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Assessing Factors Driving High Utilization of Inpatient Services in Diabetes Patients

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Introduction. There is a cohort of patients in the University of Kansas Health System (UKHS) that are high-utilizers of inpatient services due to diabetes-related conditions, with more than three hospital visits per year. This project's purpose is to identify these patients and qualitatively determine common variables between them. These variables may shed light on factors that cause higher inpatient services utilization and lead to potential interventions to address this issue.

Methods. A retrospective descriptive chart review of patients who are high utilizers of inpatient services at UKHS was conducted. Subjects were stratified into a high utilization and a low utilization group, then further stratified by a most recent HbA1c that is normal or elevated. High utilization was defined as more than three inpatient hospital discharges within the previous twelve months and elevated HbA1c was defined as greater than 7.0%. Data included number of hospitalizations over the previous year, cause of hospitalizations, number of outpatient visits over the previous year, most recent HbA1c, diagnosed comorbidities, diabetes medication use, and other variables. No statistics have been completed at this time.

Results. 102 low-utilizing and 108 high-utilizing diabetic patient charts were reviewed. Of these 210 patients, 99 had a most recent HbA1c greater than 7.0% while 111 did not. Of the cohort of patients with HbA1c greater than 7.0%, 17 of them had an HbA1c greater than or equal to 10.0%. On average, these 17 patients had 3.8 hospitalizations over the 12-month review period. The group with HbA1c less than 7.0% had 2.3 hospitalizations on average and the group with HbA1c between 7.0% and 10.0% had 2.5 hospitalizations on average. 80.6% of low-utilizing patients had between one and five outpatient visits over the previous year, 14.8% had between 5 and 10 and 3.7% had greater than or equal to 10, compared to 52.0%, 33.3%, and 11.8% in the high utilization group, respectively. 38.0% of low-utilizing patients had heart disease compared to 52.9% in the high utilization group. Of the patients with HbA1c greater than or equal to 10.0%, 64.7% had dyslipidemia and 29.4% had obesity, compared to 79.3% and 45.0% in the HbA1c less than 7.0% group and 82.9% and 41.5% in the group with HbA1c between 7.0% and 10.0%, respectively. 29.6% of patients in the low utilization group and 38.2% of patients in the high utilization group had depression, while 28.7% of low-utilizing patients and 26.5% of high-utilizing patients had anxiety. 50.9% of low-utilizing patients and 29.4% of high-utilizing patients were prescribed metformin, while 35.2% of low-utilizers and 59.8% of high utilizers were prescribed insulin. 39.8% of patients in the low utilization group and 19.6% of high-utilizing patients were prescribed GLP-1 agonists.

Conclusions. High-utilizing patients are more likely to have a high HbA1c, more frequent outpatient visits, are more likely to be diagnosed with heart disease and depression, and are more likely to be prescribed insulin. This cohort is less likely to be prescribed metformin or GLP-1 agonists. These findings may guide future interventions to decrease hospitalizations in this cohort.

Diabetes and Hypertension Care Pathway Outcomes Among High-Utilizing Patients at The University of Kansas Medical Center: A Preliminary Analysis

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Introduction. A 2023 study conducted at The University of Kansas Health System (TUKHS) found that in the prior year, 38% of discharge diagnoses from the TUKHS internal medicine clinic were ambulatory care sensitive conditions (ACSC). Of the ACSCs that were identified, over 10% were related to diabetes and hypertension, and a substantial proportion of these patients were high utilizers of inpatient services. To reduce inpatient utilization and improve patient care among those with uncontrolled diabetes and hypertension, TUKHS established the Care Pathway programs in January 2024 to increase patient access to PCP, pharmacy, and educator services. This study's purpose was to collect preliminary data on these pathways' effectiveness in improving clinical outcomes and reducing emergency department (ED) visits and hospitalizations among high-utilizing patients with uncontrolled diabetes and/or hypertension.

Methods. All patients on Humana Medicare Advantage insurance with a recent HbA1c ≥7.0, or BP >140/>90, and who had 3+ hospitalizations in the prior 12 months (operationalized as Transition of Care documents) were eligible for enrollment, and a retrospective chart review was completed for all patients, regardless of ultimate enrollment status. Data from the 12 months pre-enrollment and/or eligibility, and from up to six months after, was collected. Data compared the number of ED visits, inpatient stays, and appointments that patients attended. Clinical outcomes of HbA1c and BP measurements were collected before and after enrollment/eligibility.

Results. Twenty-five patients were eligible for enrollment in the diabetes care pathway, and 39 patients were eligible for the hypertension care pathway, of which 16 (64%) and 29 (74%) enrolled, respectively. The average follow-up time was 2.7 months for those in the diabetes pathway, and 3.5 months for those in the hypertension pathway. In both groups, enrolled patients were medically complex, with most having several comorbidities in addition to diabetes and/or hypertension. Enrolled patients in both pathways had an average of three admissions in the 12 months prior to program enrollment, of which 10% were diabetes-related and 40% were hypertension-related. In the post-enrollment period, the diabetes group had 0.4 admissions on average of which 30% were diabetes related, and the hypertension group had 0.7 admissions of which 40% were hypertension related. In the 12 months prior to enrollment, patients tended to see a specialist twice as often as they saw a PCP - a trend that continued in the post enrollment period. Less than 30% of enrolled patients had referrals/visits with pharmacy or educators. While no changes were observed in the HbA1C among those enrolled, this was expected given the short duration of follow-up. In comparison, patients' most recent blood pressures since enrollment trended down, with 40% fewer patients in stage 2 hypertension compared to the pre-enrollment period.

Conclusions. The conclusions that can be drawn from this study are limited by the short duration of follow-up time, challenges of retrospective chart review, and small sample sizes. Trends towards improving blood pressure may be noted since the start of this program. Opportunities for improving program implementation were identified, including the operationalization of admissions counts, and emphasizing available pharmacy and educator resources.

Improving Access to Appropriate Care for ADHD in Adulthood

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Introduction. To develop and implement a comprehensive, systematic, and measurable approach to the diagnosis, treatment, and management of adult attention deficit/ hyperactivity disorder (ADHD) in the outpatient setting.

ADHD is a complex neurodevelopmental disorder that presents in childhood and can often progress into adulthood. If missed or left untreated, ADHD can have significant negative consequences on individuals' relationships and livelihood. For many patients, especially symptomatic adults without a previous childhood diagnosis, diagnosis and management of their ADHD symptoms are typically done piecemeal by multiple providers. To date, there are limited practice guidelines in medical literature for diagnosing and treating adults with ADHD.

Methods. This Quality Improvement (QI) project is designed to address the lack of practice guidelines for diagnosis and management of ADHD in our outpatient clinic. The Adult ADHD Self-Report Scale (ASRS) was chosen to measure ADHD symptoms. A meta-analysis was performed to evaluate the minimal clinically significant difference in the ASRS scale to help determine when score changes are suggestive of improvement and remission. This novel management of ADHD is based off the measurement-based screening and treatment for depression and anxiety as recommended by the U.S. Preventive Services Task Force (USPSTF).

This project implements an initial screening of clinic patients with suspected or reported ADHD diagnosis. The ASRS is then utilized to screen patients for symptoms. For patients with positive ASRS, and without prior ADHD diagnosis, referral is made to neuropsychiatry for comprehensive evaluation to confirm ADHD and rule out possible confounding diagnoses.
For patients with positive ASRS screens and a reported history of ADHD, previous documentation to confirm diagnosis will be obtained. All patients with a confirmed ADHD diagnosis will be entered into a treatment contract, including required recreational drug screening. Patients will be regularly scheduled for medication adjustment and compliance, starting with the "initiation phase" of management. This phase requires a follow-up appointment within 30 days. The ASRS, PHQ-9, and GAD-7, will be administered at each appointment. Medication adjustments will be based on ASRS scores and subjective complaints.

Patients will continue with monthly follow-up appointments until their ASRS score meets the criteria for "remission". They will then be moved to the "continuation phase" of treatment, requiring at least two follow-up appointments within a minimum of nine months to continue receiving medication refills. The clinic's ADHD team will monitor and address patients whose scores are not improving or have been lost to follow-up.

Results. We project that establishment of a consistent standard of care in diagnosis and treatment will result in a net decreased cost to the patient by reducing the number of physician appointments. Additionally, this project is anticipated to help reduce the burden on patients by decreasing symptoms and increasing overall adherence to treatment plans by increasing access and treatment of ADHD in adults in the outpatient clinic setting as documented by improving ASRS scores.

Job Crafting in Healthcare: A Meta-Analysis of a Proactive Approach to Workforce Well-being

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Introduction. Burnout is increasing among healthcare professionals. There is a relationship between burnout and worse patient safety. While well-being adaptations are on the rise in workplace environments, many interventions place responsibility on workers to reduce burnout via building resiliency. In contrast, job crafting, where workers can change their jobs to match demands, is emerging as a proactive strategy to improve burnout. Job crafting is consistent with two of the three factors in self-determination theory (SDT), in which autonomy and task mastery increases workforce engagement. This meta-analysis evaluates job crafting interventions in healthcare on emotional exhaustion, job engagement, and task performance.

Methods. A preliminary living systematic review was performed following PRISMA guidelines as described at openMetaAnalysis on GitHub. First, we reviewed existing meta-analyses by a preliminary literature search using Google Scholar with the keywords "job crafting meta-analysis" and PubMed using the term "job crafting," with the filters for systematic review or meta-analysis. Then, we did a cited references search of the dominant systematic review. Lastly, we created PubMed search alerts for articles containing "job crafting." Inclusion criteria were limited to studies on job crafting in healthcare regardless of specific occupation. Outcomes of burnout, emotional exhaustion (the dominant component of burnout), engagement, or task performance were also limited. Studies were pooled after converting outcomes to standardized mean differences (SMD). Our current search results, data, and R code are available at the website openMetaAnalysis under job-crafting.

Results. In this preliminary study, we included three quasi-experimental studies with a total sample size of 244 participants. Participants included physicians, nurses, and healthcare professionals working with the hearing impaired. Job crafting interventions resulted in a trend towards medium reduction in emotional exhaustion compared to controls (SMD = -0.49, 95% CI: -1.10 to 0.11). In contrast, job crafting significantly increased engagement (SMD = 0.55, 95% CI: 0.04 to 1.07). Job crafting also significantly improved task performance (SMD = 0.78, 95% CI: 0.25 to 1.30).

Conclusions. Job crafting can improve workforce engagement, task performance, and reduce emotional exhaustion for healthcare workers. Improved task performance might help patient safety. Further research is needed in larger populations as the broad confidence intervals for the I2 indicate opportunities for more nuanced investigation. In addition, amplifying the impact by collaborative job crafting (crafting with colleagues) and knowledge sharing could be explored. In knowledge sharing, the company helps disseminate successful job crafting such as customizations for each user's electronic health records. Furthermore, knowledge sharing may promote well-being by bringing in the third component of SDT: "relatedness" or connectedness with colleagues. A new study of job crafting is under development by the KU School of Business with the Kansas Chapter of the American College of Physicians.

Huddle Up: Using Multidisciplinary Huddles to Improve Utilization of Telemetry Monitoring

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Introduction. The American Heart Association recommends appropriate telemetry use to reduce costs associated with device acquisition, maintenance, and human oversight. Proper telemetry use also improves patient care by reducing alarm fatigue and ensuring availability for those who need it.

While our institution provides clear guidance for telemetry initiation, it lacked clear guidelines for telemetry re-evaluation and discontinuation. This study aimed to determine the efficacy of a simple daily checkpoint for inpatient medicine teams with the goal of improving the utilization of non-invasive cardiac monitoring.

Methods. We implemented the AHA practice standards, with the charge nurse prompting discussion of telemetry necessity at daily team huddles on a general medicine unit. The initial prompt was made for each patient 48 hours or greater from admission, followed by daily prompts. Physicians placed discontinuation orders when appropriate. We then collected and compared pre- and post-intervention telemetry utilization data. Telemetry discontinuation orders were evaluated nine months pre- and post-intervention.

Results. Post intervention, the huddle team recorded 200 encounters of prompting telemetry discontinuation at 48 hours. Of these prompts 75 (38%) were discontinued on the same day as prompt with eight more discontinued within a week. Of the remaining 117, diuresis, heart failure, and arrythmias were the most common reason for continuation. Mean days on telemetry were reviewed and improved from 4.6 days to 4.3 days for unit huddle teams. This contrasts with an increase of 3.1 to 4.7 days for teams who did not huddle on the intervention unit.

Conclusions. Telemetry is often overused, incurring significant costs. De-escalation of telemetry based on AHA criteria have numerous benefits including cost reduction, reduced alarm fatigue, and enhanced patient mobility. We found a decrease in telemetry days on huddle teams that underwent a simple nursing checkpoint intervention. This intervention could be applied to additional units and potentially additional health care systems. Further investigation is needed to determine the impact of aggressive de-escalation on patient outcomes and runoff effects to the non-huddle teams.

Enhancing Team-Based Care: The Impact of Active Dietitian Involvement on Nutritional Counseling Referrals at a Resident-Run Clinic

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Introduction. Dietitians, particularly certified diabetes care and education specialists (CDCES) play a crucial role in team-based care for the patients requiring nutritional counseling. Programs like Diabetes Self-Management Education and Support (DSMES), Diabetes Prevention Program/Halt (DPP), and Intensive Behavioral Therapy (IBT) for obesity have demonstrably improved care results at The University of Kansas School of Medicine's Center for Health Care (KU-CHC).

One key factor for these programs' success is timely referral to dietitians and early enrollment of the patients. Historically, these referrals were usually provider-initiated and relied primarily on physicians to screen eligible patients. As a part of an ongoing quality improvement (QI) project, a new approach was developed which involved the active participation of our CDCES in recognizing patients eligible for various dietary programs.

Methods. Every week starting from September 2023, the in-clinic CDCES reviewed charts for the upcoming week and prospectively identified eligible patients then discussed the recommendations in a weekly "Team Patient Care" meeting with nurses, medical assistants, and physicians.

Eligible patients met with the CDCES at clinic visits before the physician entered the room. The CDCES spent that encounter informing, educating, and recommending dietary programs to patients.

Between October 2022 and June 2024, 372 CDCES referrals were sent. The intervention was implemented in September 2023. The number of referrals before and after September 2023 was calculated using segmented regression analysis.

Results. From October 2022 to August 2023, 180 referrals were received. Following the intervention, from September 2023 to June 2024, 192 patients were identified. The mean number of referrals before intervention was 15 which increased to 19 post-intervention (p value- 0.07). Initially, there was an increase in the number of referrals after the intervention (immediate mean change), but the effect plateaued in a few months and the intervention was not statistically significant (p value- 0.947; slope- 0.53).

Conclusions. Active involvement of providers such as CDCES can help identify and recruit patients for suitable programs working alongside physicians, medical assistants, and nurses in team-based care. Rather than encouraging physicians to refer patients to behavioral programs, we believe the CDCES proactively identifying and recruiting patients may be more effective.

It is important to check the effectiveness of any intervention in a QI project to make necessary changes in the existing workflow and to identify improvement areas.

Our project highlights KUSM-W CHC's ongoing efforts to improve the quality of care our patients receive and the steps taken to maximize patient care.

Patient Access at The University of Kansas Health System Internal Medicine Outpatient Clinics: Examining the Effect of Adding Nurse Practitioners to the Team

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Introduction. The national average wait time for a new patient to get a primary care appointment is 26 days, while at The University of Kansas Health System it is 45. If patients are not seen, their health may get worse which increases their morbidity and mortality, emergency department utilization and hospitalizations- ultimately driving up the cost of healthcare. To alleviate the continuously long wait time, the internal medicine outpatient department hired nurse practitioners and assigned them to several physicians. This study evaluates the influence that hiring nurse practitioners (NP) had on patient access.

Methods. Data on the third next available appointment wait times was collected for physicians comparing six months before a NP was assigned to them, and six months after. These dates were within the window of 2019 and 2023. The data was provided from The University of Kansas Health System's Access Center. Third next available was chosen in case a physician had a cancellation, and a patient was seen sooner, which would not be an accurate representation of the physician's availability. A REDCap® survey was sent to the physicians who met the inclusion criteria to gauge what type of appointments they assign their NP to.

Results. Due to a software change at the Access Center in 2019, data was not available for physicians who have been at the health system prior to that year, and thus they were excluded from the study. For those included in the study, wait times improved for about half. While the same NP was assigned to two different physicians, wait time decreased by more than half for one (97 days to 37), yet it increased for another (106 days to 113). In the REDCap® surveys, physicians reported varied uses for their NPs, but 100% assign their NP to urgent care visits.

Conclusions. Due to confounding physician factors that affect appointment wait times, clear results were not achieved. An explanation as to why there was not a decrease in wait time for some is that due to a high demand, when appointments were available, they still filled quickly. While patient wait time is not decreasing, more visits are completed. Further investigation needs to be conducted into the significant variation in the results. Physician parental leave and full-time equivalent (FTE) need to be accounted for in the data and then re-evaluated. From the REDCap® survey results it is evident that individual physicians have preferences on how much they utilize their NPs. Even though NPs are an available resource, some physicians prefer to personally follow-up with their patients. Since patient access is a significant problem at KU, this is a key step to addressing long wait times.

CMV Status and Rejection in Solid Organ Transplant Patients

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Introduction. Cytomegalovirus (CMV) is one of the most common infections in organ transplantation. The primary risk factor for infection is the serostatus of the donor and recipient, especially if the donor is positive and recipient is negative. CMV status is designated into the following risk categories: high risk (CMV D+/R-), intermediate risk (CMV R+), and low risk (CMV D-/R-). The role of CMV infection and graft rejection remains under investigation. The goal of this study is to better understand if CMV infection is a protective or risk factor for graft rejection.

Methods. In this retrospective cohort study, we sought to compare CMV status and the rate of rejection in solid organ transplant patients who received a transplant between January 1, 2018 and December 31, 2021 at The University of Kansas Health System (n = 500), an urban academic medical center. Preliminary data identified 32 patients who had evidence of rejection within the first year after transplant. Outcome variables include gender, type of transplant, age at time of transplantation, CMV status, evidence of rejection, and type of treatment for rejection.

Results. To be included, patients had to receive a solid organ transplant (SOT) at The University of Kansas Health System and have evidence of graft rejection within the first year of transplantation. Patients who died from complications of SOT while receiving primary CMV prophylaxis or those with missing medical records or lost to follow up were excluded. Of these 32 patients, the majority were men (n = 19), heart transplants were the most common organ transplanted (n = 17), and deceased donors were the most common donor type (n = 31). The highest rate of rejection occurred in patients with intermediate CMV risk, (n = 19) followed by high-risk patients (n = 10). The majority of patients developed acute cellular rejection (n = 26) while only 4 patients developed acute antibody mediated rejection. Of all patients treated for rejection, the majority received corticosteroids (n = 15), 3 received a combination of corticosteroids with other agents, and 7 received other therapies without corticosteroids. Of the 32 patients treated for rejection, 17 developed CMV infection within one year following transplant.

Conclusions. Preliminary data suggests that the CMV intermediate risk group had the most frequent rate of graft rejection. Of the patients who had evidence of graft rejection, just over half of patients developed CMV infection within the first year of rejection. Collection of data is ongoing but preliminary results demonstrate the importance of routine CMV surveillance in post-transplant patients and especially those with graft rejection.

Mapping AEDs: Enhancing Survival with App-Based Location Awareness

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Introduction. 350,000 people die every year in the United States from an out of hospital cardiac arrest (OHCA). This equates to a 90% fatality rate for this event. However, studies have shown that bystander Automated External Defibrillator (AED) use significantly improves the chances of survival and more favorable neurological outcomes when adjusted for age, sex, and bystander CPR. Bystander AED use is critical, as probability of survival decreases 10-12% for every minute defibrillation is delayed. Many communities rely on unreliable bystander knowledge of AEDs in the case of an emergency. A nonprofit organization called PulsePoint created an app, PulsePoint AED, to act as a publicly available database dispatch and bystanders can reference. This app was endorsed by the Kansas Emergency Medical Services Association for implementation. This study aimed to register as many AEDs to the PulsePoint AED app as possible in a city (population 50,000 in a rural county) where there were no pre-existing records of AED locations, while collecting data to make future registration endeavors more efficient.

Methods. This quality improvement study used various volunteer-led contact methods, including email, phone, word of mouth, and door-to-door inquiries about AEDs in community buildings. If an AED were present at the location, a volunteer would register the device to the PulsePoint AED app in-person or the owner of the AED would download the app and register, based on owner preference. Buildings were divided into categories: small retailers, large retailers, exercise institutions, education institutions, government owned (other), faith institutions, apartments/hotels, medical buildings, and Other. We compared the percentages of buildings that had an AED by category.

Results. Over a year, 100 institutions were contacted via phone and email. Only seven responses yielding three AED location verifications occurred through this method, leading volunteers to visit 65 buildings in person. Of the 65 buildings visited, 32 had an AED on-site (49%), resulting in the registration of 37 AEDs. Every faith, medical, educational, and government owned building had an AED. 83% of exercise institutions and 27% of large retailers had AEDs. Of the 21 small retailer or apartments/hotels buildings visited, none had AEDs; 100% of other buildings had AEDs.

Conclusions. This study resulted in a registration of 37 AEDs to PulsePoint AED and showed that AED location and registration is best performed through use of door-to-door inquiries, prioritizing government owned, educational, medical, faith and exercise buildings in the community. Several limitations exist to this study. Volunteers were only able to visit a small portion of all buildings in the city, and were denied access to some buildings, which could have skewed the results.

SBRT – A Lifesaving Approach to Refractory Ventricular Tachycardia: A Case Report

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Introduction. Recurrent sustained ventricular tachycardia (VT) is a re-entry cardiac arrhythmia defined by a wide QRS complex (≥120 ms), rate > 100 beats/min that lasts > 30 seconds, produces symptoms, and/or requires early intervention due to hemodynamic instability. Unstable patients are emergently cardioverted and managed per advanced cardiac life support (ACLS) resuscitation protocol. Stable patients are initially managed with antiarrhythmics. Recurrent VT may require additional interventions, the most invasive being catheter ablation and placement of an implantable cardioverter-defibrillator (ICD). Advanced management for persistent VT includes advanced techniques like cardiac sympathetic denervation and stereotactic body radiation therapy (SBRT) that uses high levels of radiation to target specific VT origins. SBRT, in this case, was a life-saving approach for a 73-year-old male with recurrent SVT who had exhausted all other treatment modalities.

Case Presentation. The patient has a past medical history of recurrent sustained VT with ICD in place that continued despite four cardiac ablations and medication management with two antiarrhythmics. The patient arrived at the emergency department following multiple ICD discharges over the past week. Electrophysiology subsequently scheduled him for his fifth ablation, during which a bipolar technique was employed. After the ablation, the patient underwent a cardiac MRI with his ICD device turned off. During the MRI, he suddenly went into ventricular fibrillation, triggering a code and initiating ACLS. His ICD was turned back on, and within a minute, it delivered a shock, restoring sinus rhythm. Ongoing discussions had already been taking place between electrophysiology and radiation oncology that this patient may benefit from undergoing SBRT if his VT remains refractory following the fifth ablation. Due to the challenges in demonstrating and ablating his reentry circuits in previous procedures, SBRT was considered a promising option for managing his sustained VT. Because of the patient's high frequency of symptomatic VT, they opted to pursue inpatient SBRT. The images obtained during the patient's cardiac MRI allowed for appropriate mapping for radiation. Since undergoing SBRT, the patient has been following up with cardiology and his device evaluations have shown no further VT episodes. He continues to feel well and is active on his ranch.

Discussion. This case underscores the value of SBRT as a potential early intervention for sustained VT. Traditionally reserved as a last resort after failed ablation, SBRT has shown promise in managing VT effectively. Incorporating SBRT sooner in the treatment strategy, rather than solely after ablation failure, could provide a proactive approach to managing sustained VT that reduces a patient's risk of entering a perimortem arrhythmia.

Microscopic Polyangiitis in a Patient Presenting with Diffuse Alveolar Hemorrhage: A Case Report

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Introduction. Microscopic Polyangiitis (MPA) is an anti-neutrophil cytoplasmic antibody (ANCA)-associated necrotizing vasculitis that primarily affects small arteries. While MPA can involve virtually any organ or tissue, it most commonly affects the upper and lower respiratory tracts and kidneys. The condition often presents with nonspecific symptoms such as fever, malaise, myalgias, and weight loss, alongside possible respiratory symptoms like cough, hemoptysis, dyspnea, and chest pain. Due to these vague symptoms and a prevalence of 9 to 94 cases per million, MPA is frequently initially misdiagnosed as infections, malignancies, or inflammatory diseases. Diffuse alveolar hemorrhage (DAH), a serious complication in ANCA-associated vasculitis (AAV), can be life-threatening.

Case Presentation. A 62-year-old Hispanic male with a history of chronic obstructive pulmonary disease (COPD) was admitted to a rural hospital after experiencing a four-week history of cough and shortness of breath, which was accompanied by hemoptysis in the two days prior to admission. His social history was noteworthy for employment at a meat packing plant. Initially diagnosed with pneumonia and then interstitial pneumonitis as an outpatient, he showed no improvement with oral antibiotics and steroids. A computed tomography (CT) scan at the outside hospital showed bilateral ground glass opacities progressing into dense consolidations involving all lobes concerning for pulmonary alveolar hemorrhage.

Upon transfer to a tertiary center, his physical exam was significant for diffuse rales and respiratory distress requiring heated high-flow oxygen. He was started on methylprednisolone and piperacillin and tazobactam, later modified to levofloxacin. A bronchoalveolar lavage confirmed alveolar hemorrhage. A metabolic panel showed a serum creatinine level of 1.93 mg/dl with a urinalysis showing 5-10 RBCs and trace protein, consistent with rapidly progressive glomerulonephritis and pulmonary-renal syndrome. Infectious serologies, including tests for tuberculosis, histoplasmosis, and cryptococcosis, were negative. Autoimmune tests revealed a positive p-ANCA titer of 1:80 and an elevated anti-myeloperoxidase level >8.0 U/mL, suggesting MPA. A confirmatory kidney biopsy could not be performed due to respiratory distress. The patient was started on rituximab and steroids transitioned to oral prednisone. With this therapy, his respiratory condition improved.

Discussion. Microscopic polyangiitis can be challenging to diagnose due to its nonspecific symptoms. It should be considered in patients with progressive pulmonary symptoms, especially when accompanied by acute kidney injury and urinalysis findings suggestive of glomerulonephritis. DAH is a life-threatening feature that warrants serologic evaluation for AAVs. Other differentials of DAH include multilobar pneumonia, acute respiratory distress syndrome, excessive anticoagulation, rheumatic diseases like systemic lupus erythematosus, connective tissue diseases, and drug/toxin reactions. In this case, infection was initially high on the differential given the patient's occupation and travel history. Following the diagnosis of MPA, treatment with rituximab and steroids led to significant improvement in both respiratory and kidney function, resulting in the patient's discharge to long-term acute care for continued recovery.

Disseminated HSV Challenges: Atypical Presentation Post CAR-T Therapy

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Introduction. Disseminated herpes simplex virus is a clinical condition marked by widespread eruptions of pustules and vesicles affecting the skin and/or internal organs, including CNS infection, hepatitis, pneumonitis, and keratitis. Its extensive and varied presentation poses a significant challenge in immunocompromised hosts, who are commonly given prophylaxis to prevent reactivation or latent disease.

Case Presentation. A 71-year-old male presented to the emergency room with high fevers, headache, and photophobia. He also had new, raised, singular nodular lesions on all extremities. The patient has a history of IgG kappa multiple myeloma with recent chimeric antigen receptor T-cell (CAR-T) therapy five months prior to presentation. He had acyclovir prophylaxis discontinued two months prior to presentation. Physical examination revealed single, violaceous tense nodules on his hands, feet, wrists, and ankles. He denied any pruritis or pain associated with the lesions. In this immunocompromised host, the differential diagnosis included angioinvasive fungal infection, particularly fusarium and cryptococcus neoformans, tularaemia, disseminated gonorrhoea and ecthyma gangrenosum. Given his recent CAR-T, he was commenced on intravenous cefepime, metronidazole and amphotericin B. In addition, punch biopsies of the lesions were obtained and demonstrated a viral dermatitis, with immunohistochemical stain positive for HSV. He was started on IV acyclovir and other antimicrobials were stopped. Further investigations revealed a positive HSV-2 plasma PCR, with titres at 145,000 and a positive HSV-2 PCR lesion swab. A lumbar puncture was performed due to headache and photophobia, with CSF analysis showing 67% PMN, 17% lymphocytes and a negative HSV1/HSV2 PCR. Therefore, it was deemed that this presentation was due to disseminated herpes simplex virus type 2, with atypical appearing skin lesions. The patient had never had Shingrix, shingles, or oral/genital herpes. Previous evaluation at the time of his myeloma diagnosis in 2017 revealed he was positive for HSV-2 IgG and Varicella IgG, HSV-1 IgG was negative. By day nine of admission, his fevers and headaches had resolved, and the lesions present on his extremities were beginning to crust over. He was discharged with a one-week course of 1-gram oral valganciclovir, followed by a three to six-month course of 500 mg, serving as secondary prophylaxis. He was seen in the infectious diseases clinic four weeks later and is doing well, although the lesions are still present.

Discussion. This case highlights the vigilance needed to diagnose disseminated herpes in immunocompromised patients who may present atypically. It demonstrates the importance of keep a wide differential in immunocompromised patients with varied skin manifestations and poses the question how of how long prophylaxis should be continued in these high-risk patients.

Pulmonary Light Chain Deposition Disease: A Rare Pulmonary Manifestation of Systemic Light Chain Deposition Disorder

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Introduction. Non-amyloid monoclonal immunoglobulin light chain deposition (LCDD) in tissues mostly affects the kidneys, liver, and heart. The kidney is the most affected organ and approximately 20% of patients have renal failure requiring dialysis. Pulmonary involvement is rare. In 1987, light chain deposition of non-amyloid nodules limited to the lung was first described and was considered a new clinicopathological entity of LCDD called "pulmonary light chain deposition disease (PLCDD)." Patients are usually asymptomatic, but occasionally present with cough and dyspnea. We present a case of a patient who was diagnosed with PLCDD after multiple abnormal lymph nodes were incidentally detected on a chest x-ray.

Case Presentation. A 39-year-old non-smoking female with no past medical history presented after a motor vehicle accident. Her labs were unremarkable. A chest x-ray showed multiple suspicious pulmonary nodules in the right upper and lower lobes, warranting further investigation. Her only complaints on directed questioning were a cough persisting for years and occasional dyspnea. A CT thorax with contrast showed several slightly atypical lymph nodes in the left axilla, the largest measuring 12mm, along with several small mediastinal nodes including a 2.4cm x 7mm pre-vascular node and multiple sub centimeter pretracheal nodes. The lungs showed multiple bilateral focal consolidated and ill-defined densities in the right middle and lower lobes and the left lower lobe. Subtle ground-glass opacities were seen in both lower lobes with scattered bullous emphysematous changes. There was a pleural-based lesion measuring 11mm in the anterior left upper lobe. Multiple ill-defined consolidated densities were also seen in the right lower lobe, the largest of which measures approximately 2.8 cm. There was no effusion or pneumothorax. A CT-guided biopsy of the dominant right lower lobe nodule revealed lambda immunoglobulin light chains, consistent with PLCDD. The patient was diagnosed with Sjogren's syndrome and initiated treatment with rituximab. In approximately 10% of Sjogren's disease patients, a clone of plasma cells proliferates and produces increased amounts of one immunoglobulin, with identical structure and specificity.

Discussion. PLCDD is a complex and challenging condition due to its varied presentation and the need for a multidisciplinary approach to management. Treatment often focuses on the underlying clonal plasma cell disorder with chemotherapy, immunotherapy, or other targeted treatments. Supportive care, i.e., management of organ-specific complications (e.g., renal failure, cardiac symptoms) is also crucial.

The prognosis of PLCDD depends on the extent of organ involvement and the effectiveness of treating the underlying plasma cell dyscrasia. Early detection and management of both the systemic disorder, and organ-specific complications can improve outcomes.

Pancreatic Neuroendocrine Tumor Recurrence after Tirzepatide Use

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Introduction. Pancreatic neuroendocrine tumors (PNETs), or islet cell tumors, arise from pancreatic endocrine tissue. While most fall within non-functional PNETs, about 25% to 50% are functional PNETs. Following pancreatectomy, drugs such as tirzepatide may be prescribed to address endocrine insufficiency. Tirzepatide is a dual agonist for glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP) which stimulate insulin secretion. However, some PNETs with beta cells can present with increased expression of GLP-1 and GIP receptors. This receptor expression can stimulate key growth signaling pathways, potentially driving tumor progression and may increase the risk of PNET recurrence.

Case Presentation. We present a 57-year-old patient with a past medical history of gestational diabetes mellitus, hyperlipidemia, and angioedema, who initially presented with one year of abdominal pain. Imaging at another hospital revealed a pancreatic mass, leading to referral to our hospital. MRI showed an 8.5 cm x 8.5 cm complex cystic pancreatic body and tail region mass. The patient underwent exploratory laparotomy, distal pancreatectomy, splenectomy, and cholecystectomy. Pathology identified a low-grade well-differentiated pancreatic neuroendocrine tumor that was low-grade. Pathological stage was pT2N0M0. Further staging workup revealed a clinical stage IB PNET and the patient was treated with curative intent. Chromogranin A, pancreatic polypeptide (PPP), and urinary 5-hydroxyindole-acetic acid (5-HIAA) were within normal limits and the patient was placed on active surveillance The patient was noted to be hyperglycemic due to endocrine pancreatic insufficiency and was started on metformin. She did not tolerate metformin and was subsequently started on insulin. Eight years after her initial surgery, the patient was noted to have an enlarging mild right anterior diaphragmatic and paracaval lymph nodes on computed tomography (CT) of the abdomen/pelvis. She then underwent a dotatate neuroendocrine PET scan which showed two discrete foci of intense tracer uptake in the upper retroperitoneum at midline superior to the distal pancreatectomy site, without distinct CT correlate, compatible with somatostatin receptor-positive neuroendocrine tumor implants. There was also tracer avid anterior diaphragmatic and middle diaphragmatic nodal metastatic disease. The patient reported that she had started tirzepatide two months prior to this visit. Following a discussion at our tumor board, the patient was referred to interventional radiology for a CT-guided biopsy of the anterior diaphragmatic lymph node. Pathology was consistent with metastatic well-differentiated neuroendocrine tumor. Ki-67 was 4% which was consistent with WHO Grade G2. Chromogranin, urine 5-HIAA, and PPP were rechecked and noted to be within normal limits. Tirzepatide was stopped and the patient was started on octreotide LAR with an initial dose of 10 mg and then increased to 20 mg for subsequent injections. PET scan was done after three injections which showed redemonstration of the radiotracer avid lymph nodes however, decreased in size compared to prior imaging. The patient remains on octreotide monthly and will have imaging prior to cycle seven.

Discussion. This case report illustrates the potential role of GLP-1 and GIP agonists in malignant transformation of the pancreas. Further characterization with additional pathological staining would provide clues to diagnosis in such clinical scenarios.

Common Complaints, Unexpected Findings: Uncovering an Incidental Osteochondroma in the Evaluation of Knee Pain

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Introduction. Knee pain is a common chief complaint in the primary care setting and comprises approximately 5% of all general practice presentations. Among older adults, persistent musculoskeletal pain is highly prevalent with rates of 40 to 60%. Chronic musculoskeletal pain is associated with falls, frailty, depression, anxiety, sleep disturbance, reduced mobility, and impaired cognitive function. Osteoarthritis, patellofemoral pain, and meniscal tears are three of the most common causes of knee pain globally. First line treatment of these conditions typically includes exercise therapy, weight loss, walking aids, and education and self-management. First line treatments are often combined with pharmacologic options such as NSAIDs, intra-articular steroid injections. Failing these measures, referrals for surgical interventions should be considered when conservative options have not effectively treated patient symptoms.

Case Presentation. A 34-year-old female with a history of pre-diabetes, osteoarthritis, morbid obesity presents to the general medicine clinic with a chief complaint of knee pain. She reports a seven-year history of knee pain in her bilateral knees with significant worsening in the past several months. Her pain is associated with popping and cracking in both knees with movement. She has been using Naproxen for pain management which provides mild relief of the pain. On examination, no obvious deformities of the knees and bilateral lower extremities are noted. She has had previous imaging with a left knee X-ray in 2020 showing small marginal osteophytes off the lateral joint line and trace joint effusion. She was prescribed meloxicam for pain control and bilateral knee X-rays were repeated. Repeat imaging was significant for tricompartmental OA of both knees, as well as a pedunculated osteochondroma arising from the right distal femoral metaphysis. She was referred to orthopedic surgery for further evaluation and treatment of her osteoarthritis and osteochondroma.

Discussion. Osteochondromas are the most common benign bone tumor, and account for 20-50% of all benign tumors and 9% of all bone tumors. Almost half of these tumors are located around the knee. They are defined as cartilage capped bony projection on the external surface of bone. Typically symptomless, osteochondromas are usually incidentally diagnosed during the evaluation of other conditions. However, these benign lesions can cause side effects such as fractures, vascular and neurologic sequela from mass effect, osseous deformities, and bursa formation. The risk of malignant transformation of osteochondromas remains around 1% for solitary tumors. Surgical excision may be reasonable for patients with significant symptoms due to osteosarcoma, or in whom there is elevated concern for malignant transformation.

A Case of Drug-Induced Lupus due to Hydralazine Presenting with Severe Serositis Including Cardiac Tamponade

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Introduction. Hydralazine induced lupus (HIL) occurs in 5-10% of patients exposed to the medication. Manifestations typically include arthralgias, myalgias, fever, and rash. Here, we present a case of a patient with HIL who initially had arthralgias but progressed to develop severe serositis.

Case Presentation. A 39-year-old male with past medical history of hypertension and chronic kidney disease stage 3b due to polycystic kidney disease presented to internal medicine clinic with migratory arthralgias involving wrists, knees, shoulders, and elbows. His symptoms continued for months and transiently improved with steroids. Testing revealed high titer anti-nuclear antibody (ANA) positive (> = 1280). The patient had been on hydralazine for two years, so it was discontinued due to suspicion for HIL. He was concomitantly started on hydroxychloroquine (HCQ). With both changes, his arthralgias resolved within days. Incidentally, he developed a shingles rash on his torso, treated with acyclovir.

Two weeks later, he presented to the hospital with chest pain and dyspnea. Echocardiogram and CT chest showed large volume pericardial effusion with tamponade physiology and bilateral pleural effusions. He improved after emergent pericardial drain placement and thoracentesis. Pericardial fluid analysis showed 7166 white blood cells (95% neutrophils), lactate dehydrogenase 390 U/L, glucose 62 mg/dL, negative gram stain and cultures. Other labs were significant for white blood cell count 11 k/UL, platelet count 484 k/UL, creatinine 4.05 mg/dL (baseline 2-2.3). The patient denied fevers, sinusitis, photosensitivity, malar rash, ulcers, or hematuria. Physical exam showed no skin tightening or synovitis. Pertinent normal labs included: complements, rheumatoid factor, anti-Scl70 antibody (Ab), anti-SSA Ab, anti-SSB Ab, anti-PR3 Ab, dsDNA Ab, and anti-CCP Ab. Pertinent positive labs included: centromere Ab >8 AI (normal<1), anti-MPO Ab 5.3 AI (normal<1), and histone Ab 5.9 units (normal<0.9). With the continued holding of hydralazine, the patient's symptoms improved, his creatinine returned to baseline, and he was discharged. It was thought the patient's presentation was due to HIL. He was advised to avoid hydralazine. The patient's HCQ was stopped as it was likely not contributing to his improvement, given the long half-life of the drug. The patient was recommended to follow up with a rheumatologist and consider repeat testing.

Discussion. This case is unique because of the severity of disease and constellation of lab findings. Cardiac tamponade occurring in HIL has been seen in <10 case reports. Additionally, renal involvement is rarely seen with the condition, although it is unclear if this was related to HIL vs. acyclovir use. The most common serologic findings in HIL are positive ANA and histone antibody, both of which were seen here. He had incidental MPO positivity, which can likewise be drug-induced from hydralazine. This case demonstrates the importance of considering HIL in patients presenting with severe serositis with no other obvious cause.

Uncommon Encounter: Symptomatic Pulmonary Cryptococcosis due to *Cryptococcus neoformans* in an Immunocompetent Patient in the Outpatient Setting

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Introduction. *Cryptococcus neoformans* is widely present in the environment, including soil, vegetation, and bird droppings. It infects immunocompromised hosts, but in immunocompetent individuals, inhalation commonly results in focal pneumonitis, which is usually asymptomatic or, if symptomatic, is generally self-limiting. In contrast, *Cryptococcus gattii* more commonly causes disease in immunocompetent hosts than *C. neoformans*. Risk factors for symptomatic and persistent cryptococcosis in immunocompetent individuals include conditions such as diabetes mellitus. We present the case of an immunocompetent woman with symptomatic pulmonary cryptococcosis who was diagnosed and managed in an outpatient setting.

Case Presentation. A 60-year-old woman with a medical history significant for atrial myxoma status-post resection, obesity, type 2 diabetes on metformin, a remote smoking history of less than five pack-years, asthma, and chronic hypoxic respiratory failure secondary to obesity hypoventilation syndrome and severe obstructive sleep apnea presented to the pulmonology clinic for evaluation of worsening chronic respiratory symptoms despite optimal management of her known conditions. She described a two-year history of persistent cough, shortness of breath, wheezing, and crackles, along with a recent increase in oxygen requirements.

A chest x-ray revealed bilateral alveolar infiltrates, worse in the apices but present in all five lobes. Pulmonary function tests (PFTs) were consistent with restrictive lung disease (FVC 42%, FEV1 48%, TLC 62%, DLCO 77%). An echocardiogram revealed an ejection fraction of 50 – 55% with normal pulmonary artery pressures and grade 1 diastolic dysfunction. Computed tomography (CT) of the chest showed diffuse alveolar opacities bilaterally, multiple enlarged mediastinal lymph nodes (the largest of which was 3.7 x 2.6 cm), and no focal lung lesions. Blood work revealed 9% eosinophilia (700 cells/ml) and a C-reactive protein level of 11.4 mg/L. A rheumatologic workup was negative, and a hypersensitivity pneumonitis panel was positive for *Penicillin chrysogenum*, but this was not suspected to be the source in the setting of only mild eosinophilia. She underwent a bronchoscopy with ultrasound-guided biopsy of her mediastinal lymph nodes, which showed normal cytology.

A trial of diuresis for possible heart failure did not improve her symptoms. She was started on prednisone for suspected interstitial lung disease which temporarily improved her symptoms. Repeat PFTs and chest CT scan after four months were largely unchanged. Consequently, she underwent an open lung biopsy. Tissue histology was consistent with follicular bronchiolitis and organizing pneumonia with no granulomas identified. Her tissue fungal culture grew *C. neoformans* and she was started on oral fluconazole 400mg daily and referred to infectious disease for further workup and management.

Discussion. This case illustrates the challenges with diagnosing pulmonary cryptococcosis in immunocompetent patients, particularly in the outpatient setting. Physicians should be aware of the increased risk of symptomatic cryptococcosis in patients with diabetes, particularly when additional pulmonary comorbidities are present. For patients who continue to experience respiratory symptoms despite optimal management of their existing pulmonary conditions, timely evaluation by a pulmonologist is recommended.

A Fishy Case of Osteomyelitis

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Introduction. The differential diagnosis for pathogens in osteomyelitis varies depending on anatomic location and host risk factors. We present a rarely encountered culprit of osteomyelitis.

Case Presentation. A 55-year-old male with a chronic left uretero-pelvic junction (UPJ) obstruction presented with complaints of two to three weeks of low midline back pain. He denied known mechanism of injury or other systemic complaints. Since his 20s, his incidentally discovered UPJ obstruction had been managed with chronic stent exchanges. He had seen some blood-tinged urine lately but denied dysuria.

On presentation, he was afebrile, normotensive and antimicrobials were held. Palpation of the spine showed no major tenderness, but he did have difficulty moving around due to discomfort. His white blood cell count was unremarkable. CRP was elevated at 3.88 mg/dL, as was ESR at 43 mm/hour. Urinalysis revealed 3+ leukocytes, but culture ultimately grew urogenital/skin microbiota.

MRI of the lumbar spine revealed spondylodiscitis at L4-L5, with contiguous inflammation into the epidural space. On hospital day two, he underwent an L4/5 disc biopsy. Pathology revealed focal necrosis and acute inflammation (discitis). Cultures remained negative on day three, day four, and day five. Blood cultures from admission were also negative. On hospital day five, he underwent repeat L4/5 disc biopsy. Results of repeat L4/5 disc biopsy were pending at time of discharge. He was started on empiric IV Daptomycin and Cefepime.

Twelve days after initial admission, biopsy cultures resulted with *Gardnerella vaginalis* on both routine and anaerobic cultures. IV antimicrobials were stopped, and oral Metronidazole was started. He completed 10 weeks of Metronidazole therapy, with significant improvement in his pain.

Discussion. *Gardnerella vaginalis* is a rare cause of bone and joint infections. To our best knowledge, there have only been four cases of osteomyelitis reports in females, three cases of prosthetic joint infections (PJIs) in females, and one case of PJI in a male. *Gardnerella* is difficult to identify and culture and has less virulence than more common pathogens associated with native vertebral osteomyelitis. *Gardnerella* can form biofilm on contraceptive intravaginal ring, but there is no data on foreign bodies in males. It is reported to colonize the urethra in up to 4.5% to 11.4% of men. We suspect that our patient had developed colonization of his left ureteral stent, which could have predisposed him to develop native vertebral osteomyelitis.

In the setting of a negative initial biopsy, IDSA guidelines recommend a second biopsy to be sent for culture, as was performed in this case. Were repeat biopsy not pursued in this case, he likely would have developed empiric treatment failure and developed worsening symptoms, and potentially hospital re-admission. Holding antibiotics after initial biopsy in this case proved highly beneficial.

Alcoholic Wernicke Encephalopathy Presenting as Refractory Lactic Acidosis and Bilateral Cranial Nerve VI Palsy

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Introduction. Wernicke encephalopathy is a diagnosis that requires high clinical suspicion. It is typically associated with individuals with severe alcohol use although it may be found in other malnourished populations. Its classic triad is ophthalmoplegia, encephalopathy, and ataxia. However, this triad may be only found in up to one-third of patients, which increases the challenge of prompt diagnosis. A lesser-known complication of this disease process is lactic acidosis, which is secondary to impaired aerobic metabolism from thiamine deficiency.

Case Presentation. A 33-year-old man presented to the Kansas City VA Medical Center for general malaise and abdominal pain. He was found to have a lactic acid level of 6.7 mmol/L (reference range 0-2 mmol/L) on admission. Workup for sepsis and acute intrabdominal processes, such as ischemic bowel and pancreatitis, was negative. During the early part of his hospitalization, he was given five liters of isotonic fluids with minimal change in his lactic acidosis. The patient was thus re-evaluated. The patient stated he chronically drank 8 to 12 beers per day; however, in the two weeks prior to admission, he also began to consume 6 to 12 shots of hard liquor per day. He also noted that he began to have difficulty with ambulation. On exam, it was observed the patient had both significant horizontal and vertical gaze nystagmus. Additionally, it was seen that he had difficulty with abduction of both eyes, suggesting bilateral cranial nerve VI palsy. High-dose intravenous (IV) thiamine was promptly started with resolution of lactic acidosis and improvement in his ocular symptoms. By the third day of high-dose IV thiamine, his cranial nerve VI palsy had resolved. Brain MRI was unremarkable for a competing process. He was then discharged home with plans to get enrolled in the VA's local alcohol rehabilitation program.

Discussion. This case highlights several key points. The first of which is the importance of identification of Wernicke's encephalopathy in high-risk patients. Of note, a thiamine level does not need to be obtained if there is high clinical suspicion, particularly since it takes several days to come back. In these patients, there is value in performing a comprehensive ocular exam. Lastly, lactic acidosis refractory to aggressive fluid resuscitation may suggest a type B lactic acidosis, which in this case was found to be secondary to thiamine deficiency.

The HAART of the Issue: Treating TB in Uncontrolled HIV

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Introduction. A 35-year-old male was admitted with complaints of shortness of breath, productive cough, subjective fevers, vomiting, and 20-pound weight loss for a few months. His history was significant for uncontrolled human immunodeficiency virus (HIV) who had been off antiretroviral therapy, polysubstance use, and prior homelessness. He was born in Mexico. He had numerous presentations to emergency departments in the month prior with similar symptoms, during which time he was empirically prescribed a course of doxycycline for bacterial pneumonia and trimethoprim-sulfamethoxazole for pneumocystis prophylaxis. On presentation to the emergency department, he had sinus tachycardia but was afebrile and did not require supplemental oxygen. He had cervical lymphadenopathy, otherwise the examination was unremarkable. Lab studies were notable for HIV viral load of 1,164,497 copies/mL, CD4 count of 24, and negative QuantiFERON-TB Gold Plus. Computed chest tomography revealed clustered nodules in the upper lung zones and axillary, supraclavicular, and lower cervical lymphadenopathy. The patient was put in airborne isolation and sputum samples were obtained which later returned with acid fast bacilli (AFB) and positive *Mycobacterium tuberculosis* polymerase chain reaction. Tuberculosis therapy was initiated with rifampin, isoniazid, pyrazinamide, and ethambutol. Hospital stay was complicated by fevers and altered mental status prompting lumbar puncture which was unremarkable including negative *Mycobacterium tuberculosis* polymerase chain reaction. In addition, he had a left axillary lymph node biopsy with pathology showing AFB. After additional opportunistic infections were ruled out, he was started on antiretroviral therapy with dolutegravir and emtricitabine/tenofovir disoproxil fumarate. A prednisone taper was initiated as well for prevention of immune reconstitution inflammatory syndrome (IRIS).

Discussion. This case illustrates the importance of keeping tuberculosis on the differential diagnosis for patients with risk factors. Interferon-gamma release assays should not be used for diagnosing active tuberculosis. Furthermore, the sensitivity of the test is also lower in patients with HIV. Special consideration should be given to patients with uncontrolled HIV infection and active tuberculosis as starting antiretroviral therapy during tuberculosis treatment can lead to IRIS and should not be started simultaneously. If the CD4 count is $\geq$50, antiretroviral therapy should be started within 8-12 weeks of starting therapy for tuberculosis. If the CD4 count is <50, as was the case with our patient, antiretroviral therapy should be initiated within two weeks of starting tuberculosis therapy given severe immunocompromise and the risk for additional opportunistic infections. Regardless of CD4 count, tuberculous meningitis must be ruled out if there is a suspicion because antiretroviral therapy initiation would need to be delayed.

Management of Hypercalcemia and Calciphylaxis in a Patient on Futibatinib

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Introduction. Futibatinib is an antineoplastic agent used in the treatment of fibroblast growth factor receptor (FGFR) positive cancers, such as intrahepatic cholangiocarcinoma and urothelial carcinoma 2. The mechanism of action is irreversible selective inhibition of FGFRs, inhibiting phosphorylation, preventing survival of malignant cells, and decreasing proliferation of cancerous cells. Futibatinib's side effect profile includes hyperphosphatemia (seen in 97% of patients), which is associated with soft tissue mineralization, calcinosis, nonuremic calciphylaxis, and vascular calcification. Far less information is available in the literature about calciphylaxis from nonuremic causes. This case report will explore the challenges in the management of vascular and metabolic derangements in patients on Futibatinib.

Case Presentation. A 64-year-old woman with a history of metastatic cholangiocarcinoma (complicated by peritoneal carcinomatosis and malignant ascites) on treatment with Futibatinib, presented with worsening bilateral lower extremity swelling with painful necrotic medial thigh wounds. Punch biopsy of the right leg wound was obtained and pathology was consistent with calciphylaxis. During her hospitalization, she became hypercalcemic with a peak corrected calcium level of 13.4, ionized calcium of 1.75, PTH 5.8, and Phos 6.6. In addition to painful wounds, she reported nausea, vomiting and constipation. Oncology was consulted, and Futibatinib was held as it was likely contributing to the patient's presentation. Aggressive hydration for hypercalcemia was initiated. Nephrology was consulted for nonuremic calciphylaxis and recommended sodium thiosulfate 25g three times weekly. Calcium levels failed to improve with hydration. After discussion with endocrinology, three doses of calcitonin were given and again no improvement in calcium levels. She received Zometa 4 mg for long-term management. At the time of discharge, calcium and ionized calcium levels had improved to 8.2 and 1.25, respectively, with concurrent improvement in symptoms. Given limited improvement while on sodium thiosulfate, it was stopped at time of discharge. Patient followed with oncology outpatient, who ultimately decided to permanently discontinue Futabinib.

Discussion. Calciphylaxis occurs due to calcification of arteries and capillaries which decreases a patient's quality of life while also increasing their risk for death, with an estimated six-month survival of 50%. Patients with ESRD increase one's risk for calciphylaxis. Initial treatment for all patients with hypercalcemia is fluid resuscitation. Patients with ESRD-related calciphylaxis often have a component of secondary hyperparathyroidism and are treated with cinacalcet. However, in our patient's case, their PTH was low-normal. Other causes of calciphylaxis are thought to be related to chronic inflammatory states, medications, hyperparathyroidism, or autoimmune disorders. Our patient's only known risk factors were her cancer and the medication, Futibatinib. Despite discontinuing the medication, aggressive hydration and calcitonin, the patient's hypercalcemia failed to improve. To successfully normalize calcium levels and improve symptoms, a bisphosphonate was required. It is important to note that successful treatment of hypercalcemia and associated calciphylaxis included a bisphosphonate, and one such as Zometa should be initiated early to help control levels and therefore, symptoms.

Uncommon but Real: Pulmonary Embolism in a Young CrossFit® Athlete - A Case Report Highlighting the Risks of Supplements and Missed Diagnoses

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Introduction. It is well established that the incidence of venous thromboembolisms (VTEs) increases with age and is influenced by risk factors such as obesity and physical inactivity. Consequently, healthcare providers tend to lean away from VTEs and towards musculoskeletal disorders in their differential diagnosis when young, healthy, and athletic individuals present with the classic symptoms of deep vein thrombosis (DVT) or pulmonary embolism (PE). We present the case of a young athlete who was diagnosed with pulmonary embolism.

Case Presentation. A 25-year-old man with no significant past medical history presented to the emergency department (ED) with a one-week history of pain over his right posterior ribs. He endorsed some dyspnea, and the pain worsened with deep inspiration. He denied any calf swelling or pain but reported a low-grade fever and night sweats.

The patient was a CrossFit® athlete and had participated in an event the day before his symptoms began. He had no family history of blood clots and denied using steroids or illicit drugs. He regularly took multiple supplements, including creatine, vitamin B12, the "fat burner" Thermo-X, branched chain amino acids (BCAAs), and green tea extracts, often in inappropriate amounts. He also took oral minoxidil for hair loss, in addition to topical minoxidil with finasteride. He reported smoking one pack of cigarettes every two weeks for three to four years and drank alcohol occasionally.

He had sought medical attention at an urgent care center on two occasions for his symptoms. Initially, he was diagnosed with a muscle strain and was prescribed ibuprofen and cyclobenzaprine. During his second visit, a chest x-ray revealed a right pleural effusion with bibasilar atelectasis, and he was started on oral steroids and antibiotics. His symptoms did not improve, prompting his presentation to the ED.

A chest computed tomography (CT) angiogram revealed multiple small pulmonary emboli in the right lower lung lobe, along with a mildly dilated pulmonary artery, indicating increased pulmonary pressures. His labs were largely unremarkable, but his vitamin B12 levels were elevated at 1062 pg/mL. Doppler ultrasonography of his extremities was negative for DVTs, and an echocardiogram (ECHO) showed a mildly dilated right ventricle and a pulmonary artery systolic pressure (PASP) of 32 mmHg, with an ejection fraction (EF) of 60-65%. He was started on apixaban and discharged after three days with follow-up arranged in outpatient hematology.

Discussion. This case highlights several important points regarding VTEs in young athletes. First, these patients often take supplements, sometimes in inappropriate doses, some of which have been linked to VTEs. There have been reports associating excessive intake of creatine, BCAAs, and some ingredients in Thermo-X with VTEs and other cardiovascular complications. Second, athletes face additional VTE risk factors, including dehydration, significant trauma, and injuries. Finally, the diagnosis of VTEs in young athletes is often delayed or missed.

Falsely Elevated Parathyroid Hormone in a Patient with CKD: The Role of Human Anti-Mouse Antibody Interference in Misdiagnosis of Hyperparathyroidism

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Introduction. Hyperparathyroidism in patients with chronic kidney disease (CKD) and vitamin D deficiency is commonly seen due to impaired calcium metabolism, leading to secondary hyperparathyroidism and increased risk of bone and cardiovascular complications. In rare cases, falsely elevated PTH levels may result from high-dose biotin supplementation, positive rheumatoid factor, and Human Anti-Mouse Antibody (HAMA). HAMA can interfere with PTH immunoassays, leading to falsely elevated parathyroid hormone levels and potentially resulting in the misdiagnosis of hyperparathyroidism. We present the case of a female patient with significantly elevated PTH without impact on calcium and bone metabolism and found to have positive HAMA.

Case Presentation. A 74-year-old asymptomatic female with a past medical history of CKD stage 3a, anemia, vitamin D deficiency (on vitamin D3 50 mcg daily), prediabetes, hypertension, coronary artery disease, and obesity (BMI 37.5) presented for a routine clinic visit. The physical examination was unremarkable. Workup was remarkable for low vitamin D level at 8.0 and elevated PTH at 608 pg/mL with normal calcium levels at 8.4-8.6. Secondary hyperparathyroidism was suspected due to CKD and vitamin D deficiency. However, due to the significantly elevated PTH levels, typically above 200 pg/mL, further investigation was initiated. Following discussion with an endocrinologist, he reported that a PTH level out of proportion to her other clinical markers raises suspicion for a false positive result. The most common causes of a false-positive PTH are rheumatoid factor and Human Anti-Mouse Antibody (HAMA). The rheumatoid factor was negative. HAMA result was elevated at 121 ng/mL. Patient was continued on vitamin D replacement and calcium supplementation, with close monitoring and potential future initiation of calcitriol or cinacalcet when indicated.

Discussion. Secondary elevated PTH levels secondary to CKD and vitamin D deficiency is common. However, the usual range of PTH is below 150-200 pg/mL. PTH levels significantly elevated and out of proportion to clinical examination and laboratory markers, raise suspicion for falsely elevated levels. The incidence of interference of immunoassay used for PTH measuring, can reach up to 6%, contingent upon the specific type of antibody involved. This Includes, but are not limited to, the abovementioned rheumatoid factor and HAMA. Cavalier et al. found that among 743 patients with elevated PTH levels, 3.4% experienced interference from heterophile antibodies, while 1.2% were affected by the rheumatoid factor. The presence of these antibodies in patient serum is often linked to the administration of therapeutic monoclonal antibodies or the presence of monoclonal gammopathy. However, the patient in our case had no history of receiving therapeutic monoclonal antibodies, nor did she show any clinical signs of gammopathy. As a result, clinicians need to recognize this problem to prevent unwarranted diagnostic procedures and improper treatment decisions.

Blastomycosis with Cutaneous Involvement Spreading to Non-Endemic Areas

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Introduction. Blastomycosis is a systemic fungal infection caused by inhalation of Blastomyces dermatitidis or Blastomyces gilchristii spores. Blastomycosis is endemic in the southeastern and south-central states near the Mississippi and Ohio River, midwestern states near the Great Lakes, and St. Lawrence River, where it may be hyperendemic. Blastomycosis infections can be asymptomatic, though the most common sites of infection are lung with hematogenous spread to skin. Pulmonary involvement usually presents as pneumonia. Cutaneous manifestations typically present as a verrucous lesion with irregular borders or ulcerative lesions that reveal broad-based budding on microscopy.

Case Presentation. A 71-year-old male with a past medical history of hypertension, hyperlipidemia, and bladder tumor resection presented to The University of Kansas Medical Center with an erythematous, purulent wound located on the left lateral forearm. The patient's wound began two months prior to presentation and had worsened despite debridement and outpatient antibiotic treatment with Doxycycline, Bactrim, and Clindamycin. The patient denied fever, chills, cough, or systemic symptoms. He denied any specific trauma to the area and reported some outdoor activity landscaping around his house in Grain Valley, MO where he noted garbage and debris. Due to the rapid enlargement, worsening pain, and a non-healing wound, he was admitted for an expedited workup. A punch biopsy of the large 4.5 cm violaceous, ulcerated plaque showed epidermal hyperplasia, neutrophilic abscess, and fungal budding yeasts compatible with blastomycosis. Blastomyces urine and serum antigen were negative. Histoplasma urine antigen was positive. HIV screen was nonreactive. Patient was started on Itraconazole and followed up as outpatient with Dermatology and Infectious Disease. His CT chest showed isolated hilar lymphadenopathy. He underwent EBUS as an outpatient that had no fungal growth on culture, Strep viridans and Actinomyces odontolyticus on bacterial culture, and ruled out malignancy given his history of bladder tumor. He was started on Amoxicillin for possible mediastinal actinomycosis and continues to see wound care for the forearm lesion.

Discussion. Diagnosis of blastomycosis is challenging and often delayed due to limited testing options available for this infection. This patient had negative serum and urine antigen for blastomycosis, but positive Histoplasmosis urine antigen, highlighting a common clinical quandary. Histoplasma capsulatum antigen assay has shown to be cross-reactive in cases of blastomycosis and paracoccidioidomycosis, which can lead to diagnostic challenges in non-endemic regions. Blastomyces is historically not endemic to this area, though there has been significant expansion of the geography of Blastomyces in the past decade. Climate change has been theorized as a possible factor, with shifts in temperature and weather patterns priming fungi to adapt to previously inhospitable environments and allowing them to spread to traditionally non-endemic areas. Clinicians should have a high index of suspicion for blastomycoses in this area when a patient presents with typical skin lesions, particularly with history of travel to endemic areas or engagement in outdoor activities or construction.

Diffuse Large B-Cell Lymphoma: An Uncommon Cause of Upper Gastrointestinal Bleeding-A Case Report

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Introduction. Non-Hodgkin Lymphoma (NHL) can develop in different areas of the body and frequently involves both lymph nodes and other structures within the abdomen. While there are reports of lymphomas in the stomach causing upper gastrointestinal (GI) bleeds, there are few reports of diffuse large B-cell lymphoma (DLBCL) causing upper GI bleeding. In this case report, we present a 62-year-old male who presented with a severe upper GI bleed caused by DLBCL.

Case Presentation. A 62-year-old male with a nonsignificant past medical history presented to the emergency department with complaints of shortness of breath, chest discomfort, and non-specific diffuse abdominal pain, most prominent in the epigastric area. The patient reported episodes of dark, tarry stools over the last two months. Upon presentation, his blood pressure was 95/55 mmHg, and his heart rate was 110 beats/minute. Laboratory tests revealed a hemoglobin level of 3.3 g/dL. The patient received intravenous fluids and blood transfusions for resuscitation and was started on intravenous (IV) pantoprazole for a suspected upper GI bleed. Due to hypovolemic shock, he was transferred to the ICU for further resuscitation. A computed tomography angiogram (CTA) of the abdomen and pelvis showed abnormal wall thickening of the stomach involving the lesser curvature, extending into the antrum and pylorus, with prominent perigastric lymphadenopathy, raising concerns for a neoplastic or infectious/inflammatory process. An esophagogastroduodenoscopy (EGD) revealed a necrotic ulcer on the lesser curvature of the stomach, suggestive of possible malignancy. Helicobacter pylori antigen was negative. Biopsies were positive for B-lymphocyte antigen cluster differentiation 20 (CD-20) and high proliferation of Ki-67. Double-hit fluorescence in situ hybridization (FISH) testing was negative. The patient consented to treatment with rituximab, cyclophosphamide, hydroxydaunomycin, vincristine (Oncovin®) and prednisone (R-CHOP) with a good prognosis anticipated with therapy. The patient's hemoglobin was stable and improved after initiation of the regimen.

Discussion. Lymphomas often affect both nodal and extranodal structures in the abdomen, with DLBCL being the most common type of primary extranodal lymphoma in the GI tract. Patients with gastric lymphomas typically present with non-specific symptoms such as abdominal pain, dyspepsia, nausea, vomiting, diarrhea, weight loss, or a palpable mass. GI bleeding is an uncommon symptom of gastric lymphoma, especially DLBCL. A definitive diagnosis is usually made through biopsy, as imaging often does not provide specific findings. For stomach lesions, biopsies are typically obtained via EGD. Treatment for an upper GI bleed includes administering IV pantoprazole, and if a visible vessel with active bleeding is identified at the ulcer base, a clip and argon plasma coagulation are effective for hemostasis. DLBCL is potentially curable, with CHOP being the first-line treatment for extranodal lymphoma. The addition of Rituximab has significantly improved the prognosis for these patients.

Multidisciplinary Management of the Inpatient Chameleon: A Case Report of Acute Intermittent Porphyria

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Introduction. Acute intermittent porphyria (AIP) is caused by a deficiency of the porphobilinogen deaminase enzyme. The clinical presentation of patients with AIP varies dramatically by case, which can lead to delayed time to diagnosis or treatment. However, in a patient with a known diagnosis of AIP, there are other barriers and considerations to the most efficient management.

Case Presentation. We report a case of a 56-year-old female who presented to the emergency department with generalized pain and worsening left-sided weakness. Past medical history was significant for a cerebral vascular accident with residual left-sided weakness, hypertension, low back pain, alcohol use disorder, substance abuse, and a remote history of AIP. On admission, her blood alcohol level was elevated at 266mg/dL, and her urine drug screen was positive for amphetamines, opioids, and cannabis. She underwent an extensive stroke workup, given her acute focal neurological deficit with worsening left-sided weakness. Workup included computed tomography (CT) of the head, CT angiography of the head/neck, magnetic resonance imaging (MRI) of the brain, and echocardiography with a bubble study, all of which were unrevealing. The patient developed seizure-like activity, requiring transfer to intensive care. Given the history of AIP, previous stroke, and substance and alcohol use, the differential diagnosis was broad as to the specific cause of seizure-like activity. The neurology team was consulted, and electroencephalography (EEG) confirmed non-epileptic shaking spells, rather than epileptiform abnormalities. Unfortunately, the patient's diffuse pain and shaking spells persisted.

Given the broad constellation of symptoms and minimal improvement, AIP exacerbation rose to the top of our differential list. The patient was treated with intravenous dextrose and a high carbohydrate diet. She had been given a diagnosis of AIP more than 10 years prior by a physician in another state, so records and confirmatory lab work were limited. Urine porphobilinogen and total porphyrins had been ordered on day one of this hospitalization, but unfortunately, took several days to result. Noteworthy, elevated lab values from spot urine collection included: uroporphyrin octa 101 ug/L, heptacarbxporph 73 ug/L, hexacarbxporph 5 ug/L, pentacarbxporph 11 ug/L, coproporphyrin (CP) I 51 ug/L, coproporphyrin II 127 ug/L.

By the time confirmatory lab work returned, the hematology team had been consulted and was already working towards approval for appropriate treatment with hemin, a lyophilised iron-containing porphyrin. Hemin is more than $10,000 per infusion, and our patient underwent four days of infusions prior to improvement and symptom resolution. She returned to baseline and was discharged with education on avoiding substances known to exacerbate AIP.

Discussion. This case illustrates the varying manifestations of AIP attacks, including neurological and visceral symptoms. It reminds us that AIP should be on the differential for hospitalized patients despite its rare occurrence, and highlighted the multidisciplinary approach to management, often involving several different sub-specialists depending on clinical progression. Lastly, prompt treatment with appropriate therapy is ideal, but not always attainable. In this case, it took several days for lab work to confirm the diagnosis of AIP, and for hemin to be approved for use given its cost.

A Common Finding with an Uncommon Etiology: Biliary Stricture Secondary to Metastatic Lung Cancer

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Introduction. While it is difficult to place an exact number on the incidence of biliary strictures each year, they are not an uncommon entity, with a prevalence of 1-2 per 100,000 patients per year. Most often, these strictures are secondary to malignancy. Of malignant strictures, pancreatic adenocarcinoma is the most common, followed by cholangiocarcinoma, ampullary cancer, gallbladder cancer, and metastatic lesions.

Case Presentation. We present the case of a 77-year-old male with past medical history significant for right lung adenocarcinoma, status post chemotherapy and radiation, currently on immunotherapy, who presented with jaundice, right upper quadrant abdominal pain, and decreased oral intake. His exam was positive for jaundice, scleral icterus, and right upper quadrant tenderness. Labs were significant for the following elevated levels: total bilirubin of 14.7 mg/dL, aspartate aminotransferase (AST) 262 U/L, alanine aminotransferase (ALT) 192 U/L, alkaline phosphatase 469 IU/L, and lipase 303 U/L. Computed tomography (CT) of the abdomen showed intrahepatic biliary ductal distention, hepatic cysts, moderate distention of the gallbladder, gallbladder wall thickening, pericholecystic fluid, biliary distention, common bile duct dilation (1.8 cm) up to the head of pancreas, and small ascites. Chest x-ray showed a right lower lobe pleural effusion with thickening, concerning for empyema. The patient was diagnosed with pancreatitis, biliary obstruction, and pleural effusion and started on ceftriaxone and metronidazole. Magnetic resonance cholangiopancreatography (MRCP) showed intra- and extrahepatic biliary duct dilatation, common bile duct dilation, a cystic mass in the pancreatic head, acute interstitial pancreatitis, and a moderately large loculated pleural effusion. Cytology of thoracentesis fluid was positive for lung adenocarcinoma. CT of the pancreas was concerning for cholangiocarcinoma and endoscopic retrograde cholangiopancreatography (ERCP) with stenting of the right hepatic duct resulted in a temporary improvement in jaundice and a fall in serum transaminase and bilirubin levels. Biopsies of the pancreatic head cystic lesion, main bile duct stricture, and gastric ulcer returned positive for metastatic lung adenocarcinoma, and after worsening abdominal pain and CT evidence of persistent intrahepatic dilatation and increased bilateral pulmonary effusions, a biliary drainage catheter was inserted, and the patient was discharged to home hospice care with a diagnosis of stage IV metastatic lung adenocarcinoma.

Discussion. Biliary stricture secondary to metastatic lesions are infrequently reported. The incidence of lung adenocarcinoma leading to biliary stricture is not well covered in the literature. While outcomes of patients affected with such a disease course are often terminal, it is important to consider this process to best prognosticate for the patient. While management of such strictures can be challenging, it is vital to provide the patient with both symptomatic relief as well as further diagnostic information.

Diffuse Large B Cell Lymphoma Presenting as a Sinus Abscess

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Introduction. Diffuse large B cell lymphoma (DLBCL) represents 31% of non-Hodgkins's lymphomas. The typical symptoms are fevers, night sweats, weight loss, and painless lymphadenopathy. The prognosis is variable and largely dependent on prompt diagnosis.

Case Presentation. We present a case of DLBCL with an atypical presentation. A 63-year-old male returned from overseas and developed symptoms of productive cough, sinus pressure, and headache. He managed his symptoms at home for the first few weeks then presented to an urgent care when his symptoms were not improving. Over the next few weeks, he was treated multiple times for suspected sinus infection and given oral antibiotics. Despite courses of azithromycin, cefpodoxime, and levofloxacin, his sinus symptoms persisted with minimal improvement. Six weeks after the onset of initial symptoms, his headache worsened prompting an ED visit where a CT head showed sinusitis. The next day he developed diplopia and swelling of the left eyelid with proptosis. He re-presented to the ED and was found to have a sphenoid mass on MRI of the brain concerning for a meningioma with abscess. The mass was removed with purulent debris seen and a biopsy was performed. IV antibiotics were initiated with vancomycin, cefepime, and metronidazole to treat the suspected sinus abscess. The patient noted some improvement in sinus related symptoms after mass excision and IV antibiotic initiation. The next day he developed numbness of the left side of his face and part of the right. The physical exam was without any acute changes. CTs of chest, abdomen, and pelvis were done to further investigate for a potential source of infection and revealed soft tissue focus on multiple locations with retroperitoneal lymphadenopathy. The differential diagnosis at that point included infection, IgG4 disease, Erdheim-Chester disease, or lymphoma. An additional biopsy was performed of the mesenteric mass. Both masses were positive for CD10 and CD20 consistent with DLBCL, germinal center type. He was also found to have lymphoma involvement of the CNS and bone marrow. He was diagnosed with double-hit DLBCL with bone marrow, cavernous sinus invasion, and leptomeningeal involvement. The patient was started on chemotherapy inpatient per MARIETTA trial protocol with planned MATRix followed by RICE and eventual plans for stem cell transplant.

Discussion. This case demonstrates the importance of recognizing an atypical presentation of lymphoma. This patient had symptoms consistent with sinus or respiratory infection for weeks but was unresponsive to treatments. The rapid progression of symptoms favored meningeal abscess though further imaging revealed a more diffuse disease process. He had widespread involvement at the time of presentation which confers a worse prognosis. We encourage all providers to consider emergent imaging when presented with ongoing symptoms of persistent sinusitis and development of neurological symptoms.

A Case of Severe Methotrexate Toxicity in Burkitt Lymphoma

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Introduction. Methotrexate (MTX) is an anti-folate metabolite that inhibits dihydrofolate reductase and prevents the reduction of dihydrobiopterin and tetrahydrobiopterin. This leads to nitric oxide synthase uncoupling, increased levels of radical oxygen species, and triggers apoptosis in rapidly dividing cells. This makes MTX an excellent chemotherapy for hematologic malignancies, such as Burkitt's Lymphoma (BL). MTX is a cornerstone in many chemotherapy regimens because of its efficacy in rapidly dividing cells. However, some regimens have higher doses which produce bone marrow suppression, pulmonary toxicity, nephrotoxicity, hepatotoxicity, hematologic toxicity, severe mucositis, and an increased risk of infections. The following case highlights these toxicities in a young patient with BL and strategies to mitigate their effects.

Case Presentation. A 19-year-old Caucasian male with no significant medical history presented to the Emergency Department with abdominal pain, nausea, and non-bilious emesis. His vitals were within normal limits. His initial exam was positive for mild right lower quadrant abdominal tenderness. Initial labs were relatively normal except for mild anemia with Hemoglobin of 12. CT abdomen revealed a 6.6 x 7.5 cm colonic mass with omental thickening, concerning malignancy. Colonoscopy and biopsy revealed high-grade B-cell lymphoma. Pathology demonstrated small and medium cells with a Ki-67 of 98-99%, tingible body macrophages, and morphology consistent with Burkitt Lymphoma. PET/CT highlighted an intensely hypermetabolic colon mass with omental and peritoneal hypermetabolic disease. No hypermetabolic disease was noted outside of the abdomen. He was evaluated by hematology/oncology and admitted for initiation of R-CODOX-M/IVAC (rituximab, cyclophosphamide, vincristine, doxorubicin, and high-dose methotrexate, alternating with ifosfamide, etoposide, and cytarabine). On day 10, he received high-dose IV methotrexate (7650 mg) and vincristine. Despite pre-treatment with IV and oral sodium bicarbonate, he suffered delayed clearance of MTX and acute tubular necrosis. Creatinine peaked at 5.12 on day 15. During this time, he was aggressively treated with IV fluids, oral and IV Bicarbonate, and oral Leucovorin. He experienced severe nausea, frequent emesis, elevated transaminases, and severe mucositis requiring total parenteral nutrition and Hydromorphone PCA for pain. His symptoms and renal function gradually improved with hydration and alkalinization of his urine after day 16. His next cycle of chemotherapy was delayed, and methotrexate was removed from the remainder of his regimen. His creatinine improved to baseline after four weeks.

Discussion. This case highlights the risks of high-dose IV MTX even in young patients. MTX remains a valuable tool in the treatment of malignancy and rheumatologic diseases. Hydration, urine alkalinization, and leucovorin are vital to ensure renal clearance and minimize toxicity. Another tool that was not used in this case is glucarpidase. Glucarpidase is an enzyme that catabolizes extracellular MTX into less toxic byproducts that undergo hepatic excretion. Glucarpidase is extremely expensive and needs to be administered within 96 hours to ensure efficacy. Understanding how to manage its side effects allows providers to mitigate the harm and reduce the risk of permanent damage.

Disseminated Histoplasmosis as a Complication of Long-term Anti-TNF Therapy in a Patient with Crohn's Disease: A Case Report

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Introduction. Crohn's disease (CD) is a chronic inflammatory bowel condition that has various symptoms, including abdominal pain, fevers, diarrhea, and weight loss. Tumor necrosis factor (TNF) inhibitors have revolutionized CD management through effective inflammation control. Nonetheless, due to their immune-suppressing activities, these agents increase the risk of infections, including granulomatous infections. We report a case of disseminated histoplasmosis mimicking flare in a patient in long-term remission on infliximab therapy.

Case Presentation. A 61-year-old man with a history of CD diagnosed 37 years ago, status post right hemicolectomy with ileocolonic anastomosis, in clinical remission on infliximab, developed fevers, night sweats, abdominal pain, and significant diarrhea. He had non-specific abdominal tenderness without other abnormalities on the exam. CD flare was suspected. Initial workup revealed Hemoglobin 9.0 g/dL, CRP 5 mg/dL (Lab range 0-0.5), ESR 75 mm/hr, fecal calprotectin 650 mcg/g. Fecal GI PCR and *C. difficile* toxin were negative. Abdominal CT scan showed thickening of the distal ileum and mesenteric adenopathy. Annual urine histoplasma antigen, collected due to living in an endemic area, returned positive. The diagnosis of disseminated histoplasmosis was made, and he was started on oral itraconazole therapy. Despite adequate dosing and holding of proton pump inhibitors, his abdominal pain and fevers continued so he was admitted to the hospital for ongoing care. After holding PPI, he complained of severe heartburn, sore throat, and tongue pain. Oral examination revealed an infiltrative ulcer of the tongue base consistent with histoplasmosis. He was evaluated by infectious disease and started on intravenous amphotericin B which was continued for two weeks. He then transitioned to oral itraconazole taken two hours after famotidine for one year to prevent recurrence. Colonoscopy (CSP)/Esophagogastroduodenoscopy (EGD) was deferred as the patient's symptoms improved on ambisome therapy. Subsequent visits demonstrated resolution of fever and night sweats, stabilization of weight, and improvement in gastrointestinal symptoms on cholestyramine. Regular surveillance for recurrent Histoplasmosis or Crohn's activity was continued every three months for one year. Urine histoplasma antigen was negative on the six-month check. Repeat EGD/CSP after one year of itraconazole and off infliximab showed mild mucosal inflammatory changes, aphthous erosions in the ileum, and diverticulosis along the entire colon with non-significant histopathological findings. Repeat calprotectin was at 367.

Discussion. TNF inhibitors increase the risk of granulomatous infections. Tuberculosis is the most common granulomatous infection and thus screening is recommended prior to starting immunosuppressive medications and annually thereafter. What is not clear is whether screening for histoplasma is beneficial before starting or during therapy. Typically, histoplasmosis will occur within the first two years of starting anti-TNF therapy. Our case was diagnosed decades after starting infliximab, and after years of showing negative urine histoplasma antigen screening. This case shows the importance of recognizing histoplasmosis can occur decades after anti-TNF therapy and should be considered as a differential in those with CD flare-like symptoms and fevers.

Arthralgias of Unknown Origin: A Puzzling Presentation Beyond Musculoskeletal Causes

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Introduction. Arthralgias is a common presentation that has a broad differential including musculoskeletal, rheumatologic, autoimmune, infectious, or even oncologic etiologies. The details of the presenting patient can help to narrow the differential. We hereby present a case of a middle-aged woman who presented with polyarthralgia, which originally had a seemingly negative initial work-up.

Case Presentation. A 43-year-old female presented as a transfer from an outside hospital where she was admitted for polyarthralgia, with the primary location in her right knee. The patient underwent multiple imaging modalities without explanation of her symptoms. The patient had progressively worsened back, right shoulder, upper extremity, and eventually right knee pain with associated swelling. Knee aspirate had 10,340 white blood cells with 90% neutrophils predominance yet revealed absence of crystals and negative growth on cultures. Inflammatory markers including ESR and CRP were elevated at 70 and 10.78, respectively. High-dose steroids were initiated for suspicion of a rheumatologic source. Due to limited response to steroids and no identified cause of symptoms, she was transferred to our facility.

On repeat history, she stated she had been screened for sexually transmitted infections three months ago yet had a new sexual partner afterwards. Additionally, the screening at that time predated the onset of her symptoms. A urine gonorrhea and trichomonas screen were obtained, which returned positive for *Neisseria gonorrhea* (*N. gonorrhea*) PCR. Intravenous ceftriaxone was initiated. Repeat imaging and arthrocentesis were pursued in the interim, which showed advanced synovitis with effusion, yet fluid cultures were not positive for *N. gonorrhea* until several days. She completed 14 days of intravenous ceftriaxone with resolution of her pain and improved mobility.

Discussion. *N. gonorrhoeae* causes a spectrum of diseases, including gonococcal arthritis, a clinical manifestation of disseminated gonococcal infection (DGI). Classically, gonococcal arthritis is a diagnosis made through arthrocentesis followed by growth of *N. gonorrhoeae* on fluid cultures; although there are cases in which cultures are originally or persistently negative.

This case highlights the importance of obtaining screening for sexually transmitted infections in any patient who is sexually active, despite the patient's age. Acquiring an accurate and detailed sexual history can give further clues into possible new partners, past screening, as well as previous sexually transmitted diseases. Diagnosis of DGI can be obtained through fluid samples, although in several instances, the diagnosis must first be clinically made. Arthrocentesis is characteristically thought to confirm the infection, but in clinical practice *N. gonorrhoeae* isolate will only be present in about 50% of synovial fluid specimens. In these cases, *N. gonorrhoeae* urine PCR paired with clinical history may be the only diagnostic criteria present. Overall, disseminated gonococcal infection has an excellent prognosis if appropriately diagnosed and treated in a timely fashion.

A Diagnostic Conundrum of Pancreaticopleural Fistula: Uncommon Cause of Recurrent Pleural Effusion

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Introduction. Pancreaticopleural fistula (PPF) is a rare but serious complication of chronic pancreatitis, characterized by abnormal communication between the pancreatic duct and the pleural cavity. This condition arises when persistent inflammation, often due to chronic pancreatitis, leads to ductal disruption, allowing pancreatic enzymes to escape into the pleural space. As a result, large volumes of enzyme-rich fluid accumulate, causing significant pleural effusion. After detecting elevated levels of amylase and lipase on pleural fluid, diagnosis of PPF can be confirmed using computed tomography (CT) or magnetic resonance cholangiopancreatography (MRCP). Treatment options include conservative medical management with cessation of oral intake and octreotide, endoscopic intervention with stenting, or, in severe or refractory cases, surgical intervention. Early recognition and appropriate management are crucial to prevent significant morbidity and optimize outcomes.

Case Presentation. A 32-year-old male with a history of chronic pancreatitis secondary to alcohol use, hepatic steatosis, and gastritis presented with shortness of breath and a pleural effusion. He was hypotensive on admission but otherwise stable. Lab results showed a mildly elevated INR and elevated transaminase, alkaline phosphatase, and lipase (496 U/L). A CT scan revealed peripancreatic inflammation. Thoracentesis removed 6 liters of pleural fluid, and a pigtail catheter was placed. Despite conservative treatment for acute pancreatitis, including intravenous pain management and dietary advancement, pigtail catheter output remained elevated (600 mL/24 hours) requiring a second thoracentesis and an additional pigtail catheter. Pleural fluid analysis showed elevated levels of amylase (>3200 U/L) and lipase (>1200 U/L). MRCP confirmed a pancreaticopleural fistula. The patient was made nil per os (NPO) for three days, with octreotide (100 mcg subcutaneously TID) initiated. Feeding slowly transitioned from parenteral to orogastric tube feeding. Fluid output from the pigtail catheters decreased, and they were removed within seven days of starting octreotide. Serial chest X-rays confirmed progressive resolution of the pleural fluid.

Discussion. PPF may present as atypical respiratory symptoms often delaying diagnosis as they mimic common thoracic conditions. Diagnosis of PPF requires a high index of suspicion, particularly in patients with chronic pancreatitis and unexplained pleural effusions. Elevated pleural fluid amylase levels above 1,000 U/L are a key indicator. Imaging, especially MRCP, can confirm the fistulous tract and assesses pancreatic ductal anatomy, while CT scans more typically reveal only peripancreatic inflammation and pseudocysts.

Treatment focuses on conservative measures like bowel rest, octreotide, and nutritional support. If ineffective, endoscopic intervention with ERCP and pancreatic duct stenting may be considered, with surgery reserved for refractory cases. Early diagnosis and treatment are crucial due to PPF's misleading presentation. Awareness of PPF in patients with chronic pancreatitis and respiratory symptoms is essential to avoid delays and improve outcomes.

Unmasking the Mystery: Rare Etiology IgG4-Associated Aortitis

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Introduction. Inflammatory aortitis, inflammation of the aortic wall, is a diverse yet distinct pathologic entity which can occur in isolation or in the setting of known rheumatologic disorders including giant cell arteritis, Takayasu arteritis, systemic lupus erythematosus, and rheumatoid arthritis, among others. Herein, we present a case of another rare etiology of inflammatory arteritis: IgG4-associated aortitis.

Case Presentation. A 64-year-old woman with a history of seronegative rheumatoid arthritis was referred to clinic after work-up of her chronic iron-deficiency anemia and multi-focal arthritis including sacroiliitis with CT identified an ascending aortic aneurysm with mural inflammation measuring 51mm in total diameter with a 9mm thick aortic wall. She denied any constitutional symptoms of fevers, chills, or night sweats, but did endorse fatigue. She was referred to Rheumatology for presumed inflammatory large vessel vasculitis and was started on corticosteroid therapy and tocilizumab but did not tolerate this due to development of a symptomatic left lower lobe cavitary lesion suspicious for aspergilloma. This responded to steroid cessation and antifungal therapy. She was then referred for aortic replacement surgery.

This patient underwent planned ascending aortic and transverse hemiarch replacement involving deep hypothermic circulatory arrest with retrograde cerebral perfusion. Intraoperatively, she was found to have a dense inflammatory periaortic infiltrate enveloping the pulmonary artery and obliterating the plane between aorta and main/right pulmonary arteries. She thus required pulmonary artery angioplasty. Her aortic valve was competent and did not require replacement. Most of her aortic root was spared from inflammation. Her ascending replacement involved external felt reinforcement proximally and distally. Her post-operative course was unremarkable with the exception of low-grade fevers and chills and leukocytosis post-operatively, but she was ultimately discharged post-operative day seven. Her final pathology revealed transmural lymphoplasmacytic aortitis and periaortitis with dense adventitial fibrosis with >50 IgG4+ cells/hpf. She was seen by Rheumatology and started on a prednisone taper and rituximab with prophylactic posaconazole.

Discussion. This case demonstrates the complexity of diagnosing and managing IgG4-associated aortitis. Initially, the patient's presentation and imaging suggested inflammatory large vessel vasculitis, but complications necessitated a reevaluation of the treatment approach. The definitive diagnosis of IgG4-associated aortitis was confirmed through histopathology, revealing high IgG4-positive cell counts and dense inflammatory infiltration. This case highlights the importance of considering IgG4-related disease. The intricate surgical procedure and postoperative management reflect the challenges of addressing both the aortic pathology and secondary complications, such as fungal infections. Long-term management with corticosteroids and rituximab, alongside careful monitoring, is crucial. This case exemplifies the need for a multidisciplinary approach to manage IgG4-associated aortitis effectively.