiple punctate erythematous lesions and non-tender, non-pruritic, large erythematous macules. Pulmonary exam was initially unremarkable. Lab work obtained thirteen days prior at a Rheumatology office visit was positive for anti-nucleic acid (ANA) titer 1:160, rheumatoid factor (RF), and anti-cyclic citrullinated peptide (CCP). A CT scan of his chest revealed patchy ground-glass opacities predominantly at the periphery and lung bases with mild cylindrical bronchiectasis, consistent with a nonspecific interstitial pneumonia (NSIP) pattern.

Dermatomyositis (DM) was suspected based on elevated serum ANA, RF, and CCP in conjunction with a clinical presentation of diffuse arthralgias, mild myopathy, fever, dyspnea, and Gottron's papules. An extended myositis panel was sent, and biopsy of erythematous palmar lesions displayed predominantly lymphocytic inflammatory infiltrate in a perivascular distribution suggestive of an immune-associated connective tissue disease. The patient was treated for an atypical pneumonia and discharged on a prolonged oral steroid taper after his arthralgias and weakness improved. He returned to the Emergency Room a week later with worsening dyspnea on exertion and was found to be profoundly hypoxic. The extended myositis panel ordered at the initial hospitalization had returned and was positive for anti-melanoma differentiation-associated protein 5 (MDA5). Repeat CT of the chest revealed an acute interval development of bibasilar fine reticulations with worsening ground glass opacities and mosaic attenuation with areas of air trapping. The patient was treated with cyclophosphamide, mycophenolic acid, and pulse dose steroids. However his respiratory status continued to rapidly decline and he unfortunately passed away two weeks later.

Discussion: The pulmonary manifestations of systemic autoimmune diseases are diverse. Although anti-MDA5 antibody-positive DM with RP-ILD is exceedingly rare, it is associated with very poor prognosis with reported ninety day mortality as high as 66.7%.⁵ This case illustrates the rapid deterioration that is seen in DM with RP-ILD and the importance of early diagnosis and aggressive therapy.

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GEORGIA CLINICAL VIGNETTE POSTER FINALIST - SINDHUJA SURAPANENI

Gardner Did It: The Case of the Unrelenting GI Bleeding

Authors: Sindhuja Surapaneni and Noble Maleque, M.D., Emory University School of Medicine; Noble Maleque, M.D., Emory University Hospital Midtown

Introduction: Gardner's syndrome is a systemic disease characterized by thousands of polyps in the colon and sometimes, extraintestinal manifestations such as desmoid tumors. In the case below, we present a man with an abdominal mass, hematochezia, and melena. We outline extraintestinal manifestations of Gardner's and the management of desmoid tumors.

Case Presentation: This is a 37-year-old man visiting from Cameroon with an abdominal mass presenting with an eight-week history of gross hematochezia, intermittent melena, and abdominal pain.

Two years ago, he underwent a subtotal colectomy for polyps. One year ago, he noticed a non-reducible 1 cm abdominal mass and associated diffuse abdominal pain. Both the mass and pain progressed until 8 weeks before presentation when he started having hematochezia, melena, and intermittent diarrhea and constipation. He endorsed associated 16-pound weight loss, dizziness, headaches, and fatigue.

On physical exam, his vitals were notable for hypotension. His abdominal exam was notable for a large 15 cm abdominal mass with pain and dullness to percussion circumferential to the mass. He had normal bowel sounds and had no peritoneal signs or distention.

Initial CT raised concern for soft tissue sarcoma invading the skin as well as the bowel (photo available). On colonoscopy, there were no signs of invasion through the remaining ileum. Results of a transcutaneous CT biopsy of the mass showed a desmoid-type fibromatosis (photo available).

He continued to require transfusion support for recurrent blood loss. On hospital day 11, a 21.8 cm abdominal mass abutting small bowel and involving the muscularis propria as well as three loops of jejunum were surgically removed (Figure 3). He had an uneventful recovery and did not require transfusion support postoperatively.

Discussion: Gardner's syndrome is a multisystem disease is characterized by an increased risk of developing colon cancer due to innumerable polyps in the colon. Therefore, the standard treatment of care includes total colonic resection, which is consistent with our patient's operation in Cameroon.

Our patient's large desmoid tumor is one such reported extraintestinal manifestation of Gardner's syndrome (1). While desmoid tumors are histologically benign, can be locally aggressive, cause mass effect, and recur in unprecedented areas. Invasion of his desmoid tumor into different segments of the bowel such as the muscularis propria of the jejunum explains both his symptoms of melena and hematochezia.

Due to the significant variability of the history and progression of desmoid tumors, guidelines for management are still in nascent stages. When borders are well defined, surgical resection is a viable treatment option, but still comes with a risk of recurrence. Resection has been studied to have a 50% 5-year recurrence-free survival rate (2). Therefore, our patient's symptomatic anemia and unrelenting bleeding were the primary factors we considered in evaluating courses of treatment.

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ILLINOIS CLINICAL VIGNETTE POSTER FINALIST - JOSHUA KOGAN

Unique Case of Large Abdominal Mass and Bulky Follicular Lymphoma

Authors: Joshua Kogan MS, Michal Kubiak MD

Introduction: Follicular lymphoma is a low-grade non-Hodgkin lymphoma of B-cell origin and is the most common low-grade non-Hodgkin lymphoma in adults. It is characterized by the histologic presence of densely packed lymphoid follicles or germinal centers. These germinal centers contain minimal macrophages, small cleaved cells without nucleoli (centrocytes) and larger noncleaved cells with multiple nucleoli (centroblasts).

Follicular lymphoma typically displays a t(14;18) chromosomal defect, which is a translocation between heavy-chain Ig (14) and Bcl-2 (18), resulting in the overexpression of Bcl-2, which inhibits apoptosis.

Typical clinical presentation includes slowly progressive, painless lymphadenopathy of alternating size (“waxing and waning”) and splenomegaly.

Case Presentation: History: Patient is a 66 yo female presenting with 2 weeks of lower extremity swelling and unintentional 30lb weight loss over 1.5 months. She denies fever, chills, chest pain, dyspnea, abdominal pain, or nausea. Patient has no PMH and takes no medications. She denies tobacco, alcohol or drug use.

- Vitals: Afebrile, HR 80, BP 93/51, RR 18, O2sat 95%
- Physical Exam: Pt in NAD, left axillary lymph node enlargement, lungs clear to auscultation, heart RRR, abdomen soft and protuberant with hard mass on left side, lower extremities with bilateral 3+ edema
- Labs: Na 142, K 3.9, Cl 110, HCO3 26, BUN 44, Cr 2.08, Glu 78, LDH 388, LFT normal, WBC 5.6, RBC, 2.51, HGB 7.4, HCT 23.9, PLT 365, % Fe 12, Fe 42, TIBC 359
- CT: Complex large mass filling the left sided mid/lower abdomen extending into the upper pelvis. Lobulated appearance of left kidney, retroperitoneal adenopathy, diffuse edema secondary to underlying anasarca, moderate to large amount of ascites.
- Surgery: Three days after admission she underwent surgery consisting of debulking and removal of the mass, drainage of lymphocele and 7L of milky fluid, bowel resection, ileoduodenal anastomosis, partial liver resection and biopsy.
- Pathology: Mesenteric mass specimen showed diffuse positivity for CD20 and Bcl-2, during confirmatory immunostaining. Liver biopsy specimen also stained positively for CD20 marker, indicating complete involvement of hepatic tissue biopsy.

Treatment: Planned to begin following sufficient post-operative recovery. On post-op day seven a large abdominal abscess was discovered and determined to consist of bilious fluid draining from an enterocutaneous fistula. On post-op day 30, she underwent reoperation for fistula correction and is currently recovering, awaiting to begin immunotherapy.

Discussion: When evaluating the patient’s status with the most current follicular lymphoma grading, staging, and prognostic criteria, the following were established:

- WHO/REAL classification: Histologic grade 2
- Cotswolds-Modified Ann Arbor Classification: Stage IV

•Follicular Lymphoma International Prognostic Index (FLIPI) Score: High Risk; 10-year overall survival is approximately 35%

Bulky follicular lymphoma tumors benefit from treatment with chemotherapy, immunotherapy, and possible, additional radiotherapy. First line therapy for elderly patients with Stage III/IV consists of rituximab, which may be combined with chlorambucil and/or cyclophosphamide, depending on patient response.

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ILLINOIS CLINICAL VIGNETTE POSTER FINALIST - ALEXANDER MATELSKI

A Case of Immune-Mediated Necrotizing Myopathy Due to Anti-HMG CoA Reductase Antibodies

Authors: Matelski, Alex; Moni Roy, MD; Ashish Kumar Roy, MD

Introduction: Clinicians deliberating etiologies of proximal muscle weakness and elevated creatinine kinase commonly consider hypothyroid myopathy, dermatomyositis and polymyositis, inclusion-body myositis, and statin-induced myositis. Another uncommon but important cause to consider is antibodies targeting the cholesterol synthesis enzyme HMG-CoA reductase (HMGCR), in which disease process can persist despite cessation of statin therapy or even in the absence of statins altogether. Here we present a patient with anti-HMGCR causing immune-mediated necrotizing myopathy (IMNM).

Case Presentation: A 67-year-old white female with a history of hypertension, hyperlipidemia, and type 2 diabetes presented to the ED with complaints of 2 months of proximal muscle weakness and fatigue that had begun to interfere with activities of daily living, including rising out of a seated position, walking up short steps, and brushing her hair. She had been started on atorvastatin and linagliptin 2 months prior. An outpatient creatine kinase (CK) study returned 6,482 U/L with a repeat value of 5,326 U/L in the ED. Atorvastatin was stopped and, after PT review, she was discharged with expectation of improvement. One month later, she returned with complaints of similar symptoms. Her second presentation vitals signs showed hypertension but were otherwise stable. Physical examination was negative for stigmata of dermatomyositis and polymyositis. CK was 5,335, aldolase was 54.6 U/L, and AST and ALT were 138 and 198, respectively. TSH of 1.48 mIU/L, negative ANA, CRP of 18 mm/h, and negative infectious testing decreased suspicion for other pathologies. An MRI showed bilateral T2-enhanced inflammation of the mid-thigh consistent with myositis. Anti-HMGCR antibody testing showed a massively elevated titer >200 in a lab-developed test (<20 ref). Microscopic review of a quadriceps biopsy showed a necrotizing myopathic process with less-than-expected CD 45-stained lymphocytic infiltrate along with angulated, atrophic fibers of both types consistent with mild denervation atrophy. She was diagnosed with IMNM, started on 500 mg of methylprednisolone QID for a 3-day course, and discharged on long-term prednisone therapy with follow-up appointments with rheumatology.

Discussion: IMNM is an uncommon pathologic process that should be suspected in patients with symptoms consistent with proximal myopathy that have low clinical suspicion for other pathologies. It should not be assumed to be related to a statin history and in fact is associated with statins in just 38% of cases [1]. The age of onset varies considerably, but there is a female predominance. Pathological study shows pauci-lymphocytic inflammation, suggesting that humoral immunity is the key driver of the disease process. Thankfully, these patients typically respond to immune modulation through glucocorticoids. Clinicians should maintain suspicion for IMNM with anti-HMGCR antibodies in atypical cases of myopathy to ensure prompt treatment and improve patient course.

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ILLINOIS CLINICAL VIGNETTE POSTER FINALIST - SAYAM UDDIN

The Unrelenting TIA: A Case of Undiagnosed Seizure Disorder

Authors: Sayam Uddin, Rakin Rashid, Dr. Mohamed Mandeel, Dr. Mohamad Hatahet

Introduction: Acute onset of focal neurological deficits correlated to a single vascular distribution reflexively necessitate stroke assessment to identify ischemia or hemorrhage. Often patients that present within 24 hours of symptoms are defined as a transient ischemic attack if no acute pathology is noted by CT or MRI. To further stratify risk, further imaging of the carotid arteries and assessment for comorbidities such as hypertension or hyperlipidemia or diabetes is performed and prophylactic medications like statins are initiated. However, recurrent symptoms over the same distribution without underlying unaddressed comorbidities raises suspicion for an alternative etiology. A Simple Partial Status Epilepticus (SPSE) is a seizure with an electrical surge affecting a focal area producing typical symptoms without impairment of consciousness.¹ We describe the case of an 82-year-old male with multiple CVA comorbidities that presented for recurrent ephemeral neurological deficits within the same focal distribution for 5 years presumed to be TIAs.

Case Presentation: Patient is an 82-year-old male with history of diabetes, PAD, hypertension & Dyslipidemia, presented to the emergency department complaining of an inability to speak. His symptoms began 5 hours prior and lasted for 2 hours continuously and were associated with a headache. He could understand people's speech, but he was unable to respond meaningfully. He denied experiencing any change in vision, weakness, numbness or loss of consciousness. He denied nausea and vomiting; no shoulder pain or hand tremors/ataxia. No one noted any change in his facial features during the episode, nor was he lip-smacking or biting his tongue. Patient denied tobacco use.

The patient was extensively worked up for similar symptoms for the last 5 years with CT, CTA, MRI, MRA, and Ultrasound of the carotid arteries, and only once the MRI showed remote lacunar infarcts in the bilateral basal ganglia and right pons. As with previous admissions, the stroke protocol was initiated and the patient had a CT scan and preventative CVA reinfarction medications were started. Once the CT scan revealed no abnormalities, MRA and MRI of the brain were ordered and revealed no acute ischemia or infarct. Patient was initiated on Cardizem for suspected cerebral vasospasm; however, he returned to the Emergency Department with recurrent symptoms. Once again, the stroke protocol was initiated and the findings were not significant for acute pathology. However, he responded well to Keppra and had no recurrence of symptoms.

Discussion: Regardless of historical context, patients with acute focal neurological deficit localized to an arterial distribution require a stroke assessment. While prior imaging and patient history may guide clinical decision-making regarding aggressiveness in risk stratification and further imaging, initial evaluation with non-contrast CT or MRI and hypercoagulability workup are imperative. Unfortunately, in a patient with recurrent intermittent symptoms, that leads to excessive radiation, bloodwork, and medication readjustments to rule out and prevent strokes.

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INDIA CLINICAL VIGNETTE POSTER FINALIST - DIVNOOR KAUR

HZO and Abducens nerve palsy

Authors: Divnoor Kaur (MBBS Student), Dr. Shakeen Singh (M.S, D.O.M.S), Dr. Perminder Singh Sanghera (M.D)

Introduction: Herpes Zoster ophthalmicus is a localized disease, caused by varicella zoster, characterized by hemifacial vesicular eruptions with preeruptive erythema, localized scalp tenderness. There are very few reports focusing on oculomotor palsies in patients of HZO. The involvement of ophthalmic division of trigeminal nerve represents 10–20% of all cases of herpes zoster.[1,2] The acute course of HZO is usually benign, however serious ocular complications have been documented.[3,4] Severity is related to the age of the patient, older patients are affected more than younger patients.[5] In our case report we come across a rare case of HZO with horizontal diplopia either because of lateral rectus palsy or sixth cranial nerve lesion.

Case Presentation: We come across a rare case of HZO with horizontal diplopia because of lateral rectus/sixth cranial nerve lesion. A 50 years old male presented as emergency with extensive facial swelling and excruciating pain. He had a history of fever, lethargy, scalp tenderness for last 2-3 days for which he got treatment from outside. On examination, he had an extensive localized vesicular eruptions on left half of his face with bilateral periorbital and lid oedema, pre-auricular and sub-mandibular lymphadenopathy. Patient was unable to open his eyes. The vesicular eruptions were typically hemifacial, on left side. There was bilateral mechanical ptosis and lifting the lid manually revealed no motor deficit or diplopia. There was moderate conjunctival infiltration without any corneal involvement. Seeing the clinical picture, patient was put on medical management of oral antiviral and other supportive therapy with further investigations. After one week follow up he was almost cured, but complained of diplopia in primary position as he had spontaneous opening of his eyes then. Further investigation revealed abduction deficit in the left eye. There was no head tilt. Cornea, AC, Fundus were normal again. Medical reports were favorable at that time. Patient's MRI Brain Scan revealed normal study hence there was no systemic cause for the motor deficit. This forced us to conclude that this 6th nerve palsy i.e left lateral rectus paresis which was related to Herpes disease rather than to some thing else.

Discussion: There are very few reports that focused on oculo-motor palsies in patients of HZO. Though understood, it may involve the motor neurons. The most common cranial nerve palsy affecting the ocular motility is abducens, while in herpes disease is oculomotor. The mechanism by which the motor neurons are involved is still not clear. Many theories have been put forward like, motor neuritis was independent of the inflammation of any ganglion.[6] or cavernous sinus inflammation or intracavernous radiculo-meningitis[7] due to peri-vascular myositis. To conclude in HZO disease, the morbidity can be reduced by medical management started well in time and the use of vaccination for age of 50 years and above will further reduce its occurrence and related complications.

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JAPAN CLINICAL VIGNETTE POSTER FINALIST - TOSHIRO GOTO

Cavitary Lung Lesions in a Patient with Positive IGRA and PR3-ANCA are not Always due to TB or GPA: A Case Report of Right-Sided Infective Endocarditis (RSIE)

Authors: Toshiro Goto MS, Tokai University School of Medicine, Japan; Hidetaka Yanagi M.D.F.A.C.P., Tokai University Hospital, Japan.

Introduction: Infective Endocarditis (IE) can mimic various diseases including autoimmune, renal, musculoskeletal, and neurological disorders. Although heart murmurs and peripheral signs in patients with fever are hallmarks for left-sided IE, right-sided IE may lack peripheral signs and can present with migratory pulmonary infiltrates due to embolization. IE has also been associated with positive antineutrophil cytoplasmic antibody (ANCA), that could lead to misdiagnosis as Granulomatosis with Polyangiitis (GPA).

Case Presentation: A 67-year-old Japanese man with history of tooth extraction, diabetes mellitus, and benign prostatic hyperplasia presented with a one-month history of fever and multiple cavitary lung lesions. On examination, there were fine crackles bilaterally on auscultation. The patient was diagnosed as having active tuberculosis (TB) based on positive Interferon Gamma Release Assay (IGRA) and the clinical presentation, and treated accordingly. After ANCA was found to be positive and urinalysis showed red blood cell casts, he was referred to a nephrologist for a kidney biopsy which revealed proliferative glomerulonephritis. The patient was referred to a rheumatologist, and corticosteroid therapy was planned. The fever persisted, and blood cultures were sent, which turned out to be positive for *Enterococcus faecalis*. He was transferred to the Infectious disease division of the General Internal Medicine department. We noticed systolic heart murmurs and found the lung cavities migratory. The cardiac ultrasonography showed huge vegetations on the tricuspid valve. He was successfully treated with antibiotics therapy consisting of ampicillin and ceftriaxone, and underwent cardiac surgery.

Discussion: The diagnosis of IE, especially right-sided, tend to be delayed because RSIE lacks manifestations typically associated with left-sided IE such as peripheral signs and heart murmurs at the time of presentation that tend to develop in later stages. RSIE mimics other diseases especially pulmonary diseases. Differential diagnosis of lung cavitation includes but is not limited to tuberculosis, lung cancer, septic emboli and GPA. We must not miss right-sided IE because it's treatable and can be fatal if untreated. We need to keep a high index of suspicions for RSIE when we see patients with recurrent fever and multiple pulmonary infiltrates which may be cavitary and increasing in number, even if there are no risk factors such as intravenous drug use. Summarizing the above, we could possibly say that the most important test for the diagnosis of vasculitis is blood culture.

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KENTUCKY CLINICAL VIGNETTE POSTER FINALIST - JONATHAN D HENDRIE

A Deadly Case of Non-Obstructive Coronary Artery Disease

Authors: Jonathan D. Hendrie, Thomas H. Wool, MD, Adam J. Gray, MD

Introduction: Cholesterol embolism syndrome is a potentially deadly complication that has been reported in up to 1.4% of left heart catheterizations (LHC) with a mortality rate of 62.8%. Therefore, it is of paramount importance that physicians balance the risks and benefits of pre-operative stress testing and cardiac catheterization. Physicians can follow the guidelines released by the American College of Cardiology and American Heart Association, which provide a stepwise approach to perioperative cardiac assessment for coronary artery disease.

Case Presentation: An 84-year-old man presented with three weeks of worsening renal failure. He had a preceding LHC prior to an elective cholecystectomy that demonstrated non-obstructive coronary artery disease. He was subsequently admitted to an outside hospital twice after the procedure for malaise, fatigue, and renal failure thought due to dehydration and contrast nephropathy. He had only minimal improvement with intravenous fluids, and was discharged with stable renal function. This presentation, he again had persistent fatigue and malaise, but additionally had generalized weakness. He denied any non-steroidal anti-inflammatory drugs, new medications, chest pain, dyspnea, hematuria, dysuria, flank or suprapubic pain. He had diabetes mellitus, hypertension, and hyperlipidemia, and took metoprolol, ramipril, rosuvastatin, clopidogrel, and isosorbide mononitrate.

His heart rate was 127 and his blood pressure 160/103 mmHg. He was a thin elderly male appearing comfortable and in no distress. He had cool blue toes bilaterally. His heart sounds were soft with regular rhythm. There was no abdominal or costovertebral angle tenderness.

Sodium was 136 mmol/L, potassium 5.3 mmol/L, bicarbonate 15 mmol/L, blood urea nitrogen 82 mg/dL, creatinine 5.39 mg/dL, and albumin 3.0 g/dL. Leukocyte count was 14.5k/uL, hemoglobin 11.3 g/dL, and platelets 236k/uL. Urinalysis showed no proteinuria, 4-10 red blood cells per high-power field, and no eosinophils. Renal ultrasound revealed no nephrolithiasis or hydronephrosis. Given the blue toes and timing of the renal failure post-LHC, he was diagnosed with renal atheroemboli. He did not want hemodialysis and ultimately passed away several days after admission due to progressive renal failure.

Discussion: The renal complications of LHC are something every internist should recognize. Whereas contrast-induced nephropathy is usually self-limited and presents as an acute tubular necrosis 24-48 hours post-catheterization, cholesterol emboli-related kidney injury usually has a subacute onset with progressive decline. Rupture of atheromatous plaques and subsequent embolization to small arteries can additionally lead to livedo reticularis, blue toe syndrome, or ischemia in the gastrointestinal or central nervous systems.

Renal atheroemboli are from small cholesterol crystals and don't occlude larger vessels, but rather lead to distal small vessel ischemia and often a bland urinary sediment. The diagnosis is usually clinical, with the combination of a precipitating event, subacute renal injury, and typical skin findings. There is no therapy for renal atheroemboli and the prognosis is poor.

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MARYLAND CLINICAL VIGNETTE POSTER FINALIST - MAKOTO TANIGAWA

Atypical skin infection in a Maryland crabber

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Introduction: *Mycobacterium marinum* is a nontuberculous mycobacterium found in salt and fresh water world-wide, which infects humans following contact with fish or contaminated water. Patients typically present with a papule, nodule, or ulcer at the inoculation site with subsequent lesions extending along the path of lymphatic drainage known as “sporotrichoid spread”. Although typically not life-threatening in the immunocompetent patient, this rare infection can be resistant to treatment, especially if diagnosis is delayed.

Case Presentation: A 78 year old man presented to his primary care physician with a small painful erythematous papule on his dorsal right fourth finger associated with swelling and reduced range of motion. He was crabbing in the Chesapeake Bay area a few days before the lesion appeared. He was prescribed colchicine and prednisone for a presumed gout flare, however symptoms persisted and he started a course of cephalexin and amoxicillin-clavulanate for presumed cellulitis. He was further treated with several weeks of prednisone. Despite this treatment regimen, his pain and range of motion worsened. He was admitted one month later for persistent swelling. A biopsy of the hand lesion was obtained and yielded *M. marinum*, and he was started on rifampin and ethambutol. One month later, he was admitted for worsening swelling, pain and new, firm, non-tender nodules extending up his forearm. Previous biopsy culture sensitivities were reviewed and his regimen was changed to clarithromycin, rifampin, and doxycycline. He was re-admitted again one month later for progressive swelling extending to the mid-biceps, additional nodules now extending just proximal to the elbow, and evidence of tenosynovitis on outpatient magnetic resonance imaging. He underwent debridement of his right third and fourth digits. Cultures obtained from this debridement grew *M. marinum* and he was discharged on the same three-drug regimen. He experienced transient improvement in the swelling, but ultimately required a second debridement of the hand and forearm. Cultures again grew *M. marinum* and trimethoprim-sulfamethoxazole was added to the existing regimen due to concern for resistance.

Discussion: The main prognostic factor in *Mycobacterium marinum* infection is promptness of treatment, which is typically delayed by late presentations and misdiagnosis¹. Due to the indolent and chronic nature of the infection, patients typically do not seek medical attention immediately^{2,3}. *M. marinum* infections have been misdiagnosed as gout, rheumatoid arthritis or lupus, and treatment with corticosteroids in some cases exacerbated the infection^{4,5}. Antibiotic choice is based on susceptibility testing, clinician experience and case reports, and surgery is indicated for refractory cases. Treatment failure is associated with infection spread to deeper structures⁶. This case highlights the importance of obtaining a detailed social history including occupation and lifestyle in patients presenting with atypical skin lesions, and the importance of surgical intervention in deep tissue infections, especially those involving tendons.

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MARYLAND CLINICAL VIGNETTE POSTER FINALIST - SANSKRITI VARMA

Spine and Wine: A Rare Presentation of Classical Hodgkin Lymphoma

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Introduction: Most patients with Classical Hodgkin lymphoma (CHL) present with B-symptoms. While spinal metastasis as the initial manifestation of CHL is rare, it has been reported among case reports that the initial presentation of CHL may be musculoskeletal pain^(1,4). Pain in synchrony with alcohol consumption is another rare entity that has been previously reported as a presenting symptom of CHL^(2,3). Indeed, CHL can present atypically, and should remain on the differential for patients who present with alcohol-related pain or “red flag” back pain (longer than 6 weeks, age younger than 18 or older than 50, signs of infection, constitutional symptoms, neurologic deficits, history of cancer)⁽¹⁾.

Case Presentation: A thirty-two-year-old Chinese man without significant past medical history presented with a two-month history of worsening lumbosacral back pain radiating to the groin and left lower extremity that began with and was exacerbated by alcohol consumption (typically 8-12 ounces of red wine and Chinese white liquor). On physical exam, an anterior mediastinal mass was incidentally noticed. Laboratory values included a normal white blood cell count with manual differential showing 12% bands and 12% monocytes. He also had an elevated lactate dehydrogenase and serum beta-2 microglobulin, mild normocytic anemia, and elevated ESR and CRP. Computerized tomography (CT) showed a large minimally enhancing anterior mediastinal mass, extending through the anterior chest wall into soft tissues superficial to the sternum with osseous erosion of the manubrium, associated lymphadenopathy, and mild compression of the superior vena cava. Magnetic resonance imaging of the lumbar spine showed diffuse osseous metastatic disease of the lower thoracic and lumbar spine, with some extension into the right sacroiliac joint and the right S2 neural foramen; there was no vertebral body collapse or stenosis. Subsequent FDG-PET CT was significant for an intensely hypermetabolic infiltrative anterior mediastinal mass that extended through the anterior chest wall, and innumerable moderate to intensely hypermetabolic bone lesions throughout the spine, sacrum, bilateral pelvis, bilateral ribs and skull base. Tissue biopsy of the mediastinal mass was consistent with the diagnosis of CHL, Stage IVA, International Prognostic Score 2. The patient was subsequently started on ABVD therapy. Given some clinical response after two cycles of ABVD therapy but ongoing evidence of disease on subsequent PET-CT, he is planned for continued therapy for an additional two cycles and is currently on cycle three.

Discussion: This case illustrates the importance of maintaining malignancies on the differential for a patient presenting with “red flag” back pain. There is very little data with regard to lower back complaints or pain with alcohol in relation to CHL; future studies are needed to elucidate such clinical considerations. Furthermore, in the right context, having a high clinical suspicion for the malignancy will allow for early treatment.

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MASSACHUSETTS CLINICAL VIGNETTE POSTER FINALIST - LAURA BURNS

Acne Fulminans from Vedolizumab - An Uncommon and Severe Adverse Effect

Authors: Laura Burns, Kaitlin Blankenship, Mark Scharf

Introduction: Vedolizumab is an innovative monoclonal antibody, targeted against the $\alpha 4\beta 7$ integrin, approved for the treatment of moderate to severe ulcerative colitis or Crohn disease refractory to standard treatment¹. Vedolizumab is thought to be gut specific, blocking integrins specific to T-lymphocytes destined for the GI tract and their interaction with endothelial cells, thereby modulating the adaptive immune system in the gut without systemic immunosuppression². Vedolizumab is generally well tolerated, with acne rarely reported as an adverse event^{3,4,5}. Here we present a case of acne fulminans without systemic symptoms (AF-WOSS) as a severe side effect of vedolizumab, which responded very well to systemic steroids and oral isotretinoin in addition to discontinuation of vedolizumab therapy.

Case Presentation: A 46-year-old obese, Caucasian male presented with rapidly progressive tender skin lesions. He had a long-standing history of severe fistulizing and stricturing Crohn disease status post bowel resection with ileostomy. He recently started vedolizumab after failing infliximab, adalimumab, certolizumab, pegol, ustekinumab, and methotrexate. Only several weeks after beginning vedolizumab via IV infusion, he began to develop erythematous papules and pustules on the face, chest, and buttocks, which then rapidly progressed into painful and coalescing nodules and cysts over the next several months. He tried 10% benzoyl peroxide wash, as well as several weeks of oral doxycycline 100mg twice a day without any improvement. He denied fever, chills, bone pain, headache, fatigue, and myalgias.

On physical exam there were large, tender, erythematous, and indurated plaques heavily studded with coalescing red papules, pustules, and nodular deep seated cysts with honey crusting on the face, central chest and buttocks. Punch biopsy showed ruptured suppurative folliculitis with neutrophilic scale crust and a brisk mixed inflammation and fibrosis. The patient was diagnosed with AF-WOSS.

After cessation of vedolizumab, he completed a 7-day course of Bactrim, which was switched to Augmentin after culture of resistant *E. coli*, neither of which improved lesions. He then began a prednisone taper, ultimately totaling 14 weeks, with flairs below 40mg daily. After 3 weeks on oral prednisone, he concomitantly started oral isotretinoin 30 mg every other day slowly increasing as tolerated, which significantly improved the acneiform lesions, allowing for successful tapering of prednisone.

Discussion: Many studies have been published regarding the safety and side effect profile of vedolizumab, but acne is rarely reported⁴. Our patient demonstrates a severe and uncommon case of acne classified as AF-WOSS following initiation of therapy, ultimately requiring cessation of vedolizumab. Although vedolizumab was previously thought to have gut specific action, there is new evidence to suggest that the principal ligand of the $\alpha 4\beta 7$ integrin, mucosal addressin cellular adhesion molecule (MAdCAM-1), is not only expressed on gut endothelial cells but also on fibroblasts and melanomas, which may shed insight into the observed extra-intestinal side effects of vedolizumab⁶.

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MASSACHUSETTS CLINICAL VIGNETTE POSTER FINALIST - TOVA KOSOWSKY

Sinus Bradycardia: A Rare Side Effect of Dicyclomine Use

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Introduction: Sinus bradycardia is a common presentation in young, healthy patients.^{1,2} In asymptomatic patients, further management is not recommended and such patients can be followed outpatient. However, symptomatic patients or those with new onset bradycardia warrant thorough evaluation.

Case Presentation: A 43-year-old homeless man with a history of compensated cirrhosis secondary to chronic Hepatitis B and C, recent Hepatitis A infection, polysubstance use disorder (cocaine, opiates) on suboxone, depression and anxiety presented to his PCP with dizziness and lightheadedness. His symptoms began after a hospital discharge 5 days prior for an acute Hepatitis A infection. He presented with a resting heart rate of 45 and was sent to the emergency room, where he was admitted for further workup. On admission, his vitals were notable for a heart rate as low as 29. His cardiac exam was significant for bradycardia, normal S1 and S2, no murmurs, rubs or gallops, and an intact cardiac chronotropic response to leg lifts and ambulation. Workup was notable for serial EKGs consistent with sinus bradycardia, direct hyperbilirubinemia with elevated transaminases (all decreased from previous admission), and slightly elevated inflammatory markers (erythrocyte sedimentation rate, C-reactive protein). His negative workup included complete blood counts, electrolytes, cardiac enzymes, thyroid stimulating hormone, Lyme serologies, HbA1C, glucose levels, chest x-rays, blood cultures, and a transthoracic echocardiogram without signs of depressed cardiac function, valvular vegetations or structural abnormalities.

A thorough medication evaluation was performed. His medications prior to admission included suboxone, lorazepam, and paroxetine, all of which he had been on for years, along with cholestyramine and dicyclomine, recently started during his prior hospitalization for acute Hepatitis A infection. Based on recent initiation of these medications, dicyclomine and cholestyramine were held, along with his home lorazepam. Over the next three days, his heart rate remained in sinus rhythm with a gradual rate increase. He was asymptomatic at discharge with a heart rate of 52 and was instructed to discontinue dicyclomine, cholestyramine and lorazepam, with plans for close outpatient follow up.

Discussion: The differential diagnosis for sinus bradycardia includes cardiac disease such as acute coronary syndrome, myocarditis, congenital disorders or cardiomyopathy, electrolyte disturbances, medications or toxins, hypothyroidism, infections, autoimmune diseases or infiltrative diseases.³ This case illustrates the importance of proper evaluation of medication regimens. Although the use of dicyclomine has only rarely been associated with sinus bradycardia, with regards to this patient, the cessation of such drug was followed by a slow incremental increase in heart rate over two days while admitted. Though it is not an advertised side effect, post-marketing studies have shown that among patients greater than 40 years old, 0.3% developed new onset bradycardia.⁴ As such, the decision was made to stop his newly initiated medications.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - TAYLOR ANDERSON

The Perplexing Texting of Dystextia – Why the Message Indicates That Is A Problem

Authors: Taylor Anderson, Albert Gjeluci, Shyam Moudgil MD

Introduction: First presentations of stroke are generally taught in some form of the FAST mnemonic: Face drooping, Arm weakness, slurred Speech, and Time to treatment. However, with the prevalence of mobile phones, we are noticing that an increasing number of patients are presenting with the inability to write intelligible text messages. Here, two cases from St. John Hospital will be discussed. These patients presented with symptoms of what is now known as “dystextia,” a term originally used in 2006.

Case Presentation: The first case is a 43-year-old woman initially noticing headache typical of her normal migraine and spelling errors on texts and Facebook posts. On exam she was found to have a left facial droop and visuospatial anomalies. Brain MRI showed multiple acute embolic infarcts in the right frontal and parietal lobes. The second case is a 66-year-old female with difficulty writing text messages and typed notes. She visited her primary care physician and was sent to an urgent care. She was found to have a left frontal subacute infarct on head CT.

Discussion: Unimpaired texting requires the patient to be able to recognize and interpret previous messages, develop a response, and compose that response using intact visuospatial awareness and fine motor functions of the hand. These areas are commonly affected by stroke, but it is possible for them to be directly targeted by infarction leading to the presenting symptom of dystextia. As our two patients demonstrate, dystextia can develop after lesions of either hemisphere.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - RYAN ANDERSON

Lung Injury from Inhaling Butane Hash Oil Mimics Pneumonia

Authors: Ryan Anderson, MS3; Katie Zechar, MD; Anusha Karra, MD

Introduction: "Dabbing" is a relatively new form of inhaling high concentrations of Tetrahydrocannabinol (THC) utilizing Butane Hash Oil (BHO). BHO is produced using liquid butane to extract high levels of THC from dried cannabis; the resulting product contains both butane and terpene byproducts. The extraction process yields a waxy substance that is then heated, vaporized and subsequently inhaled. We describe a case involving inhalation of BHO that lead to an acute lung injury in a patient presenting with symptoms of atypical pneumonia

Case Presentation: A previously healthy 18-year-old female presented to the Emergency Department with shortness of breath for 3-4 days. Her initial oxygen saturation was 79% on room air. She was refractory to bronchodilators, steroids and supplemental O₂. She has a 1-pack year smoking history and daily BHO abuse. Her chest x-ray was positive for bilateral patchy infiltrates with mild hyperinflation. CT was negative for Pulmonary Embolus or other acute pathologic process. Sputum gram stain and blood cultures were negative. Arterial blood gases confirmed a pO₂ of 73 mmHg. On physical exam she was tachycardic and tachypneic. Respiratory auscultation showed decreased air entry bilaterally with diffuse expiratory wheezing, bilateral rhonchi and a prolonged expiratory phase. We concluded her severe pneumonitis was secondary to daily BHO inhalation.

Discussion: Heating a dab of BHO to high temperatures, releases up to 75% of THC, compared to 5-20% THC in traditional smoked cannabis. At 978°F terpenes degrade into methacrolein and benzene, both known carcinogens. Methacrolein is structurally similar to acrolein, a pulmonary irritant, which causes acute lung injury and pulmonary edema in laboratory animals. We hypothesize a mechanism of lung injury and acute respiratory failure secondary to inhalation of high levels of methacrolein and benzene related to relatively novel phenomena of BHO use.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - ANDREW BACYINSKI

Not all that is dead is pulseless: Venous limb gangrene in the setting of disseminated intravascular coagulation and malignancy.

Authors: Andrew Bacyinski, Jon Berguson, Hani Alhourani

Introduction: Acute limb ischemia in the setting of disseminated intravascular coagulation (DIC) may rarely present as venous limb gangrene. In such cases, the presence of distal pulses is insufficient to rule out ischemia.

Case Presentation: A 62-year-old male with a past medical history of coronary artery disease, diabetes, hypertension, and hyperlipidemia presented with persistent vomiting, diffuse stomach pain, and painful left lower leg and foot swelling for the past four weeks. The symptoms were all insidious in onset, but the patient's pain had recently become unbearable. On physical exam, the left foot was cold and edematous, with cyanosis of the medial three toes. Strength and sensation were mildly reduced in the left foot and ankle compared to the right. Pulses were palpable and equal in both feet. Initial labs revealed a picture consistent with DIC: hemoglobin 7.6, platelets 82,000, PTT 83.4, INR 6.9, D-dimer > 5250, and fibrinogen 74. Doppler ultrasound revealed multiple deep vein thromboses throughout the left leg, and CT scan of the abdomen revealed a mass in the wall of the sigmoid colon consistent with malignancy. Over the next few days, the patient's condition deteriorated. He developed severe melena and his hemoglobin continued to drop, although esophagogastroduodenoscopy was unable to identify a bleeding source. The patient's foot became exquisitely painful and developed large fluid-filled blisters, concomitant with an increased degree and distribution of cyanosis. Five days after admission to the hospital, the patient required a below the knee amputation of his left lower leg due to severe tissue gangrene. Notably, the patient's posterior tibial and dorsalis pedis pulses were palpable, confirmed with Doppler, throughout his entire course.

Discussion: Acute limb ischemia is classically described as a distal extremity with the "6 P's": pain, pallor, paresthesia, paralysis, poikilothermia, and pulselessness¹. However, ischemic limb gangrene can occur with the preservation of distal pulses. This phenomenon occurs due to thrombosis in the microcirculation and is strongly associated with DIC and underlying malignancy^{2,3}, as seen in this case. The pathophysiology of venous limb gangrene in the presence of malignancy and DIC is complex and involves both tumor-derived procoagulant particles and the failure of natural anticoagulants, including the protein C and antithrombin systems². Clotting in small venules leads to vascular congestion and tissue ischemia, occasionally with preserved pulses. This clinical vignette serves as a reminder that, although rare, venous limb gangrene must be on the differential list of a patient presenting with an ischemic extremity, especially in the picture of DIC and possible malignancy. The presence of a pulse, in and of itself, cannot rule out acute limb ischemia and should not delay urgent intervention in the right clinical setting.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - ARYAN GANJI

Emphysematous cystitis: a case report

Authors: Ganji, Aryan., Malhi, Ali., & Kouyoumjian, Sarkis.

Introduction: Emphysematous cystitis (EC) is a rare complication in which air remains trapped within the lumen or wall of the bladder. The majority of patients with emphysematous cystitis are female, between the age of 60-70 years, and exhibited diabetes mellitus. Although research demonstrates abdominal tenderness and pain are common symptoms amongst patients, there is currently a paucity of specific clinical symptoms that can be used by clinicians to diagnose. Thus physicians rely on risk factors for screening patients for EC which include: older age(over 60), diabetes mellitus, recurrent urinary tract infection or neurogenic bladder.

Case Presentation: We report a case of a 37 year old female with abdominal pain, nausea, vomiting, diaphoresis, chills, and burning with urination. Patient stated she had dysuria and bubbles in her urine. She also stated that the pain was crampy and on a scale of 1-10, the pain was a 10. The patient had a history of diabetes mellitus, gastritis, hypertension, a kidney stone, and a C-section.

Work up consisted of laboratory studies and urine analysis. Labs revealed an elevated glucose level at 392 with normal electrolytes and an anion gap of 15. WBC count was 8.0 cells/mcL, platelet count of 214,000 cells/mcL, hemoglobin of 15.6 gm/DL and a low potassium level of 3.3mMol/L. A urine analysis indicated the patient was positive for leukocyte esterase, positive hematuria and positive bacteria. A CT scan of the pelvis and abdomen without contrast indicated that the patient had abnormal bladder wall thickening which contained air. The diagnosis of acute emphysematous cystitis was made after multiple subtle indications.

Discussion: Limited information regarding the clinical symptoms of emphysematous cystitis exists thus physicians often rely on risk factors and imaging to complete a diagnosis. Currently only three literature reviews regarding emphysematous cystitis have been reported but demonstrate that the majority of patients with emphysematous cystitis were between the age of 60-70 years, mainly female and diabetes mellitus was present in more than 50 percent of patients. However the patient discussed in this report was significantly younger than the typical age of onset for EC and displayed unconventional symptoms such as vomiting. Vomiting was not a mentioned symptom in the three literature reviews and we were only able to sparsely locate a few cases of vomiting in EC patients. This case highlights the importance of physicians remaining vigilant and not only relying on common risk factors such as age.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - CINDY GE

A Case of Atrioventricular Nodal Reentry Tachycardia Secondary to Lung Cancer

Authors: Cindy X. Ge; Alessandra Rader, MD; Evan Asper, MD; Nabeel Shabo, MD

Introduction: Although cardiac metastases of malignant tumors are rare, it is a critical situation clinically when it does occur. The pericardium is the most frequently involved site and can cause arrhythmias and conduction disturbances, as well as pericarditis and congestive heart disease.

Case Presentation: A 74-year-old male with no significant past medical history was admitted for palpitations and syncope. Further history elicited a history of chronic cough, 60-pack-year smoking history, 50 lb weight loss over the past year, and no health care provider visits in 7 years. At admission, physical exam was unremarkable except a left supraclavicular firm lymph node consistent with Virchow's node and diminished breath sounds at the base of the right lung. Serum electrolytes, creatinine, and cardiac enzymes were within normal limits. Hemoglobin was 11.4 gm/dL and bicarbonate was 18 mmol/L. In the emergency department, the 12-lead electrocardiogram showed supraventricular tachycardia (SVT), diagnosed as atrioventricular nodal reentry tachycardia (AVnRT), with a ventricular rate of 164 bpm. Adenosine 6 mg and diltiazem 10 mg IV bolus converted patient rhythm back to normal sinus rhythm (NSR).

A computed tomographic imaging of the thorax with contrast showed large right infrahilar mass inseparable from the pericardium and invading/occluding the right inferior pulmonary vein. Echocardiogram revealed preserved ejection fraction with minimal tricuspid regurgitation and pericardial effusion. Bronchoscopy showed a preliminary diagnosis of adenocarcinoma.

On day 2 of hospitalization, patient spontaneously entered AVnRT after eating. He remained alert but his blood pressure decreased to 90/60. Adenosine 6 mg was given without successful conversion, but metoprolol 2.5 mg converted into NSR. Later that day, patient reentered AVnRT. Adenosine 6 mg and metoprolol 2.5 mg converted into NSR but went back into AVnRT within minutes. Additional metoprolol was unsuccessful. He refused electrical cardioversion and adenosine at that time. He spontaneously converted into and out of AVnRT throughout the next few hours, which was temporarily improved by coughing and other vagal maneuvers. He was started on flecainide 50 mg twice a day and verapamil extended-release 120 mg once a day. This maintained NSR without recurrence of AVnRT during his stay.

Discussion: This case illustrates the potential for serious clinical events, such as an arrhythmia, to occur as the first sign of the presence of a mediastinal tumor invading cardiac structures. Myocardium metastases associated with arrhythmia are very rare. Most of the reported cases with arrhythmias associated with cardiac metastasis ended up in death shortly after the arrhythmic episodes. As such, it is important to keep cardiac metastasis in the differential if there is a suspicion of cancer with drug-refractory tachycardia.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - EMMANUEL W LEUNG

Good Intentions Gone Wrong: How Smoking Cessation Efforts resulted in Water Intoxication

Authors: Emmanuel Leung, MS3, Saravana Lakshumanan, MD, Gurbir Singh, MD

Introduction: Self-induced water intoxication is a potentially fatal complication of primary (psychogenic) polydipsia, which is classically attributed to psychosis. Patients may present with altered mental status and seizures^{1,2}. This is a case of severe symptomatic hyponatremia induced by water intoxication in a patient with no active psychiatric illness. The patient reported finding internet articles that encouraged nonspecific quantities of water consumption to combat nicotine withdrawal symptoms.

Case Presentation: 42-year-old African-American male with history of seizures and abuse of alcohol, tobacco, and cocaine was brought to the emergency department by his sister for acute altered mental status. The patient was found on the floor with facial abrasions, likely secondary to a seizure. He abruptly discontinued use of all three substances 2 months ago, takes no medications, and reported increased water consumption lately. Vital signs included blood pressure of 150/70, heart rate of 93 beats/min, temperature of 98.3°F, and no signs of respiratory distress or depression. The patient was alert only to self. Physical exam revealed facial abrasions and tongue laceration but was otherwise unremarkable. Labs revealed serum sodium 113 mmol/L, potassium 3.7 mmol/L, chloride 76 mmol/L, glucose 156 mg/dL, and serum osmolality 234 mOsm/kg. Urinalysis and drug screen were negative. Urine osmolality and sodium were 127 mOsm/kg and 41 mmol/L, respectively. CT of the head and neck were negative for acute findings. Clinical diagnosis of severe symptomatic hyponatremia secondary to water intoxication was given and supportive therapy was initiated^{3,4}. His status improved dramatically overnight, and serum sodium was re-established within normal range. The following day, the patient admitted to drinking 2 gallons of water daily for at least 1 month due to internet recommendations on combating smoking withdrawal symptoms.

Discussion: Clinical findings were consistent with severe hypotonic hyponatremia (serum Na⁺ <120 mEq/L) secondary to self-induced water intoxication³. Water consumption in smoking cessation has yet to be substantiated by literature as an effective nonpharmacologic strategy⁵. Past studies typically associated heavy smokers with a higher propensity to develop symptomatic hyponatremia due to potent stimulation of ADH by nicotine. This suggests that increased water consumption may exacerbate hyponatremia with concurrent use of other nicotine-containing products when attempting smoking cessation, resulting in water intoxication^{6,7}. To our knowledge, this is the first reported association between smoking cessation efforts and water intoxication via primary polydipsia. Therefore, in the setting of symptomatic hyponatremia and significant smoking history or attempted smoking cessation, physicians should consider water intoxication in the differential. This case also illustrates the impact of patient misinformation and emphasizes the importance of providing patients with evidence-based nonpharmacologic guidelines for smoking cessation.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - SEAN MILLER

A Unique Case of Simultaneous Large - and Small-vessel Vasculitis: A Case Report

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Introduction: Temporal arteritis is a large-vessel vasculitis that classically presents in adults > 50 yo with headache, temporal pain, scalp sensitivity, cranial nerve palsies, jaw claudication, and constitutional symptoms. It is often attributed to Giant Cell Arteritis (GCA), so often in fact that “Temporal Arteritis” and “GCA” are considered synonyms by most medical texts. Microscopic polyangiitis (MPA) is a predominantly small-vessel vasculitis that classically presents in adults of any group with rapidly progressive glomerulonephritis (RPGN) and/or alveolar hemorrhage. Here, we describe a case involving MPA with an initial presentation of Temporal Arteritis.

Case Presentation: A 73-year-old woman with past medical history of traumatic enucleation of the right eye in childhood and myelodysplastic syndrome presented to a community hospital with acute vision loss of her left eye and severe headache for three days. She had weakness, fatigue, decreased appetite, 30lbs weight loss, and periodic fevers for three months prior to admission. ESR > 120. Temporal artery biopsy met ACR criteria for GCA. She was treated with prolonged course of high-dose steroids.

Several weeks later, while on steroids, she developed nephritic syndrome and mononeuritis multiplex of the lower extremities bilaterally, prompting re-hospitalization and transfer to our institution. Fundoscopic exam showed a normal disc, no obvious pallor, and no disc edema. Neurologic exam showed severely reduced sensation and strength of the lower extremities. Labs showed Cr of 4.7 (from baseline of 1.6), ESR of 109, and high-titer MPO-ANCA level. CT chest revealed a solitary lung nodule. She received high dose steroids, plasmapheresis, and rituximab, as well as intermittent hemodialysis. In the subsequent weeks, she had improvement in her vision, strength, and renal function.

Discussion: This case is unusual due to the simultaneous presentation of small and large vessel vasculitis. GCA is unlikely to cause RPGN while most reports of large vessel involvement in MPA are of aortitis. In this case, histopathologic findings of pauci-immune necrotizing vasculitis in the setting of high-titer anti-myeloperoxidase antibodies is consistent with microscopic polyangiitis. MPA however is an unusual cause of temporal arteritis and does not definitively account for the patient’s initial presentation. Furthermore, absence of giant cells does not exclude GCA - in fact, 50% of temporal artery biopsies in cases of GCA lack giant cells.

In cases of Temporal Arteritis, it is of critical importance to differentiate GCA from ANCA-associated vasculitis (AAV) as these diseases have very different management strategies. GCA is treated predominantly with a prolonged course of high-dose steroids followed by methotrexate or tocilizumab. Although AAV also requires a prolonged course of high-dose steroids, induction therapy also includes plasmapheresis and rituximab, and possibly cyclophosphamide. Prompt recognition and initiation of treatment was critical to preserve end-organ function.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - JAIME TAN

A rare case of desmoplastic infantile ganglioglioma with double expression of BRAF V600E and ALK

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Introduction: Desmoplastic infantile ganglioglioma (DIG) is a rare low-grade (WHO grade I) brain tumor that is usually found in the temporal lobe¹. DIG patients can present with macrocephaly and seizures. It typically occurs in the first two years of life, but some cases have a later presentation^{2,3,4,5,6}. A subset of DIG tumors is positive for the BRAF V600E mutation^{7,8}; this is indicative of worse outcomes in low grade glioma⁹. Moreover, ALK (Anaplastic Lymphoma Kinase) is a proto-oncogene that is often seen in tumors such as melanoma and neuroblastoma among others^{10,11,12}. In some tumors, ALK expression is associated with a worse prognosis. Here, we present a case of DIG that is positive for BRAF V600E and ALK – something that has not been described in the past. Although surgical resection is the preferred treatment for DIG, some of these tumors are not resectable⁹. Determining the significance of BRAF V600E and ALK expression in DIG is important because it may give alternative treatments such as targeted inhibitors for patients with non-resectable tumors. Magnetic resonance imaging (MRI). MRI of the head with and without contrast was performed. Immunohistochemistry (IHC). Tumor sections were stained with BRAF V600E (VE1 antibody, Ventana), Anaplastic lymphoma kinase (ALK; 5A4 antibody, Ventana), and Ki-67 (Mib-1, Ventana). Diaminobenzidine (DAB) staining was used for detection. Histological Staining. Paraffin-embedded tumor sections were stained with hematoxylin and eosin (H&E).

Case Presentation: A seven-year-old female presented with new-onset seizures. Axial T1 MRI showed a right sided parietal lesion composed of a superficial enhancing lesion with associated cyst and right to left mid-line shift. Incomplete resection was performed. IHC showed that the tumor had cytoplasmic staining for BRAF V600E and ALK. Ki-67 was low; 1% of tumor nuclei were positive. H&E staining showed a cellular lesion in the meninges composed of ganglion cells and glial cells with a desmoplastic background. These findings are consistent with DIG.

Conclusion: This brain tumor, which is positive for both BRAF V600E and ALK, presents as a unique case of DIG. An extensive literature search found that an analogous co-expression of BRAF V600E and ALK can be seen in atypical Spitzoid neoplasm, where these markers indicate worse outcomes¹³. It is unclear if that is the case for DIG. Because the co-expression of these markers may offer additional targeted treatment options, it is important to test for these markers in all cases of DIG¹⁴. Also, this would help determine the clinical significance of these findings.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - DANIELLE YEE

A Case of Eosinophilic Mastitis Successfully Treated with Omalizumab

Authors: Danielle Yee; Renee Dhar Dass, MD; Kathleen Dass, MD

Introduction: From 1985 to 2018, there have only been 8 reported cases of eosinophilic mastitis in literature. We report the ninth case of eosinophilic mastitis, a rare manifestation of peripheral eosinophilia, presenting similarly enough to be confused with both hives and breast carcinoma. In addition, this is the first case of eosinophilic mastitis to be successfully treated with omalizumab.

Case Presentation: A 74-year-old female presented to an outpatient clinic with a fixed erythematous rash increasing in size on her breasts that had been ongoing for 2 years. Due to a skin biopsy showing perivascular eosinophilic infiltrate and severe generalized pruritus, she was initially diagnosed with urticaria. The patient had failed a course of four H1 anti-histamines, doxepin, topical corticosteroids, and montelukast. The presentation of a fixed erythematous rash on her breasts, raised the concern for possible breast malignancy and diagnostic testing was performed. Pertinent positive laboratory studies revealed an elevated absolute eosinophil count (227 cells/ uL) with significantly elevated IgE (1840 kU/L). Additional testing included a breast ultrasound, mammogram, breast biopsy, and CT scan of the brain, chest, abdomen, and pelvis, all of which was negative. The patient was diagnosed with eosinophilic mastitis. While corticosteroids have previously been reported as successful for this condition, there was hesitation to start these due to the patient's medical history of type 2 diabetes mellitus. Instead, the patient received subcutaneous omalizumab 300 mg q4 weeks for the symptomatic pruritus. The rash completely resolved after 8 weeks of treatment and has not returned since.

Discussion: Eosinophilic infiltration of the breast is an extremely rare manifestation of tissue involvement in peripheral eosinophilia. Due to its presentation as a fixed rash of the breasts, it is commonly mistaken for other conditions, including hives and breast carcinoma. It is unusual for hives to present as a fixed rash. Rather, a fixed erythematous and pruritic breast rash, with associated high IgE levels, negative cancer screenings and imaging, and biopsy showing eosinophilic infiltration, should raise a clinician's suspicion for eosinophilic mastitis. While previous cases have been managed with prednisone and anti-histamines, this is the first documented case to be successfully treated with omalizumab, utilizing the IgE neutralization therapy of this anti-IgE monoclonal antibody. Our case demonstrates the importance of including eosinophilic mastitis as a differential diagnosis for breast rash as well as the efficacy of omalizumab for treatment of this condition.

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MONTANA CLINICAL VIGNETTE POSTER FINALIST - KELCIE FOSHAG

A Recurrent Case of ACE-Inhibitor Induced Angioedema Despite Cessation of Medication

Authors: Kelcie Foshag, OMS-IV, Pacific Northwest University of Health Sciences, Yakima, WA, Emma Sargsyan, MD, FACP, Benefis Health System, Great Falls, MT

Introduction: Angioedema, a well-known side effect of ACE-inhibitors, is a localized, noninflammatory, asymmetric swelling of the lips, tongue, face, oropharynx, intestines, and genitals. Among those taking ACE-inhibitors, the prevalence of drug induced angioedema is 0.1% to 0.7%. While the side-effect is rare, a late presentation of angioedema and repetitive episodes after discontinuation of an ACE-inhibitor is even more uncommon.

Case Presentation: An 80-year-old Caucasian male with a history of hypertension has been on benazepril daily for over ten years. He presented to the walk-in clinic with complaints of mild lip swelling. He was instructed to discontinue his ACE-inhibitor and saw initial improvement. At this point, he was started on a calcium channel blocker to control his hypertension. However, one day later, the swelling worsened and he presented to the emergency room with facial and neck soft tissue edema, hoarseness, and dysphonia. The patient was immediately intubated. A CT of the neck was performed and showed pharyngeal thickening with soft tissue edema. He was started on steroids, anti-histamines, and given one unit of FFP. The patient's angioedema responded overnight to the therapy and he was subsequently extubated the next morning. His symptoms completely resolved and he was discharged home. The patient then continued to have multiple episodes of angioedema after this presentation. These episodes presented at day 11, 48, 54, and 72 after stopping the ACE-inhibitor. His complement C4, C1q and C1 esterase inhibitor levels were checked and found to be within normal limits. He was also evaluated by an immunologist and no other explanation for these episodes was found. Each of the following episodes consisted of lip and lower facial swelling. He responded quickly to FFP, steroids, and anti-histamines and did not require intubations with these episodes. He was given an epinephrine pen to use on discharge. Since his last episode, 72 days after stopping the ACE-inhibitor, he has not had any more occurrences which has been over 6 months now.

Discussion: This case emphasizes the importance of recognizing medication induced side effects even when a patient has been on a medication for a long period of time and despite discontinuation, patients may still have sequelae from their medical therapy. ACE-inhibitor induced angioedema is a rare complication that usually presents within three months of initiation of the medication. However, it is important to be aware that a third of the cases present after the first three months and like this case, along with a few other case studies, have shown that recurrences can occur up to 6 months after discontinuation of the ACE-inhibitor.

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MINNESOTA CLINICAL VIGNETTE POSTER FINALIST - MATTHEW EIDENSCHINK

A New Achy Joint a Day Leads the Doctors Astray: A Confusing Case of Migratory Polyarthritis

Authors: Matthew Eidenschink, MS3; David Ewart, MD; Albertine Beard, MD

Introduction: Migratory Polyarthritis is a disabling condition with multiple etiologies. Prompt synovial fluid analysis is crucial to determine etiology. Despite this, only 50% of patients with polyarticular arthritis receive a definitive diagnosis. Pattern of joint involvement and clinical course can assist with correct diagnosis.

Case Presentation: A 73-year-old Navy veteran recently diagnosed with stage 4 pleural mesothelioma presented to the VA hospital with a two-day history of progressively worsening joint pains. What began as an achy pain in his left knee, progressed to a throbbing, very severe, constant ache in both his left knee and right shoulder. He was unable to get out of bed due to this pain, prompting a call to EMS. On arrival to the Emergency Department, he was found to have a low-grade fever, swelling, warmth and tenderness in these joints, leukocytosis (15.14K) and markedly elevated inflammatory markers. He had no history of trauma, fall, chronic arthritis, gout, pseudogout or other autoimmune condition. He did not have any skin rash, tick exposure, or sick contacts. Blood cultures were drawn, and he was started empirically on ceftriaxone and eventually vancomycin for presumed septic arthritis.

Over the course of five days, his left knee, right shoulder, right elbow, left shoulder and right wrist were sequentially involved. The affected joints became swollen, warm to the touch and painful enough to limit ROM and weight bearing before resolving in the order that they became affected. X-rays of the affected joints were unremarkable. Joint aspirations were suggestive of septic arthritis with high neutrophil counts and no crystals, but no organisms grew. On day three he developed aphthous ulcers. Since blood, urine and synovial cultures did not grow bacteria, antibiotics were discontinued. On day five, he continued to improve without antibiotics and was discharged from the hospital. All blood and joint cultures had no growth. Shortly after discharge he started chemotherapy for his new diagnosis of metastatic mesothelioma and since starting treatment has not had any recurrent joint symptoms.

Discussion: Our patient had an acute-onset asymmetric, migratory, polyarticular arthritis of medium and large joints lasting 1-2 days in each location. The differential diagnosis for synovial fluid with a white blood cell count greater than 100,000 cells/mm³ is septic arthritis, crystal-induced arthritis, or leukemic infiltration. Synovial fluid showed classic findings of septic arthritis with significantly elevated WBCs, neutrophil predominance and no crystals, but when gram stain and culture showed no organism his history and clinical course helped refine the differential diagnosis. His continued clinical improvement despite discontinuing antibiotics and lack of recurrence is suggestive of inflammatory arthritis secondary to paraneoplastic disease.

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MISSOURI CLINICAL VIGNETTE POSTER FINALIST - JEFFREY CHOI

A stressful stress test: Takotsubo cardiomyopathy as a rare complication of exercise treadmill testing

Authors: Jeffrey Choi MS4, Phillip King MD, Joel Schilling MD. Washington University in St. Louis School of Medicine.

Introduction: Takotsubo cardiomyopathy (TC) is an increasingly recognized mimicker of acute coronary syndrome, characterized by transient regional left ventricular systolic dysfunction in the absence of obstructive coronary artery disease. Also known as stress-induced cardiomyopathy or broken heart syndrome, TC is often associated with a provoking physical or emotional stressor and most commonly seen in postmenopausal women. This case describes, to the authors' knowledge, the first report of a male patient who developed confirmed TC as a rare complication of exercise treadmill testing.

Case Presentation: A 55-year-old male with a 30-pack-year smoking history and several months of progressive exertional dyspnea presented with acute chest pain and diaphoresis. Prior medical workup was only notable for coronary CT angiography in 2008 that was negative for coronary artery stenosis. On admission, troponins were < 0.03 ng/ml, while ECG noted left ventricular hypertrophy and no ST segment changes suggestive of ischemia. For further risk stratification, he underwent exercise stress echocardiography with standard Bruce protocol. Pre-stress echocardiogram showed normal chamber morphology and function, no wall motion abnormalities, and left ventricular ejection fraction of 60%. At maximal stress, echocardiogram showed left ventricular dilatation and akinesis of the apical segment, septum, and anterolateral walls suggestive of myocardial ischemia in the LAD/diagonal distribution. He subsequently developed chest pain, troponin elevation to 0.39 ng/ml, and ECG changes concerning for NSTEMI. As a result, he underwent cardiac catheterization, which revealed no significant coronary artery disease, but left ventriculography was compatible with mid-ventricular variant TC. He was initiated on medical management with carvedilol, lisinopril, aspirin, and atorvastatin as well as one month of rivaroxaban. Repeat transthoracic echocardiogram the following day demonstrated hypokinetic but improving left ventricular apical function.

Discussion: The diagnosis of TC is based on the clinical presentation of suspected acute coronary syndrome, imaging evidence of transient apical or mid-ventricular regional wall motion abnormalities, and the absence of obstructive coronary artery disease on angiography. Besides ruling out ACS, differential diagnosis also includes pheochromocytoma, myocarditis, cocaine abuse, and coronary vasospasm. The pathogenesis of TC remains controversial, but is often thought to be secondary to catecholamine excess resulting in microvascular vasospasm and myocardial stunning. There are very few reported cases of this syndrome occurring secondary to exercise stress testing, all of which have previously occurred in female patients. Guideline-directed medical therapy for heart failure is the mainstay of treatment, and anticoagulation can be considered to prevent thrombus formation in the setting of left ventricular dyskinesis.

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NEW HAMPSHIRE CLINICAL VIGNETTE POSTER FINALIST - NATASHA MERALI

Infarct versus Infection: Renal Artery Thrombosis Masquerading as Pyelonephritis in a 19 year-old Female

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Introduction: Renal infarction is a rare diagnosis estimated to have an incidence of less than 2%; however, the actual incidence is believed to be higher due to missed or delayed diagnosis. This is likely due to its diagnostically challenging nature, as presenting symptoms often mimic common causes of acute abdominal pain. It is therefore important to have a suspicion for renal artery thrombosis to begin early anticoagulation therapy.

Case Presentation: A 19 year-old female without significant past medical history presented with 1 day sudden onset malaise, nausea, vomiting, and left flank pain radiating to the abdomen. She denied fever, chills, urinary frequency, dysuria, or hematuria. She was on an oral contraceptive pill. Surgical history included ACL repair 2 months prior, and family history was notable for recurrent nephrolithiasis in mother. There was no history of renal or hypercoagulable disorders. She was a college student, denied alcohol, tobacco, or illicit drug use, and was not sexually active. On presentation, she was hemodynamically stable, afebrile, and physical exam was pertinent for mild left costovertebral angle tenderness. Admission labs showed WBC 8.1 mo/L, creatinine (Cr) 1.32 mg/dL, and Lactate Dehydrogenase (LDH) 852 u/L. Urine analysis and microscopy demonstrated elevated protein (30 mg/dL), but was otherwise unremarkable. CT abdomen/pelvis showed asymmetric reduced enhancement of the left kidney with loss of cortical medullary differentiation suggestive of pyelonephritis without abscess or obstruction. This was thought to be an atypical presentation of pyelonephritis, given the initial lack of fever or UTI, and she was empirically started on IV ceftriaxone. Within 24 hours of admission, she developed fevers, tachycardia, leukocytosis, progressive AKI (Cr to 1.56 mg/dL), and LDH to 1177 u/L. Retroperitoneal ultrasound confirmed wedge-like hypoechoic region in the left kidney consistent with renal infarction. Extensive autoimmune and rheumatologic workup was significant for a positive lupus anticoagulant. Echocardiogram revealed patent foramen ovale (PFO). Antibiotics discontinued on day #4, and she was started on Aspirin 325 mg daily. On hospital day #9, she had acute-onset left-sided pleuritic chest pain and elevated D-dimer. V/Q scan showed wedge-shaped perfusion defect in left lung base consistent with a pulmonary embolus, and she started a 3-month course of Apixaban.

Discussion: This case illustrates the possibility of a renal artery thrombosis and infarct presenting as pyelonephritis in an otherwise healthy individual. Her risk factors for thrombosis include OCP use, and immobilization from surgery for an ACL tear two months prior to admission. There have only been two case reports of renal artery thrombosis in the setting of OCP use, and the association between OCP use and renal artery thrombosis has not been well-studied. The presence of her PFO is unlikely to be the cause of a paradoxical embolism, as isolated renal infarcts in these cases are exceedingly rare. Positive lupus anticoagulant could be falsely elevated in the setting of acute inflammation, and warrants retesting and further workup of lupus and other prothrombotic disorders.

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NEW JERSEY CLINICAL VIGNETTE POSTER FINALIST - HAE-SUN LA

A Cold Case: A case of spontaneous periodic hypothermia

Authors: Hae-Sun La, Marygrace Zetkolic, MD

Introduction: Hypothermia secondary to abnormal thermoregulation of the body is rarely reported in the literature. Abnormal thermoregulation at the level of the hypothalamus has been caused by stroke, multiple sclerosis, or other structural lesions. In this case report, we will discuss a patient with recurrent episodic hypothermia without evidence of a structural lesion. With limited number of reports on secondary hypothermia, this case report poses important questions regarding the pathophysiology of unexplained recurrent episodic hypothermia.

Case Presentation: We present a 63-year-old African-American woman with multiple admissions over two years for unexplained hypothermia associated with fatigue, mild hypoglycemia, psychomotor retardation, and unsteady gait. The patient also had pancytopenia and a mild transaminitis. During episodes of hypothermia, the patient reported no shivering or awareness of being cold. Over two years she had a 50 lb. weight loss. Evaluations of the adrenal and pituitary axis were normal. At times of hypothermia, the patient would have sugars in the 60-70 mg/dl range. As hypoglycemia is associated with hypothermia, evaluation for insulinoma was performed by a 72-hour fast. Results showed appropriately low c-peptide levels with hypoglycemia, suggesting no insulinoma. IGF-1 and IGF-2 were also normal. Neuroimaging revealed no hypothalamic lesions to explain her central hypothermia. Bone marrow biopsy did not demonstrate a primary bone marrow disorder. Hypothermia was concluded that the pancytopenia was caused by the hypothermia and was not an etiology of the hypothermia.

The patient had proximal muscle weakness and was tested for myasthenia gravis. She was found to have positive acetylcholine receptor antibody and was treated with IVIG with symptomatic improvement. However, since her hypothermia was episodic, it is possible that improvement was secondary to the natural course of her condition.

The patient was discharged euthermic. Four weeks later she was brought to an outside hospital in cardiac arrest. The cause of death was attributed to a stroke though there was no autopsy to confirm the cause of her expiration.

Discussion: Normal thermoregulation involves the hypothalamus as the main regulator. The hypothalamus senses the temperature by receiving signals from the thermoreceptors in the periphery, or by direct stimulation from the changes in temperature in the perfused blood in the brain. When body temperature decreases, the hypothalamus signals the body to increase the heat production increasing muscle activity (shivering), and triggering hormones (epinephrine, norepinephrine, thyroxin) to increase metabolism. In our patient, each mechanism of heat production was investigated. No shivering was present and hormonal testing was normal. Neuroimaging demonstrated no abnormalities that may have caused interruptions in the signaling in the central nervous system. Therefore, her hypothermia was presumed to have been caused by hypothalamic dysfunction. Two etiologies were hypothesized: an autoimmune process given the identification of acetylcholine receptor antibodies or undetectable microinfarctions in the hypothalamus.

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NEW JERSEY CLINICAL VIGNETTE POSTER FINALIST - ALESSANDRA PETRILLO

Hunting Down the Zebras: Hemophagocytic Lymphohistiocytosis Secondary to EBV-driven Classical Hodgkin Lymphoma

Authors: Alessandra Petrillo MS-III, Dr. Marygrace Zetkulich, Dr. Lori Ann Leslie, Dr. Chinwe Ogedegbe

Introduction: Secondary hemophagocytic lymphohistiocytosis (HLH), a rare and life-threatening condition affecting adults, is triggered by autoimmune diseases, infections, and malignancies. EBV has been the most consistently reported virus associated with HLH. If HLH is left untreated, severe neutropenia results in death secondary to bacterial or fungal infections.

Case Presentation: Patient was a 54-year-old Dominican woman admitted to a hospital for a 4-month history of relapsing fever, 30lb weight loss, and symptomatic anemia. She was evaluated for symptomatic anemia at another hospital, where she had a colonoscopy/endoscopy and her home country, Dominican Republic, where she received 4 blood transfusions. She was discharged with a diagnosis of liver infection and told to have a bone marrow biopsy when returning to United States. Complete blood count on admission was significant for peripheral blood cytopenia with a hemoglobin 5.2g/dL. Patient was transfused with 2 units pRBCs. On hospital day 3, the patient had a bone marrow biopsy which revealed 90% cellularity, scattered large atypical lymphoid cells in a histiocytic background, mono/bi multinucleated, resembling Reed-Sternberg cells and Hodgkin cells. On hospital day 4, patient decompensated, and was admitted to ICU with confusion, respiratory distress, worsening hyperbilirubinemia, and hemodynamic instability. Patient had a non-contrast brain MRI which revealed minimal white matter disease compatible with residual or prior posterior reversible encephalopathy (PRES). She was found to have reactivation of EBV. Subsequently, this patient had Tmax 39.3°C, hepatosplenomegaly, pancytopenia, hypertriglyceridemia, and hyperferritinemia >10,000 ng/mL. Despite diffuse lymphadenopathy on CT, minimal clinical lymphadenopathy resulted in unattainable left axillary lymph node tissue at biopsy. Patient remained hemodynamically unstable and was on vasopressin, epinephrine, and phenylephrine. Antimicrobial coverage included acyclovir, vancomycin, amphotericin B, meropenem, azithromycin, clindamycin, and atovaquone. Both adult T cell lymphoma and Hodgkin lymphoma were considered. Patient was started on cyclophosphamide and dexamethasone. On hospital day 13, patient suffered from cardiac arrest secondary to septic shock confirmed mixed bacteremia with resistant organisms. This patient had reactivation of EBV driven stage IV classical Hodgkin lymphoma accurately diagnosed after lymph node biopsy on autopsy.

Discussion: Secondary HLH is associated with infections, malignancies, autoimmune diseases, and immunodeficiency (2). Although EBV is the most common infection associated with HLH, others include CMV, HSV, VSV, measles, HHV-8, H1N1 influenza, parechovirus, and HIV(1). Malignancies are most commonly associated with T, NK, and anaplastic large cell lymphomas and leukemias. Adult HLH can be diagnosed if five of the eight clinical findings exist; fever $\geq 38.5^{\circ}\text{C}$, splenomegaly, peripheral blood cytopenias, absolute neutrophil $< 1000/\text{microL}$, hypertriglyceridemia, hypofibrinogenemia, hemophagocytosis in bone marrow, spleen, lymph node, or liver, low or absent NK activity, ferritin $> 500 \text{ ng/mL}$, or elevated soluble CD25 two standard deviations above age-adjusted laboratory specific norms (1). Supportive evidence includes cerebral symptoms, transaminitis, elevated bilirubin, and elevated LDH. Patients whom are at high risk develop PRES (1), which was incidentally found on this patient's MRI.

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NEW JERSEY CLINICAL VIGNETTE POSTER FINALIST - VICTOR RAZUK

Percutaneous coronary intervention of ST Elevation Myocardial infarction with cardiogenic shock due to thrombosis of an unprotected Anomalous Left Main Coronary Artery: A Case Report

Authors: Victor Razuk, Medical Student, Rutgers Robert Wood Johnson Medical School, Piscataway NJ, Jasrai Gill MD, Director of Interventional Vascular Therapy, Shore Heart Group, PA

Introduction: Coronary artery anomalies in patients undergoing diagnostic coronary angiography is a rare event with an incidence of 1.3%. Case reports of patients presenting with an acute STEMI of an unprotected ALMCA are sparse in literature. Even rarer are cases complicated by cardiogenic shock who report successful therapeutic intervention.

Case Presentation: An 84 year old male non-smoker with a past medical history of hypertension, hyperlipidemia, diabetes mellitus, and coronary artery disease status post PCI of the RCA presents to a community hospital with 45 minutes of acute onset substernal chest pressure and dyspnea. An EKG demonstrated anterior ST segment elevations with reciprocal ST depressions in the inferior leads. The patient was diagnosed with an anterior STEMI and the PCI team was activated.

AL 1 guiding catheter revealed an anomalous LMCA arising from the right coronary cusp. Angiography revealed a total thrombotic occlusion of the vessel with TIMI 0 flow. Prior to intervention the patient became hypotensive, hypoxic, and tachycardic indicative of cardiogenic shock. ACLS was initiated for PEA. Two rounds of epinephrine were administered and the patient was intubated. Total resuscitation time of 10 minutes. An intra-aortic balloon pump was placed and a norepinephrine drip was started augmenting the blood pressure to 140/60 mm Hg. There was no Impella device available for support. After the patient was hemodynamically stabilized, the occlusion was dilated with a 2.5 x 15 TREK PTCA balloon catheter. Door to balloon time of 80 minutes. The anomalous LMCA was stented with a 3.0 x 23 Xience Alpine DES. Final angiography revealed patent, well apposed stent with TIMI 3 flow in all vessels. The patient was continued on aspirin, brilinta, high dose atorvastatin, and a heparin drip for anticoagulation.

The patient's clinical status improved over the next 48 hours. The norepinephrine drip was weaned off and the balloon pump was removed. A transthoracic echocardiogram revealed an ejection fraction of 40-45% with basal inferolateral wall hypokinesis. Eight days after admission the patient was discharged home. An EKG from a follow up visit 10 months later showed normalization of the ST abnormalities.

Discussion: This unique case presents the challenging intervention of PCI for a STEMI of an anomalous LMCA complicated by cardiogenic shock. It is important to obtain hemodynamic stability prior to coronary intervention. An intra-aortic balloon pump was placed prior to PCI which has been shown to reduce 30-day mortality compared to post PCI placement in the recent IMPRESS in Severe Shock trial. Currently the use of percutaneous hemodynamic support devices such as IABP for cardiogenic shock is given a IIB recommendation by the ACC. No Impella devices or surgical interventions were available at the community hospital. Many critical cases occur in this setting where IABP may be the only accessible option.

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NORTH CAROLINA CLINICAL VIGNETTE POSTER FINALIST - BENJAMIN BRYANT

Wernicke's Encephalopathy Presenting as Sensorineural Hearing Loss

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Introduction: Wernicke's Encephalopathy (WE) is a known complication following bariatric surgery (1). We present a case in which the patient's primary symptom was bilateral sensorineural hearing loss (SNHL). Initial laboratory evaluation of her complaint resulted in elevated inflammatory markers, prompting an autoimmune workup. Ultimately, correction of the patient's thiamine deficiency led to an improvement of her symptoms.

Case Presentation: The patient is a 22-year-old African American female who presented to the emergency room with decreased oral intake, bilateral lower extremity weakness, and hearing loss for 10 days. The patient had undergone sleeve gastrectomy 2 months prior at another institution and had recently been evaluated there for these complaints without diagnosis or resolution. She was alert and oriented x2, drowsy, and had 3/5 strength with decreased sensation of the bilateral lower extremities. Initial workup was consistent with fasting ketosis, and a thiamine level was drawn. After an EGD showed no evidence of stricture, the patient was started on a pureed diet with proper vitamin and nutrient supplementation. Audiometric testing showed moderate, bilateral reverse trough SNHL. ENT recommended an autoimmune workup, and steroids were started empirically. Labs showed an elevated CRP (44.9 mg/L), elevated ESR (83 mm/hr), and a positive rheumatoid factor. MRI of the brain showed bilateral mamillary body edema and enlargement. Empiric steroid therapy was stopped as the patient's symptom constellation was ultimately consistent with Wernicke's encephalopathy. Following correction of the patient's thiamine level (which resulted low at 17 nmol/L), the patient exhibited gradual improvement in her symptoms, and she was discharged on B1 supplementation with plans for post-acute physical therapy.

Discussion: Bilateral SNHL is a rare presenting symptom in patients with WE. Although it is known that patients with WE often do not present with the classic triad of ophthalmoplegia, confusion, and ataxia, the specific incidence of SNHL is unknown. Its mechanism is thought to be due to involvement of the ascending afferent auditory fibers in the brainstem (2). The neurodegeneration caused by thiamine deficiency can only be reversed with early thiamine treatment (3). Unfortunately, given the variability in presentation of WE, as well as the fact that thiamine levels can take days to result, this diagnosis is often missed in its early stages (4). In fact, a case series of post-mortem autopsies found that the diagnosis was missed in about 75-80% of patients (5). In our patient, elevated inflammatory markers led us to consider an autoimmune etiology for her symptoms. However, these laboratory findings are nonspecific. Besides a low thiamine level, no laboratory markers are specific for the diagnosis of WE (6). Given the morbidity associated with the neurological sequelae of WE, there should be a high index of suspicion for WE in at-risk populations that present with neurologic complaints.

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NORTH DAKOTA CLINICAL VIGNETTE POSTER FINALIST - MICHAEL STORANDT

Prosthetic Joint Infection: An Extremely Rare Complication of Intra-vesicular BCG Therapy

Authors: Michael Storandt MS-II, University of North Dakota School of Medicine and Health Sciences; Avish Nagpal MD, MPH, Clinical Assistant Professor of Medicine, University of North Dakota and Consultant, Division of Infectious Disease, Sanford Health, Fargo

Introduction: We present an extremely rare case of a chronic indolent prosthetic joint infection with *Mycobacterium bovis Bacillus Calmette-Guerin* following intra-vesicular administration of BCG for bladder cancer.

Case Presentation: A 66-year-old male was seen in clinic due to concerns of tuberculosis of the right hip. He had a history of bladder cancer for which he had undergone a transurethral resection of the bladder tumor 2 years prior to presentation. Following that, he received intra-vesicular instillations of BCG for a total of 6 doses. He had significant shaking and chills following these instillations, but the symptoms were self-limited and resolved within 24 hours on each occasion. A few months later, he developed slowly worsening pain over his right hip where he had a prosthesis placed 27 years prior due to secondary osteoarthritis after having had a hip fracture as a result of a motor vehicle accident when he was a teenager. Due to slowly progressive pain, he was evaluated by orthopedic surgery, and due to concerns of long-term mechanical failure of the prosthesis, a hip revision was recommended. At the time of surgery, joint effusion was noted. Therefore, the synovial fluid was sent for bacterial and mycobacterial cultures. His postop course was complicated by shaking and chills similar to the ones that he experienced at the time of BCG instillation. He also developed erythema around the incision but this resolved slowly over time. However, the patient did have ongoing intermittent night sweats and a low-grade fever. He was empirically treated with doxycycline for suspicion of Lyme disease due to his residence in an endemic area. In the meantime, his mycobacterial cultures taken at the time of surgery grew an acid-fast bacillus after 3 weeks of incubation. A nucleic acid probe identified the isolate as *Mycobacterium tuberculosis* complex. Further susceptibility testing of the isolate revealed resistance to pyrazinamide with retained susceptibility to other first-line anti-tuberculosis drugs, a pattern classically seen with *Mycobacterium bovis*. Based on this clinical and microbiological data, the patient was diagnosed with a prosthetic joint infection secondary to *Mycobacterium bovis Bacillus Calmette-Guerin* (PCR analysis obtained later confirmed this diagnosis). He was started on treatment with isoniazid, rifampin and ethambutol which he continues to tolerate well.

Discussion: BCG bladder instillation can cause local complications in the form of cystitis or prostatitis, but systemic complications like sepsis, pneumonitis, or hepatitis are rare occurring in less than 1% of cases. Only a few case reports of invasive musculoskeletal infections have been reported before. Prosthetic joint infection as a complication of BCG bladder instillation is extremely uncommon, which makes diagnosis very challenging. Ideal treatment of this condition is unknown, but likely should involve surgical debridement followed by a long course of multiple first line anti-mycobacterial agents including isoniazid, rifampin and ethambutol.

NEVADA CLINICAL VIGNETTE POSTER FINALIST – ARIEL MURTAGH

An Uncommon Cause of an Uncommon Syndrome: A Case of Non-Sodium Dependent Osmotic Demyelination

Authors: Ariel Murtagh, MSIV; Kerry Moseman, MSIV; Dr. Asem Mutasher, MD; Dr. Heather Cale, MD, University of Nevada, Reno – School of Medicine – Internal Medicine Residency

Introduction: Osmotic demyelination syndrome (ODS), formerly known as central pontine myelinolysis, is traditionally associated with overly rapid correction of severe hyponatremia or relative hypernatremia after correction of a hyperosmolar hyperglycemic state. Herein, we describe a rare presentation of ODS in the absence of sodium derangement, caused by osmotic shifts in serum glucose in a patient with uncontrolled type 2 diabetes mellitus.

Case Presentation: The patient presented with two days of dysarthria and a one-month history of bilateral lower extremity weakness and associated unsteadiness with ambulation. Neurologic exam was remarkable for 4/5 strength with flexion and extension of the left hip and knee, dysmetria and dysdiadochokinesia of the left and right upper extremities, difficulty sitting upright with a tendency to lean left, and decreased sensation to fine touch and proprioception in bilateral feet. Home glucometer revealed blood sugars ranging from 75 to >650 mmol/L and the patient's A1c was 17.5% on admission. Results of CT, carotid duplex, and echo were within normal limits. MRI demonstrated signal intensity in the pons consistent with ODS.

Discussion: The proposed mechanism for non-sodium dependent ODS is rapid and drastic increases in serum glucose resulting in hyperosmolarity. When the introduction of extracellular hypertonicity outpaces a cell's ability to regulate its osmolality, water is drawn out of oligodendrocytes causing cell shrinkage and death.

This uncommon cause of an already uncommon disease process is important for clinicians to be aware of, so they may consider it in their differential when a patient presents with atypical neurological deficits. Non-sodium dependent ODS may manifest with subacute symptoms, prompting patients to present in the outpatient setting, where neuroimaging is not always readily available. Furthermore, because deficits do not typically follow classic patterns seen in acute cerebrovascular accidents of specific vessels, physicians may delay referring patients for neuroimaging. This could postpone a definitive diagnosis or lead to misdiagnosis of ODS as a stroke.

NEW HAMPSHIRE CLINICAL VIGNETTE POSTER FINALIST - THOMAS FLYNN

Anaplasmosis Presenting as Sepsis

Authors: Thomas G. Flynn and Hilary F. Ryder, MD, FACP

Introduction: Human granulocytic anaplasmosis (HGA) is a rare but emerging cause of acute febrile illnesses nationwide, and its incidence in New Hampshire more than doubled between 2016 and 2017, rising from 135 to 317 cases per year (1). It is caused by *Anaplasma phagocytophilum*, a gram-negative intracellular bacterium transmitted by the deer tick, *Ixodes scapularis* (2). In this region, this vector is also known to carry Lyme disease, babesiosis, and Powassan virus. HGA most often presents with nonspecific febrile symptoms including chills, malaise, myalgias, gastrointestinal or respiratory symptoms, and headaches. However, 36% of cases require hospitalization, and 3-7% of cases result in life-threatening complications (3). We report a case of an immunocompetent man who presented with sepsis that was later determined to be due to HGA.

Case Presentation: A 78 year-old man with past medical history of diabetes mellitus, hypertension, and dyslipidemia re-presented to the ED with fatigue, malaise, dizziness, and anorexia a week after initially presenting with chills and a reported fever of 39.7°C. He had been treated with cefpodoxime for a suspected UTI, although urinalysis had been equivocal for infection. He denied recent tick bite, but had spent time outdoors.

On his second ED visit, he was febrile to 39.2°C, tachycardic at 113 bpm, tachypneic at 26/min, but with normal white blood cell count. He met SIRS criteria and was admitted. He was found to be hyponatremic (122 mmol/L), with a new normocytic anemia (Hgb of 11.0 g/dL, down from 14.0 g/dL one week prior), thrombocytopenia ($126 \times 10^3/\mu\text{L}$), and a new transaminitis (AST: 119 units/L, ALT 93 units/L) as well as elevated alkaline phosphatase (163 units/L).

He was started on piperacillin-tazobactam, vancomycin, and doxycycline, with rapid clinical improvement. Work-up included blood cultures and Lyme antibodies which were negative, and a urinalysis and peripheral smear, which were normal. An abdominal ultrasound was normal. On repeat questioning, the patient recalled a tick bite several weeks prior.

PCR testing for *Anaplasma phagocytophilum* was ordered on HD#3. That evening, the patient became delirious, but mental status improved on the morning of HD#4. Transaminases and WBC were seen to have peaked, and patient was discharged to home with remainder of course of empiric doxycycline and PCP appointment the following day. On post-admission day 6, *Anaplasma phagocytophilum* PCR resulted positive. Patient and health department were notified, and doxycycline course was extended from 10 to 14 days.

Discussion: Human granulocytic anaplasmosis (HGA) is an emerging tickborne disease with non-specific signs and symptoms, and it can occasionally present as sepsis (4). Cases from endemic areas presenting with unexplained sepsis with anemia, thrombocytopenia, and transaminitis, in the context of a negative Lyme test, should prompt a high index of suspicion for HGA and initiation of empiric doxycycline while awaiting laboratory confirmation.

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NEW YORK CLINICAL VIGNETTE POSTER FINALIST – ANGELICA BIALCZAK

White Rash Appearing on the Face of a Patient in Peru.

Authors: Angelica Bialczak OMS III, Jodi S. Flanders, DO, West Virginia School of Osteopathic Medicine

Introduction: In tropical climates such as Peru, high heat and moisture can increase the prevalence of certain skin conditions. A benign and commonly recurrent superficial fungal infection of the skin that causes discolored patches or plaques, known as Tinea Versicolor (TV), is one of the most prevalent superficial mycoses worldwide. Although there are common areas of the body this fungus predominantly affects, TV can occur on other parts of the body. Therefore, variations in distribution should be considered during clinical examination. Here, we present on a case of TV with uncommon distribution, the face, of a patient in rural Peru.

Case Presentation: During a medical service trip in Peru, through the WVSOM chapter of DOCARE International, a 33-year-old female presented with a “white rash” on the face that was slightly pruritic. The patient claimed that the spots on her face have been continuously present for one month. She had no other systemic complaints associated with the rash and her past medical history was unremarkable. On physical exam, the patient was not in acute distress. There were multiple hypopigmented, finely scaled macules isolated on the superior, lateral aspect of the left cheek. The fine scale was only seen when the macules were scraped by a fingernail. Due to limited access to microscopic examinations and patient records, the diagnosis of TV was made on history and physical exam. The patient was prescribed an antifungal, specifically ketoconazole ointment, and was educated on keeping the face dry as much as possible. She was given fluconazole 300 mg twice weekly orally for four weeks to be initiated in the event of a recurrence on any body region.

Discussion: Tinea Versicolor is a cutaneous, non-contagious fungal infection that commonly affects the chest, upper portion of the back, and the shoulders. However, as seen in this case, clinicians should consider this disease when it presents in an unusual distribution as it can drastically affect a patient’s quality of life. There have been cases reported of unusual and rare presentations of TV. Some of the atypical locations that have been reported include the eyelids of a 16-year-old female, areolas on an adolescent male, and on the proximal penile shaft of a 39-year-old male. The most common identified genus is *Malassezia*. Histological findings include hyperkeratosis and acanthosis. Potassium hydroxide (KOH) preparation from the scraped off scale shows spores and short hyphae. This yeast exists commensally in the stratum corneum and prefers regions of the body that have high concentrations of sebaceous glands. The disease develops due to an increase in sebaceous secretions, which stimulate the conversion of the yeast into the pathogenic mycelial form. Skin lesions are commonly seen in patients among hot and humid climates. They are often associated with malnutrition, hyperhidrosis, pregnancy, oral contraceptive use, and an altered immune response.

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NEW YORK CLINICAL VIGNETTE POSTER FINALIST – ELI CAHAN

Going Overboard: Development of a deep vein thrombosis in a medical student following prolonged sedentarism during board exam studying

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Introduction: The incidence of deep vein thrombosis (DVT) is 1.6 per 1000 individuals across the entire population though risk increases dramatically with age(1). The relative risk of DVT in patients greater than 80 years old is 75x-128x that of patients aged 20-29 (1). The lowest risk cohort are males aged 15-25, in which the incidence ranges between 5-13 per 100,000(2). The pathophysiology of DVT involves three factors—endothelial injury, venous stasis, and hypercoagulability—together forming Virchow’s triad (3). One of these risk factors is identifiable in up to 96% of cases of venous thromboembolism (VTE), typically related to endothelial injury (due to vasculopathy) or venous stasis in elderly populations, as compared to hypercoagulability (due to inherited thrombophilia) in the young(4).

Case Presentation: A 25 year-old male medical student presented with acute onset, unilateral, severe calf pain. This occurred in the fifth of six weeks of board-exam preparation, during which time the patient had been studying 10-12 hours per day with infrequent breaks. The patient had no past medical history and past surgical history of uncomplicated orthopedic procedures. He denied any relevant family or social history (including substance use) and any recent trauma or travel. On physical exam, vital signs were within normal limits, and the left calf was warm and tender to palpation with 2+ pitting edema. The exam was otherwise unremarkable. On initial work-up, notable labs included D-dimer of 640, but otherwise CBC demonstrated WBC/Hct/Plt of 5.5/41.8/161 with normal distribution, and PT/PTT/INR were 12.6/33.3/1.1.

Subsequent work-up was negative for beta-2 glycoprotein, Factor-V Leiden, Factor-VIII/Protein-C/Protein-S/Antithrombin-III activities, Cardiolipin IgG/IgM, and Lupus anticoagulant. Doppler demonstrated a dilated, non-compressible left gastrocnemius vein with occlusive thrombus as well as a partially compressible soleal vein with non-occlusive thrombus.

The patient was started on rivaroxaban 15mg BID. Serial ultrasound at 4 weeks was notable for non-occlusive thrombus in the gastrocnemius vein and resolved thrombus in the soleal vein. The patient was asymptomatic and rivaroxaban was tapered to 20mg qD. Ultrasonography at 12 weeks was negative, and antithrombotic therapy was discontinued.

Discussion: Prolonged immobility (which may precipitate DVT in 10% of patients older than 50 years) is infrequently cited as risk factor for younger populations (5). Immobility for as few as 4 consecutive hours has been associated with increased DVT risk(6). Preexisting thrombophilic disorders—which may not have been diagnosed prior to a sentinel DVT—can exacerbate this risk (7). The overall rate of inherited thrombophilia ranges between 5-40% in patients with VTE (and up to 10% in broader populations) and may be proportionally higher in the youth (8, 9). This case illustrates that prolonged sedentarism, even in low-risk populations, may precipitate clinically relevant DVTs. Future discovery of additional inherited thrombophilias can illuminate cases like this in which current diagnostic genetic panels are “silent.”

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NEW YORK CLINICAL VIGNETTE POSTER FINALIST – TAMANNA NOYON

Cola-induced Acute Phosphate Nephropathy

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Introduction: Since the first reported case in 2003, all acute phosphate nephropathy (APhN) cases have been associated with the use of oral sodium phosphate (OSP) agents in preparation for colonoscopy. The risk factors for APhN are traditionally considered to be underlying chronic kidney disease, old age, female sex, hypertension, and consumption of antihypertensive agents or nonsteroidal anti-inflammatory drugs (NSAIDs). We present the first reported case of APhN that is not associated with any of these risk factors.

Case Presentation: A 28-year-old male with no history of exposure to OSP agents or of kidney disease presents to the emergency department (ED) per recommendation of his primary care physician, who discovered his creatinine (Cr) level to be 11.57 mg/dL and blood urea nitrogen (BUN) of 116 mg/dL. At arrival, the patient's chief complaints were anorexia, body aches, thirst, fatigue, and malaise. After extensive serologic workup for unexplained acute kidney injury, the decision was made to obtain a percutaneous needle core biopsy, which confirmed the presence of calcium phosphate crystals in the tubular lumen. During the hospital stay, the patient received intravenous fluids and two sessions of hemodialysis leading to significant improvement of kidney function. At the time of his discharge, the patient's Cr level was 3.42 mg/dL, and continued to improve to about 1.0 mg/dL after 3 weeks of discharge.

Discussion: While a link between APhN and OSP use has been established in the last decade, this is the first reported case of APhN that is not associated with the use of OSP or any other risk factors. Notably, the patient reported consumption of up to two liters of cola per day for two years, but significantly decreased oral intake in the week prior to his ED admission. Thus, this patient's acute on chronic kidney injury was precipitated by severe dehydration in the setting of chronic cola consumption.

Cola-beverages, which consist of a high concentration of phosphoric acid, have been considered a risk factor for chronic kidney disease and kidney stones. In addition, long-term hypovolemia can lead to increased water reabsorption in the proximal tubule and descending limb of the loop of Henle. These two regions are relatively impermeable to calcium and phosphate. Overall, persistent dehydration decreases reabsorption of phosphate from the proximal regions of the nephron. This was accompanied by a hyperphosphatemic state due to chronic consumption of cola-beverages, thus resulting in accumulation of calcium-phosphate crystals and injury of the tubular interstitium and surrounding regions.

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NEW YORK CLINICAL VIGNETTE POSTER FINALIST – DARIA SCHATOFF

Gastrointestinal Tract Involvement of Chronic Lymphocytic Leukemia

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Introduction: CLL is typically asymptomatic until nonspecific symptoms such as fever, chills, night sweats, fatigue, and lymphadenopathy present. When symptoms emerge, the initial presentation uncommonly involves the GI tract. It is important to consider the range of presentations, which may include upper and lower GI hemorrhage, intussusception, colitis, and bowel perforation.

Case Presentation: A 73-year-old female, with a history of non-treated CLL, LGIB 3 years ago showing inflammatory lesion in the cecum without definitive diagnosis, presented with painless hematochezia for two days. Patient was AF, 101, 16, 123/67, 97% RA on presentation. She reported up to 20 bloody bowel movements described as frank blood and clots within the stool. Initially the stools were large in volume with an overall decrease in quantity of blood. Initial imaging notable for CT A/P, with colitis in the cecum, colon, rectosigmoid; as well as some gastroduodenitis. Given acute onset of symptoms and diffuse findings on CT scan, patient's hematochezia was thought to be secondary to an infectious etiology. However, her GI pathogen PCR and C. diff was negative, so she underwent an EGD and colonoscopy for further workup. Her EGD and colonoscopy revealed abnormal erythematous mucosa with aphthae and ulcers in the terminal ileum and multiple sessile polyps in the recto-sigmoid region. The terminal ileum was found to have an aberrant population of CD5+ small B-lymphocytes immunophenotypically compatible with previously diagnosed B-cell CLL, without a large cell component.

Discussion: GI involvement in CLL is unusual. Those with advanced disease may present with severe constitutional symptoms, recurrent upper respiratory tract infections, anemia, thrombocytopenia, and lymphadenopathy. If GI involvement is present, it typically occurs after malignant transformation to diffuse large cell lymphoma known as Richter syndrome. In the ileum, about 48% of malignancies are attributed to lymphoma, followed by adenocarcinoma, leiomyosarcoma, and carcinoid. Small bowel lymphoma can present as single or multiple segmental areas of marked thickening, circumferential thickening, or ulcerations, with fistula formations to adjacent bowel loops. A report by Bitetto et al revealed that GI complications could occur without transformation. Some reported manifestations include intussusception, small intestinal bacterial contamination, colitis, chronic diarrhea or iron-deficiency anemia secondary to chronic bleeding, malabsorption, or frank GI hemorrhage. GI hemorrhage can present in both upper or lower tract locations. Upper GI hemorrhage can be caused by direct infiltration of the GE junction or via bleeding from esophageal varices caused by CLL-associated splenomegaly and portal hypertension. Lower GI hemorrhage occurs during infiltration of the intestinal mucosa, presenting as colitis or diarrhea. As endoscopy and colonoscopy are not used for screening in these cases, GI infiltration is detected when patients become symptomatic or when observed on surgically resected specimens.

NEW YORK CLINICAL VIGNETTE POSTER FINALIST – KAZI ULLAH

Hypotension and Increasing Abdominal Girth: A Case of Hemoperitoneum Diagnosed by Ultrasound

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Introduction: Hemoperitoneum is a condition in which blood accumulates in the peritoneal cavity. Clinical manifestations vary based on the degree of internal bleeding.¹ In the unstable patient, prompt diagnosis and intervention are imperative for improving outcomes and mortality. Here we present a case of hemoperitoneum in an unstable patient diagnosed via rapid ultrasound (US) at the bedside which may have otherwise been delayed if pursued by other imaging modalities.

Case Presentation: A 77-year-old gentleman was brought to our institution by his family with a complaint of altered mental status for 2 days. In the emergency room the patient was acutely encephalopathic with initial workup revealing acute liver failure. Computed tomography (CT) revealed hepatomegaly with diffuse heterogeneity of the hepatic parenchyma. A non-targeted core biopsy of the right hepatic lobe was performed by interventional radiology under US guidance. Post-biopsy the patient was noted to have a 3.7g/dl decrease in hemoglobin for which he was transfused a total of three units of packed red blood cells, four units of fresh frozen plasma and one unit of platelets. 30 hours post embolization, the patient was noted to develop rapidly increasing tense abdominal distension associated with a precipitous decline in blood pressure from 94/66 to 68/48 within 15 minutes. Physical Exam was significant for acute delirium, increasing abdominal distension and tenderness to palpation.

At this time, a bedside US was performed to guide resuscitative efforts and revealed a large amount of complex intraperitoneal fluid consistent with hemoperitoneum. The fluid demonstrated the presence of “hematocrit” sign, which is a layering effect with progressively increasing echogenicity in the gravity dependent regions of the abdominal cavity. This is caused by the accumulation of echogenic particles such as coagulated blood and cellular debris in such areas. Furthermore, the presence of swirling echogenic particles within the fluid, known as “plankton” sign, and mobile fibrinous strands indicate the presence of ongoing coagulation further indicating the presence of intraperitoneal blood.

Shortly after performing bedside US, the patient developed cardiac arrest. Based on the above diagnosis, massive transfusion protocol was initiated and emergent decompressive paracentesis was performed with 1L of frank blood drained. Return of spontaneous circulation was obtained within 10 minutes. Once stabilized the patient was sent for angiography and embolization of the right hepatic artery.

Discussion: In this case, bedside ultrasound allowed physicians to make a rapid diagnosis of hemoperitoneum and abdominal compartment syndrome, allowing swift and goal directed intervention to stabilize the patient. In prior studies, US has demonstrated sensitivity of 81.8% and 93.9% in the identification of hemoperitoneum.² Although CT scan is often the common imaging modality for the diagnosis of hemoperitoneum, US offers real-time and portable imaging to adjunct the clinical exam in detection of hemoperitoneum in unstable patients without significant delay.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - ZACHARY TUGAOEN

The stigma of HIV leading to delayed diagnosis of pneumocystis pneumonia

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Introduction: Pneumocystis pneumonia (PCP) is a relatively common opportunistic infection in patients with human immunodeficiency virus (HIV) that can cause ground glass opacities. Ground glass opacification is a radiologic term used to describe an area of increased attenuation in the lung on chest computed tomography. When manifesting in undiagnosed HIV patients, PCP presents a diagnostic challenge.

Case Presentation: A 58-year-old female presented as a hospital transfer for an open lung biopsy with four months of dyspnea on exertion associated with sore throat and cough. She was treated several times with oral antibiotics and prednisone for upper respiratory infections. She was hospitalized twice and treated for bilateral pneumonia. Her symptoms progressed and she was re-admitted to an outside facility with progressive hypoxia. CT chest showed bilateral ground glass opacities and consolidations concerning for pulmonary fibrosis. She had no significant past medical, surgical, or family history. Social history was positive for two-pack year smoking history, negative for drug use, and negative for high-risk sexual behavior. She was divorced with two adult children and worked for a software company. Vital signs were normal other than oxygen saturation of 93% on 5 liters. Physical exam demonstrated bilateral rhonchi and diminished airflow in the lung bases. Pertinent labs included a mildly elevated white blood cell count of 12 U/kL, an elevated lactate dehydrogenase of 250 U/L, and a reactive HIV. Upon further questioning, the patient admitted to prior HIV diagnosis after donating blood, but she repressed the information and never sought treatment. Confirmatory HIV testing was positive and CD4 count was 49. Unfortunately despite empiric treatment with high dose Bactrim, the patient decompensated and required intubation. Bronchoalveolar lavage was positive for pneumocystis jiroveci. The patient's course was complicated by refractory hypoxemia and ventilator associated pneumonia, but she ultimately improved and was discharged on only 2 liters of oxygen, trimethoprim-sulfamethoxazole, and antiretroviral therapy.

Discussion: This case illustrates the differential for ground glass opacities, the diagnosis and treatment of PCP, the stigma of HIV and the importance of proper HIV screening. The differential for ground glass opacities on chest CT is broad and must include acute alveolar disease, chronic interstitial disease, and opportunistic infections.¹ PCP pneumonia should be considered in patients with hypoxemia, elevated alveolar-arterial O₂ gradient, elevated lactate dehydrogenase, and diffuse, bilateral ground glass infiltrates on chest imaging.² Definitive diagnosis is made with identification of the organism on induced sputum, bronchoalveolar lavage (BAL), or tissue samples.² Early treatment with oral corticosteroids in conjunction with anti-pneumocystis therapy can reduce mortality and the incidence of respiratory failure.³ Patients admitted with pneumonia should be considered high risk for HIV infection, however only 15% of patients are tested for HIV during admission.⁴ Up to 18% of patients with HIV are undiagnosed so prompt screening is imperative to improved outcomes.⁴

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OREGON CLINICAL VIGNETTE POSTER FINALIST - ARTHUR LENAHAN

Posterior Reversible Encephalopathy Syndrome: A Pressing Cause of New-Onset Seizure in an Older Adult

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Introduction: Posterior reversible encephalopathy syndrome (PRES) is a clinical radiographic syndrome that is increasingly recognized in the literature. It has historically been considered a primarily radiologic diagnosis, but new evidence complicates this picture. The syndrome is typically characterized by altered consciousness, headache, visual disturbances, and seizures, and is frequently preceded by significant hypertension. The pathophysiology is poorly understood, but is thought to involve either the inability of the cerebral vasculature to accommodate increases in blood pressure or damage to the blood brain barrier itself, resulting in cerebral edema. The syndrome is often mistaken for acute stroke, emphasizing the high index of suspicion needed to make an accurate diagnosis, as the blood pressure management is exactly opposite and may lead to reversal of symptoms.

Case Presentation: A high functioning 90 year-old male with a history of atrial fibrillation was in his normal state of health at his care facility when he developed a series of new-onset generalized tonic-clonic seizures. He was taken to the hospital where he was found to be in status epilepticus and given benzodiazepines for reversal. His convulsive symptoms resolved, but he remained unresponsive to sternal rub. His blood pressure was noted to be 202/110 in atrial fibrillation. A CT with angiogram and later MRI were notable only for a small hyperintensive region in the right cerebellum but found no evidence of trauma, vascular occlusion, or acute ischemic event. He was managed with permissive hypertension for suspicion of occult stroke and placed on antiepileptics for new-onset seizure. EEG remained negative for new seizure events throughout. His mental status was largely unchanged until hospital day 4 when additional history received from the care facility revealed that he had been taking clonidine, which was discontinued one week before admission to hospital. His care facility also noted that his blood pressure had risen rapidly to 174/91 the day before his seizures. At this point a diagnosis of PRES secondary to rebound hypertension from clonidine was suspected and the patient was given strict blood pressure goals with ACE inhibitor and a calcium channel blocker. Over the next 3 days his mental status improved dramatically and he returned to near baseline.

Discussion: This case emphasizes the importance of accurate history taking and an expanded differential in older patients with new seizure and suspicion of acute cerebrovascular event. PRES is difficult to diagnose due to the highly variable clinical and radiologic presentation, but is often reversible if the trigger for edema is identified. Older adults are at high risk for rebound hypertension and require regular blood pressure monitoring in the days after a medication change in order to prevent RPLS, but medical record transmission from care facilities is often incomplete. Nonetheless, correct identification and application of appropriate blood pressure goals can save brain tissue.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - SHADI AHMADMEHRABI

Leukocytosis & elevated lactate – is it always sepsis?

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Introduction: When a patient has elevated lactate and leukocytosis, practitioners are often reasonably concerned for sepsis and may begin empiric treatment without a clear source of infection. However, non-hematologic neoplasms, especially non-small cell lung cancer (NSCLC), should be investigated in cases of chronic stable lab abnormalities and non-toxic clinical status.

Case Presentation: A 61-year-old man with PMH of COPD, hypertension, chronic tobacco and alcohol abuse presented to the ED with subjective dyspnea in the context of recently diagnosed NSCLC for which he was receiving no treatment at the time. He was afebrile, hypertensive, and noticeably intoxicated. He had strong pulses and good capillary refill. Labs showed positive anion gap, leukocytosis of 33,000, and lactate of 3.4. Ethanol level was 478. Given concerns for sepsis, blood cultures were drawn and empiric vancomycin and zosyn were started.

CTA-chest demonstrated a 6.2 cm right upper lobe mass abutting the pleura, which had increased in size from 4.9 cm one month prior. Tumor-related post-obstructive pneumonia, pulmonary embolism, and abscess formation were considered but ruled out with imaging. Prior biopsy had shown poorly differentiated malignant epithelioid and spindle cell neoplasm with sarcomatoid component. There was evidence of chest wall and bony invasion. On CT, he also had multiple blebs but no wheezes on auscultation. He remained afebrile and repeat lactate levels were elevated but stable at 3.5-4.5. He was placed on CIWA protocol, requiring one dose of lorazepam in the first 24 hours and none thereafter. Blood cultures at 24 hours were negative, along with procalcitonin, Strep pneumonia Ag, and Mycoplasma Ag. Infection was ruled out and treatment directed towards inpatient tumor management due to social challenges, including EBUS and thoracotomy.

Discussion: This case illustrates the importance of correlating elevated lactate and leukocytosis with the clinical picture, especially in cancer patients. This patient had been admitted a few weeks prior for a similar clinical picture and discharged when infection was ruled out. During both admissions, he appeared non-toxic and vitals were stable with no clear source of infection. In nonhematologic cancer patients, leukocytosis >40,000 is associated with large tumor burden, higher thromboembolism risk, poor clinical outcomes, and is uncommonly due to infection.¹ Specifically, non-small cell lung cancer is associated with paraneoplastic leukemoid reaction.²⁻⁴ Lung sarcomatoid carcinoma has been specifically associated with a leukemoid reaction in a prior case report.⁵ Elevated lactic acid (≥ 1.4 mmol/L) is also a negative prognostic factor in metastatic lung cancer.⁶ In addition, this patient's chronic alcoholism likely contributed to elevated lactate levels.⁷ Recognition of lab abnormalities associated with high tumor burden is important for institution of appropriate testing and management strategy.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - XEM BUI

Rare Case of Valproate-induced Hypoglycemic Coma

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Introduction: Valproic acid (VPA) is first-line therapy for myoclonic & tonic-clonic seizures. However, it has been known to cause a carnitine deficiency, resulting in hyperammonemia and encephalopathy.^{1,2} We, however, present a patient who presented with somnolence and unresponsiveness despite normal serum levels of ammonia.

Case Presentation: A 56-year-old man with a history of seizure disorder, diet-controlled diabetes, and medication non-compliance presented with confusion, somnolence, slurred speech, and unsteady gait. He had recently been to the ED a few days ago for hyperammonemia from valproic acid toxicity and was discharged on lactulose. CT imaging was negative for an acute infarct, toxicology screen was negative, and BMP was overall within normal limits. VPA was noted to be in the supratherapeutic range (154 ug/mL; normal is 50-100 ug/mL), however ammonia level was unremarkable (24 umol/L). While the patient was waiting for admission to the medicine floor, he was observed eating and drinking. Fifteen minutes later, the patient was found to be unresponsive to name and sternal rub. A fingerstick revealed a blood glucose of 36mg/dL. Dextrose 50% was given and the patient became responsive. Within an hour and a half, the patient was again found unresponsive. Naloxone 0.4mg/ml IV was given for suspected valproic acid³ or opiate toxicity, but did not improve his mentation. A drop in blood glucose (61 mg/dL) was noted and D50 was given again.

The patient was noted to have waxing and waning consciousness that correlated with changes in blood glucose despite adequate nutrition and D50 replenishment. Considering his history of non-compliance, insulin and c-peptide levels were obtained for possible factitious insulinemia, but were normal. EEG revealed no epileptiform activity, ruling out a post-ictal state. In the setting of supratherapeutic levels, his VPA dosage was decreased in an attempt to stabilize his glucose levels and neurological status. The patient did not have any similar episodes the next few days and was discharged on a lower dose of VPA.

Discussion: Literature review revealed only one other documented instance of VPA-induced hypoglycemia.^{4,5} A Japanese woman became unconscious after initiating valproate 400mg. She regained consciousness after a bolus of glucose. Labs revealed an ammonia level of 54 umol/L and insulin of 0.5 mU/mL. Valproate and other medications were discontinued while she received carnitine replacement therapy. Once her glucose was stabilized, all medications except for valproate were restarted. The metabolism of VPA proposedly decreases carnitine levels, causing hyperammonemia and subsequent metabolic encephalopathy.^{1,2} Additionally, carnitine deficiency inhibits the fatty acid beta-oxidation pathway, causing a decrease in hepatic gluconeogenesis during fasting, and ultimately resulting in a hypoketotic hypoglycemia.⁵⁻⁷ Our patient's hypoglycemia was notably not accompanied by hyperammonemia. We recommend retrospective studies on VPA-induced encephalopathy to document the incidence of hypoglycemia and hyperammonemia. Further, carnitine supplementation in patients receiving VPA regardless of ammonia levels may prove beneficial.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - MEGHA CHIRUVELLA

Anti-MDA5 Positive Clinically Amyopathic Dermatomyositis Complicated by Rapidly Progressive Interstitial Lung Disease, Pericardial Effusion, and Myocarditis

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Introduction: Recognition and management of clinically amyopathic dermatomyositis (CADM) is often challenging due to complex presentation and delayed confirmation of diagnosis. A multi-agent immunosuppressive regimen should be initiated empirically if suspicion for CADM is high, as delay can worsen outcomes. Imaging should be performed to evaluate pericardial and myocardial involvement prior to therapy.

Case Presentation: A 37 year old Senegal-American female with past medical history of GERD presented with fevers, rash, acute onset arthralgia in the extremities, and dyspnea. The itchy, dark rash began on the knuckles and spread to the fingertips, elbows, underarms, lower back, periorbitum, and thighs. The rash progressed to ulcers covered by eschars. She was admitted for tachycardia and worsening hypoxia. A thorough infectious workup was negative and only mild elevations of inflammatory markers were present. Initial rheumatologic workup, including CK, was unremarkable. CT chest showed diffuse patchy bilateral airspace disease consistent with interstitial lung disease. A bronchoscopy with biopsy was significant for patchy organizing pneumonia. Biopsies of the skin and axillary lymph node had nonspecific findings. Echocardiogram demonstrated moderate to large pericardial effusion with no clinical signs of tamponade. Cardiac MRI demonstrated 2cm pericardial effusion and myocardial inflammation of the anteroseptum. Repeat rheumatologic panels returned positive for anti-SSA and anti-MDA5 antibodies, confirming diagnosis of anti-MDA-5 clinically amyopathic dermatomyositis (CADM). She was empirically treated with 3 days pulse dose steroids followed by prednisone 1mg/kg and mycophenolate mofetil for organizing pneumonia. After confirmation of diagnosis, she was continued on a prolonged steroid course with azathioprine for maintenance therapy. She was stable at discharge with CT scan showing improvement in organizing pneumonia.

Discussion: Clinically amyopathic dermatomyositis (CADM) is a subtype of dermatomyositis (DM) characterized by typical cutaneous expression of classic DM with absence of proximal muscle weakness and lack of abnormalities in serum muscle enzyme levels. Extra-rheumatologic findings such as interstitial lung disease (ILD) and cardiac involvement can make management difficult and are frequently the cause of death in patients with CADM. Given our patient's laboratory findings and hallmark dermatologic involvement, therapy was initiated prior to confirmation of diagnosis. Cardiac involvement in CADM is rare but pericardial disease is reported. Myocarditis is infrequently identified due to lack of symptoms. Cardiac MRI can identify and monitor myocarditis in inflammatory myopathies: the septal regions are commonly involved in other cases, similar to our patient. It is unclear whether the large pericardial effusion in our patient is related to the underlying myocarditis as this concurrent presentation seems to be unique. Successful treatment regimens with prednisone, mycophenolate mofetil, and azathioprine for at least 6 months have demonstrated reduction in myocardial inflammation. This case highlights the need to evaluate cardiac involvement early and to initiate therapy promptly prior to confirmation of diagnosis.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - MANSEE DESAI

USA-Acquired Tungiasis: Late Bacterial Infection Complicating Remote *Tunga penetrans* Infestation.

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Introduction: Tungiasis is an infestation caused by *Tunga penetrans* usually acquired and diagnosed in South or Central America. We report a case acquired after travel to Florida and complicated by late secondary bacterial infection diagnosed in Ohio. Primary care physicians should be aware of this rare, but irritating ectoparasitic infestation.

Case Presentation: A 41-year-old man without significant past medical history was married 5 years ago on the beach at Sanibel Island, FL and was horribly bitten by sand fleas over both lower extremities. The entire wedding party had similar bites. His lesions took weeks to resolve, longer than anyone in the wedding party. His lesions finally healed, but he noticed that one bitten area remained firm, raised and fleshy in color. Early in 2018 this lesion began to protrude from the skin. He put frankincense oil on it resulting in erythema and skin breakdown. He pulled two calcific pieces from the open wound. He went to an urgent care center and was given trimethoprim/sulfamethoxazole and cephalexin orally due to the erythema. He was seen by his internist and extraction of the calcific mass failed so patient was admitted to hospital. On admission, the patient had shaking chills. Physical examination was negative except for erythema and purulent drainage surrounding a protruding white calcific mass on the left lower leg. Temperature = 99.3F, blood pressure = 150/87 mmHg, pulse = 69/min, respirations = 18/min. X-ray of the leg showed a 1.5 cm-diameter ill-defined rounded calcified lesion superficially 15 cm above the level of the left ankle joint. Plastic Surgery was consulted and extracted the mass at bedside in the patient's room. Laboratory: WBC = 10,900 cells/cm² with 78% granulocytes. Cultures of wound drainage revealed methicillin-sensitive *Staphylococcus aureus* and a *Proteus mirabilis* resistant only to tetracycline. Pathologic examination revealed a calcified piece of tissue measuring 2.0 x 1.4 x 1.0 cm. The patient was treated with intravenous vancomycin and ampicillin/sulbactam pending culture results. He was discharged the next day on oral amoxicillin/clavulanate. The wound was healed in 2 weeks.

Discussion: Tungiasis is an ectoparasitic infection caused by penetration of the female sand flea *Tunga penetrans* into the epidermis of animal host. The flea then undergoes a complex 5-stage developmental sequence with varying degrees of host inflammatory response to each stage. Tungiasis acquired in the United States is rare. Secondary bacterial infection is common.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - ALINA KHIL

Case Vignette: The Importance of Testing for a Secondary Cancer in Cases with Widespread Metastasis

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Introduction: Primary cancers have different patterns of metastasis. Prostate cancer metastasizes to regional lymph nodes (pelvic and abdominal), and bone, especially the spine. Less common sites of metastasis are distal lymph nodes, lung, and liver. When a patient present with metastasis, it is often assumed that new lesions came from the known cancer. When the pattern of metastases does not match the known cancer, it is important to look for a possible second primary cancer.

Case Presentation: The patient is an 88-year-old male with a history of current prostate cancer (Gleason 4+3) treated with a GNRH agonist. He presented to the emergency department with left flank pain and dysuria. Renal CT scan showed perinephric stranding and widespread metastases to the liver and peritoneal cavity that had not been diagnosed previously. Diffuse muscular and lytic bony metastases were also seen, which were not evident on spinal X-ray from 6 months ago. Pancreatic cystic lesions were concerning for papillary mucinous neoplasm.

Biopsy of a muscle lesion was consistent with likely high-grade fibrosarcoma. Immunohistochemistry study results showed that the cancer was vimentin positive, CD10 positive, SMA positive, and BCL2 positive. Bone scan showed osseous metastatic disease involving bilateral ribs, manubrium and the sternum, and the right iliac bone. Patient and daughter were informed of the biopsy results, and made a decision to go home with hospice.

Discussion: In this patient, it was first suspected that his prostate cancer, which was previously stable, had metastasized. However, the distribution of cancer based on findings in the imaging argued against prostate cancer metastasis. It was important to perform a biopsy, the gold standard for cancer diagnosis, to look for second primary cancer. The results of the biopsy can be used to guide treatment or lack thereof. Had this turned out to be metastatic prostate cancer, the patient could have been treated with the goal of prolonging his life. A high grade fibrosarcoma, a rare cancer, with widespread metastasis, however, was not amenable to treatment. This patient case demonstrates the importance of looking for possible secondary cancer when a patient presents with widespread metastases, especially when the pattern of metastases does not match that of the primary cancer. The results of such investigations are useful to guide medical and family decisions about treatment and/or hospice care.

OHIO CLINICAL VIGNETTE POSTER FINALIST - LAUREN LARKIN

Atypical presentation of mycoplasma pneumoniae-associated mucositis syndrome with no skin involvement in a young adult

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Introduction: Mucositis is a rare extrapulmonary manifestation that affects up to ~20% of patients with mycoplasma pneumoniae infection.¹ M. pneumoniae-induced rash and mucositis (MIRM) typically includes ocular and mucocutaneous eruptions, with no skin involvement reported in only ~30% of cases.^{1,2,4}

Case Presentation: We present a 24-year-old otherwise healthy male admitted with bilateral conjunctival inflammation along with oral and urethral ulcerations, sparing the rest of the skin and perianal regions. He reported a 6-day history of malaise, fever (maximum 103°F), cough, headache, and diarrhea, and had been treated for a suspected bacterial respiratory illness with azithromycin. The patient presented without significant improvement in symptoms and the development of mucosal ulcerations and eye redness.

On initial presentation, the patient was febrile and tachycardic with leukocytosis (17.3) and elevated ESR (84) and CRP (11.7). A sepsis workup was initiated and he was started on broad-spectrum antibiotics with vancomycin/zosyn/acyclovir/fluconazole. Chest x-ray revealed no abnormalities. Blood cultures, respiratory viral panel, Legionella urinary antigen, Streptococcus pneumoniae, gastrointestinal polymerase chain reaction (PCR) panel, HIV, and Gonorrhea/Chlamydia testing were negative.

On exam, there were multiple prominent erythematous lesions appreciated within upper and lower vermilion border in various stages of healing with some eschars. Ulceration was present at the urethral meatus with shallow erosion extending 1-2 mm circumferentially onto glans penis. No apparent rashes were noted. It was determined by rheumatology and ophthalmology that the patient's ocular manifestations were not consistent with uveitis and the oral ulcers were not of typical morphology for Behcet's disease. A more extensive infectious workup was done with the following labs being negative: Syphilis IgG with confirmation, Herpes Simplex Virus (HSV) 1/2, enterovirus PCR, Staphylococcus aureus PCR, and Hepatitis B and C virus.

Mycoplasma pneumoniae IgM was positive (5.21), which uncovered the likely etiology for the patient's signs and symptoms. Given the lack of improvement with azithromycin, he was treated with IV levofloxacin for 5 days. The patient was discharged with rapid improvement in clinical condition on levofloxacin, prednisone, and moxifloxacin/bacitracin/prednisone ophthalmic suspension.

Discussion: Mycoplasma pneumoniae is most commonly associated with community-acquired pneumonia, however, only 25% of patients experience extrapulmonary complications.^{1,6} MIRM most commonly presents in the pediatric population.^{3,5,8} The proposed diagnostic criteria for MIRM, include: less than 10% body surface area affected, involvement of two or more mucosal sites, scattered atypical targets, and clinical and laboratory evidence of atypical pneumonia.^{1,7} These key distinguishing features are useful in ruling out more severe diagnoses, such as Stevens-Johnson syndrome, which was a concern in this case given the patient's lack of response to azithromycin. It is important to distinguish between MIRM and mycoplasma-associated Stevens-Johnson syndrome (MASJS) to direct appropriate treatment. This case highlights a challenging, rare presentation of MIRM in an adult with ocular, oral, and urethral involvement and sparing of the skin.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - JEFF XIE

A Case of Adult Hemolytic Uremic Syndrome

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Introduction: Endemic hemolytic uremic syndrome (HUS) has been estimated to occur at a rate of 2.1/100,000/year (Noris and Remuzzi, 2005), with the majority of cases occurring in the pediatric population. However, adults may also present with HUS and given the relative infrequency, HUS is a commonly overlooked diagnosis in this population.

Case Presentation: We present a case of a 62-year-old female who was admitted to an outlying facility due to abdominal pain and watery diarrhea; she was subsequently diagnosed with infectious colitis based on these symptoms and CT imaging finding of pancolitis. She was started on broad-spectrum IV antibiotics and discharged on oral antibiotics. No stool cultures had been performed. One week after discharge, she presented with worsening abdominal pain, generalized weakness, fatigue and inability to tolerate oral intake. Further history revealed that the patient and husband both developed similar acute watery diarrhea after attending a county fair prior to the initial diagnosis of infectious colitis. The husband's symptoms resolved more quickly while our patient's necessitated hospitalization. Lab findings were significant for elevated creatinine of 3.9 mg/dL from baseline of 1.5 mg/dL, platelet count of 53,000/uL, hemoglobin of 7.2 g/dL with moderate schistocytes on peripheral smear, haptoglobin of less than 6 mg/dl, and LDH of 510 Units/L. Autoimmune and coagulopathy panels were unremarkable. ADAMTS13 was within normal limits at 72% ruling out thrombotic thrombocytopenic purpura. Given the normal complement panel, atypical HUS was deemed unlikely. Plasmapheresis was held given the spontaneous improvement in renal function and overall clinical picture following the discontinuation of antibiotics and lack of steroid use. Prior to discharge, renal function and platelet count continued to trend towards baseline. Discharge labs indicated that hemolysis had resolved. A case of endemic HUS was reported to the state health board given the travelling nature of food vendors at county fairs.

Discussion: This case highlights the importance of obtaining stool cultures when infectious colitis is suspected. Whether the administration of antibiotics in this specific case played a role in the development of HUS is difficult to determine, especially given the current state of scientific evidence on the topic. This triad of hemolytic anemia, thrombocytopenia and acute renal failure should always be an indication for working up HUS regardless of demographics.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - OMAR ZAKI

Hyperammonemic encephalopathy after Roux-en-Y gastric bypass.

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Introduction: Roux-en-Y gastric bypass (RYGB) is a common procedure performed for weight loss that is associated with many well described complications. Hyperammonemic encephalopathy has been described as a rare but potentially lethal complication of RYGB.

Case Presentation: A 45 year old woman with a history of RYGB 15 years prior to presentation, hepatic steatosis, cerebral vascular accident following anticoagulation for a pulmonary embolism, and a recent hospitalization for suspected hepatic encephalopathy presented with one day of altered mental status. Physical examination was most significant for low muscle mass, body wall edema, alopecia, scattered petechiae, angular stomatitis, and orientation only to self without focal neurological deficits. Laboratory evaluation was significant for elevated ammonia (195 $\mu\text{mol/L}$; normal 6-47), hypoalbuminemia (1.8 g/dL, normal 3.5-5), mild direct hyperbilirubinemia, and coagulopathy (INR 3.9) in the setting of normal ALT, AST, and lactate. Infectious and toxicologic workup was negative and she was not taking any medications known to cause hyperammonemia. Computed tomography scan of the head showed no acute changes and imaging of the liver only showed mild steatosis without evidence of cirrhosis. Additional workup revealed numerous vitamin and trace element deficiencies, and evaluation of her serum organic acids demonstrated a pattern consistent with a urea cycle disorder (UCD). She was diagnosed with hyperammonemic encephalopathy secondary to severe malnutrition and possible UCD. Later extensive genetic workup was unable to detect an inherited UCD. Her mental status gradually improved over three days after treatment with lactulose, rifaximin, and nutritional supplementation. She was eventually discharged on the same regimen.

Discussion: Hyperammonemic encephalopathy is a poorly understood and exceedingly rare (<25 reported cases) complication of RYGB. Proposed mechanisms include the uncovering of a late-onset UCD, increased catabolism and protein breakdown due to malnutrition, and intestinal bacterial overgrowth leading to hepatotoxic macromolecule release. Treatment includes lactulose, rifaximin, nutritional supplementation, nitrogen scavenging medications, and potentially RYGB reversal. A delay in diagnosis may result in death with >50% mortality reported, even with aggressive treatment.

This case highlights the importance of recognizing hyperammonemic encephalopathy as a potential complication of RYGB. Physicians should have a high index of suspicion for this clinical entity if hyperammonemia is discovered in a patient with RYGB without an alternative explanation such as cirrhosis or medication use. Screening for certain metabolic derangements such as vitamin or trace element deficiencies or late-onset UCDs may help support the diagnosis and assist with therapy. Nutritional support, lactulose, and rifaximin may be sufficient to resolve the encephalopathy, though reversal of the bypass may be necessary in refractory situations, and close follow up with a bariatric surgeon is recommended.

ONTARIO CLINICAL VIGNETTE POSTER FINALIST - MATTHEW CORNACCHIA

Non-Uremic Calciphylaxis: Using Radiography to Aid in Diagnosis

Authors: Matthew Cornacchia, Aishwarya Vyas-Lahar, MD, Jonathan Kandiah, MD, Dave Munger, MD, Emanuela Sangeorzan, MD, Charles Halasz, MD

Introduction: Calciphylaxis, rare and life-threatening condition characterized by inadequate perfusion of subcutaneous adipose and dermal tissues as a result of arteriolar calcification and occlusion. This occurs most commonly in uremic patients with chronic kidney disease (CKD) and less frequently in patients who are not dialysis-dependent. Currently, the diagnosis of calciphylaxis is made with a tissue biopsy; however, studies have suggested a potential role for various imaging modalities to facilitate in expediting the diagnosis. We present a case of non-uremic calciphylaxis where radiography assisted in establishing the diagnosis and assessing response to treatment. This is the first case that illustrates the use of follow-up imaging to assess disease progression after treatment with intravenous sodium thiosulfate.

Case Presentation: 71-year-old female with a medical history of non-ischemic cardiomyopathy, type 2 diabetes, and atrial fibrillation on Apixaban, presented with a three-month history of progressively worsening lower extremity wounds. She did not respond to antibiotics prescribed by her primary care physician. A skin biopsy demonstrated vascular congestion and mild infiltrate of neutrophils raising the possibility of vasculitis or calciphylaxis. She had an extensive but unrevealing work up done for vasculitis and was empirically started on prednisone 20 mg/day. Given her minimal response after one month of glucocorticoid therapy she was referred to wound care. Mammographic evaluation of her right thigh showed branching subcutaneous vascular calcifications of vessels with a diameter of 0.1-0.2mm, suspicious for calciphylaxis. In addition large vessel calcifications consistent with atherosclerotic disease were noted. The patient underwent debridement of her lower extremity wounds with tissue submitted for pathology. This demonstrated acute cellulitis, fat necrosis and deep seated blood vessels with intimal proliferation and calcification of vessels of diameter 1-2 mm confirming calciphylaxis. Treatment with intravenous thiosulfate was initiated. At one month follow up, her wounds had started to improve clinically. Three months following her hospital admission, after complete healing, she had repeat mammographic imaging of her right thigh which showed fewer calcified vessels with the smallest affected vessels 0.4mm in diameter. This represented a radiographic improvement in the degree and number of calcified vessels.

Discussion: Calciphylaxis occurs rarely in non-uremic patients. In our case, detection of microvascular calcification using mammography facilitated diagnosis and initiation of treatment. Although skin biopsy is the gold standard in diagnosis, radiologic imaging provides a non-invasive diagnostic tool allowing for quicker diagnosis, and elimination of the risks associated with tissue biopsy. Multiple imaging modalities have been shown to aid in the diagnosis of calciphylaxis. Mammography has the inherent advantage of higher spatial resolution than other modalities and is ideal for evaluation of soft tissue structures. Our case is the first to show improvement in the degree of small vessel calcification after treatment with intravenous thiosulfate, correlating with clinical improvement.

ONTARIO CLINICAL VIGNETTE POSTER FINALIST - ANGELA WORKMAN

Opportunistic Yeast Infection in an Immunocompetent Patient

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Introduction: *Rhodotorula mucilanginosa* is a pigmented unicellular yeast found in the environment and can be associated with rare opportunistic infections. *R. mucilanginosa* are commensal in humans.

Case Presentation: A 34-year-old man with a medical history significant for hepatitis C, polysubstance IV drug use and chronic pain, was admitted for severe neck pain. On C-spine MRI, he was found to have septic arthritis of the left facet joints C2-C4, and osteomyelitis involving C4. Blood cultures were positive for methicillin sensitive staph aureus and he was started on treatment with nafcillin. He was switched to cefazolin prior to discharge for ease of administration. He was discharged with a left arm Peripherally Inserted Central Catheter (PICC) line, to complete a 6-week course of intravenous (IV) antibiotics. Three weeks later he presented to the emergency room with a left upper extremity deep vein thrombosis around the PICC. The physical exam was significant for fever, tachycardia and tenderness to palpation of the left arm. The PICC line was removed and he was started on anticoagulation with enoxaparin. Antibiotics were changed from cefazolin to daptomycin. Blood cultures were drawn. On day 2 of incubation, gram positive rods grew. On day 4, blood cultures were positive for yeast and he was started on micafungin. Gram positive rods were identified as bacillus not anthracis. On day 5, microbiology reported the species of fungus was not candida. Consequently, micafungin was switched to fluconazole. On day 7, the fungus was identified as *R. mucilanginosa*. Repeat cultures remained negative for *R. mucilanginosa*, but persistently positive for bacillus. However, patient remained asymptomatic. He was discharged on oral fluconazole for 2 weeks, daptomycin IV for 4 weeks from the last date of positive blood cultures and rivaroxaban.

Discussion: Fungemia by *R. mucilanginosa* is typically found in immunocompromised patients, including those with malignancy, neutropenia, acquired immune deficiency syndrome, organ transplant and congenital heart disease. It has also been reported in immunocompromised patients with central catheters. Our patient's history was negative for HIV, malignancy or immunodeficiency. This is an atypical case as this patient was presumed to be immunocompetent. In the absence of concurrent persistent gram-positive rod bacteremia, there is a likelihood that the patient may have been discharged before *R. mucilanginosa* was diagnosed. Although *Rhodotorula* fungemia is rare, the awareness and recognition of this emerging pathogen is critical for patient management and outcomes.

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OREGON CLINICAL VIGNETTE POSTER FINALIST - MACGREGOR HODGSON

An approach to pancolitis in disseminated cryptococcosis - is it the bug or the drug?

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Introduction: Cryptococcal infection typically involves respiratory tract inoculation with hematogenous spread to the central nervous system.¹ Rarely, the encapsulated budding yeast can diffusely seed the colonic submucosa with subsequent culture-positive, raised, patchy lesions despite negative stool studies.²

Case Presentation: A 57-year-old immunocompetent Caucasian man was admitted for progressive confusion and ataxia. MRI revealed multiple perivascular cystic lesions in the basal ganglia, thalamus, brainstem, cerebellar folia and cerebellar tonsils. He was initially managed in the ICU for elevated intracranial pressures, which ultimately required ventriculoperitoneal shunting. He was started on liposomal amphotericin and flucytosine for cryptococcal meningoencephalitis in the setting of seropositive cryptococcal antigen. Based on positive blood cultures (*Cryptococcus neoformans*: later re-specified to *C. gattii*) and Chest CT imaging consistent with pneumonia he was diagnosed with disseminated cryptococcosis. On hospital-day 24 the patient developed acute copious, watery, non-bloody diarrhea with a marked leukocytosis. He was afebrile and his other vital signs were normal. His abdomen was diffusely tender in the lower quadrants with no peritoneal signs. Infectious studies including *Clostridium difficile* PCR, stool ova & parasites, as well as stool cryptococcal antigen were negative. CT of his abdomen after three days of persistent symptoms demonstrated diffuse submucosal colonic and rectal mural thickening, with surrounding mesenteric fat stranding and a dilated, fluid-filled rectum consistent with pancolitis. His diarrhea and abdominal pain substantially improved three days later after stopping flucytosine.

Discussion: In addition to medication or enteral nutrition-induced causes, acute onset diarrhea and abdominal pain in the hospitalized patient should prompt consideration of infectious causes; particularly *Clostridium difficile* infection. However, in the setting of disseminated cryptococcosis an exploration of its potential role is warranted. Colonic cryptococcosis is typically seen in *C. neoformans* and associated with stool cultures and colon mucosal biopsies showing extensive polymicrobial disease.² Additionally, there have been case reports of intracranial *Cryptococcus* directly infecting the peritoneum via ventricular-peritoneal shunts, as was present in this patient. All infectious workup in this patient was negative, and inflammatory bowel disease was thought to be less likely.^{3,4} In search of a cause, a review of the adverse effects of flucytosine noted it as a potential (but rare) cause of colitis. Mucosal biopsies in prior cases of flucytosine-induced colitis showed severe inflammation along the transverse, descending, and rectosigmoid colon that mirror the radiographic disease distribution seen in the patient described in this report. Furthermore, this patient's rectal wall thickening and significant fat stranding are supported by prior published colonoscopy findings of friability and prominent edematous vasculature seen in flucytosine-induced colitis.⁵

This case is a reminder to not only search for direct complications of infection, but carefully review the broad reach of the *hand of Iatros*, and review all medications for their potential adverse effects.

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OREGON CLINICAL VIGNETTE POSTER FINALIST - IAN STRAEHLEY

Ptosis from a Protist: A Case of Horner's Syndrome Induced by Toxoplasmosis

Authors: Ian Straehley; Neilmegh Varada; Ingmar Prokop; Cassandra Muxen

Introduction: Horner's Syndrome is a neurological condition characterized by unilateral miosis, ptosis with apparent enophthalmos, and anhidrosis due to inhibition of the sympathetic pathway¹. The ocular sympathetic pathway runs from the posterolateral hypothalamus to the ophthalmic branch of the trigeminal nerve (cranial nerve V1). Inhibition can occur at multiple levels including central (hypothalamus, pons, brainstem), preganglionic (proximal to the superior cervical ganglion), and postganglionic². Central nervous system (CNS) toxoplasmosis infection is typically only seen in immunocompromised patients³. To our knowledge, toxoplasmosis has never been reported as a cause of Horner's syndrome.

Case Presentation: A forty-four year-old Caucasian male was admitted to the hospital for left upper extremity paresthesias, gait instability, and painful vesicular skin lesions. Additionally, he had intermittent double vision, anisocoria, unilateral ptosis, and unilateral anhidrosis consistent with Horner's syndrome. Upon review, he had an 18 year history of HIV initially controlled on anti-retrovirals but had been lost to follow-up for several years until he developed severe headaches 4 months earlier. CT scan showed intracranial lesions. His CD4 T-Cell count at that time was determined to be 21 and viral count was 91,000. CNS lymphoma was suspected but a biopsy showed basophilic tachyzoites and bradyzoites with no evidence of malignancy. Immunohistochemical staining was positive for Toxoplasmosis. Over several months he was treated for the Toxoplasmosis with trimethoprim sulfamethoxazole, but had poor compliance so the lesions progressed and treatment was advanced to steroids, atovaquone, and pyrimethamine. During this time he also presented with vesicular skin lesions determined to be HSV. After admission and workup, we found a CD4 cell count of 44, disseminated herpes simplex virus (HSV), and ring enhancing lesions on head CT consistent with toxoplasmosis infection. An MRI showed multi-focal ring enhancing lesions in the basal ganglia, hypothalamus, thalamus, and internal capsule. We postulated that the hypothalamic lesion was the cause of his Horner's syndrome. Toxoplasmosis infection was confirmed by IgG against toxoplasmosis and he was treated with a steroid tapering dose, pyrimethamine, and leucovorin. He was also treated with Foscarnet for disseminated HSV. After treatment, his horner's syndrome and other neurologic symptoms resolved.

Discussion: This is the first reported case of Horner's syndrome resulting from CNS toxoplasmosis. Other causes of Horner's syndrome were ruled out. For example, he was quite young to have carotid pathology or a pancoast tumor, and his corresponding CT scans were normal. Similarly, HSV has not been associated with Horner's syndrome¹. If his Horner's symptoms had somehow been driven by a postganglionic HSV flare (i.e. ophthalmic nerve involvement) he would not have shown anhidrosis because sympathetic innervation to the facial sweat glands branches before the superior cervical ganglion⁴. Overall, the location of the lesion in the hypothalamus and his symptomatology indicate that his Horner's syndrome was caused by toxoplasmosis. In conclusion, toxoplasmosis should be considered when investigating Horner's syndrome in immunocompromised patients.

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PENNSYLVANIA CLINICAL VIGNETTE POSTER FINALIST - JOON YAU LEONG

Mothball Ingestion as a Manifestation of Pica, leading to Paradichlorobenzene CNS Toxicity

Authors: Joon Yau Leong¹, Margarita Gianniosis¹, Ann Lee¹, Elwin Tham¹, Saman Zafar², Yan Zhang² Sidney Kimmel Medical College, Thomas Jefferson University; ²Department of Neurology, Albert Einstein Medical Center Philadelphia

Introduction: Pica, a poorly understood psychiatric disorder presenting with ingestion of non-nutritious substances, is commonly associated with iron deficiency anemia. Some previously described ingested materials include ice, soil and paint. Mothball abuse may be a newer form of pica and since paradichlorobenzene (PDCB) is considered less toxic, it has largely replaced naphthalene as the primary component in mothballs¹. A high index of suspicion for unusual toxin exposure aids in the diagnosis of pica patients presenting with unexplained neurodegenerative features.

Case Presentation: A 47-year-old female presented to the hospital with recurrent falls and declining cognition over the past year. Prior to all this, she was fully independent with activities of daily living, but now she is mostly housebound, having frequent falls and inability to care for herself. Past medical history is significant for menorrhagia, iron deficiency anemia and pica. She denies any allergies, surgical history, or significant family history. She is not on any long-term medications.

On examination, she was noted to have an unidentifiable chemical odor. She had a childlike affect, emotional lability, poor short term recall and inconsistencies in evaluation of her long-term memory. She also exhibited symmetrical 4/5 weakness in all four extremities, bilateral dysmetria on finger-nose testing and an ataxic gait. Her sensory exam was normal.

CBC and iron studies were consistent with iron deficiency anemia. MRI brain revealed symmetric ill-defined regions of T2 hyperintense signals predominantly affecting the middle cerebellar peduncles bilaterally.

The differential diagnosis for her clinical deficits and imaging, including Spinocerebellar Ataxia, Multiple System Atrophy and Fragile X Tremor-Ataxia Syndrome^{2,3}, were excluded based on neurological assessment, family history and genetic PCR testing.

Collateral history from her daughter revealed that the patient has been ingesting mothballs for the past 5 years, with the quantity of mothballs increasing from 1/day to 6/day over the past year. Subsequently, serum PDCB levels were found to be elevated at 15 mcg/mL.

Discussion: This case was educational to us in several respects:

- Iron deficiency anemia is associated with pica, which can lead to unusual toxin ingestions. Seeking out a history of chronic environmental ingestions in a patient with pica can be immensely helpful in making the diagnosis.
- Toxic-metabolic insults to the central nervous system generally leads to symmetrical changes on diagnostic brain imaging, as opposed to other etiologies such as stroke. Previous case reports of PDCB neurotoxicity have reported diffuse or symmetrical changes on neuroimaging. To our knowledge, there has not been any reported cases in the literature with PDCB toxicity predominantly involving the middle cerebellar peduncles.

- Mothball ingestion may be a manifestation of pica, and present with neurological findings such as cognitive deficits and ataxia.

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PENNSYLVANIA CLINICAL VIGNETTE POSTER FINALIST - RICCI KALAYANAMITRA

Hashimoto encephalopathy mimicking Bell's palsy as an initial presentation-importance of thyroid workup

Authors: Ricci Kalayanamitra MS3, Cheran Elangovan,MD, Justin Lowe PA-C, Raymond Reichwein MD, Penn State College of Medicine, Hershey, Pennsylvania

Introduction: Hashimoto encephalopathy (HE) is associated with Hashimoto thyroiditis. Common presentation is diffuse hyperreflexia and pyramidal tract signs (85%), followed by generalized tonic-clonic seizures (67%), myoclonus or tremor (38%), and status epilepticus (12%). The presence of antithyroid antibodies is essential for the diagnosis of HE. Here we present a case report of Hashimoto encephalopathy presenting with acute focal neurologic symptoms mimicking TIA and stroke.

Case Presentation: A 57-year-old woman presented to the emergency room after 3 days of right facial droop. On arrival her blood pressure was 240s/120s and blood glucose was 159. MRI scan of the brain showed restricted diffusion in the pons and corona radiata, microbleeds in left thalamus and left pons, along with old infarcts of the right medulla and right corona radiata. Serial MRI (brain) revealed new scattered multiple infarcts. Intracranial MRA did not reveal evidence to suggest a medium or large vessel vasculitis. She had elevated anti-thyroid peroxidase antibodies. CSF showed elevated IgG of 1710mg/dL. An ultrasound of head and neck was done 2 months later and it was impressionistic for Hashimoto's thyroiditis, evidenced by findings of diffusely enlarged thyroid gland at 7.5cm and sub-centimeter isoechoic to hyperechoic nodules within the isthmus with prominent bilateral cervical nodes that were likely reactive. She was discharged on methotrexate and pioglitazone. She did not have any recurrent strokes in the follow up.

Discussion: Hashimoto encephalopathy is a rare syndrome of Hashimoto thyroiditis that may mimic stroke. Diagnosis requires high index of suspicion. Findings on brain imaging are widely variable, including multiple ischemic infarcts, haemorrhagic lesions, non-specific white matter lesions, meningeal enhancement, and gadolinium enhanced T1 lesions among others. Elevated anti-thyroid peroxidase antibody or anti-thyroglobulin antibody, along with response to corticosteroids, are required for definitive diagnosis. Because of this response to immunosuppressive therapy, it is especially important to thoroughly exclude infection. Hashimoto encephalopathy is a rare disorder with rapid progression and association with both ischemic and hemorrhagic events, which may be mistaken for CNS vasculitis. This case underscores the importance of checking for anti-thyroid antibodies in rapidly progressive CNS vascular conditions.

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PENNSYLVANIA CLINICAL VIGNETTE POSTER FINALIST - HANNAH RYLES

Some Like it Hot: Topical Capsaicin for the Treatment of Cannabinoid Hyperemesis Syndrome

Authors: Hannah T. Ryles, B.S., MD Candidate, Perelman School of Medicine, Class of 2019, David J. Aizenberg, MD, FACP, Department of Medicine, The Perelman School of Medicine

Introduction: Cannabis is the most commonly used illicit drug in the United States and is often prescribed medically for its anti-emetic effects (1). However, long-term use can paradoxically lead to a condition termed cannabinoid hyperemesis syndrome (CHS) characterized by cyclic episodes of nausea, vomiting, abdominal pain and compulsive hot water showering. Given the non-specific symptoms and lack of general awareness of the condition, CHS remains a diagnostic and therapeutic challenge.

Case Presentation: A 36-year-old man presented to the emergency department with severe nausea, vomiting, and abdominal pain. He had presented to four different emergency departments over the course of 5 months due to similar symptoms. Upon questioning, he endorsed a history of daily cannabis use and frequent hot showers. The patient was afebrile, with stable vital signs, and physical exam was remarkable for epigastric/LUQ tenderness. He was treated with ondansetron, magic mouthwash (maalox, diphenhydramine, and lidocaine), and lansoprazole, without significant symptomatic improvement. Topical capsaicin cream (0.1%) was subsequently used, which significantly alleviated his nausea and abdominal pain. The diagnosis of CHS and encouragement of cannabis cessation was discussed with the patient. He reported a motivation to abstain after learning his marijuana use was likely causing, rather than helping, his symptoms.

Discussion: The pathophysiology of CHS has not yet been completely elucidated. One theory involves transient potential receptor vanilloid subtype 1 (TRPV1) receptors (2). These receptors, which are concentrated in the central vomiting center (area postrema of the medulla), GI tract, and the skin, normally exert potent anti-emetic effects via regulation of substance P. Chronic cannabinoid exposure inactivates TRPV1 receptors, leading to nausea, vomiting, and decreased gastric motility (3, 4). Heat and capsaicin activate TRPV1, which may restore normal signaling and alleviate symptoms.

The best treatment for CHS is marijuana cessation, with symptoms typically resolving after 3-4 days (5, 6). For acute presentations IV hydration and avoidance of opiates have shown to be effective (6, 7). While classic antiemetics such as ondansetron and metoclopramide are typically ineffective, haloperidol and benzodiazepines have shown good efficacy, although concerns of adverse effects and abuse potential limit their use (6, 7). Topical capsaicin is an effective, well-tolerated, and cost-effective therapy (2, 6). Capsaicin is extremely safe, with the most common adverse effects being skin irritation, itchiness, and a burning sensation.

Given the rising rates of marijuana use across the country, CHS has become increasingly common (8). Maintaining a high index of suspicion for this syndrome is important to provide patients with effective therapies and counseling on cessation of cannabis, the only absolute cure for CHS (5).

This case represents a classic presentation of a patient with CHS and successful treatment with topical capsaicin. Further research into the condition is necessary to increase awareness, elucidate the pathophysiology, and develop improved treatment strategies.

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PUERTO RICO CLINICAL VIGNETTE POSTER FINALIST - JORGE A IRIZARRY-CARO

Movement Abnormalities in a Patient with Gerstmann-Sträussler-Scheinker Disease: A Case Report with Videos

Authors: Jorge A. Irizarry-Caro, Camilo Toro

Introduction: Gerstmann-Straussler-Scheinker (GSS) is an autosomal dominant progressive neurodegenerative prion disease caused by a mutation in the *PRNP* gene. The clinical presentation of these patients is very heterogeneous. Therefore, the purpose of this report is to characterize the “classical” movement disorders of a patient diagnosed with GSS through the presentation of supplementary videos, something that has not been shown before in the literature.

Case Presentation: A 35-year-old Caucasian male presented with a progressive neurodegenerative disorder. At age 17, the patient started having epilepsy episodes that were controlled with anti-epileptic medications. At approximately age 26, motor symptoms began first in his lower extremities, and then in his upper extremities, more distally than proximally. This disorder was characterized by spastic quadriparesis of the extremities and ataxia, both of which disabled his ability to ambulate. Furthermore, the patient presented with low motor tone in his mouth, dysarthria, poor control of his head, severe dystonia of both hands, and loss of fine motor skills. The patient has not had any clinically relevant cognitive changes. Neurological examination was remarkable for difficulty coordinating movements with both hands, and great difficulty performing finger-to-nose testing. He also had tight heel cords bilaterally with clonus, and he was unable to perform heel-to-shin test on either leg. An oral motor/sensory evaluation was notable for facial myoclonus when smiling/grimacing, weakened tongue retraction, deficient pharyngeal peristalsis, and limitations in hyo-laryngeal excursion. MRI of the brain showed a focal lesion centered in the white matter of the right parietal lobe at the posterior aspect of the Sylvian fissure. The patient had an abnormal EEG with background slowing and poor organization, generalized spike-and-wave discharges with shifting predominance, multifocal epileptiform discharges during sleep, and frequent REM episodes. Laboratory blood results were inconclusive. Genetic evaluation was significant for an autosomal dominant inheritance pattern of a neurodegenerative disorder. Whole-exome sequencing performed on the patient revealed a heterozygous c.305C>T (P102L) pathogenic variant in the *PRNP* gene (the most common mutation in GSS). A final diagnosis of Gerstmann-Straussler-Scheinker disease was done based on the genetic results and the clinical features presented by the patient.

Discussion: This case provides a detailed description of some of the movement abnormalities seen in patients with this condition. Together with the other clinical and molecular findings, our proband serves as a good example to alert physicians that although it is a very rare human prion disease, GSS should be considered when evaluating a patient that has a slow progressive spino-cerebellar dysfunction with ataxia, especially in the context of a dominant family history.

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RHODE ISLAND CLINICAL VIGNETTE POSTER FINALIST - CAROLINE BURKE

A Cloudy Clinical Picture: Case of an Occult Prostatic Abscess in an Oliguric Patient

Authors: Caroline Burke MS3, Zoe Weiss MD, Jennifer O'Brien MD

Introduction: Prostatic abscesses may present insidiously and are often misdiagnosed in anuric or oliguric patients without urinary symptoms. Treatment guidelines are not well established. Here we present a case of a patient found to have a large prostatic abscess in the absence of urinary symptoms that was likely undetected for months.

Case Presentation: A 72-year-old man with insulin-dependent diabetes, ESRD on hemodialysis, and bladder outlet obstruction performing weekly self catheterization, presented to the hospital with a month of subacute fatigue and one day of vague lower abdominal pain. Over the past six months he had a rising white blood cell count (WBC) to 24 K/uL without any other signs or symptoms of infection. Serial abnormal urinalyses were regarded as expected colonization/contamination given his oliguria, and urine cultures were not sent. Admission vitals were notable for a temperature of 100.8F; exam was without abdominal or CVA tenderness. Laboratory workup revealed a WBC of 39 K/uL (2% bands), C-reactive-protein (CRP) of 353 mg/L and urinalysis with 3+ leukocyte-esterase and >100 WBCs. Despite broad spectrum antibiotics with vancomycin and piperacillin-tazobactam, his WBC rose to 59.8 K/uL (4% bands) by day two. CT chest/abdomen/pelvis demonstrated a 5.3 x 4.7 x 4.5 cm prostatic abscess. Interventional radiology performed CT-guided percutaneous drain placement through the left buttocks. Cultures from the drain and initial urine sample grew MRSA, and antibiotics were narrowed to vancomycin with dialysis. Repeat imaging showed an interval decrease in abscess size and the drain was removed after output stopped on day three. His WBC and CRP had downtrended to 23.2 K/uL and 143 mg/L respectively and he was discharged on day five for at least two weeks of vancomycin pending clinical resolution.

Discussion: Prostatic abscess is a rare complication of bacterial prostatitis and can be difficult to diagnose clinically¹. Risk factors include diabetes, immunosuppression, HIV, urinary tract instrumentation, indwelling catheters, and bladder outlet obstruction^{2,3}. Oliguric or anuric patients are at higher risk due to poor urinary washout, and frequent abnormal urinalyses may be disregarded as expected asymptomatic bacteriuria. Patients may present with fever, leukocytosis, pyuria, dysuria, and prostatic or perineal tenderness³. Transrectal ultrasound (TRUS) is the preferred imaging modality, though contrast enhanced CT may also be used, particularly when extension into the ischiorectal fossa or perineum is suspected¹. While there are no formal treatment guidelines, reported approaches typically combine broad-spectrum antibiotics with surgical drainage, either by TRUS-guided percutaneous needle drainage, transurethral drainage, or open derroofing.

While it is generally wise to regard the results of an abnormal urinalysis in anuric or oliguric patients with caution, prostatic abscess should be considered in patients with underlying risk factors and unexplained leukocytosis without an obvious infectious source. Further investigation is required to standardize medical and surgical management of prostatic abscesses.

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TENNESSEE CLINICAL VIGNETTE POSTER FINALIST - ROBERT DORRELL

Coinfection with *Mycobacterium Abscessus* and *Chelonae* Causing Infective Endocarditis in an IV Drug User

Authors: Robert Dorrell, BA, Deborah Dorrell, BA, Ron Ng, MD, Kavya Kannan, MBBS, John Sanders, MD, MPH

Introduction: *Mycobacterium abscessus* complex is a subset of rapidly growing nontuberculous mycobacteria. *M. abscessus* was originally considered to be synonymous with *M. chelonae*, but these two bacteria were reclassified a separate species in 1992. The *M. abscessus* bacterium is difficult to treat due to its extensive antimicrobial resistance. *M. abscessus* has been widely reported as the pathogenic agent responsible for infections of the lungs, eyes, and most commonly the skin and soft tissue. However, *M. abscessus* is rarely associated with endocarditis. Since its reclassification in 1992, there have been nine cases of *M. abscessus* endocarditis and four cases of *M. chelonae*. The standard treatment for these has been antibiotic therapy tailored to blood culture sensitivities. This usually consists of a macrolide, aminoglycoside, cephalosporin, and carbapenem. The most common outcome of these cases has been death or lost to followup.

Case Presentation: A 39 yo man with a history of IVDU and prosthetic TV repair following MRSA endocarditis presented to WFBH with 2 positive blood cultures for *M. abscessus* and a valvular pathology report positive for *M. chelonae*. TEE revealed a vegetation on his prosthetic valve. Patient was admitted for complex antibiotic therapy. He was transferred to the ICU for 4 days with sepsis and recovered with IV antibiotics and valve replacement.

Discussion: This patient had blood cultures positive for *M. abscessus* and a native tricuspid valve vegetation positive for *M. chelonae*. Therefore, endocarditis caused by co-infection of both mycobacterium species is suspected. There are no other documented cases of endocarditis caused by both bacteria. The patient furthermore had regrowth of a tricuspid valve vegetation after prosthetic valve replacement, which is also a unique finding in the endocarditis literature. While the patient is currently undergoing long-term broad-spectrum antibiotic therapy, his prognosis remains poor based on the documented history of nontuberculous mycobacteria endocarditis. Nine cases of *M. abscessus* endocarditis and four cases of *M. chelonae* endocarditis have been reported since these bacteria were reclassified in 1992. Five of these cases occurred in IV drug users, two occurred as postoperative infections, and two occurred in dialysis patients. All patients were treated with broad-spectrum antibiotics, most commonly with a macrolide, an aminoglycoside, and a cephalosporin. If the infection occurred on a native valve, most patients underwent valve replacement. Of the nine *M. abscessus* patients, five died from their disease, two were lost to follow-up, and two survived. Of the four *M. chelonae* patients, three died from their disease and one was lost to follow-up. Co-infection with both bacteria is likely even harder to eradicate. Ten months after initial growth of *M. chelonae* on his tricuspid valve and *M. abscessus* from his blood cultures the patient has remained stable. Patient will continue to be followed in ID outpatient clinic.

TENNESSEE CLINICAL VIGNETTE POSTER FINALIST - PRASHANT K MISHRA

Pulmonary Venous Aneurysm – Rare Cause of Hemothorax

Authors: Prashant Mishra, MS4, Dr. Daphne Norwood, MD

Introduction: Spontaneous hemothorax is present in a small percentage of patients who come with hemothorax. Most hemothorax cases are associated with trauma, pneumothorax, malignancy, AVMs, and other vascular abnormalities. Assessment of etiology of hemothorax is essential in deciding follow-up as some conditions may confer ongoing risk. Spontaneous rupture of pulmonary venous aneurysm (PVA) is extremely rare but can be a cause of fatal hemothorax. We describe a case of a non-fatal, massive hemothorax with no antecedent signs or symptoms caused by a spontaneous rupture of a PVA.

Case Presentation: A previously healthy 66-year-old Caucasian woman presented with a three-hour, abrupt onset of constant, sharp, right-sided, pleuritic chest pain accompanied with dyspnea. This chest pain worsened with deep inspirations and movements and travelled towards her right shoulder. There were no alleviating factors and she rated pain at 10/10 on pain scale. She did not have cough, recent upper respiratory infections or any trauma. Patient reports no history of asthma, COPD, smoking, pneumothorax, coronary artery disease, vascular disease, bleeding or coagulation disorders or similar previous events. She also had no family history of alpha-1 antitrypsin deficiency, Osler-Weber-Rendu syndrome, coagulation disorder or vascular abnormality. Vital signs were within normal limits and her oxygen saturation was 96% on 1 L. Physical exam was pertinent for no air movement in the right mid-lower lung field. On labs, she had mild leukocytosis and respiratory acidosis with normal labs. CXR showed moderate right pleural effusion with associated atelectasis and consolidation. CTA chest did not show any pulmonary embolism but did show large right heterogeneous effusion causing mass effect on the right lung and mediastinum. Bedside thoracentesis and thoracostomy were unable to be done due to lack of accessible free-flowing fluid pocket by ultrasound. Cardio-Thoracic surgery was consulted for video assisted thorascopic surgery (VATS). During VATS, bronchoscopy showed extrinsic compression of right basilar segmental bronchi from collapse of the right lower lobe without any endobronchial disease. Right hemothorax with extensive clot in the anterior inferior chest was found with ruptured PVA. Thoracotomy and right middle lobectomy were performed to achieve hemostasis. Her symptoms resolved after the surgery and she was discharged 3 days post-op. Pathology ruled out any malignancy. Her follow up respiratory microbial and rheumatologic panel were negative. She will follow-up in 3 months with a chest CT scan.

Discussion: Recognition of potential vascular cause of hemothorax in this case, despite her initially relatively benign presentation, helped guide care towards the appropriate and timely surgical consult resulting in a good outcome, recovery, and short hospital stay. Despite the low incidence, spontaneous rupture of PVA remains one of the causes of non-traumatic hemothorax and should be considered in differential diagnosis.

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TENNESSEE CLINICAL VIGNETTE POSTER FINALIST - BARBARA SMITH

Are We Barking up the Wrong Tree? Infective Endocarditis or Lemierre's Syndrome

Authors: Barbara Smith MS3, Mukta Panda MD MACP FRCP

Introduction: Learning objectives - 1. Describe a rare case of MRSA-associated Lemierre Syndrome without associated oropharyngeal infection. 2. Discuss the role of the modified Duke Criteria (MDC) in Lemierre syndrome. Although MDC are widely used and reported to have excellent specificity for infective endocarditis (IE), we present a case of MRSA-associated Lemierre syndrome that fulfilled Duke criteria.

Case Presentation: A 29-year-old female IV drug user (IVDU) presented with five-day history of severe right shoulder pain and right-sided pleuritic chest pain that migrated to her neck, fevers, chills, shortness of breath, and right-sided facial, neck, and arm swelling. The patient admitted to an injection of heroin two weeks prior in the right arm. She denied dental manipulation or oral piercings and no history suggestive of tonsillitis or pharyngitis. On exam she was diaphoretic, in distress, BP 93/55mmHg, temperature 99.4°F, pulse 112/min, respiratory rate 25/min, and SpO2 97%/ 2 Liters O2. Dentition was normal without abscesses or erythema. Right arm and neck were edematous, warm, and tender, right chest wall and back were tender to palpation. Cardiac exam revealed no murmurs. There were injection marks in the right antecubital fossa. Her WBC was 19.7 thousand/mm³. CT scan showed occlusion of the right internal jugular vein (IJV), extending into right and left brachiocephalic veins, right subclavian vein, and superior vena cava. Multiple cavitory nodules at the periphery of the lungs bilaterally were suggestive of septic pulmonary emboli. Anticoagulation with heparin drip was initiated and a TTE did not show any vegetations. Blood cultures grew MRSA x2. IV Vancomycin was administered and serial blood cultures were negative. Hospital course was complicated by increasing fever to 102°F, enlargement of the pulmonary cavitory lesions, and large bilateral pleural effusions treated with VATs procedure and clinical improvement. The diagnosis of IE was supported with 1 Major (two positive MRSA blood cultures) and 3 minor Duke Criteria (history of IVDU, fever > 100.4 °F, septic pulmonary emboli). She was discharged on Eliquis and PO Linezolid for a total of 6 weeks of antibiotics and was stable on discharge.

Discussion: Lemierre's syndrome refers to septic thrombophlebitis of the IJV, usually secondary to an oropharyngeal infection caused by oral anaerobes, notably *Fusobacterium necrophorum*, and often associated with subsequent septic emboli to the lungs and other organs. Our patient's CT scan showing right IJV occlusion and septic pulmonary emboli was consistent with Lemierre's syndrome. A suspicion of IE was entertained due to the patient's history of IVDU; however, no murmur or vegetations were found suggestive of cardiac involvement consistent with IE. This case is unique as it describes a rare case of MRSA-associated Lemierre syndrome with false positive MDC criteria, highlighting the importance of clinical judgement and individualized application of various diagnostic tools.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - JACLYN BOOZALIS

Catching a Zebra: An Elusive Diagnosis

Authors: Jaclyn Boozalis (MS3, ACP Member), Austin Smith (MS3, ACP Member), Rebecca Romero, MD

Introduction: Anti-NMDA Receptor Encephalitis is a condition that presents in two stages: 1) psychosis, seizures, and confusion; 2) involuntary movements, reduced consciousness, and autonomic disturbances. The rarity of this disease and its recent discovery make it a likely diagnosis to miss.

Case Presentation: A 17-year old patient consulted her doctor in January 2017 for weight loss, fidgeting, and memory problems. She was diagnosed with anxiety. Six months later she developed episodes of blinking, drooling, lip smacking, and unresponsiveness several times per day. A week later she had multiple seizures. She was hospitalized, administered lorazepam, had an EEG, and tested for meningitis and drugs. She reported voices telling her to harm herself, tachycardia, and repeated episodes of spitting. She was diagnosed with psychogenic nonepileptic seizures and ingestion of synthetic drugs, despite her clean social record and drug screen. She was transferred to a psychiatric behavioral center and discharged with a diagnosis of depression with potential elements of bipolar disorder. Treatment was initiated with an antidepressant, but her behavior did not improve. By September she developed an alternate persona, "Amber," who was aggressive, violent, and rude. A benzodiazepine and anti-epileptic were added to her regimen. The patient was somnolent and unable to attend school for one month until her medications were adjusted.

In January 2018 the patient was acting out, talking strangely, and attempted suicide. Upon return to the psychiatric behavioral center, permanent institutionalization was recommended. By March, she developed dyskinesias and was almost exclusively acting as Amber. Suspecting schizophrenia, her psychiatrist ordered an MRI, which demonstrated abnormal white and gray matter lesions. In May the patient was referred to a neurologist who had her admitted and performed multiple diagnostic procedures, including a lumbar puncture notable for oligoclonal bands. In July 2018 she developed bilateral lower extremity weakness leading to falls. She was referred to a neuro-immunologist for suspicion of multiple sclerosis, who sent a CSF encephalopathy panel, ordered a repeat MRI, and admitted the patient to the hospital to expedite a workup with a trial of IV steroids versus IVIG. CSF confirmed anti-NMDA receptor encephalitis. She is improving physically and psychologically as an outpatient on immunomodulating therapy.

Discussion: This case illustrates the arduous journey of a young girl whose diagnosis and treatment were delayed for over a year. This delay caused permanent scarring in her brain and emotional trauma to her family. Although this disorder is rare, it presented with red flags within the first six months. Recognition and suspicion of "zebras" by providers is critical in launching appropriate diagnostic procedures and initiating therapy for these patients.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - BILAWAL AHMED

Systemic Lupus Erythematosus: A pancytopenic and pancreatic presentation

Authors: Bilawal Ahmed, Omar Chaudhary, Mazhar Mustafa, Firas Siddique, Shil Shah, Byron Okwesili

Introduction: Systemic lupus erythematosus (SLE) is a multisystem disease, that may affect multiple organ systems in the body. As a rare initial presentation of SLE, acute pancreatitis presents as generalized flare-ups in most cases of patients previously diagnosed with SLE. Here we report a rare case of acute pancreatitis and pancytopenia as the initial presentation of systematic lupus erythematosus.

Case Presentation: 15 year old female patient presented with chief complaints of abdominal pain, nausea, vomiting and non bloody diarrhea. The onset of abdominal pain started 4 days prior to admission, localizing to the right upper quadrant on day 2. Associated symptoms consisted of nonbloody diarrhea and nonbloody/nonbilious vomit for 4 days. There was no contributory past medical history or past surgical history. Patient denies any drug allergies. On general physical examination, a fine lacy rash was noted on all four extremities. Vitals were T 37.9, HR 104, RR 18, BP 99/58. No guarding/rigidity and no masses or organomegaly were appreciated. CBC revealed profound pancytopenia with a platelet count of 115 (150-400 x103/uL), hemoglobin 8.5 (12-15 g/dL) and white blood cell 1.5 (4.5-13 x103/uL). Lipase was 489 u/L and Lactate Dehydrogenase was 2392 u/L. Other laboratories, including comprehensive metabolic panel, lipid panel, C-reactive protein, and pregnancy test, were all within normal limits. Patient was admitted with diagnosis of pancreatitis with pancytopenia and supportive treatment with investigative studies was initiated. Bone marrow biopsy was unequivocal. Infectious Disease was consulted. New laboratory test results indicated positive IgG and IgM antibodies to Brucella, Rickettsia, Epstein Barr Virus and Parvovirus, complicating the diagnosis. Patient started on doxycycline empirically. Rheumatology consulted most likely etiology to be SLE and await Lupus Panel Results. Erythrocyte sedimentation rate was 74mm/hr, positive antinuclear antibody (ANA) 1/640, positive anti doublestranded DNA Antibody 1/320, positive anti Smith antibody, negative rheumatoid factor, C3 <40mg/dL, Lipase 2784u/L, fecal occult blood test positive. Following lab results and clinical course, the diagnosis of Systemic Lupus Erythematosus was made on day 4 of admission. Steroids were initiated, and the patient's status was observed closely. Lipase continued to rise to 8,136 u/L which prompted MRCP. MRCP showed extensive changes of pancreatitis with upper abdominal fluid, no organized collection or dilation of ducts. Also noted was extensive wall edema of the gallbladder with no filling defect. Lipase began trending down on day 2 of steroids. CBC corrected to within normal limits. Patient reported feeling better and continued improving.

Discussion: This case aims to facilitate diagnosticians in the evaluation of patients presenting with rare manifestations of SLE. SLE should be considered in cases of pancreatitis when common etiologies have been ruled out and symptoms are not resolving despite appropriate treatment. In regards to hematologic abnormalities, SLE can cause various cytopenias as an initial presentation but pancytopenia has been reported fewer times in the literature.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - ANNA BERRY

What's at the Heart of This Ischemic Stroke?

Authors: Anna E. Berry, BS, Lauren Nicholas Herrera, MD, Basant Arya, MD

Introduction: Though cardiac etiologies for ischemic stroke are common, symptomatic cardiac papillary fibroelastomas (CPF) are rare. They can be identified by echocardiogram and surgical removal is curative in most patients.

Case Presentation: A 65 year-old female with a history of hypertension, hyperlipidemia developed sudden dysarthria and left arm and leg weakness. Upon presentation to a community hospital by ambulance, she was unable to move her left arm or leg and was moderately aphasic, dysarthric, and ataxic. NIH Stroke Scale (NIHSS) was determined to be 15 at that time, suggestive of a moderate stroke. Computed tomography of the head was performed and was negative for hemorrhage. With concern for a partial ischemic stroke in the M2 region, a bolus of t-PA was administered 50 minutes after the initial onset of symptoms with improvement to NIHSS 9. Though endovascular treatment was considered, the patient continued improve and it was determined that further intervention was not warranted. She was subsequently transferred to our institution for further workup and management.

Upon arrival, neurological exam was remarkable for residual 4+/5 weakness in the left lower extremity and decreased sensation in the left face and leg. ECG showed normal sinus rhythm without evidence of arrhythmia or ischemia. Magnetic resonance imaging of the brain demonstrated ischemic changes in the right middle cerebral artery territory, while magnetic resonance angiogram of the head and neck was unremarkable. Transthoracic echocardiogram was performed and revealed a mobile, pedunculated echodensity adhered to the base of the left coronary cusp of the aortic valve. Further characterization by transesophageal echocardiogram showed a 1cm x 1cm x 1.3cm mass that had an appearance consistent with a papillary fibroelastoma. The foramen ovale was not patent. Cardiothoracic surgery elected to surgically remove the fibroelastoma due to its embolic potential and proximity to the left coronary artery ostium. The patient subsequently underwent minimally invasive resection of the fibroelastoma without aortic valve intervention. Histological examination of the surgical specimen revealed a tumor papillary in configuration. A central fibrous core was strongly positive for elastic fibers with Verhoeff–Van Gieson (VVG) staining, while Alcian blue staining revealed mucinous substrate at the periphery of each papillae. These findings confirmed the diagnosis of papillary fibroelastoma. After surgery, she recovered to baseline and was discharged on postoperative day 3 without any additional events.

Discussion: This case highlights the importance of a thorough cardiac evaluation in the workup of an acute ischemic stroke. Though the presence of embolic cardiac neoplasms is rare, they primarily manifest with ischemic sequelae¹ and should be considered in the workup of ischemic stroke. Transthoracic echocardiography can be used initially, with transesophageal echocardiogram for further characterization. If a papillary fibroelastoma is identified, it is possible to intervene surgically to reduce the likelihood of subsequent cerebral vascular accidents and mortality.²

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - JACLYN BOOZALIS

Catching a Zebra: Diagnosing Anti-NMDA Receptor Encephalitis

Authors: Jaclyn Boozalis (MS3, ACP Member), Austin Smith (MS3, ACP Member), Rebecca Romero, MD

Introduction: Anti-NMDA Receptor Encephalitis is a condition that presents in two stages: 1) psychosis, seizures, and confusion; 2) involuntary movements, reduced consciousness, and autonomic disturbances. The rarity of this disease and its recent discovery make it a likely diagnosis to miss.

Case Presentation: A 17-year old patient consulted her doctor in January 2017 for weight loss, fidgeting, and memory problems. She was diagnosed with anxiety. Six months later she developed episodes of blinking, drooling, lip smacking, and unresponsiveness several times per day. A week later she had multiple seizures. She was hospitalized, administered lorazepam, had an EEG, and tested for meningitis and drugs. She reported voices telling her to harm herself, tachycardia, and repeated episodes of spitting. She was diagnosed with psychogenic nonepileptic seizures and ingestion of synthetic drugs, despite her clean social record and drug screen. She was transferred to a psychiatric behavioral center and discharged with a diagnosis of depression with potential elements of bipolar disorder. Treatment was initiated with an antidepressant, but her behavior did not improve. By September she developed an alternate persona, "Amber," who was aggressive, violent, and rude. A benzodiazepine and anti-epileptic were added to her regimen. The patient was somnolent and unable to attend school for one month until her medications were adjusted.

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Discussion: This case illustrates the arduous journey of a young girl whose diagnosis and treatment were delayed for over a year. This delay caused permanent scarring in her brain and emotional trauma to her family. Although this disorder is rare, it presented with some red flags within the first six months. Recognition and suspicion of "zebras" by providers is critical in launching appropriate diagnostic procedures and initiating therapy for these patients.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - ROGER BUI

Riddled with Roaches

Authors: Roger Bui, BSc

Introduction: Organophosphates (OP) are a class of insecticides that are used in agriculture, homes, gardens, and in veterinary practices. OP poisoning has gained much notoriety due to feasibility of toxicity through several mediums: inhalation, absorption through the skin, or voluntary ingestion. Organophosphate poisoning is more pervasive in rural regions owing to less stringent regulation over its usage, however the availability of strong insecticides for use in urban areas increase the risk of OP toxicity in the general population.

Case Presentation: A 50 year old man was admitted to the emergency department for acute shortness of breath, rhinorrhea, miosis, mild bronchorrhea, and pressure- like chest pain. Symptom onset occurred after driving his van, which he used in his occupation as a construction worker, for 10 minutes on a hot day with the air-conditioning on high. On physical examination, he was in apparent distress, with overt lacrimation, pupillary constriction, and modest bibasilar crackles. Clinical suspicion for chemical toxicity prompted further questioning about potential exposures. The patient revealed that he had used a large amount of Orthene fire ant killer (Acephate 50%) to eradicate a roach infestation in his vehicle. He was immediately decontaminated with a 10 minute shower and placed on supportive O₂therapy. Poison control was contacted; because the toxin had infiltrated the van's ventilation they felt the vehicle should be destroyed. The patient was discharged in stable condition two days later.

Discussion: Organophosphate poisoning is a diagnosis that is made on clinical grounds and is a major cause of mortality in several countries. Due to the several different modes of exposure to this toxin, a level of vigilance and clinical astuteness must be implemented to quickly diagnose and treat OP poisoning. Organophosphates bind to acetylcholinesterase (AChE), an enzyme responsible for the degradation of acetylcholine, rendering it dysfunctional. Consequently, this causes an inundation of acetylcholine within the synaptic cleft, notably causing a large array of muscarinic symptoms: diarrhea, urination, miosis, bradycardia, bronchorrhea, emesis, lacrimation, and salivation. Pivotal aspects in management include immediate assessment and management of disturbances in the airway, breathing, and circulation. Resuscitation and intubation may be necessary due to the disarray in airway patency, breathing mechanics, and hemodynamic stability that moderate to severe OP toxicity causes. Management with Atropine or Pralidoxime is indicated with the presence of severe bronchorrhea.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - ALBERT JANG

Double Trouble: Simultaneous Cutaneous Lymphomas in an AIDS Patient

Authors: Albert Jang BS, Lucy Huo BA, Mahmoud Gaballa MD, Robert Hester MD, MS, Nan Chen MD, Tejo Musunuru MD, Mark Udden MD, Martha Mims, MD, PhD

Introduction: To recognize that patients with HIV may develop more than one lymphoma.

Case Presentation: A 41-year-old woman with AIDS (on HAART, CD4 count 154/mm³ with an undetectable viral load) and plasmablastic lymphoma (on EPOCH chemotherapy) presented following a syncopal event. Two weeks ago, she noticed a new annular lesion with an ulcerating, necrotic center and an erythematous-violaceous border on her right thigh, similar to other lymphoma lesions on her legs. On admission, she reported four days of fever and increasing right thigh pain. In the hospital, a CT scan showed an abscess underlying this new thigh lesion. The patient underwent bilateral thigh wound incision and drainage, irrigation, and debridement, with biopsies taken. While waiting on pathology, the patient's chemotherapy regimen was changed to bortezomib followed by ICE regimen, presuming progression of the original plasmablastic lymphoma. Biopsy results revealed the new lesion was an extranodal NK/T-cell lymphoma, nasal type. Comparison to the original biopsy demonstrated a completely different immunohistochemical profile.

Discussion: Patients with HIV have more than a 60-fold risk of developing non-Hodgkin's lymphoma. The increased risk is related to transforming properties of the retrovirus, immunosuppression, cytokine dysregulation, and opportunistic infections from lymphotropic herpesviruses. Plasmablastic lymphoma, a rare and aggressive subtype of diffuse large B-cell lymphoma, comprises 2% of all HIV-related lymphomas. NK/T-cell lymphoma is a destructive and necrotic lymphoma, most commonly presenting in the nasal cavity but can manifest on the skin. Epstein-Barr virus plays a role in the pathogenesis of both lymphomas, and pathology reports for both lymphomas were positive for EBV in this case. To our knowledge, there are no previous reports of an HIV-AIDS patient having these two lymphomas concurrently. No standard chemotherapy regimens exist for either lymphoma, and outcomes are often poor for both. In this case, bortezomib with ICE to treat the progressing plasmablastic lymphoma coincidentally became an option to treat the NK/T cell lymphoma, which is sensitive to platinum agents.

When an HIV patient with lymphoma develops new lesions during treatment, it is important to biopsy the new lesion. Not only does an immunocompromised state place a patient with HIV at increased risk of infection and malignancy, chemotherapy may induce a new malignancy or transformation of the original malignancy. In this case, the second lymphoma was diagnosed after four courses of EPOCH for her first lymphoma diagnosed just five months prior. Whether these two malignancies are related to each other or simply a manifestation of the underlying immune compromise is not clear. One hypothesis is this patient's immunocompromised state allowed EBV to infect both plasma cell and NK/T cell precursors to create two concurrent but separate malignancies. The use of HAART and a carefully chosen chemotherapeutic regimen able to treat both lymphomas were of utmost importance.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - KARA JENCKS

Hemolytic Anemia Due to Pernicious Anemia: An Atypical Presentation

Authors: Kara Jencks, , Jared Raabe, Sara Journey, Dongming Li, M.D., Department of Internal Medicine, University of Texas Medical Branch, Galveston, TX.

Introduction: Pernicious anemia is an autoimmune disease that leads to the absence of intrinsic factor and the inability to absorb vitamin B12. This case demonstrates an interesting presentation of pernicious anemia associated with hemolysis.

Case Presentation: A 35-year-old female with no significant past medical history presented to the hospital with dyspnea on exertion and dizziness. For four months, she had experienced progressive fatigue, jaundice, and 12 pound weight loss. She also endorsed new onset, intermittent tingling in her fingertips. She denied using tobacco or alcohol, and reported eating a normal, well-balanced diet. Upon admission, her vital signs were stable, and her physical exam was significant for mild weakness and diffuse jaundice with no focal neurological deficits. Her labs showed a macrocytic anemia with a hemoglobin of 4.4 and MCV of 109.2. She was admitted for severe, symptomatic anemia and given two units of packed red blood cells. Further lab studies were performed to classify her anemia. Her iron panel showed elevated iron levels and a normal TIBC. Because she was severely jaundiced, a hemolytic work-up was also conducted that showed unconjugated hyperbilirubinemia at 3.3 mg/dL, elevated lactate dehydrogenase greater than 6450 U/L, and undetectable haptoglobin. Based on these results, the primary differential diagnoses for her hemolytic macrocytosis were vitamin B12 or folate deficiency due to impairment of nucleic acid metabolism, reticulocytosis secondary to hemolysis, liver disease, hypothyroidism, and alcohol use. To clarify her anemia, a blood smear was collected. Her smear showed an increased reticulocyte count, schistocytes, and numerous hypersegmented neutrophils. Because hypersegmented neutrophils were present on the smear accompanied by her physical findings of tingling in her fingertips, B12 deficiency was suspected despite her well-balanced diet. Vitamin levels including folate and B12 were ordered and found to be elevated and undetectable, respectively. A TSH panel was also done and was found to be elevated at 22.1, which raised suspicion for an autoimmune process resulting in B12 deficiency. Further tests including anti-parietal cell antibody and anti-thyroid peroxidase titers were sent. These returned elevated, and the diagnosis of pernicious anemia with likely concomitant Hashimoto's thyroiditis was made. The patient was started on levothyroxine 50 mcg and 1000 mcg cobalamin injections daily. She showed near complete symptomatic improvement in 5 days with an associated improvement of hemoglobin levels without additional blood products.

Discussion: In this case, the presentation of pernicious anemia was clouded by a hemolytic picture. It emphasizes the importance of understanding that a severe vitamin B12 deficiency can present as hemolytic anemia due to intramedullary hemolysis. Early recognition of this diagnosis in cases such as this one will shorten hospital courses with rapid symptomatic improvement and avoid unnecessary blood transfusions and associated risks for these patients.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - ALICE JIANG

A Consternating Constellation: Gastritis, Colitis, and Dermatitis in an HIV-Positive Male

Authors: Alice Jiang, Medical Student, UT Southwestern Medical School, Dallas, TX, Stephen Harder MD, UT Southwestern Medical School, Dallas, TX

Case Presentation: A 36-year-old man with human immunodeficiency virus (HIV) on antiretroviral therapy presented with an anterior mediastinal mass on computed tomography (CT). A biopsy was not concerning for a malignant or infectious process, and the mass was monitored with routine imaging. Two years later, he presented with neck weakness, diplopia, and dysphagia concerning for myasthenia gravis. Medical workup found a positive anti-acetylcholine receptor antibody, and biopsy of his mediastinal mass was consistent with thymoma. CT imaging demonstrated implants along the right hemi-diaphragm consistent with pleural metastases. He received a partial course of intravenous immunoglobulin but did not follow-up for radiation or chemotherapy.

Four years after initial presentation, he returned with chronic diarrhea and failure to thrive. His stool was watery, non-bloody, and associated with abdominal pain. He had a pruritic rash involving his trunk, buttocks, extremities, palms, and soles. Clinical examination revealed pink papules with scale, coalescing into plaques involving 60% total body surface area. His abdominal examination was benign, and there was no pathologic lymphadenopathy. Laboratory findings were remarkable for a CD4 count of 605 cells/mm³ and an undetectable viral load. The white blood cell count was 11.99 x10⁹/L, and liver enzymes were normal. Antinuclear antibody titer was 1:2560. Anti-SSA, anti-SSB, anti-Smith, anti-SCL-70, anti-Jo-1, anti-RNP, and calcium channel binding antibody were negative. Stool cultures for *Salmonella*, *Shigella*, *Campylobacter*, *Clostridium difficile* toxin, *Cryptosporidium*, ova, and parasites were negative. Cultures and serologies for *Legionella*, *Nocardia*, *Pneumocystis jiroveci*, *Histoplasma*, *Aspergillus*, *Cryptococcus*, and acid-fast bacilli were negative. Esophagogastroduodenoscopy and colonoscopy showed gastritis involving oxyntic and antral mucosa and colitis with prominent apoptosis. A skin biopsy revealed vacuolar interface dermatitis with acanthosis and epidermal necrotic keratinocytes. Direct immunofluorescence to evaluate for paraneoplastic pemphigus was negative for IgG, IgA, IgM, and C3 deposits.

Discussion: Paraneoplastic syndromes result from tumor secretion of peptides or hormones or immune cross-reactivity. They most commonly affect the endocrine, neurologic, dermatologic, and rheumatologic systems and may manifest prior to diagnosis of malignancy or with an established malignancy. An estimated 8% of individuals with cancer have a paraneoplastic syndrome. This patient presented with a diffuse rash and chronic diarrhea in the setting of HIV and thymoma. Biopsies demonstrated dermatitis, gastritis, and colitis, consistent with multi-organ autoimmune syndrome.

Thymoma-associated multi-organ autoimmunity (TAMA) is a rare paraneoplastic syndrome that mimics graft-versus-host disease (GVHD). It can affect the liver, skin, and gastrointestinal tract and histologically resembles GVHD. Physicians should maintain a high index of suspicion for TAMA in patients with cutaneous eruptions, chronic diarrhea, and/or abnormal liver enzymes in the setting of thymoma. More broadly, physicians should consider paraneoplastic syndromes to explain a constellation of seemingly disjointed symptoms in the setting of malignancy or prior to a diagnosis.

TEXAS CLINICAL VIGNETTE POSTER FINALIST - NICHOLAS KING

Don't Ignore Back Pain! A Rare Case of a Common Complaint

Authors: Nicholas King, Keshav Kukreja, Albina Murzabdillaeva, Yasir Ali, Joan Bull

Introduction: Sarcomatoid carcinoma, or carcinosarcoma, is an uncommon neoplasm containing both sarcomatous and carcinomatous elements. While usually found in visceral organs, it can extremely rarely arise from bone. Recognizing the infrequency of its diagnosis, varying presentation, and high mortality, early detection and treatment is crucial.

Case Presentation: A 36-year-old woman with no past medical history presented with diffuse musculoskeletal pain to the emergency department. The pain was chronic, severe, and primarily located in her back, right shoulder, and right arm.

Initial x-rays showed multiple lytic lesions suspicious for malignancy. Subsequent computed tomography (CT) of the chest, abdomen, and pelvis revealed extensive lytic lesions to bilateral humeral heads, iliac bones, ischial bones, thoracic spine and lumbar spine with pathologic fracture of T9. Due to new-onset numbness and tingling of her left leg, she also underwent magnetic resonance imaging (MRI), which showed additional metastases to the humerus, scapula, clavicle, 4th and 5th ribs, throughout the pelvis, and spine with pathologic T9 fracture and mild spinal canal stenosis but no cord compression. Whole body positron emission tomography scan (PET-CT) for tumor staging confirmed extensive metastasis to bony skeleton, but a non-osseous primary was never identified. T9 biopsy was obtained and histopathologic examination showed mainly sarcomatous spindle cells with focal bone formation. Immunostaining showed the cells to be OSCAR cytokeratin and patchy positive for pankeratin, indicative of an epithelial origin. This neoplasm was ultimately diagnosed as sarcomatoid carcinoma.

Due to the tumor burden, the patient was unable to undergo resective surgery. She received external beam radiotherapy to limit spinal stenosis, systemic chemotherapy, and extensive physical therapy in a rehabilitation facility.

Discussion: Primary *de novo* bone sarcomatoid carcinoma of the bone is exceedingly rare, with only three cases reported in English literature. In this case, we report the fourth documented case of *de novo* carcinosarcoma, arising from the bone. Like the other cases, the presenting symptom was pain at the site of the lesion; but unlike the other cases, our case showed a very poorly differentiated neoplasm that exhibited predominantly sarcomatous spindle cells with epithelial-origin cell markers. It is also the first case to present with diffuse bony skeleton involvement, indicating that this neoplasm follows an insidious course and has the ability to progress beyond focal lesions. Evidence points to carcinosarcomas as arising from an epithelial to mesenchymal transition, although other sources are possible.

Given the incidence of this tumor, almost no data has been generated regarding prognosis or natural course. Nor has ideal chemotherapy been derived; this patient is receiving chemotherapy based on the sarcomatous phenotype of the neoplasm, with concurrent radiation and physical therapy for a multimodal approach. Further work is required to elucidate the clinical course and treatment options for this malignancy.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - GEORGINA KOLCUN

A Rare Cause of a Rare Disorder (Cardiac Amyloidosis)

Authors: Georgina Kolcun¹, Lawrence Rice, MD^{1,2}, ¹ College of Medicine, Texas A&M Health Science Center, College Station, Texas, ² Department of Internal Medicine, Houston Methodist Hospital, Houston, Texas

Introduction: Cardiac amyloidosis generally complicates one of four processes: light-chain (AL) amyloidosis, hereditary mutant transthyretin amyloidosis, senile transthyretin amyloidosis, or inflammation-related secondary (AA) amyloidosis. AL amyloidosis represents abnormal depositions of light chain immunoglobulin fibril aggregates. This plasma cell dyscrasia is generally isolated or associated with multiple myeloma (MM). We are caring for a patient with a surprising underlying disorder.

Case Presentation: A 67 year old man was admitted for increasing shortness of breath due to acute on chronic systolic heart failure. He had become unable to climb stairs due to dyspnea and was experiencing lower extremity swelling for four months. He had no bone pain, neuropathy, or visual changes. Home medications were carvedilol, lisinopril, furosemide, metolazone, potassium, and aspirin. On physical exam, there was no lymphadenopathy, normal heart sounds, decreased breath sounds at the lung bases, no hepatosplenomegaly, and 2+ bilateral pitting edema. Laboratory tests revealed normocytic anemia (hemoglobin 12 g/dL), thrombocytopenia (110k/ μ L), and hypoalbuminemia (3.3 g/dL). Troponin was normal; BUN (30 mg/dL), creatinine (1.1 mg/dL), and markedly elevated BNP (1677 pg/mL) and beta-2 microglobulin (5.6 mg/L). Chest X-ray showed cardiomegaly and pleural effusion. EKG showed RBBB.

Cardiac workup included echocardiogram with moderate left ventricular hypertrophy and impaired systolic (EF 35-40%) and diastolic functions. MRI found biventricular heart failure and evidence of infiltrative cardiomyopathy. Endomyocardial biopsy demonstrated AL (lambda-type) amyloid deposition (positive Congo red stain; lambda by mass spectroscopy). There was a 1.4 g/dL IgM-lambda monoclonal paraprotein on serum protein electrophoresis. Serum free light chains showed increased lambda (245 mg/L, normal <26 mg/L) and decreased kappa: lambda ratio (0.04, normal >0.26). Bone marrow had Congo red positive proteinaceous deposits and 28% lymphoplasmacytic lymphocytes without an increase in plasma cells; flow cytometry showed 9% lambda light chain restricted B cells. PCR was positive for MYD88 L265P mutation, typical of lymphoplasmacytic lymphoma (LPL)/Waldenström's macroglobulinemia (WM).

Discussion: Cardiac amyloidosis has been seen with plasma cell dyscrasias such as monoclonal gammopathy of undetermined significance or WM. Whereas MM cells overproduce IgG, IgA, or light chains only, WM cells overproduce IgM. WM underlies only 5% of AL amyloid cases,¹ with cardiomyopathy present in 44% of these.² Before cardiac involvement, this patient had no symptoms of WM. This case highlights the challenge of recognizing asymptomatic disease before the development of life-threatening complications, and the importance of a thorough workup to define the underlying cause of a disease (affecting prognosis and treatment). Since prolonged survival (median ten years) can be seen with WM, this patient has been judged a candidate for orthotopic heart transplant, and he is currently receiving chemoimmunotherapy.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - KALLIE KRAM

Of All the Causes of Back Pain: ALL Presenting as Spinal Cord Compression of All the Causes of Back Pain: ALL Presenting with Spinal Cord Compression

Authors: Kallie Kram, BS, Albert Jang, BS, Scott Berger, BS, and Marc Robinson, MD

Introduction: Recognize acute lymphoblastic leukemia (ALL) as a rare cause of spinal cord compression that obviates the need for surgical decompression and/or radiation and responds to systemic chemotherapy alone.

Case Presentation: A 38-year-old previously healthy man presented with acute on chronic non-radiating midback pain. The pain began seven months prior, originally intermittent, now constant. Over the past four days, he developed gait instability, saddle anesthesia, lower extremity weakness, and urinary retention. Physical exam demonstrated point tenderness in the lower thoracic spine, reduced strength of lower extremities, intact fine touch sensation, hyperreflexia in both knees, negative Babinski bilaterally, and normal rectal tone. Hemoglobin was 10.7g/dL. Platelet count was $13 \times 10^3/\mu\text{L}$. A peripheral blood smear included 13% blasts.

MRI of the thoracic spine showed compressive fractures to the T2 and T9 vertebrae. A soft tissue mass encompassed the T2 vertebral body, extending through the bilateral neural foramina into the ventral epidural space causing canal narrowing. A similar mass was visualized at T9. There was no lymph node involvement.

A diagnosis of B cell ALL was made. Immediately, high dose dexamethasone was started, which quickly improved neurological symptoms. Bone marrow biopsy had >95% blasts. The patient was started on high dose methotrexate, cytarabine, rituximab, and administered intrathecal methotrexate. At cycle 1 day 5, the patient's neurological symptoms further improved, with resolution of saddle anesthesia, normal reflexes, and normal urination.

Discussion: ALL is a malignant transformation and proliferation of lymphoid progenitor cells in the bone marrow, blood, and less commonly extramedullary sites. ALL has a nonspecific presentation, including B symptoms, infection, easy bruising, and fatigue. Diagnosis warrants rapid initiation of systemic treatment.

ALL initially presenting as an isolated spinal lesion with cord compression is rare with only one adult case previously documented. Spinal cord compression most commonly occurs with solid tumors such as breast, prostate, or non-small cell lung cancer which is managed with steroids followed by surgery and/or radiation. A tissue biopsy is needed if surgical decompression is deferred. We present an unusual case of adult B cell ALL associated with compression fractures and cord compression without classic ALL symptoms. Fortunately, an early detection of acute leukemia, triggered by the presence of severe thrombocytopenia, resulted in rapid initiation of systemic therapy that adequately treated patient's systemic and local disease. This is a different approach than chemosensitive solid tumors, in which local treatment takes precedence over systemic management. Image-guided biopsy, surgery, or radiation would have delayed systemic treatment in this patient.

Conclusion: In patients presenting with spinal cord compression, ALL is rarely at the top of a differential diagnosis. However, suspicion should be raised in a patient with thrombocytopenia, as early diagnosis may alter standard management.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - MIN HYUNG H LEE

Lymphocutaneous infection of the hand in a patient with HIV

Authors: Min Hyung Lee, MS; Matt Remz, MD; Mridula Nadamuni, MD; James Galloway, MD; University of Texas Southwestern, Dallas, Texas

Introduction: Patients with HIV are particularly prone to skin and soft tissue infections; successful management requires careful attention to epidemiologic exposures, broad microbiologic testing, and close follow-up.

Case Presentation: A 54-year old male with HIV and unknown CD4 count on anti-retroviral therapy presented with five days of painful swelling and purulent drainage from the tip of his right fourth finger. Symptoms began after a splinter injury from water damaged wood flooring in his recreational vehicle, which was parked at a campsite in north Texas that used well water. A pustule developed at the site of injury, which the patient lanced with a needle, but the pustule worsened and the swelling and erythema extended to the forearm. He denied exposures to cats or other animals, gardening, or brackish water. He denied constitutional or pulmonary symptoms. Physical exam showed a pustule on the pad of the right fourth finger with swelling and erythema streaking proximally up the forearm. Vancomycin IV and piperacillin-tazobactam IV were started to cover *Streptococcus*, *Staphylococcus* (including MRSA), *Pseudomonas* and *Aeromonas* species in light of water exposure. Irrigation and debridement was performed and cultures were sent for bacterial, acid fast, fungal, and *Nocardia* species. Over the subsequent 48 hours, as his erythema improved, the palpable lymphadenopathy on the dorsum of his hand, forearm, and axilla became more visible. Gram stain showed yeast, prompting the addition of fluconazole, and culture grew coagulase negative *Staphylococcus*. *Sporothrix* antibodies were negative. Infectious disease consultants assessed the yeast, which did not speciate, to be a contaminant. His CD4 count was 640 cells/ μ l. The patient was discharged on empiric amoxicillin-clavulanate. After discharge, the patient's cultures grew *Nocardia brasiliensis*. Based on sensitivities, treatment was changed to sulfamethoxazole-trimethoprim DS 800/160mg TID and minocycline 100mg BID for 30 days. His infection was improved at follow-up.

Discussion: The differential diagnosis of infections of the hand in patients with HIV is broad. The saprophyte *Nocardia brasiliensis*, a gram-positive, weakly acid-fast bacillus, is ubiquitous in soil and can cause cutaneous infections, often after inoculation injury¹⁻³. Cutaneous nocardiosis mimics the skin and soft tissue infections of *Staphylococcal* and *Streptococcal* infections as well as the nodular lymphangitis of *Bartonella henselae*, *Sporothrix shenckii*, *Francisella tularensis*, and non-tuberculous mycobacteria^{1,4}. While cutaneous infection occurs in immunocompetent patients, immunocompromised patients are at risk for disseminated infection⁴⁻⁶. This case illustrates several points. Careful attention must be paid to epidemiologic exposures to modify the differential diagnosis in the case of such infections. Broad microbiologic testing is required, and many potential culprits are slow-growing organisms. As a result, patient care does not stop when the patient is discharged—post-hospital follow up by discharging providers is a critical component of complete care.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - LARA SAMARNEH

Granulicatella adiacens prosthetic valve endocarditis in a patient with neutropenia

Authors: Lara Samarneh, Medical Student, McGovern Medical School, Houston TX, Lokesh Shahani, MD, MPH, FACP, Assistant Professor, McGovern Medical School, Houston TX

Introduction: Abiotrophia (ABI) and Granulicatella (GRA) species are rare causes of infective endocarditis. They are found in the normal flora of the oral cavity, urogenital tract, and intestines and account for about 4.3 to 6% of infective endocarditis cases [1]. These gram-positive cocci were formerly named nutritionally variant streptococci (NVS) because they require certain nutrients, such as pyridoxal hydrochloride or cysteine, to grow on chocolate agar or in media [2]. Immunocompromised or neutropenic patients are most at risk for infection with NVS. ABI and GRA have been identified as causes of bacteremia among patients with neutropenic fever; however, there is no documented case of Granulicatella causing endocarditis among neutropenic febrile patients.

Case Presentation: A 63-year-old male presenting to the ER with a fever that began 4 days prior to admission. He was recently (2 weeks prior to this presentation) noted to be pancytopenic on recent routine laboratory exam and was diagnosed with myelodysplastic syndrome (MDS) based on bone marrow examination. However, the patient was not currently on treatment. The patient had a history of methicillin-sensitive Staphylococcus aureus bacteraemia, aortic valve endocarditis, and abscess secondary to intravenous drug use, requiring cardiac intervention and metallic valve placement 9 years prior. On examination, the patient had a fever of 38.6 °C with normal vitals otherwise. Upon auscultation of the heart, a 3/6 systolic murmur was appreciated at the upper sternal border along with a mechanical click. A trans-thoracic echocardiogram (TTE) revealed two mobile echodense vegetations attached to the aortic side of the prosthetic valve. Upon further workup, magnetic resonance imaging (MRI) of the brain showed three ischemic infarctions in different vascular territories: the right posterior frontal region, right occipital region and right cerebellar hemisphere. The presence of multiple brain infarcts in the setting of an aortic valve endocarditis raised the possibility of embolic infarcts. Blood cultures were negative the first 72 hours after presentation, however later yielded slow growing gram-positive, catalase positive organisms in chains. Granulicatella was identified using an automated blood culture system. The patient was started on intravenous ceftriaxone and gentamycin. Surgical intervention was deferred, considering the patient's MDS related pancytopenia. Repeat blood cultures were negative three days later with the recommended antibiotics. Ten days after admission, the patient suffered a brain hemorrhage, resulting in withdrawal of care and death.

Discussion: The authors report a fatal case of prosthetic valve endocarditis caused by Granulicatella adiacens in a patient with neutropenia. Considering the delayed diagnosis of this condition secondary to its subacute nature, prompt identification using automated blood culture systems and aggressive treatment are essential for favorable clinical outcomes.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - TAYLOR L SULLIVAN

Dermatomyositis: A Delayed Diagnosis in an Uninsured Patient

Authors: Taylor Sullivan; Bernard Hildebrand, MD, University of the Incarnate Word School of Osteopathic Medicine, San Antonio, Texas

Introduction: Dermatomyositis is amongst the heterogenous idiopathic inflammatory myopathies that manifest with underlying muscular weakness, elevated serum muscle enzymes, and photosensitive dermatitis. We describe a case of longstanding, undiagnosed dermatomyositis complicated by diagnostic delay related to the patient's lack of health insurance.

Case Presentation: A 29-year-old female presented to a Federally Qualified Health Center Rheumatology clinic (FQHC-Rheum) for evaluation of facial swelling, myalgia, and photodermatitis. In the preceding two years, she presented multiple times to emergency departments and acute-care clinics. Systemic corticosteroids controlled the symptoms; however, recurrence was noted with discontinuation of each course. After presenting to a student-run, dermatology clinic, the patient was instructed to undergo evaluation by a rheumatologist. She presented to the FQHC-Rheum clinic on prednisone 20mg daily with a widespread erythematous, maculopapular rash. She exhibited normal muscle strength (5/5) in the proximal extremities and neck flexors/extensors. Laboratory analysis revealed minimally elevated ALT and AST concentrations, normal creatine kinase (CK) concentration (131 U/L; reference: 26 – 192) and a negative anti-nuclear antibody (ANA). Prednisone was rapidly tapered. Within two weeks, the dermatitis, generalized swelling and myalgia recurred. Muscle strength and CK (138 U/L) remained normal, prednisone was resumed, and symptoms improved. An autoimmune connective tissue disease was suspected, however further evaluation was halted due the patient's financial status. Two months after initial presentation to the FQHC-Rheum clinic, the patient returned with moderate weakness and worsening photodermatitis. Despite normal CK levels (81 U/L), muscle strength testing revealed proximal hip flexor weakness (3+/5), and the patient was diagnosed with dermatomyositis. She elected to forego an extremity MRI, electromyography, muscle biopsy, and screening CT scans due to prohibitive costs. The patient subsequently obtained Medicaid health insurance, and a thigh MRI confirmed the diagnosis of dermatomyositis nearly 36 months after symptom onset.

Discussion: Patients with dermatomyositis often endure long diagnostic delays. An uninsured status further limits the prompt and accurate diagnosis of rheumatic disease [1]. Typically, the diagnosis of dermatomyositis is based upon a clinical presentation of muscle weakness, elevated serum muscle enzymes, electromyography findings, MRI results, and characteristic muscle histopathology [2]. Uninsured patients are more likely to refuse or postpone diagnostic evaluation and choose not to fill necessary prescriptions due to cost [3].

A lack of health insurance had detrimental effect on the timing and quality of care provided to our patient with dermatomyositis. Initially, she had limited access to specialty care and chose not to pay for cost prohibitive procedures and imaging studies. A recent member survey of the American College of Rheumatology revealed the most common practice-related ethical issues in Rheumatology involve the cost of expensive treatments and the care of uninsured/underinsured patients [4]. These issues proved to be at the forefront of this patient's care.

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UNITED ARAB EMIRATES CLINICAL VIGNETTE POSTER FINALIST - MIR INZAMAM ALI

A Rare Presentation of Aberrant Papillary Thyroid Cancer

Authors: Sasmith Menakuru, Mir Inzamam Ali, Nuhah Omar, and Bhavishya

Introduction: To describe extra thyroid tissue masses in the neck, especially lateral to the jugular vein, Albers in 1829 had coined the term “lateral aberrant thyroid”. However, this term, was only limited to thyroid tissue found on the lateral side of the neck and did not consider the possibility of presence of thyroid tissue at any other site. Defects in embryogenesis during the descent of thyroid from the primitive foregut to its usual pre-tracheal position in the neck have yielded the commonest ectopic presentations encountered. Aberrant thyroid tissue is liable to pathological changes that may occur in ectopic thyroid gland.

Primary malignant transformation of ectopic thyroid tissue is considered rare. It is generally more common in females with an average incidence of 1 per 300,000 cases [1]. Awareness of this condition is needed to prevent unwarranted complications. Hereby we present a case of a mediastinal thyroid papillary carcinoma without evidence of cervical thyroid gland involvement.

Case Presentation: A 21-year-old woman presented to the emergency department with chest pain and shortness of breath of three days duration. The pain was pressure-like in sensation, initially 3-4/10 in intensity on severity scale and gradually progressed up to a 7/10 intensity on the day of presentation to the ER. The pain radiated to her right shoulder down to the right arm as well as her mid-back during inspiration. The pain was relieved with naproxen and did not occur at rest. No exacerbating factors were noted other than deep inspiration. She also noticed a gradual decrease in exercise tolerance down to two blocks walking distance. She denied any fevers, chills, nausea, vomiting, diarrhea, constipation, palpitations, abdominal pain, lumps, night sweats or leg swelling.

On chest X-ray, a central shadow suggestive of mediastinal mass. CT showed a 5.1 cm right anterior mediastinal mass with 1.7 cm right paratracheal lymph node mass. A provisional diagnosis of pericarditis secondary to the mediastinal mass was made. Biopsy revealed classic papillary carcinoma of thyroid findings with Orphan Annie nuclei (ground glass nuclei with thick nuclear membrane), and psammoma bodies (calcified bodies) seen across the specimen.

Discussion: In this case, we report a patient presenting with acute pericarditis secondary to aberrant mediastinal malignant thyroid tissue. Ectopic thyroid tissue occurs during the embryological development with 90% of the cases taking place along the line of thyroid tissue descent. Only around 10% of cases show deviation from the midline, or presence at other sites as described in our case [2]. Different pathological changes may occur to the aberrant thyroid tissue, with functioning hyperthyroidism being the commonest encountered in literature [3]. Malignant transformation of the ectopic thyroid tissue without involvement of the thyroid gland is noteworthy as only around 40 cases have been reported in literature [2].

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US NAVY CLINICAL VIGNETTE POSTER FINALIST - KATHRYN DRIGGERS

MERRF: What is That Again? A Case of Young Onset Dementia

Authors: Kathryn Driggers, MS4, Mary J H Willis, MD PhD

Introduction: Young onset dementia describes abnormal cognitive decline before age 65.¹ While around 6.4% of people older than 65 have dementia,² between the ages of 45 to 65 years, the incidence is much lower, 67 to 98 per 100 000.¹ The most common etiologies for young onset dementia remain early presentations of later onset neurocognitive disorders (Alzheimer's Disease, vascular disease, etc.), however as age of onset decreases, late presentations of congenital disorders become more common.¹ Myoclonic Epilepsy with Ragged Red Fibers (MERRF) is a rare mitochondrial disorder found in 0-1.5 in 100,000 people.³ However when combined, mitochondrial disorders in general have a much higher prevalence, ~1 in 8500.⁴ These cause hallmark clinical features which, in combination, should raise suspicion for a mitochondrial etiology. Frequent manifestations include myopathy, exercise intolerance, diabetes mellitus, sensorineural hearing loss, retinopathy, and dementia.⁴ Here, we describe a case of MERRF which presented with young onset dementia and liver enzyme abnormalities.

Case Presentation: Mrs. F is a 56 year old woman with a history of myoclonus who was evaluated for altered mental status (AMS) after being found unconscious for an unknown time. She was found to have elevated creatinine kinase, acute kidney injury, and elevated liver function tests (LFTs). The etiologic evaluation was initially unrevealing and her laboratory abnormalities and AMS were attributed to rhabdomyolysis. However, as this insult cleared, the patient continued to be disoriented, frequently not knowing her name or where she was. Her husband admitted that the patient's memory had declined over the past two months. He also revealed that the patient's mother had died of MERRF. He provided records from 14 years earlier which showed that the patient carries the MERRF associated, mtDNA, pathogenic variant; A8344G. At this point her complete medical history and other clinical features of recently diagnosed dementia, myoclonus, persistently abnormal LFTs, and partial deafness since childhood were taken into consideration. In combination, this phenotype is consistent with MERRF. The patient was started on Coenzyme Q 10 and carnitine and referred to a mitochondrial specialist.

Discussion: MERRF is a rare disorder that many adult medicine physicians never think about after medical school. In fact, many of the less common disorders that can cause young-onset dementia are found on board exams but if not encountered, fade from memory, so are seldom thought about in clinical practice. Because of this, these diseases are easy to miss. Many present with a constellation of symptoms that present a recognizable phenotype when considered in concert. This case of MERRF may never have been diagnosed except for the patient's positive family history. Familiarity with features of MERRF and mitochondrial diseases in general will allow recognition of when to include them in the differential diagnosis.

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VIRGINIA CLINICAL VIGNETTE POSTER FINALIST - AMANDA JOHNSTON

I Can't Believe It's Not Cancer--The Case of IgG4-Related Disease Masquerading as a New Onset Lung Mass.

Authors: Amanda C. Johnston, MS4, Eastern Virginia Medical School; Dr. Eileen Hsu, Pulmonary, Kaiser Northern Virginia

Introduction: IgG4-related disease is a newly identified set of conditions, previously believed to be unrelated, that has a predilection for older males. Typically, the disease targets the biliary system, pancreas, parotid glands and various ophthalmic locations. However, new cases are uncovering manifestations of the disease in almost every organ system. IgG4 can mimic certain autoimmune conditions and other diseases, which may be a factor in the delayed diagnosis of this condition.

Case Presentation: 68 y/o male with Type 2 Diabetes and hyperlipidemia presented with weight loss, fevers, fatigue, diarrhea with pale stools, dark urine and increased pruritus. The patient denied any appetite changes or abdominal pain. Liver enzymes were elevated at 463 ALT, 193 AST, Alkaline phosphatase 198 and total bilirubin of 2.2. Further examination with ERCP and abdominal MRI was ordered. There were no masses in the biliary or pancreatic system found on abdominal MRI. ERCP showed evidence of biliary strictures requiring stent placement, but liver enzymes remained persistently abnormal. There was concern for occult cholangiocarcinoma but bile duct brushings were negative for malignancy. During this time, patient was also found to have a 2.5cm spiculated right lower lobe lung mass. CT-guided needle biopsy of the lung mass revealed chronic inflammatory changes, but no evidence of malignancy. Further consideration for nonmalignant causes of cholangitis led to evaluation of IgG level which revealed elevated IgG4 of 275 mg/L. Special IgG4 staining was requested of lung biopsy sample which showed high intensity staining of IgG4-positive plasma cells raising the suspicion for IGG4-RD. Prednisone was started with improvement in LFT and resolution of lung mass. The effectiveness of prednisone began to diminish after about three weeks of treatment. Two courses of Rituximab infusions successfully treated the disease and led to remission without requiring constant steroid use.

Discussion: This case demonstrates an atypical presentation along with more classic symptoms of this newly identified disease. The various manifestations, with intermittent and alternating presentations, are important to consider when evaluating the patient and discerning the failure of treatment versus relapses, as disease management differs. International consensus states that glucocorticoids are the first line of treatment, but Rituximab can be added for relapses and when IgG4 is nonresponsive to steroids. In certain patient presentations, including severe disease targeting multiple organs, glucocorticoids and Rituximab may be used simultaneously for more intensive disease management.

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VIRGINIA CLINICAL VIGNETTE POSTER FINALIST - ALICE LEE

A Challenging Headspace: Recognizing and Treating Epstein-Barr Virus Meningoencephalitis in a Complex Patient

Authors: Alice Lee, MS4, University of Chicago Pritzker School of Medicine; Mike Cheng, MD, University of Chicago Medicine, Department of Medicine, Internal Medicine Residency; Mim Ari, MD, University of Chicago Medicine, Department of Medicine

Introduction: Determining the etiology of meningoencephalitis is challenging, especially for atypical pathogens. Our case highlights the complexity of diagnosing and treating EBV meningoencephalitis, a rare diagnosis, in the setting of HIV and untreated psychiatric disorders.

Case Presentation: A 29-year-old male with a history of HIV on HAART (CD4 332, viral load undetectable) and untreated bipolar I disorder and schizophrenia was admitted for assessment of fever. His fever was initially accompanied with vomiting, diarrhea, and generalized body aches. On physical exam, he had no signs of meningismus and was alert and oriented to self, time, and location. The initial infectious work-up was positive for enteropathogenic *E. coli* in the stool, but fevers persisted despite appropriate treatment. During his hospital stay, he developed persistent headaches and his exam became concerning for nuchal rigidity. He developed delirium, auditory hallucinations, and agitation with attempts to leave against medical advice, despite lacking decisional capacity. Given his HIV history, a broader infectious work-up was sent and returned positive for EBV (serum), though it was unclear if that was the cause of his neurologic symptoms. Complicating his mental status/neurologic assessment, the patient was diagnosed with bipolar I disorder and schizophrenia several years ago and self-discontinued his psychiatric medications. Throughout his admission, he had an odd affect and was an unreliable historian. Ampicillin, acyclovir, and ceftriaxone were added to the patient's medication regimen for meningitis coverage. The patient underwent two lumbar punctures. The first LP showed that the CSF had an elevated WBC with neutrophil predominance and was positive for EBV. All other viral, bacterial and fungal tests were negative. The second LP two days later showed an evolution from neutrophil to lymphocyte predominance, consistent with viral meningitis. MRI brain showed no signs of intracranial masses or abnormal enhancements. EEG was consistent with encephalopathy. At this time, antibiotics were stopped and supportive care was continued. One day later, the patient's wife decided to have the patient discharged against medical advice after he had been afebrile for 36 hours.

Discussion: EBV meningoencephalitis is an uncommon disease process and presents in a non-specific manner with fever, confusion, headaches, and occasional focal neurological deficits. Clinicians should maintain a broad differential when assessing for the etiology of meningoencephalitis, especially in HIV positive patients. EBV can also affect the nervous system presenting as Guillain-Barré syndrome, facial nerve palsy, transverse myelitis, and peripheral neuritis. While EBV meningoencephalitis often presents as a co-infection with other pathogens, this case illustrates that EBV can be the primary cause of meningoencephalitis for HIV positive patients even in the setting of HAART compliance, low viral load, and CD4 count > 300. Diagnosis of meningoencephalitis can be a challenge for patients with uncontrolled psychiatric disorders; however clinicians should assess patients holistically, combining rigorous history-taking with astute physical exam skills.

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VIRGINIA CLINICAL VIGNETTE POSTER FINALIST - ALFRED RABINOVICH

An Unusual Cause of Chest Pain in a Healthy Young Female

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Introduction: Spontaneous coronary artery dissection (SCAD) is a rare but devastating cause of 1% to 4% of acute coronary syndromes, requiring a high degree of clinical suspicion and rapid intervention to prevent mortality¹. Interestingly, those most commonly affected by SCAD are women under the age of 50 years with few or no risk factors for coronary artery disease¹⁻². As such, SCAD is commonly misdiagnosed as chest pain of non-cardiac origin.

Case Presentation: A 40 year old Caucasian female presented to the ED following 48 hours of waxing substernal chest pain associated with numbness of the left arm and left leg. Her past medical history was notable only for essential hypertension managed through dietary compliance, and a history of migraines for which the patient was prescribed a sumatriptan. The patient additionally had a long history of combination oral contraceptive pill (OCP) use since the age of 13. Lastly, she also noted intense emotional stress over the previous week.

On admission, her blood pressure and heart rate were noted to be 150/81mmhg and 80 beats per minute. Electrocardiogram (ECG) showed T wave inversion in leads II, III, and V3-V6. Elevated cardiac biomarkers were as follows: cardiac troponin I level was 1.55ng/ml (normal range, 0-.07ng/ml), cardiac troponin T level was .45ng/mL (normal range, 0-.01ng/mL), and creatine phosphokinase-MB was 63.7ng/mL (normal range, 0-7.9ng/mL). The patient was determined to have a non-ST elevation myocardial infarction and started on dual antiplatelet therapy and a low dose beta-blocker. Coronary angiography revealed evidence of distal left anterior descending artery (LAD) dissection with subsequent 100% occlusion of the mid LAD with TIMI grade 1 flow. Intracoronary stenting was performed and three SYNERGY drug-eluting stents were placed successfully in the LAD: 2.25mm x 38mm (distal), 2.25mm x 20mm (mid), 2.5mm x 12mm (proximal) in overlap. Follow up angiography was performed and demonstrated 0% residual stenosis with TIMI grade 3 flow.

The patient's symptoms resolved entirely in the hours following her procedure. The patient was discharged with dual antiplatelet therapy (aspirin 81mg, Effient 10mg), high intensity statin (Lipitor 40mg) and a beta-blocker (Coreg 3.125mg BID).

Discussion: SCAD is an under-diagnosed and potentially deadly cause of acute coronary syndrome in young women. Therapeutic interventions for SCAD include conservative medical management, percutaneous coronary artery intervention (PCI), and surgery, with the optimal strategy differing based on disease severity¹⁻³. While the etiology of SCAD is not entirely known, an association with prolonged OCP use has been demonstrated². Additionally, a history of migraines and recent emotional stress have both been reported as potential predisposing factors⁴⁻⁵. This case demonstrates the importance of considering SCAD in a young woman with chest pain, particularly in the setting of multiple predisposing factors.

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WEST VIRGINIA CLINICAL VIGNETTE POSTER FINALIST - HILARY BROWNSTEAD

CLINICAL CORRELATION REQUIRED: A CASE OF POSTERIOR MEDIASTINAL MASS

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Introduction: Neurogenic tumors comprise 20% of adult mediastinal neoplasms. The posterior mediastinum is where most occur. The vast majority of neurogenic tumors are benign and encompass schwannomas and neurofibromas arising from the peripheral nerve sheath (PNS). They appear as well-circumscribed spherical masses on radiography. Schwannomas are encapsulated tumors that contain Schwann cells and loose reticular tissue without nerve fibers. Neurofibromas are not encapsulated and arise from proliferation of nerve components like Schwann cells, myelinated and nonmyelinated nerve fibers, and fibroblasts. Symptoms result from pressure deformities in adjacent structures or by eroding into the spinal canal causing neurologic symptoms. Neurofibromas can also undergo malignant transformation, conferring a very poor prognosis.

Case Presentation: A 70-year-old Asian male with a history of frequent falls presented with right sided weakness and was found to have a left subdural hematoma requiring burr hole craniotomy evacuation. Abdominal CT performed for abdominal pain showed a 3.2 x 2.4cm well-circumscribed lesion with fluid density in the posterior mediastinum close to the neural foramina. The lesion was stable compared to imaging done 5 months ago and was thought to represent a bronchogenic cyst in the radiologist's interpretation. Because of the mass, a pulmonary evaluation was requested. On history, he noted worsening gait impairment, lower extremity numbness and weakness, and back pain ongoing for the last year. Due to the chronic neurologic symptoms, a neurogenic tumor with cystic degeneration was high on the differential. A MRI of the thoracic spine was therefore performed which demonstrated a 3.5cm heterogeneous T8 paravertebral lesion. CT-guided biopsy of the mass revealed a spindle cell tumor with features consistent with neurofibroma. Because of his recent subdural hematoma, surgical excision was not performed at that time to allow adequate rehabilitation. Unfortunately the patient was lost to follow up after discharge.

Discussion: Neurogenic tumors are the most common cause of posterior mediastinal mass. While often thought of as asymptomatic, around half of benign PNS tumors will cause symptoms from compression of local structures and pressure erosion leading to rib deformity, vertebral body deformity, and interruption of the neural foramina. These often vague symptoms usually date back over years and are subsequently found incidentally. On CT imaging they are well circumscribed masses and can be confused for other benign posterior mediastinal masses such as bronchogenic cysts, particularly if cystic degeneration is present. A high degree of clinical suspicion needs to be maintained in order to obtain an accurate diagnosis. In this instance, the patient's correlating neurologic symptoms and abdominal pain prompted further evaluation revealing a neurofibroma abutting the T8 vertebrae. Surgical excision not only may resolve presenting problems, but can also prevent potential malignant transformation in benign PNS tumors which carries a poor prognosis.

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WISCONSIN CLINICAL VIGNETTE POSTER FINALIST - MEINUO CHEN

Utilization of Thyroid Transcription Factor-1 (TTF-1) for Non-Overt Lung Adenocarcinoma Metastasis

Authors: Meinuo Chen, Kieran McAvoy, Geoffrey Lamb, MD

Introduction: Lung cancer causes about 25% of total cancer deaths in the United States. For non-small cell lung cancer (NSCLC), recurrence rate after tumor resection is estimated to be as high as 33.1% in patients with negative margin resections. Twenty percent of patients with NSCLC ultimately develop CNS metastases, which will be the first site of relapse in 30% of these cases. Neurocognitive changes may be the initial manifestation of such metastases and in an older population this may be difficult to distinguish from other causes such as dementia. In patients with a history of lung malignancy with presenting neurological symptoms, thyroid transcription factor-1 (TTF-1) immunochemistry can be useful in differentiating between recurrent disease and other neurocognitive etiologies.

Case Presentation: A 59-year-old woman with a history of previously resected NSCLC presented to the ED with acute confusion, left sided weakness, and slurred speech. History of present illness was pertinent for a 6 month decline in functional status, recurrent falls including 35lb weight loss, increased confusion, and gait abnormalities. Upon presentation at ED, CT findings suggested stroke but subsequent MRI was negative for acute intracranial disease. Neurology was consulted and a lumbar puncture was performed. The CSF was positive for 8 WBC, protein 64 a glucose of 21 and a cytospin was done. Autoantibody panel for lung cancer paraneoplastic panel was performed using CSF and resulted in negative AGNA-1, Amphiphysin Ab, ANNA-1, ANNA-2, ANNA-3, CRMP-5-IgG, PCA-1, PCA-2, PCA-Tr. However, TTF-1 staining was positive in rare cells in the cytospin, suggesting lung adenocarcinoma recurrence. A subsequent MRI demonstrated questionable findings in the cervical spinal cord and concern for leptomeningeal disease versus inflammatory polyneuropathy due to a small enhancement in the cauda equina. A follow-up PET showed no signs of recurrent lung disease or metastasis. The suspicious MRI findings and positive TTF-1 in CSF suggested that the patient's progressive neurological decline was most likely due to leptomeningeal disease from recurring lung adenocarcinoma and she was started on pembrolizumab.

Discussion: TTF-1 is a commonly used immunohistochemical marker to distinguish between lung adenocarcinoma and small cell lung cancer diagnosis, as it is highly specific (95-100%) for lung adenocarcinoma. In previous case reports and studies, TTF-1's value in determining brain metastasis origin has been shown when there are visible intracranial lesions on imaging. Our case demonstrates the utility of TTF-1 in distinguishing neurological symptoms secondary to CNS involvement from underlying lung adenocarcinoma from neurocognitive disorders, even when not detected by imaging. Similar to TTF-1, serum paraneoplastic panels may help distinguish whether new onset neurological symptoms are more likely secondary to underlying malignancies when differential diagnostic work up is negative. Furthermore, TTF-1 is useful in likely patients when imaging does not show overt metastasis.

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