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# Wisconsin Chapter

## 2019 Abstracts

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**63<sup>rd</sup> Annual Wisconsin Scientific Meeting**  
**Wilderness Resort and Glacier Canyon Conference Center**  
**Wisconsin Dells, Wisconsin**

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# Case Based Vignettes

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## ACUTE MYELOID LEUKEMIA PRESENTING WITH CENTRAL DIABETES INSIPIDUS

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**Background:** Central diabetes insipidus (CDI) is characterized by a deficiency of antidiuretic hormone resulting in an inability to concentrate urine. Acute myeloid leukemia (AML) is the most common type of acute leukemia in adults. The association of AML with CDI is rare and the underlying pathogenic mechanism remains unknown. Here, we present a case of CDI preceding the diagnosis of AML.

**Case:** A previously healthy 71-year-old man presented to his primary care physician with an abrupt onset of polyuria and polydipsia. Physical exam was unremarkable. Laboratory evaluation revealed leukopenia (WBC 2.3 K/uL) and macrocytic anemia (Hb 13.5 g/dL, MCV 101) in the setting of a previously normal CBC. Polyuria was confirmed with a 24 hour urine collection (urine output, 12.5 L/d). A water restriction test followed by a desmopressin challenge was completed and consistent with CDI. MRI of the brain demonstrated lack of the normal posterior pituitary bright spot, which can be seen in CDI. The patient started treatment with desmopressin and had a rapid improvement of his symptoms. Meanwhile, weekly CBCs were obtained given the unexplained leukopenia and anemia. Further laboratory evaluation demonstrated persistent leukopenia, worsening macrocytic anemia, and a progressive thrombocytosis. This ultimately led to a bone marrow biopsy (approximately one month after the onset of CDI) which revealed AML with myelodysplasia-related changes. The patient urgently began treatment with induction chemotherapy. However, despite many lines of therapy he had refractory disease and unfortunately passed away nine months after initial diagnosis.

**Discussion:** The association of CDI as a complication of AML is rare. The onset most commonly precedes initial diagnosis. However, there are several reports of CDI occurring as the first manifestation of relapse. The mechanism of this association is not well understood. Recurrent chromosomal abnormalities have been noted and may predict poor prognosis. The majority of reported cases document resolution of CDI symptoms with initiation of desmopressin. While the association of AML and CDI is rare, clinicians should be prompted to further evaluate subtle hematologic abnormalities in a patient with newly diagnosed CDI and to consider the possibility of an acute leukemia.

## **AN UNUSUAL PELVIC MASS: A CASE OF EXTRAPULMONARY SMALL CELL CARCINOMA OF THE GASTROINTESTINAL TRACT**

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Extrapulmonary small cell carcinoma (EPSCC) is an extremely rare entity, accounting for 1000 new cases in the United State or roughly 2.5-5% of all small cell carcinoma and 0.1-0.4% of all cancers (1). The gastrointestinal or genitourinary tract are the most common sites of EPSCC (1). It is clinically aggressive with 5 year overall survival between 8-15% (1,2). Here we present a case of an 18 year old female with a long-standing history of hereditary spherocytosis and Crohn's disease since age 4 status post total colectomy with end ileostomy who presented with urinary retention, abdominal pain, and fatigue. Pertinent workup demonstrated leukocytosis with a white count of 26 k/uL, acute on chronic anemia with Hgb of 5.8 g/dL (baseline of 8 g/dL), and AKI with serum creatinine of 1.1 mg/dL (baseline of 0.5 mg/dL). CT abdomen/pelvis showed a 13x11x13 cm pelvic mass with retroperitoneal adenopathy, moderate left and mild right hydronephrosis, and small volume ascites. Percutaneous nephrostomy tubes were placed bilaterally. Pelvic mass biopsy demonstrated combined small cell carcinoma (90% of tumor) and moderately differentiated intestinal-type adenocarcinoma (10% of tumor). Pathology was confirmed by a second institution with the final diagnosis of mixed adenoneuroendocrine carcinoma (MANEC). Her hospital course was complicated by generalized seizures and a head MRI showed leptomeningeal enhancement suggestive of metastatic spread; lumbar puncture was non-diagnostic. Given poor surgical candidacy, chemotherapy with carboplatin and etoposide was started. She developed a neutropenic fever with pelvic abscess formation which improved with IV antibiotics and drain placement. Interval re-staging imaging showed moderate improvement of tumor burden. The plan was to continue chemotherapy with a goal for possible resection and radiation therapy. Disease progression occurred after 3 cycles of chemotherapy, so treatment was changed to palliative radiotherapy. Given functional decline, the patient ultimately opted for hospice. EPSCC is a rare and aggressive malignancy, often occurring with other tumor types. EPSCC, as well as MANEC, has not been previously described in correlation with Crohn's. Patients with IBD diagnosed in childhood have an increased risk of colon and small bowel malignancy, possibly 40x higher than the general public (3). While the histologic subtype was unusual, this is an excellent reminder that IBD survivors require increased cancer surveillance even at a young age.

## WHATS WRONG WITH YOUR EYE? A RARE CASE OF GPA!

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**Introduction:** Granulomatosis with polyangiitis (GPA) is a systemic autoimmune disease causing vasculitis and granulomas of small and medium sized blood vessels. Most patients present with respiratory symptoms, however other areas that can be affected including the kidneys, skin, eyes, and the nervous system. We present a rare case of GPA initially presenting primarily with ocular symptoms and limited systemic symptoms.

**Case Description:** A 71-year-old patient with a past medical history of BPH, renal cyst, and diverticulosis developed progressive eye irritation and erythema consistent with conjunctivitis that failed to improve with topical steroids and cycloplegic drops. He developed progressive eye pain, redness, and photosensitivity as well as headache, weakness, fever and tachycardia prompting admission to the hospital. He was diagnosed clinically with necrotizing scleritis and additional work up revealed an elevated ESR (82), positive c-ANCA (1:160), high titer PR-3 (196), and UA with hematuria and proteinuria. CT showed bilateral mastoid effusions, moderate pericardial effusion and bilateral pleural effusions. A 600mL pericardiocentesis showed hemorrhagic pericarditis. Infectious workup was negative and other workup included a normal creatinine, negative Anti-MPO, RPR, HIV, ANA, RF, CCP, ACE, SPEP and complement. The findings of necrotizing scleritis, mastoid inflammation, hemorrhagic effusion, microscopic hematuria, with a positive C-ANCA and high PR3 were consistent with a diagnosis of GPA. Due to his rapidly progressive scleritis, the patient was started on prednisone 60mg daily with improvement and Rituximab was initiated as an outpatient. Close follow up with rheumatology and ophthalmology were arranged.

**Discussion:** GPA typically affects Caucasians between 65 and 74 years of age with the most common complications including necrotizing granulomas of the respiratory tract, necrotizing glomerulonephritis, or necrotizing vasculitis leading to skin complications. ANCA is positive in over 90% of patients with GPA and 80-90% of patients with GPA and a positive ANCA have positive PR3-ANCA. Ocular involvement is less common but has been seen in up to 58% of patients with GPA and can include conjunctivitis, episcleritis, scleritis, ulcerating keratitis, uveitis, retinal vasculitis, retinal artery occlusion, and optic neuropathy. Ocular findings can occur with or without systemic manifestations and can represent the first sign of the disease as was seen in this case. The presentation of GPA can be broad and the disease should be considered in the differential for necrotizing scleritis.

## **SINUSOTOMY TO THE RESCUE**

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**Introduction:** Pott's puffy tumor is an osteomyelitis of the frontal bone associated with a sub-periosteal abscess. It is a potentially life-threatening complication of untreated frontal sinusitis.

**Case Description:** A 65-year-old female with a history of chronic sinusitis presented with 2 months of frontal headaches and a progressively enlarging soft tissue mass in the center of her forehead, as well as new onset drainage from the mass. She had a recent minor forehead laceration that was repaired in the ED. On exam, a soft tissue mass slightly to the right of the midline measuring 4.2 X 2.2 X 6.3 cm with purulent discharge was noted. Other than mildly elevated ESR and CRP, the laboratory findings were unremarkable. CT scan of the sinus and MRI of the orbits showed complete opacification of the right frontal and right maxillary sinus, with a large communicating subcutaneous fluid collection. With these findings and history, a diagnosis of Pott's puffy tumor was made. The patient was admitted and started on IV ceftriaxone, clindamycin and micafungin. On Day 3 of hospitalization, she underwent a sinusotomy and resection of the lesion. Intraoperative cultures of the fluid and sinuses were obtained, which yielded *Prevotella loescheii* and *Staphylococcus epidermidis*. She was discharged without complications on Day 7 of hospitalization with 8 weeks of oral trimethoprim-sulfamethoxazole.

**Discussion:** Pott's puffy tumor is an uncommon complication of a common disease with risk of fatal intracranial complications. This case illustrates the need for prompt diagnosis and combined treatment of surgical drainage and IV antibiotics to prevent fatal outcomes.

## **SPINAL EPIDURAL ABSCESS DUE TO PASTEURELLA MULTOCIDA- CASE REPORT AND LITERATURE REVIEW**

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**Background:** *Pasteurella multocida* is a gram negative coccobacilli making up the normal flora of oral cavities of many wild and domestic animals. Cat or dog bites, as well as scratches or licks on open wounds, can cause transmission of the bacteria to humans. It has been reported to cause a variety of clinical manifestations, however, we report a case of spinal epidural abscess caused by a cat bite, in an immunocompetent person with no other manifestations of the disease process.

**Case presentation:** A 66 year old man presented with severe back pain for 4 weeks and a cat bite mark on his distal left forearm. Pain was localized to the lumbar spine, radiating to the flanks, only partially relieved by Tylenol, Advil and epidural steroid injection. On physical examination there was pain on bending, tenderness on palpation of L3 vertebra; neurological examination showed no inconsistencies. MRI with contrast of the spine indicated the presence of an epidural abscess. Aspiration and culture of the abscess identified *Pasteurella multocida* as the causative agent. The patient received ceftriaxone during hospitalization and was discharged home on ceftriaxone therapy for two months with a follow up visit after 8 weeks of continued therapy.

**Conclusion:** *Pasteurella multocida* has been reported to have caused meningitis and abscesses in extremes of ages however an epidural abscess has not been previously reported in an immunocompetent individual as per our literature review. Cat and dogs bites are often under reported and treated at home; as per our case report, these can have serious repercussions. Therefore, it is essential that such cases receive appropriate medical attention.

## **BLEEDING ARTERIOVENOUS MALFORMATION AND AORTIC STEONIS IN AN ELDERLY PATIENT: REVISITING HEYDE SYNDROME**

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**Introduction:** The association between Aortic stenosis and gastrointestinal bleeding (GIB) due to arteriovenous malformation (AVM) has been reported as far back as 1958<sup>1</sup>. This observation is based on the finding that resolution of bleeding follows valvular replacement in > 90% of cases<sup>2</sup>.

**Case:** An 89-year-old male with history of chronic GIB secondary to AVMs presented to the emergency department with complaints of increased lethargy for the past several days with hemoglobin of 5.4. Patient had been receiving thrice weekly ambulatory blood transfusion and quarterly enteroscopy with Argon Plasma Coagulation for the past 4 years for bleeding AVMs. Recent transthoracic echocardiogram was remarkable for moderate aortic stenosis. Up until this point, no clear etiology was established for the bleeding AVMs. Given the concurrent finding of AVMs and moderate aortic stenosis, patient was considered for transaortic valve replacement consultation, however, given his recently diagnosed renal cancer, patient and family opted for comfort-directed care.

**Discussion:** Heyde syndrome was first described in 1958 as the triad of AVM, aortic stenosis and coagulopathy<sup>3</sup>. The association was borne out of the observation that a disproportionate number of elderly patients with AVMs had concomitant severe aortic stenosis. Pathophysiologically, it is theorized that aortic stenosis causes GIB via Von Willebrand factor dysfunction and hypoxia leading to ectasia of colonic vessels<sup>4</sup>. Furthermore, studies have demonstrated resolution of bleeding in 93% of cases following valvular replacement<sup>2</sup>. Thus, early recognition of this association in the elderly is essential for a timely intervention to mitigate the predictable increased morbidity and mortality associated with chronic GIB in this vulnerable population.

## A CASE OF CEREBRAL MALARIA IN A RETURNING TRAVELER: A CALL FOR VIGILANCE WITH CHEMOPROPHYLAXIS AMONG HEALTHCARE PROVIDERS

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Cerebral malaria (CM) is a severe form of malarial disease and occurs when parasitemia exceeds 5%. This complicates up to 7% of all *P. falciparum* malaria cases. Mortality is estimated to range from 30% to 50%. Symptomatology of CM includes a febrile encephalopathy with neurologic symptoms including severe headache, seizures, edema, or coma. Most survivors have no neurologic abnormalities, however untreated can progress to death within hours to days.

We present a 23-year-old nursing student who presented with fever, altered mental status and septic shock 2 weeks after returning from Guinea. Yellow fever vaccination and malaria chemoprophylaxis status was not known, upon presentation. She was intubated for airway protection and needed vasopressors. Physical examination was remarkable for mild splenomegaly; however, the patient did not have neck stiffness, pharyngeal injection or exudates, lymphadenopathy, rashes, petechiae or significant respiratory, cardiovascular or abdominal findings. Laboratory evaluation revealed metabolic acidosis, acute renal injury, hemolytic anemia, severe thrombocytopenia, and transaminitis (table 1). Preliminary blood smear showed ring-shaped trophozoites (figure 1), consistent with *P. falciparum* infection with parasitemia >20%. The patient was diagnosed with cerebral malaria and was treated with quinidine and doxycycline, transitioning to malarone and doxycycline for a total of 7 days. She improved rapidly, discharged stable and had been attending school by the time she returned for infectious disease clinic follow up. Patient endorsed that she did not take malaria chemoprophylaxis prescribed by the travel clinic.

This case underscores the importance of malaria chemoprophylaxis, even in individuals native to endemic areas as immunity to malaria wanes with time. Residents of malaria non-endemic regions who return to visit friends and relatives (VFRs) residing in endemic regions remain at high risk.



## TOO YOUNG TO HAVE A STROKE?

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**Introduction:** Stroke is a condition usually seen in elderly individuals with multiple cardiovascular risk factors. Thereby, it is often disregarded as a possibility in younger patients, potentially leading to misdiagnosis.

**Case Presentation:** A previously healthy 18-year-old female presented to the emergency room after suddenly developing weakness and paresthesias in her left arm, leg and face during gym class. Associated symptoms included generalized headache. Her only medication was a combined oral contraceptive which she started two months prior. Non-contrast CT scan of the head was unremarkable. Her symptoms were initially attributed to dehydration and she was discharged. Six hours later, she returned without improvement of her symptoms. Neurologic exam revealed unchanged findings except for left homonymous hemianopsia, which was missed initially. Her NIHSS was 6. CT angiogram of the head and neck showed focal thromboembolic occlusion of the right posterior cerebral artery. She was not considered a candidate for tPA or endovascular interventions and was managed medically. Further interview revealed a history of unprovoked pulmonary embolism in her mother and multiple strokes in her grandfather. Transthoracic echocardiogram showed evidence of shunt with Valsalva and transesophageal echocardiogram confirmed a patent foramen ovale. Hypercoagulable workup was unremarkable aside from elevated factor VIII activity of 231%. She was discharged to inpatient rehabilitation and achieved remarkable improvement in her strength and functionality.

**Discussion:** Amidst the push for high value care nationally, this case serves as a cautionary tale. Although stroke in young healthy individuals is quite uncommon, clinicians should always maintain a high degree of suspicion especially given classic features such as in this patient. In addition, elevated factor VIII activity has been associated with increased risk for VTE. The benefits of starting anticoagulation for such patients should be weighed against the risks.

# Research Based Vignettes

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## **CORRELATION BETWEEN SERUM SODIUM LEVELS AND AMBULATORY BLOOD PRESSURES**

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**Background:** Sodium intake contributes to blood volume, cardiac output and indirectly to blood pressure. Management approaches for hypertension include limiting sodium intake to 2g/day. However, the association between in vivo sodium levels and blood pressure is not well established. We hypothesize that serum sodium will be moderately correlated with ambulatory blood pressure.

**Methods:** We obtained 77093 ambulatory blood pressure readings from 39261 patients and serum sodium levels. We ran a correlational analyses to determine the kappa statistic between sodium levels and mean arterial blood pressure.

**Results:** The kappa statistic for our correlation analysis was 0.064. There was no correlation between serum sodium levels and ambulatory blood pressures.

**Conclusion:** Contrary to our hypothesis, there was no correlation between serum sodium levels mean arterial blood pressures. Perhaps, it is sodium intake that determines the blood pressure or that blood pressure is a complex interplay of several other factors.

## URINE MY HEART

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An 86-year-old woman with history of atrial fibrillation, aortic stenosis, and hypertension presented to the emergency department due to altered mental status. She was lethargic, confused and not answering questions appropriately for the past four days. On arrival she was afebrile, pulse 139 beats per minute, blood pressure 110/79 mmHg, respiratory rate 16 breaths per minute with saturation 96%. Physical exam significant for slow to respond female, orientated to self who was able to follow commands with no focal neurological deficit. Skin was warm, well perfused with normal capillary refill with no rashes or petechiae. Cardiovascular exam significant for tachycardia, irregular heart rhythm and systolic murmur heard best at the right upper sternal border. She had lower extremity pitting edema bilaterally. Labs notable for white blood cell count (WBC)  $25.2 \times 10^3$  uL, hemoglobin 11.0 g/dL, platelets  $58 \times 10^3$  uL, troponin 0.164 ng/mL, lactic acid 2.5 mmol/L and basic chemistry within normal limits. Blood cultures obtained and urine analysis remarkable for WBCs, leukocyte esterase and bacteria. Electrocardiogram significant for atrial fibrillation with a rapid ventricular rate. She was admitted to the hospital and started on ceftriaxone. Further diagnostics included lower extremity Doppler positive for deep venous thrombosis (DVT). Bedside echo noted right ventricular strain and N-terminal proB-type natriuretic peptide level was elevated. The patient was started on continuous heparin infusion for DVT with concern for possible pulmonary embolism. A transthoracic echocardiogram revealed severe aortic valve calcification with new aortic insufficiency. Blood and urine cultures returned positive for *Aerococcus urinae*. A transesophageal echocardiogram revealed moderate to severe aortic regurgitation with findings suggestive of infective endocarditis (IE). Antibiotics expanded to include gentamicin with ceftriaxone for IE and surgical evaluation consulted. No surgical intervention performed and intravenous antibiotics continued at discharge.

*Aerococcus urinae* is a gram-positive coccus often identified in cystitis or urinary tract infections. Risk factors include older age, male sex and pre-existing urinary tract abnormalities including strictures or benign prosthetic hyperplasia. In addition to IE, *A. urinae* may result in pyelonephritis, joint infections, discitis, lymphadenitis, or embolization to the brain. While IE is not a common presentation of aerococcal infections, more cases are being identified due to improved methods of pathogen speciation. Due to rarity and lack of studies, standard treatment of aerococcal IE is not well understood. Early identification among those with risk factors is important in reducing the risk of disseminated aerococcal infections.

## PERCEPTION AND EXPERIENCES OF COMPASSION FATIGUE AMONG MEDICAL STUDENTS DURING CLINICAL ROTATIONS

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**Background:** Compassion fatigue is a form of occupational stress which occurs when individuals are exposed to suffering and trauma on an ongoing basis. It is proven to affect medical providers at all levels, but has not been studied in medical students. This study was designed to explore compassion fatigue among medical students (M3 and M4) at MCW during clinical clerkship.

**Methods:** A questionnaire was administered to 403 medical students at MCW. The survey questionnaire assessed student's perception, experiences, and management of compassion fatigue during clinical rotations. We also assessed perceived factors contributing to CF and possible interventions at the curricular level to combat it. Responses were obtained on a 5-point Likert scale and the data was analyzed as respective frequencies and percentages.

**Results:** One hundred and ten (27%) of the 403 medical students completed the survey. 78% of M3 and 69% of M4 reported compassion fatigue ( $p=0.27$ ). 72% of females and 77% males reported feeling CF ( $p=0.50$ ). Majority of the students reported high patient load (83%), lack of support from colleagues and medical school (including attendings and seniors) (83%), and clinical and social situations of the patients as main factors. Talking to other students, spending time with family/friends and activity to clear mind were some of the reported coping strategies. 42% students reported dreading to go to work as a result of feeling CF. Majority of students felt that having small group discussions and sharing personal stories in large groups (reflective writings) as possible interventions to combat compassion fatigue among students during clerkship.

**Conclusion:** From this survey based study it is clear that students experience compassion fatigue and this has a psychological effect on their wellbeing and ability to learn in the clinical practice setting. Medical schools and educators need to find ways to provide support in both clinical and university settings. There is a need for innovation in curriculum to support exploration of student's feelings, build resilience and effective ways of coping. Moving forward, priorities for research include: continued data gathering from medical students, potentially assessing residents/attendings, and working with administration to combat compassion fatigue in medical students on a curricular level.

## LONG-TERM OUTCOMES AND SURVIVAL IN PORTOPULMONARY HYPERTENSION PATIENTS AFTER LIVER TRANSPLANT

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**Background:** Portopulmonary hypertension (PoPH) is a type of pulmonary arterial hypertension (PAH) observed in cirrhotic patients who have evidence of portal hypertension and right heart catheterization (RHC) showing elevated mean pulmonary artery pressure (mPAP) and elevated pulmonary vascular resistance (PVR). The prevalence of PoPH in cirrhotic patients ranges from 5% - 9.4%. Five-year survival without medical therapy is estimated between 14-28%. Moderate-severe PoPH (mPAP >35 mmHg, PVR >240 dynes/cm<sup>5</sup>) is a contra-indication to orthotopic liver transplant (OLT) due to high perioperative mortality (~50%), but patients who are optimized with PAH medical therapy can become eligible for OLT.

**Methods:** We performed a retrospective analysis of moderate-severe PoPH patients seen in the UW Pulmonary Clinic from 2005-2019. We identified 24 patients optimized with PAH medical therapy who underwent subsequent OLT, and 24 patients who received only PAH medical therapy.

**Results:** In the medical therapy plus OLT cohort, 41.6% (10/24) were optimized with oral therapy alone. Median time from medical therapy initiation to OLT eligibility was 6.53 months. At PoPH diagnosis compared to time of OLT eligibility, mean mPAP decreased from 47.08 to 33.43 mmHg ( $p<0.05$ ), mean PVR decreased from 517.04 to 177.37 dynes/cm<sup>5</sup> ( $p<0.05$ ), and mean cardiac output increased from 6.24 to 9.09 L/min ( $p<0.05$ ). Statistically significant improvements were also seen in the right ventricle (RV) size and RV function on transthoracic echo (TTE). In the medical therapy plus OLT cohort, 6 month, 1, 3, and 5 year survival post-transplant were 86.9% (20/23), 85% (17/23), 84.2% (16/19), and 80% (12/15), respectively. 65% (13/20) of the surviving patients were able to come off all PAH medical therapy post-transplant, median time of 14.06 months. In the medical therapy only cohort, 6 month, 1, 3, and 5 year survival from medical therapy start date were 95.8% (23/24), 57.1% (12/21), 42.1% (8/19), and 17.6% (3/17), respectively.

**Conclusions:** This is the largest single-center study to date to evaluate long term outcomes of moderate-severe PoPH patients after optimization with medical therapy followed by liver transplant. Oral PAH medical therapy can be effective treatment to qualify a patient for OLT. Our study shows significant improvement in long term survival in the medical therapy + OLT cohort relative to the medical therapy only cohort and the reported natural history of PoPH. OLT was curative in a majority of our patients.

## **A DOUBLE-EDGED SWORD: THE DEVELOPMENT OF ENDOCRINOPATHIES IN PATIENTS ON NIVOLUMAB**

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The immunotherapy drug nivolumab works as a PD-1 checkpoint inhibitor in the treatment of malignancies including non-small cell lung cancer (NSCLC), renal cell cancer (RCC), malignant melanoma, and small cell lung cancer. Among the known side effects of nivolumab are endocrinopathies, including thyroiditis, diabetes, adrenal insufficiency, and hypophysitis. In our study, we looked at the patient population treated with nivolumab at Gundersen Health System from 2010 to 2018, and whether they developed endocrinopathies. Our study examined a patient population of 108 patients. Categorical comparisons utilized Pearson's chi-square and Fisher's exact tests. Overall survival was compared via a multivariate Cox proportional hazards regression model. All analyses were performed using SAS 9.4.

About 18.5% of patients reviewed developed endocrinopathies, 95% of which (19/20) were thyroiditis. Of those 19 patients with thyroiditis, one also had hypophysitis (5%), and one developed adrenal insufficiency (5%). The remaining patient developed diabetes (5%). 55% of these patients were female (11/20) and 45% were male (9/20). All of these patients were treated with appropriate hormone replacement. Median survival time for all patients was 2.5 [1.7-3.8] years. After controlling for stage of cancer at diagnosis via multivariate survival analysis, development of endocrinopathy was associated with enhanced overall survival (Hazard Ratio 0.40 [0.18 – 0.90],  $p = 0.03$ ).

Due to the small sample size, it was difficult to determine if prior immunotherapy, chemotherapy, radiation, or history of autoimmune disorders predisposed patients to endocrinopathies. Elements like these could be used for detection of endocrinopathy-susceptible patients and warrants further research. Further studies will be needed to confirm an association between the development of endocrinopathies and decreased mortality.

# Displayed Posters

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# 1) SEVERITY OF CYTOKINE RELEASE SYNDROME AS A PREDICTOR OF INFECTIONS AFTER T-CELL REPLETE HAPLOIDENTICAL HEMATOPOIETIC CELL TRANSPLANTATION (HAPLOHCT)

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**Introduction:** HaploHCT is a common alternative donor graft source for patients with hematological malignancies. A sepsis-like hyper-cytokine state referred to as cytokine release syndrome (CRS), similar to CRS with chimeric antigen receptor T-cells, has been described following haploHCT. The understanding of the pathophysiology of CRS occurring in the setting of haploHCT is mainly extrapolated from studies investigating T-cell therapies.

**Objectives:** Given the distinct biology of CRS in haploHCT, understanding the infectious complications as a function of severity of CRS is critical.

**Methods:** We evaluated 78 consecutive adult haploHCT recipients at our center for development of CRS and examined the incidence of infections in correlation with CRS severity. All patients received haploHCT for malignancies (mostly hematologic) between 04/2012-04/2018, using post-transplant cyclophosphamide (PTCY) and tacrolimus/mycophenolate mofetil for graft-versus-host disease prophylaxis. The incidence of infections was examined in two separate time periods in relation to the day of stem cell infusion (day 0): day 0-100 (early) and day 101-180 (late).

**Results:** Among the 78 patients included, 41 (53%) developed grade 0-1 CRS and 37 patients (47%) developed grade 2-5 CRS. Overall, 61 patients (78%) experienced early infections whereas 19 patients (27%, n=70) experienced late infections. In the first 180 days, blood-stream infections (BSI) were seen in 10% (n=4) of patients with grades 0-1 CRS and 46% (n=17) in the CRS 2-5 cohort ( $P<.001$ ), with similar proportions of central line-associated BSI (CLABSI) in both cohorts ( $P<.001$ ). There was evidence for an increased rate of viral infections in patients with CRS grade 2-5 (81% vs 61% in the CRS 0-1;  $p=0.05$ ), mainly driven by an increased frequency of BK viruria in CRS grade 2-5 patients (46% vs. 24%,  $p=.046$ ). There was no statistically significant difference in the incidence of fungal infections in the first 180 days in correlation with severity of CRS.

**Conclusion:** Infections are common post-transplant complications in the first 6 months. The severity of CRS developing after haploHCT using PTCY-platform is associated with increased frequency of BSI, including CLABSI. Viral and fungal infections do not have a higher risk post-haploHCT based on CRS severity.

## 2) IDENTIFICATION OF A NOVEL ENTEROBACTER CLOACAE ISOLATE PRODUCING AN IMP-13 METALLO-BETA-LACTAMASE: FIRST HOME-GROWN REPORT FROM THE MIDWEST

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**Background:** Metallo- $\beta$ -lactamases (MBLs) have been identified as emerging resistance determinants in *Enterobacteriaceae*, *A. baumannii*, and *P. aeruginosa*. Early identification of carbapenemase-producing organisms (CPOs) is essential to prevent dissemination within healthcare settings. We report a case of a patient who was blood culture positive for a multidrug resistant *E. cloaca* which was subsequently found to be positive for the MBL *bla*<sub>IMP-13</sub>.

**Methods:** A 74-year-old female, with no significant past medical or travel history, developed sepsis 2 days after undergoing debulking surgery for stage IIIc ovarian carcinoma. Blood cultures were positive for gram-negative bacilli and the organisms identified as *Enterobacter* spp. with *bla*<sub>IMP</sub> MBL (Verigene). Antimicrobial susceptibility testing demonstrated high-level resistance to all penicillins, ureidopenicillins, cephalosporins, and beta-lactam/inhibitor antibiotics, and susceptibility to colistin, tigecycline, and monobactams.

**Results:** Further testing using micro-broth dilution, BD phoenix, and Etest, demonstrated susceptible MICs to meropenem and imipenem, with intermediate to resistant MICs to ertapenem. The patient was treated with a combination therapy of amikacin, aztreonam, and ceftazidime-avibactam and responded clinically.

Per standard protocol, the organism was sent to WI Laboratory of Hygiene for further characterization. Phenotypic testing using the modified carbapenem inactivation test (mCIM) was positive, indicating the presence of a carbapenemase; however, results using Xpert CarbaR (Cepheid) were negative. Subsequent sequencing of the isolate confirmed the presence of *bla*<sub>IMP-13</sub>.

**Conclusion:** This was an important case for several reasons. First, *bla*<sub>IMP-13</sub> is historically reported in *Pseudomonas aeruginosa*. Indeed, this was the first report of *Enterobacteriaceae* harboring *bla*<sub>IMP</sub> in WI. Second, it had unique susceptibility pattern to carbapenems and was not detected by the CarbaR. Third, these data demonstrate clinical success in treating an MBL CPO with a combination anti-microbial regimen, based on an understanding of resistance mechanisms involved. This report calls for more vigilant screening for CPO using both phenotypic and genotypic methods.

### 3) METHIMAZOLE INDUCED AGRANULOCYTOSIS IN THE SETTING OF AMIODARONE INDUCED THYROTOXICOSIS

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**Introduction:** Adverse reactions are serious and potentially life threatening side effects of prescribed medications. Two well documented adverse reactions are agranulocytosis induced by antithyroid drugs (ATDs) and thyrotoxicosis induced by amiodarone. Described is an unfortunate case of one patient who developed both these adverse reactions.

**Case:** This is a 67 year old male with a history of coronary artery disease, ischemic cardiomyopathy, and atrial fibrillation who developed methimazole induced agranulocytosis and amiodarone induced thyrotoxicosis. The patient originally presented in atrial fibrillation with rapid ventricular response (RVR) despite taking amiodarone (he had been taking it for the past two and a half years). His lab work was notable for elevated T3 and T4 levels. Amiodarone was discontinued, and the patient was subsequently discharged on methimazole and prednisone for medical management of his thyrotoxicosis. The patient again presented in atrial fibrillation with RVR. The patient was then scheduled for a total thyroidectomy, however, prior to surgery the patient developed agranulocytosis. Methimazole was discontinued and the white blood cell count (WBC) continued to downtrend off methimazole with nadir WBC of 0.3 with ANC 0.00. The patient was treated with G-CSF and his ANC normalized. The hospital course was complicated by neutropenic fever and hypotension. The patient eventually underwent a total thyroidectomy.

**Discussion:** This case highlights the importance of monitoring for adverse reactions from medications. In the United States. Between 3 to 5 percent of patients treated with amiodarone develop hyperthyroidism, mostly four months to three years after initiation of drug. The prevalence of agranulocytosis with thionamide therapy (including methimazole) is 0.2 to 0.5%.

According to a recent retrospective cohort study, there is an increased risk of developing ATD in those patients with complications from AIT. It is imperative to recognize that patients with AIT being treated with ATD may be at increased risk for agranulocytosis.

## 4) METHEMOGLOBINEMIA SECONDARY TO CYTOCHROME B5 REDUCTASE DEFICIENCY

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**Introduction:** Methemoglobin is formed when heme iron is oxidized from a ferrous ( $\text{Fe}^{2+}$ ) to ferric ( $\text{Fe}^{3+}$ ) state, resulting in decreased oxygen-carrying capacity and tissue hypoxia. Most cases of methemoglobinemia are acquired due to administration of oxidizing agents. However, methemoglobinemia can rarely occur in the setting of inherited mutations affecting heme iron metabolism.

**Case:** A 47-year old Hispanic man with no significant medical history presented with a three-week history of fever. One week prior to presentation, he was diagnosed with pneumonia and completed a five-day course of azithromycin. Despite antibiotic treatment, his fevers persisted. He had been taking acetaminophen for fevers but denied additional medication use. Upon evaluation, he was found to be hypoxic by pulse oximetry with  $\text{SpO}_2$  of 85% with perioral cyanosis. A methemoglobin level was found to be elevated at 25.6%. Methylene blue was administered with improvement in his oxygenation and methemoglobin level. He had an extensive workup for fever of unknown origin, including testing for bacterial, viral, and fungal pathogens, autoimmune serologies, CT imaging of the chest/abdomen/pelvis, echocardiography, and bone marrow biopsy, which did not yield a cause of his fevers. A congenital methemoglobin evaluation was consistent with inherited cytochrome b5 reductase deficiency. Eventually, the patient's fevers resolved spontaneously, and his methemoglobin level remained stable in the 7.0-9.0% range.

**Discussion:** Cytochrome b5 reductase is an enzyme that functions in the reduction of methemoglobin. Cytochrome b5 reductase deficiency is inherited in an autosomal recessive fashion and is classified into two types. Type I causes mild methemoglobinemia, typically with cyanosis being the only clinical abnormality; treatment is usually unnecessary, but methylene blue can be used to treat severe methemoglobinemia, which is defined as methemoglobin levels  $>30\%$  or  $>20\%$  if symptomatic. Type II is characterized by progressive neurologic abnormalities in addition to methemoglobinemia, for which there is no effective therapy.

## 5) TOXIC EPIDERMAL NECROLYSIS OR PARANEOPLASTIC PEMPHIGUS, A DIAGNOSTIC DILEMMA

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**Case:** A white male in his 60s with past medical history of CLL presented to the hospital with erythroderma covering >90% of his body. He developed a rash lasting 4 months after initiating ibrutinib (irreversible inhibitor of Bruton's tyrosine kinase) chemotherapy. After discontinuing ibrutinib, the rash continued to worsen with new sores involving the oral mucosa. His only medications at admission were daily aspirin and prednisone. On physical examination, he had crusted erosions on his lips and buccal mucosa, as well as ocular injection and crusting in periocular areas. He had erythematous papules coalescing into plaques with erosions on the trunk, scalp, face, and extremities, and atypical targetoid lesions and vesicles on the distal extremities. There was pitting edema of all extremities. His palms, soles, and genitalia were spared. Punch biopsies of the left dorsal arm and infraumbilical abdomen showed interface dermatitis with focal epidermal necrosis, dyskeratosis, and lichenoid dermatitis with follicular extension. ANA, RF, and DIF were negative. He was treated with prednisone, doxycycline, oral rinses of dexamethasone and nystatin, and corticosteroid wet wraps, and began showing improvement over the course of 3 days.

**Discussion:** Toxic Epidermal Necrolysis (TEN) is a severe mucocutaneous reaction most commonly associated with medication use, particularly NSAIDs, antibiotics, anticonvulsants, and allopurinol. TEN is rare, occurring in only 1-2 people per million, but is a serious, life-threatening condition. Mortality rates are as high as 25-35%. PNP is a rare autoimmune skin disease associated with CLL and other neoplasms. It has a mortality rate up to 90%. It has also been shown to be triggered by drugs, including fludrabin and bendamustine. Based on the presentation and negative DIF, this patient most likely had TEN, but PNP could not be ruled out. TEN and PNP can both present similarly with painful oral mucosal erosions and crusting on the lips and widespread cutaneous involvement with erythema, erosions, and plaques. Given the timeline of chemotherapy with ibrutinib, and the severe rash the patient developed, ibrutinib must be considered as a potentiating factor in the patient's symptoms. Physicians must be mindful of tyrosine kinase inhibitors as potential causes of TEN and PNP.

## **6) INSULT TO INJURY: IATROGENIC TOXICITY ON CIRRHOSIS**

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Hyperbilirubinemia is a common symptom of numerous disorders with varying etiologies ranging from hemolytic process, bilirubin overproduction, impaired conjugation, to hepatic and biliary tract obstruction. It is imperative to narrow the differential to evaluate and address the underlying condition.

A 72-year-old African-American male with a past medical history of Child Pugh Class B cirrhosis, presented with abdominal discomfort secondary to ascites. He had only recently been diagnosed with cirrhosis given minimal physician follow-up and was in the process of transplant work-up. In this time, he required multiple hospitalizations for therapeutic paracenteses of recurrent ascites. On examination, patient was cachectic, with scleral icterus, jaundice, and his abdomen was distended and tender. Labs were notable for indirect hyperbilirubinemia, while aspartate aminotransferase, alanine aminotransferase, and alkaline phosphatase were normal. Bloodwork was not revealing of any hemolytic process. Abdominal ultrasound showed mild cholelithiasis and gallbladder thickening but was not grossly concerning for cholecystitis. Magnetic Resonance Cholangiopancreatography revealed no ductal dilatation. Labs done at previous admission were negative for anti-smooth muscle antibody and anti-mitochondrial antibody. Furthermore, post-hepatic obstructive outflow was deemed less likely given that the elevation was more indirect in nature. At this point it was hypothesized the hyperbilirubinemia might be attributed to Rifampin, which had been started a few weeks prior, during his liver transplant work-up. The Rifampin was discontinued, and the patient's bilirubin levels returned to baseline.

Rifampin is commonly used in conjunction with other anti-tuberculosis medications but is rarely used alone to avoid development of resistance. While hepatotoxicity is a well-known side-effect of these drugs, a rare potential side effect of Rifampin is a prominent increase in both direct and total bilirubin within a few weeks of starting therapy without evidence of liver injury. This is due to the induction of multiple hepatic enzymes, affecting the transport of conjugated bilirubin. While this is a rare effect from Rifampin that is likely limited to those with significant underlying liver disease or liver enzyme mutations, understanding Rifampin's metabolism and potential to cause this reaction can lead to timely identification and potentially avoid unnecessary workup.

## **7) HERPETIC OPTIC PERINEURITIS PRESENTING AS CLASSIC ABDUCENS NERVE PALSY: A VIDEOGRAPHIC CASE REPORT**

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Herpes zoster optic perineuritis is a rare manifestation of herpes zoster ophthalmicus (HZO) that may simultaneously occur when inflammation spreads from the ganglion of Gasser to the ophthalmic branch of the trigeminal nerve. Robust clinical examination allows early detection of such rare, metachronous manifestation of cutaneous HZ and institution of timely management for such sight-threatening conditions.

A 55-year-old woman presented acutely with double vision in the right eye. Physical examination was remarkable for deviation of the right eye toward the midline and she was unable to abduct it laterally past central gaze (Video). She was found to have an isolated abducens nerve palsy clinically and enhancement of right optic nerve sheath, without optic nerve damage, radiographically (Figure 1). This was preceded by vesicular eruption over her eye and forehead (Figure 2) and ipsilateral frontal headache. She was treated with IV acyclovir 10mg/kg/dose every 8 hours for 7 days followed by another week of oral valacyclovir. Upon early follow-up after discharge, the patient's rash and headache had resolved while diplopia was still persistent. Optic perineuritis, a very rare, sight-threatening complication of herpes zoster ophthalmicus (HZO), can occur simultaneously with the acute vesicular skin eruption<sup>1,2</sup>.

## 8) UNUSUAL CASE OF ACUTE LIVER FAILURE

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**Introduction:** Acute liver failure (ALF) is a rare condition with an incidence less than 10 per million in the developed world. Prompt identification of the etiology is imperative as overall mortality is between 30-40%.

**Case:** A 77-year-old male with past medical history of chronic alcohol use presented with weakness, fatigue, and jaundice. Due to elevated LFTs, patient had undergone a liver biopsy 1.5 months prior at an outside facility with reported findings of a possible infectious process. At our hospital, initial labs were significant for an elevated INR at 1.6, AST 221 units/L, alkaline phosphatase of 521 units/L and a bilirubin of 21.7 mg/dL consistent with ALF. Viral hepatitis serologies, HIV-1/2, anti-smooth muscle antibody and hemochromatosis panel were all negative. Ceruloplasmin, amylase and lipase were within normal limits. Toxicology screen and acetaminophen were negative. Patient was not taking hepatotoxic medications. Magnetic resonance cholangiopancreatography with contrast revealed hepatomegaly with a 1.6cm lesion within the left liver lobe and an indeterminate lesion in the right liver lobe suspicious for hepatocellular carcinoma (HCC). No intrahepatic or extrahepatic biliary dilatation was observed. Bone scan was negative, CT chest revealed bilateral indeterminate nodules and MRI of the brain was negative. Evaluation for hematolymphoid neoplasia was pursued and was negative. Patient's hyperbilirubinemia and coagulopathy continued to worsen; however, location and size of suspected HCC suggested it was not the cause of the progressive ALF. After eight days with no clear etiology, a transjugular random liver biopsies was performed. Pathology revealed infiltrative metastatic melanoma (BRAF V600 assay with no mutations). Patient reported history of basal cell carcinoma requiring excision but no history of melanoma. No uveal melanoma was found on eye exam and no primary tumor was identified to date. Patient has since been started on ipilimumab/nivolumab immunotherapy. His hospital course was later complicated by acute tubular necrosis and encephalopathy.

**Discussion:** Evaluation of indeterminate ALF should be expedited with biopsy to identify specific etiology. Malignant infiltration is rare but should be on the differential for ALF. In this case, infiltrative metastatic melanoma with no primary skin lesion or primary source was identified. We hypothesize the patient above may have benefited from earlier invasive diagnostic procedures to allow for earlier treatment intervention.



## 9) A RARE CASE OF IDIOPATHIC NODULAR GLOMERULOSCLEROSIS (ING)

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**Introduction:** ING is a rare clinical entity which presents with reduced GFR and nephrotic range proteinuria. It is common in an elderly white male with hypertension, smoking and hypercholesterolemia. It is indistinguishable from diabetic nephropathy (DN) on histopathology with diffuse nodular mesangial expansion associated with micro aneurysms, arteriolar hyalinosis and arteriosclerosis with tubulo-interstitial fibrosis. We present a unique case of ING in an elderly male with chronic hypoxia from persistent asthma.

**Case Description:** 80M with resistant HTN, CAD, CKD 3 and persistent asthma admitted to hospital with dyspnea secondary to pulmonary edema from hypertensive emergency. He developed AKI on CKD and had >300mg of protein on u/a. His urine microalbumin was 6269ug/mg and protein/creatinine clearance ratio was 15.05. He underwent kidney biopsy which demonstrated areas of hyalinosis and nodules replacing normal glomeruli along with +2 interstitial fibrosis under light microscopy. No crescentic or necrotizing lesions identified. Immunofluorescence staining was negative and electron microscopy showed no electron dense deposits. These findings are consistent with DN but our patient never had any history of diabetes. Other causes of nephrotic syndrome in elderly like para-proteins, PAL2R antibody, autoimmune panel (ANA, ANCA, ENA, Anti-GBM) were negative. No secondary causes except for h/o colon cancer in past with no recurrence. Tighter blood pressure control and use of ARBs improved his proteinuria and his protein on routine urine analysis was down to 100mg/dl.

**Discussion:** It has been postulated that smoking promotes formation of advanced glycation end products (AGE), induction of oxidative stress, angiogenesis (increased PDGF, TGF B AND IGF-R) altering intrarenal hemodynamics. Our patient has chronic hypoxia from persistent asthma which could be the likely culprit resulting in ING (he is not a smoker and never had diabetes). Further studies are needed to unravel the complex pathogenicity of ING resulting from chronic hypoxia.

## **10) THE MONEY IS IN THE MARROW**

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Breast cancer is the most common cancer in women worldwide. It is important to identify, as certain cases of metastatic estrogen receptor positive breast cancer have hormone therapy options that may extend life for years.

A 68 year old female presented with acute on chronic back pain. She had point tenderness in the thoracic spine. MRI of the spine revealed pathologic thoracic compression fractures with multiple lytic lesions concerning for spinal metastases. Screening mammogram done six months prior was negative. Colonoscopy done nine years ago showed no polyps. No history of abnormal pap smears. Chest x-ray was unrevealing for a primary lung cancer. CT chest, abdomen, pelvis with contrast was unrevealing for a primary cancer. Multiple myeloma workup was negative. Complete blood count and basic chemistry were normal. There were no abnormalities in liver function. Flow cytometry was negative for leukemia. She underwent bone marrow biopsy to look for non-secretory multiple myeloma. Interestingly enough it revealed metastatic adenocarcinoma concerning for a breast primary. Mammogram revealed an irregular spiculated one-centimeter mass in the left breast with evidence of axillary lymph node involvement. Further testing on the bone marrow biopsy specimen revealed estrogen receptor positive, progesterone receptor positive, HER2/Neu negative breast adenocarcinoma. She underwent vertebroplasty to stabilize her spine. She is currently undergoing neo-adjuvant chemotherapy with eventual plan for mastectomy.

This case highlights an unusual method of diagnosing a non-hematologic malignancy. Although it is known that solid tumors metastasize to the bone marrow, using this method as a diagnostic tool is rare. In cases where an obvious primary cancer cannot be identified, it is important to consider the most common cancer etiology given the patient's unique risk factors. Moreover, screening mammograms may include false negatives, and this fact should not be overlooked in the setting of known metastatic disease with unknown source.

## 11) AN ATYPICAL CASE OF MESENTERIC ISCHEMIA: GASTRIC INFARCT

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**Introduction:** Mesenteric ischemia is characterized by a decrease in blood flow to the gut leading to cell death and is characterized as acute or chronic. Gastric involvement is rare due to excellent collateral circulation to the stomach. Here we present a case of gastric infarct of unclear etiology.

**Case Presentation:** A 53-year old male with past medical history of diabetes type II with macro- and micro-vascular complications (including nephropathy, multi-vessel CAD, and gastroparesis), hypertension, and stage IIb esophageal adenocarcinoma s/p chemoradiation in remission presented for EGD follow-up of his esophageal cancer in the context of four months of worsening abdominal pain, intermittent bloating, and multiple episodes of vomiting. On arrival to the endoscopy suite vital signs were within normal limits and physical exam was notable only for mild abdominal distension and diffuse mild tenderness. EGD was significant for a gastric ulcer and severe blackening of approximately one third of the stomach, concerning for ischemia. He was admitted to the hospital with lab evaluation unremarkable other than WBC count of 14.4. CT Angiogram was performed which showed diffuse gastric wall thickening and submucosal edema. However, the underlying vasculature appeared to be patent. Biopsies from the EGD were consistent with gastric mucosa with severe ischemic changes with full thickness mucosal necrosis and notably no cancer recurrence. He was made NPO, NG tube was placed and he was started on a high dose PPI. His diet was gradually advanced and discharged 4 days later given improvement in symptoms and no reversible cause. Interval EGD/EUS three months later still showed some nonspecific inflammation but complete healing of the gastric mucosa. AE1/AE3 immunostain revealed no malignancy. Etiology to this day remains unclear.

**Discussion:** Gastric ischemia results from diffuse or local vascular phenomenon such as systemic hypotension, vasculitis, or thromboembolic events. The patient we present has clear atherosclerotic factors evidenced by his multivessel CAD but CT Angiogram was devoid of vascular obstruction, leading us to believe systemic hypoperfusion was culprit. The medical management includes fluid resuscitation, NG placement, and aggressive acid reducing therapy, with IV antibiotics if sepsis or pneumatosis is present. Gastric ischemia is under-recognized and under-reported. It is associated with poor prognosis and early diagnosis is key to favorable recovery.

## 12) DISSEMINATED HISTOPLASMOSIS PROGRESSING TO SMALL BOWEL OBSTRUCTION IN A NON-AIDS PATIENT

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**Introduction:** *H capsulatum* is a well-known pulmonary fungal pathogen. In immunocompromised patients it can easily disseminate to other organ systems, especially to the GI tract. GI presentation typically is pseudopolyps, ulcerations, and thickening. Some cases in AIDS patients have shown progression to SBO.

**Case Description:** A 79 yo male with a history of multiple myeloma status post BMT presented to the ED with one month of weakness, diarrhea, and poor appetite. He was from Wisconsin and had no recent travel history. Patient was severely dehydrated and underweight requiring admission to the ICU. He was subsequently started on linezolid, cefepime, and metronidazole without improvement in diarrhea or appetite. Stool culture, C-diff, isospora, cyclospora, rotavirus, norovirus, crypto, giardia, O+P, PJP, respiratory viral panel, AFB, atypical PNA, strongyloides, CMV, aspergillosis all tested negative. BAL Histoplasma antigen was negative, but urine and serum tests were positive. Amphotericin b was initiated and later transitioned to itraconazole. He continued to present to the ED with dehydration and diarrhea requiring multiple admissions. A colonoscopy showed ulcerations with a biopsy demonstrating yeast forms representative of Histoplasmosis. With concern for Histoplasma resistance to itraconazole, he was reverted back to amphotericin b. A repeat colonoscopy showed a colonic polyp and extensive ileocecal valve fibrosis. He was diagnosed with a SBO and underwent ileocecal resection. Pathology showed necrotizing, granulomatous inflammation, ulceration, and yeast forms compatible with Histoplasma. After this resection, symptoms continued to improve.

**Discussion:** This case is an example of immunocompromised patient developing a primary GI histoplasmosis infection. It also shows the natural progression of the intraluminal infection. Consistent with past cases, there was involvement of the IC valve, but this represents a unique presentation of SBO in a non-AIDS patient. The other distinctive aspect is the poor response to itraconazole. This would be the first known incidence of resistance, although the slow decline in urine histoplasma antigens demonstrates some treatment effect. Alternatively, malabsorption from extensive colitis may have limited drug availability and this phenomenon must be considered in future therapy.

### 13) EPIDURAL AND PARASPINAL ABSCESES DUE TO BRUCELLOSIS

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Brucellosis is a zoonotic infection transmitted through direct contact with infected animals or consumption of infected dairy products in endemic areas. The musculoskeletal system is frequently affected with manifestations such as osteodiscitis, osteomyelitis, spondylitis or arthritis. Epidural and paraspinal abscesses are rare complications of brucellosis.

A 55 year old woman from Ecuador presented to the emergency department for a second opinion on back and hip pain which had started 2-3 months prior to presentation. Imaging in Ecuador was concerning for epidural abscess. She had recently had gluteal B12 infections which were thought to be the source of infection. Her son brought her to the U.S. for further evaluation and treatment. On presentation here, patient was febrile to 101.9. Labs were remarkable for hyponatremia to 123 and elevated CRP to 5.4. MRI of the L-spine revealed osteodiscitis centered around L5-S1 with epidural, paraspinal and intramuscular abscesses bilaterally. She received one dose of vancomycin and ceftriaxone in the ED after blood cultures were drawn, however further antibiotics were held until cultures from the abscesses could be obtained. She went CT-guided biopsy of the left piriformis abscess the next day and antibiotics were resumed. Additional laboratory tests such as HIV and quantiferon gold were negative. Patient's pain worsened over the next two days with no growth from the cultures so antibiotics were broadened to vancomycin and zosyn. On the fourth day of her hospitalization, 1 of 2 blood cultures from admission and culture from the piriformis abscess grew gram negative rods. Cultures speciated two days later as *brucella melitensis*. On further questioning, patient revealed history of eating unpasteurized cheese and cooking sheep in a slow cooker. She was started on doxycycline, rifampin, and gentamicin with a planned duration of three months. Gentamicin was discontinued early due to AKI. She completed the three months of doxycycline and rifampin with significant improvement in back and hip pain.

Spinal epidural abscess is a serious complication of brucellosis and can result in permanent neurological damage if not diagnosed and treated early. Infection of the epidural space may occur by hematogenous spread or by local spread from spondylitis. MRI is the mainstay of diagnosis of spinal epidural abscess due to brucellosis. Brucellosis should be considered in any patient from an endemic region (Middle East, South and Central America, and the eastern Mediterranean) presenting with inflammatory back pain.

## **14) NON-UREMIC CALCIPHYLAXIS ASSOCIATED WITH WARFARIN**

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Calciophylaxis is a rare condition characterized by the development of non-healing ulcers due to calcification and thrombosis of arteries and arterioles leading to soft tissue ischemia and necrosis. This disease typically presents in patients with end stage renal disease, though cases in patients with normal renal function are now being increasingly recognized.

A 35 year old woman with past medical history of Down Syndrome, systemic lupus erythematosus (SLE), rheumatoid arthritis, interstitial lung disease (ILD), pulmonary hypertension, peripheral arterial disease, and type 2 diabetes mellitus presented to the emergency department with severe pain due to non-healing wounds on her bilateral buttocks, bilateral groin creases, and left anterior thigh. The wounds first appeared 1.5 years prior to presentation. They were initially attributed to pyoderma gangrenosum so the dose of steroids for her ILD was decreased but the wounds did not improve. Biopsies of the wounds showed only dermal fibrosis and were negative for pyoderma gangrenosum or vasculitis. Wound cultures grew peptostreptococcus anaerobius. Further workup including C-ANCA, P-ANCA, B2 glycoprotein, Jo1, Scl70, SSA/B, prothrombin gene mutation, fibrinogen, lupus anticoagulant screen, cryoglobulin, cryofibrinogen, protein C activity, protein S activity, fungal culture, and mycobacterial culture were all negative. She developed new wounds on her back and underwent debridement of the wounds at an outside hospital one month prior to presentation here with deep tissue cultures growing proteus and Corynebacterium species. An X-ray of the pelvis obtained just prior to admission showed extensive soft tissue calcifications, many of which appeared vascular. Based on prior lab results, lack of response to prior therapies, and the calcification seen on X-ray, non-uremic calciophylaxis was suspected as the cause of her wounds. She was started on IV sodium thiosulfate infusions at a dose of 25mg diluted with 250mL normal saline at a frequency of three times weekly. Infusions were continued for at this frequency for 5 months. Her wounds had improved significantly at 5 months so a plan for tapering the infusions was initiated. Of note, patient had been on warfarin prior to presentation to prevent clotting in the lungs due to pulmonary hypertension. Warfarin was discontinued two weeks prior to presentation here as this practice has fallen out of favor and has no evidence to support it. Non-uremic calciophylaxis has been associated with warfarin use in several case studies.

## 15) A RARE CASE OF ASEPTIC MENINGITIS

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**Introduction:** Aseptic meningitis is a condition of meningeal inflammation with negative routine bacterial cultures and is most commonly due to viruses, specifically enteroviruses; other etiologies include: medications, autoimmune disorders, and malignancies. The prevalence of drug- or chemical-induced aseptic meningitis (DCAM) is unknown. Medications commonly associated with DCAM include: nonsteroidal anti-inflammatory drugs, certain antibiotics, intravenous immune globulin, and antiepileptic drugs.

**Case:** A 70-year-old man with past medical history of simple partial seizures, controlled on lamotrigine, who presented with weakness, nausea, vomiting, headache, and episodic confusion. Of note, he was seen by a dentist one week prior to admission for routine cleaning and was incidentally found to have a dental abscess; he was started on oral amoxicillin. Patient was febrile upon presentation, but other vital signs were within normal limits. Physical exam demonstrated an elderly male who was alert and oriented, with normal neurological exam, and no photophobia, but was remarkable for nuchal rigidity. Labs were significant for hyponatremia (131); otherwise, there was no leukocytosis and the lamotrigine level was therapeutic. A CT of head without contrast showed no acute intracranial pathology. The patient was started on empiric antibiotics. A lumbar puncture was performed and was significant for an elevated WBC count of 55 (with lymphocytic predominance), elevated protein of 81, and normal glucose of 56. Gram stain showed rare PMNs and no bacteria. The Biofire panel for the most common pathogens responsible for community-acquired meningitis/encephalitis was negative. An MRI of brain with and without contrast was obtained and was largely unrevealing. With input from infectious disease and neurology, antibiotics were discontinued, and antiviral therapy was not initiated. The presumed offending agent, amoxicillin, was held, and ultimately, all symptoms improved.

**Discussion:** Here we present aseptic meningitis in an elderly male patient who recently began amoxicillin followed by the indolent progression of meningeal symptoms and who improved following discontinuation of amoxicillin. While DCAM is rare and a diagnosis of exclusion, it remains an important diagnostic consideration when evaluating a patient presenting with meningeal symptoms. In every case, a careful drug history should be obtained. Treatment of DCAM involves stopping the offending agent and supportive cares. Patients improve within 2-3 days without complications.

## **16) RARE CASE OF PROTEIN LOSING ENTEROPATHY**

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The patient was a 64 year-old male with a past history of HTN who presented to his primary care clinic in July with a 2 month history of persistent and diffuse abdominal pain, nausea, vomiting, early satiety, abdominal fullness, 10 lb weight loss and new lower extremity edema. He tried MiraLax and a PPI without relief. Physical exam was remarkable for LUQ tenderness to palpation without guarding or peritonitis, 1+ pitting edema of the lower extremities bilaterally. Labs and imaging significant for; hyponatremia (134), hypokalemia (3.3), elevated serum creatinine (1.16, baseline ~1), elevated Hgb (17.7) and Hematocrit (50) was well as low albumin (1.4) and low total protein (3.1), CT Ab/Pelvis showed no acute findings to explain his pain. EGD showed “diffuse moderately erythematous, friable, atypical mucosa without bleeding at the gastric fundus.” Biopsies confirmed the diagnosis of Menetrier’s disease. He was admitted to the hospital one week later for dehydration and protein-calorie malnutrition.

The patient was treated symptomatically with anti-emetics, fluids and a PPI. Dobhoff-tube was inserted, and the patient was fed enterally. Octreotide (50mcg q6h sub-cutaneous) was initiated with modest response. EUS 8/6 showed “marked wall thickening in the body of the stomach, consistent with Menetrier’s disease.” He was referred to oncology for initiation of Cetuximab given the small case series suggesting some benefit with an EGFR inhibitor (TGF-alpha mediated pathogenesis). He was started on Cetuximab and completed 4 cycles of treatment before interval EGD in October. There was persistent erythematous mucosa in the cardia, gastric fundus and body which was “mildly improved from prior.” He showed modest improvements in his oral intake and weight gain, but given the poor mucosal response to therapy, it was felt that surgical resection was the most durable and definitive care for his disease. He underwent Roux-en-Y esophagojejunostomy reconstruction in December.

There is a scarcity of data regarding management of Menetrier’s Disease, including a widely cited case involving Cetuximab in which 4/7 patients had near complete histologic remission in 1 month. Unfortunately, this patient failed on this therapy and proceeded with definitive total gastrectomy.



## 17) CAT GOT YOUR DIALYSIS CATHETER

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*Pasteurella multocida* is a gram negative, non-motile coccobacillus that colonizes the oropharynx of 90% of cats. It can be transmitted to humans through bites, scratches, and licks resulting in infections such as cellulitis, septic arthritis, pneumonia, or meningitis.

The first case of *Pasteurella* peritonitis was reported in 1987. Several additional cases have been reported; a majority are related to close contact with a household pet.

We report a rare case of *Pasteurella* bacteremia and peritonitis in a patient on continuous ambulatory peritoneal dialysis (CAPD) with the risk factor of a household cat. Case was remarkable for pleural-peritoneal fistula resulting in recurrent pleural effusion with *Pasteurella* also in the pleural fluid.

## **18) BILATERAL ADRENAL HEMORRHAGE SECONDARY TO RIVAROXABAN**

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Acute bilateral adrenal hemorrhage is an extremely rare disorder, which is difficult to diagnose because of its non-specific presentation.

The condition frequently occurs in association with extreme physical stress and may lead to acute adrenal insufficiency or death if not promptly and properly treated.

Major causes include sepsis (meningococcemia), underlying adrenal tumors, burns, hypotension related to hemorrhagic diathesis or anticoagulation use.

We report a rare case of acute bilateral adrenal hemorrhage in a patient receiving Rivaroxaban for DVT/PE prophylaxis after total knee arthroplasty.

## 19) DISSEMINATED SALMONELLA IN A RETURN TRAVELER

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**Introduction:** *Salmonella* is a motile gram-negative bacilli, classified as a facultative anaerobic Enterobacteriaceae. Within the genus *Salmonella*, the most common species is *Salmonella enterica*; a major cause of diarrheal illness worldwide and a reportable illness within the United States. Rarely, *Salmonella enterica* can lead to a systemic typhoidal-like illness characterized by bacteremia and sepsis. Presented is a case of disseminated *Salmonella enterica* in a return traveler.

**Case:** A 51 year old male with a past medical history pertinent for HTN, IgA nephropathy leading to ESRD s/p deceased donor renal transplant (2008) on chronic immunosuppression complicated by post-transplant diabetes presented with a 12 day history of diarrhea, abdominal pain, bloating with associated anorexia leading to twenty pound weight loss, fevers and drenching night sweats. Diarrhea characterized as 3-4 loose, voluminous stools per day. No history of renal rejection or opportunistic infections while maintained on maintenance dosing of Tacrolimus, Mycophenolate and Prednisone. Physical examination notable for ill-appearing gentleman with hypotension, tachycardia, fever and distended abdomen with tenderness to palpation throughout. Labs notable for leukocytosis (WBC 19.1) with neutrophil predominance, platelet count unable to be performed given clumping. CMP with hyponatremia (134), hyperchloremia (113) and AKI with creatinine 3.38 (baseline 1.9-2.3). Stool studies returned positive for *Salmonella* species within 5 hours of admission. Blood cultures returned positive at 9.3 hours with pan-susceptible *Salmonella enterica*. Given his recent travel history, Infectious Disease was consulted. Patient was initiated on broad spectrum antibiotic treatment (renally dosed Meropenem) given his complex medical history and the rate of Fluroquinolone and Ceftriaxone resistant *Salmonella* that exists in Mexico. Symptoms resolved on prolonged antibiotic treatment. He subsequently underwent abdominal imaging given that disseminated *Salmonella* can lead to mycotic aneurysm and was found to have retroperitoneal mass with associated lymphadenopathy. Biopsy was obtained and positive for PTLN, DLBCL type.

**Discussion:** Non-typhoidal *Salmonella* gastroenteritis is typically a food-borne illness most commonly associated with consumption of infected poultry and eggs. Disseminated disease has been reported in patients with impaired cellular immunity, particularly populations including: HIV infection, transplantation, prolonged corticosteroid use and underlying malignancy. Furthermore, *Salmonella* bacteremia can progress to involve seeding of the bone, joint space, CNS or lead to endovascular involvement particularly mycotic aortic aneurysm. Antibiotic selection for treatment of disseminated disease should take into account local and foreign resistance patterns. addition to the resistance patterns of countries recently traveled to.

## 20) MEDICAL MANAGEMENT VS CORONARY REVASCULARIZATION IN SCAD

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**Introduction:** Fibromuscular Dysplasia is a non-atherosclerotic, non-inflammatory disease of unknown etiology that affects multiple arterial levels. A known complication of the condition is aneurysm and dissection of affected vessels, particularly the coronary arteries. The connection between Fibromuscular Dysplasia and spontaneous coronary artery dissection (SCAD) has been well established, with one study finding features of FMD in 72% of individuals with a spontaneous coronary artery dissection. Despite this, there is controversy on the optimal management strategy. This case demonstrates outcomes for a patient after both surgical intervention and medical management.

**Case:** A 44-year-old African-American female presented to the ED with hypertension, shortness of breath, diaphoresis, nausea, and vomiting. Initial EKG evaluation showed T-Wave inversion in lateral leads and elevated troponins, consistent with NSTEMI. PCI was performed with 3 DES in LAD and findings consistent with SCAD were noted. Following procedure, patient had nausea and diaphoresis. Repeat EKG revealed patient then had inferior STEMI and emergent Cath revealed SCAD in proximal RCA. Decision to medically manage BP with goal systolic of 110-120 was made due to risk of disease progression with intervention. Given such uncommon findings, a workup for vasculitis and connective tissue disorder was started; family history of connective tissue disease was negative as well as Rheumatologic history and physical exam. ESR and CRP were normal. Abdominal CT angiography of head and neck were normal, but angiography of abdomen showed findings suggestive of FMD in the right renal and bilateral external iliac arteries. Patient was started on blood pressure regimen of Coreg 12.5 BID and Lisinopril 20mg qd and remained asymptomatic.

**Discussion:** There are no definitive guidelines for the treatment of SCAD, and both medical and surgical strategies have been proposed for the treatment of the condition. However, coronary revascularization as first-line therapy was found with a 6.3% increased risk of target vessel revascularization (RD=0.06; 95% CI=0.01-0.11). This case presents a situation in which both coronary revascularization and medical management were attempted, with PCI leading to immediate recurrent SCAD. We believe this case demonstrates the need for continued discussion of medical therapy versus PCI in the management of SCAD and highlights the potential complications of coronary intervention.

## **21) A RARE CASE OF DYSPNEA: PULMONARY ALVEOLAR PROTEINOSIS**

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Pulmonary alveolar proteinosis (PAP) is a rare, diffuse lung disease characterized by the accumulation of amorphous, periodic acid-Schiff (PAS) positive and lipoproteinaceous material resulting in the disruption of surfactant homeostasis. The most common type of PAP is related to an autoimmune process that generates granulocyte macrophage-colony stimulating factor (GM-CSF) antibodies. Here we present a case of a 27-year-old male with a pertinent PMH of morbid obesity, who presented with a two-week history of cough, shortness of breath, chills, and high-grade fevers. He was initially found to be markedly hypoxic with oxygen saturations in the 60s, which improved with continuous positive airway pressure. Pertinent workup included unremarkable complete blood count, basic metabolic panel, and brain natriuretic peptide. CT angiography was negative for PE; however, it did show extensive diffuse ground-glass opacities with a crazy-paving pattern. The patient's oxygenation needs significantly increased despite noninvasive ventilatory management. Influenza A returned positive. Subsequent bronchoscopy alveolar lavage (BAL) demonstrated a milky fluid with a differential showing a monocytic predominance. The patient remained intubated following bronchoscopy due to evolving ARDS. Extensive workup from the BAL sample notably demonstrated PAS-positive and diastase-resistant staining, a finding consistent with pulmonary alveolar proteinosis. Given the patient's tenuous clinical course, whole lung lavage for PAP was discussed with our cardiothoracic surgery team but was ultimately deferred until he clinically stabilized. Subsequent interval CT chest imaging demonstrated improvement of the "crazy-paving" pattern; as such, whole lung lavage was not pursued. Additional testing to confirm PAP included a GM-CSF antibody screen, which returned negative. The next step would have been to obtain a GM-CSF serum level. Unfortunately, the patient was discharged before this could be obtained. In conclusion, PAP is a rare pulmonary disorder that should be considered on the differential for dyspnea in the setting of a crazy paving pattern appearance of CT imaging.

## 22) CREATININE AND RENAL FUNCTION CHANGES FOLLOWING HIGH RISK INOPERABLE TRANSCATHETER AORTIC VALVE REPLACEMENT (TAVR)

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**Background:** Severe aortic stenosis results in tissue hypoperfusion. The kidneys are one of the most commonly affected organs from hypoperfusion due to severe aortic stenosis. Transcatheter aortic valve replacement (TAVR) is a novel treatment for high risk inoperable severe aortic stenosis. It is unclear if TAVR improves renal perfusion and in turn kidney function in patients with severe aortic stenosis. We hypothesized that kidney function will improve following TAVR.

**Methods:** We examined kidney function data in 269 patients who underwent TAVR for high-risk inoperable severe aortic stenosis from the Marshfield Aortic Valve Experience (MAVE) study database. We evaluated their renal function using creatinine levels and trends prior to TAVR and post TAVR during all evaluations within the Marshfield Clinic Health System.

**Results:** Of the 269 TAVR patients, 183 patients received Balloon Expandable Valve (BEV) TAVR and 86 patients received Self-Expandable Valve (SEV) TAVR. Overall in all patients, average creatinine prior to TAVR was 1.57mg/dl and it was 1.54mg/dl post-TAVR ( $p=0.367$ ). Among those who received BEV TAVR, pre-TAVR creatinine was 1.45mg/dl and post-TAVR creatinine was 1.52mg/dl ( $p=0.021$ ). Among those who received SEV TAVR, pre-TAVR creatinine was 1.77mg/dl and post-TAVR creatinine was 1.59mg/dl ( $p=0.002$ ). There was no statistically significant difference between changes in creatinine following TAVR by valve groups ( $p=0.257$ )

**Conclusion:** There were statistically significant changes in creatinine levels in both valve groups with a slight decline in creatinine among those who received SEV TAVR and conversely a slight increase among those who received BEV TAVR. However, these are small changes in creatinine levels which may not be clinically significant. Overall, there were no changes in creatinine level among all the TAVR patients. These findings will need to be replicated in other studies.

## 23) DOES TAVR IMPROVE HEMOGLOBIN LEVELS IN PATIENTS WITH SEVERE AORTIC STENOSIS?

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**Background:** Severe aortic stenosis patients often experience a number of complications as a result of the hemodynamic blood flow across a tight valve. Macroangiopathic hemolysis may result in anemia among these patients. Transcatheter aortic valve replacement (TAVR) is a novel treatment for high risk inoperable severe aortic stenosis. It is unclear if TAVR improves hemoglobin level in patients with severe aortic stenosis due to lower risk of macroangiopathic hemolysis. We hypothesized that hemoglobin level will improve following TAVR for severe aortic stenosis.

**Methods:** We examined hemoglobin data in 269 patients who underwent TAVR for high-risk inoperable severe aortic stenosis from the Marshfield Aortic Valve Experience (MAVE) study database. We evaluated all hemoglobin levels and trends prior to TAVR and post TAVR during all evaluations within the Marshfield Clinic Health System.

**Results:** Of the 269 TAVR patients, 183 patients received Balloon Expandable Valve (BEV) TAVR and 86 patients received Self-Expandable Valve (SEV) TAVR. In all 269 patients, average hemoglobin prior to TAVR was 11.6 g/dl and it was 10.9g/dl post-TAVR ( $p<0.001$ ). Among those who received BEV TAVR, pre-TAVR hemoglobin was 11.7g/dl and post-TAVR hemoglobin was 10.9g/dl ( $p<0.001$ ). Among those who received SEV TAVR, pre-TAVR hemoglobin was 11.4g/dl and post-TAVR hemoglobin was 10.9g/dl ( $p<0.001$ ). There was no statistically significant difference between changes in hemoglobin following TAVR by valve groups ( $p=0.773$ ).

**Conclusion:** There was statistically significant declines in hemoglobin levels in both valve groups. Overall, there was a decline in hemoglobin level among all the TAVR patients. Contrary to our hypothesis, there were no differences by valve groups in hemoglobin levels following TAVR. These findings will need to be duplicated in other studies.

## 24) ACUTE IMMUNE MEDIATED ENCEPHALOPATHY SECONDARY TO COMBINATION CHECK POINT INHIBITORS

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### Learning Objectives:

1. The approach to new onset altered mental status
2. Recognizing and managing immune related adverse events

**Introduction:** Use of immune checkpoint inhibitor therapy is effective in multiple tumor types but is associated with diverse ranges of immune related adverse events.

**Case Description:** Patient is a 65 yo male with a PMHx of DM2, HTN, depression, substance abuse, secondary adrenal insufficiency, and stage IV RCC with boney metastases who presents from a referring hospital with acute encephalopathy. Correction of presenting hypoglycemia and hypotension failed to improve mental status. Initial toxicology, metabolic, and infectious work up negative. MR brain w/ & w/o contrast showed nonspecific mild T2 hyperintense signal in the supratentorial white matter with no additional findings. EEG with generalized slowing consistent with encephalopathy. LP negative for infectious etiology, although CSF protein and glucose elevated. Autoimmune studies negative for NMDA receptor. Initial paraneoplastic panel negative. Mental status slowly improved but did not return to previous baseline. Patient exhibited episodes of agitation and psychosis which were secondary to steroids for concurrent treatment of hypophysitis from ipilimumab/nivolumab immunotherapy. Agitation improved as steroids tapered. In setting of negative work up, encephalopathy likely immune mediated encephalitis secondary to ipi/nivo.

**Discussion:** Immune checkpoint inhibitors are innovating the systemic treatment of cancer. Innovation is not without cost. Immune mediated adverse events frequently result in tissue inflammation. Ipilimumab is associated with 85% of immune related CNS events. Prompt diagnosis and management is essential to offsetting serious complications. Treatment often involves discontinuation of therapy and steroids, with rituximab in refractory cases.

### References:

1. Larkin J, et al. Neurologic Serious Adverse Events Associated with Nivolumab Plus Ipilimumab or Nivolumab Alone in Advanced Melanoma, Including Case Series of Encephalitis. *The Oncologist*. 2017; 22(6): 709-718.



## 25) MENTAL HEALTH SCREENING OF D.C. EVEREST JUNIOR HIGH STUDENTS USING THE GAIN-SS

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**Background:** The Marathon County Youth Risk Behavior Survey reported that 31.5% of students described their mental health as not good during the past 30 days before the survey for 3 days or more. Prevention and early intervention during adolescence is crucial. The Global Appraisal of Individual Needs Short Screener (GAIN-SS) is an evidence-based survey that identifies needs for further assessment in the areas of mental health, substance abuse, and anger management. The GAIN-SS has been used in the clinical setting but has not yet been implemented in schools. This study aims to determine if the GAIN-SS is an effective tool to be implemented in schools for mental health screening of adolescents.

**Methods:** A consent form was sent to all parents of D.C. Everest Junior High students to allow their student to participate in the GAIN-SS. Students who obtained parental consent were then required to give or decline individual assent the day that the screener was administered. Of the students who gave assent to taking the GAIN-SS, those who reported thinking about committing suicide were flagged by student services. School counselors met with the students who reported suicidal thoughts the same day that the screener was administered. Parents of these students were contacted and follow up assessment varied on an individual basis.

**Results:** Active consent from parents was low with 134/877 (15.3%) forms being signed and returned to the school. 130/134 (97.0%) students gave individual assent. 7 screeners were not included in data analysis due to computer error not recording data. 20/123 (16.2%) of successfully recorded screeners were flagged for having suicidal thoughts and these students received intervention from the school. 48.7% of students who completed the screener had a total GAIN-SS score considered to be high risk and in need of further assessment.

**Conclusions:** Of the students screened, 16.2% reported suicidal thoughts and received interventions from the school counselors. However, 48.7% of students screened had a high risk total GAIN-SS score which is recommended to have further assessment. This was not possible for the school with their current resources. This shows the need for further support at the school level for mental health resources. There was also a very low participation of students taking the screener due to only 15.3% of parents giving consent for their child to participate.

## 26) BULLOUS PEMPHIGOID SECONDARY TO FUROSEMIDE

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**Introduction:** Furosemide is regularly used and has many adverse effects; commonly including nausea, vomiting, diarrhea, constipation, dizziness, and headache. There are an array of dermatologic side effects that are more rare including bullous pemphigoid. Bullous pemphigoid is characterized by pruritic tense vesicles and bullae on the arms, legs, and trunk. Drug induced bullous pemphigoid comes in two unique categories: a self-limited type and a chronic type. The self-limited type resolves post furosemide cessation, and the chronic type assumes the typical autoimmune disease.

**Case Presentation:** A 68yo with history of CKD, DM2, and HFpEF presented for 3-4 weeks of an extremely pruritic papular rash that started on b/l hands and progressed to trunk, back, and legs, eventually coalescing and forming large tense blisters. Pt has no fever, shortness of breath, cough, chest pain, dizziness or sick contacts. Two weeks in, hydrocortisone cream and Benadryl cream started with no improvement. Pt then given loratadine and fluocinolone cream with no improvement before presenting with fully formed bullae. Of note, patient discontinued furosemide five months prior, which she had been on for many years, and restarted it 3 weeks prior to the rash formation. Physical exam was unremarkable except skin exam showing a coalescing raised red papular rash extending from hands to proximal legs, neck, back, and trunk. Bullae draining clear fluid were noted on b/l distal forearms, b/l upper arms, and proximal thighs. Skin exam showed diffuse excoriations throughout rash. Nikolsky sign negative. Positive serology to BP180 and BP230 were confirmed after skin biopsy showed IgG linear immunofluorescence at basement membrane zone. Patient was treated with Doxycycline and Clobetasol cream with only minimal improvement. Once started on a prednisone taper, the patient experienced vast improvement in skin eruption and pruritis.

**Discussion:** Although it is a more rare side effect, patients receiving furosemide can get dermatologic side effects. Patients on furosemide with a skin eruption not explained by another diagnosis should be evaluated for a drug induced reaction. If furosemide induced bullous pemphigoid is diagnosed, close follow up is required to assess for resolution of symptoms and therefore the differentiation of types. Making this diagnosis can be challenging because furosemide can cause dermatologic reactions no matter the length of time a patient has been on the medication. Treatment goals include prevention of rash progression, prevention of secondary skin infection from opened bullae, and finding an alternative medication.

## **27) NPH-LIKE SYNDROME AS THE PRESENTING FEATURE OF LYME NEUROBORRELIOSIS**

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**Introduction:** Lyme's disease occurs following the transfer of the *Borrelia* species from a tick bite. Lyme's disease typically comes in 3 stages: early localized, early disseminated, and late disseminated. Each stage has unique and characteristic symptoms. Neurological involvement is estimated to include only 10-15% of all cases and only occurs in disseminated stages. Common presentations of neurological Lyme's disease include lymphocytic meningitis, cranial nerve palsies, and peripheral neuropathy. Rarely, it can present as a myelitis, encephalopathy, polyneuropathy, and radiculopathy.

**Case:** An 81yo male presented for four falls in four days after one month of progressive abnormalities in gait, chest/arm pain and AMS. Patient had no fever, joint pain or swelling. Of note, the patient was treated for Lyme's disease twelve months prior and completed two of the four week course of oral doxycycline. During initial exam, vital signs were stable, A&Ox1, CNs intact, sensation intact, finger-to-nose intact, heart regular rate and rhythm, lungs clear to auscultation, abdomen nontender and soft, no masses, normal bowel sounds, and a normal joint exam. Initial labs were only remarkable for hyponatremia at 128 and leukocytosis at 12.1. Urine analysis, CXR and EKG were unremarkable. CToH and MRI remarkable for hydrocephalus. With NPH at the top of the differential, a lumbar puncture was performed and provided only minimal relief of symptoms. LP showed normal pressures. Cell counts abnormal, yet nonspecific. Serum labs negative for HIV Ab/Ag, RPR Screen, Cryptococcal Ag. CSF labs negative for Biofire panel and *Cryptococcus*. CSF western blot for Lyme was positive for 5 IgG bands and 2 IgM bands. Patient was treated with 2 weeks of IV Ceftriaxone and subacute rehab with vast improvements.

**Discussion:** Although it is a rare presentation, neurological Lyme's disease can present with an NPH-like syndrome, encephalopathy and radiculopathy. A travel history, in patients presenting with these symptoms, should be utilized to determine whether Lyme should be on the differential. Diagnosis of neurological Lyme's disease is best achieved by detecting *Borrelia* antibodies in the serum and CSF simultaneously. CSF antibody alone is not sensitive, yet it is highly specific, so a negative result cannot rule out infection. CSF PCR is not a reliable or sensitive method for detecting active neurological Lyme's disease due to the low number of organisms in the CSF. Treatment of confirmed neurological Lyme's disease should be prompt and completed by IV Ceftriaxone for 2-4 weeks duration.

## 28) SOMETHING FISHY: ABDOMINAL PAIN IN A 66-YEAR-OLD

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**Case Description:** A 66-year-old man presented with 2 weeks of progressively worsening abdominal pain and intractable hiccups. He also noted subjective fevers, nausea, vomiting, and anorexia. Past medical history included hepatitis C and alcohol abuse. On presentation, he was afebrile and normotensive with heart rate of 133. Exam was remarkable for abdominal distention and tenderness to palpation in bilateral lower quadrants with radiation to the right upper quadrant. Laboratory tests, including liver function and complete blood count, were normal. CT abdomen revealed a 6.6 cm liver mass suspicious for hepatocellular carcinoma (HCC). Worsening symptoms and concern for etiology other than cancer led to obtaining a multiphasic abdominal CT, which revealed a heterogeneous liver mass with adjacent colonic wall edema, and linear calcific density within the liver. These findings were suspicious for an evolving liver abscess. Exploratory laparotomy resulted in the drainage of a large hepatic abscess and identification of subphrenic abscess. A small band of bony-like material was felt within the liver parenchyma, and a fishbone was extracted from the liver. The patient subsequently reported eating fried catfish a few days before onset of symptoms.

**Discussion:** Ingestion of a fishbone is a common cause of esophageal injury or perforation, however there are few reports of colonic perforation. Even rarer is translocation of the fishbone into the liver parenchyma. This case highlights the need to consider the possibility of foreign body ingestion being the underlying cause in any case of an unexplained intra-abdominal process, especially in an alcoholic patient. The fishbone within the liver dictated surgical intervention versus the standard of care, which is percutaneous drainage. Limiting the differential diagnosis to the most obvious cause of symptoms can lead to mistakes and missed opportunities for swift treatment. The backbone of the practice of internal medicine is forming and investigating a broad differential diagnosis, and of taking a thorough history. With this information, we can identify health or lifestyle factors that put our patients at risk of acute processes that we might otherwise not consider.

## 29) GENITOURINARY BLASTOMYCOSIS: A DEADLY CASE OF PROSTATITIS

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**Background:** Blastomycosis is one of three major endemic mycoses in North America with endemic areas including the Great Lakes region. Pulmonary disease is the most common clinical manifestation. However, disseminated disease can also affect the skin, bone, genitourinary tract, and central nervous system. Here, we present a case of blastomycosis presenting as prostatitis and epididymitis.

**Case:** A 47-year-old man with type 2 diabetes mellitus presented to his local emergency department with lower urinary tract symptoms and perineal pain. Laboratory evaluation was notable for sterile pyuria and CT imaging demonstrated prostatic inflammation. He was started on a course of antibiotics for presumed bacterial prostatitis. He was repeatedly evaluated over the next month given persistent symptoms. He subsequently noted swelling of his right testicle and ultrasound imaging was consistent with epididymitis. Despite multiple courses of antibiotics, his symptoms persisted. Two months after initial symptom onset, he developed a cough and dyspnea. Imaging was notable for interstitial bilateral pulmonary infiltrates and persistent prostatic inflammation complicated by a prostate abscess. He underwent a transurethral resection of the prostate with deroofing of the abscess cavity followed by a bronchoscopy with bronchoalveolar lavage (BAL). Histopathologic examination of the prostatic abscess demonstrated necrotizing granulomatous prostatitis with broad-based budding yeast, consistent with *Blastomyces dermatitidis*. BAL fluid also demonstrated broad-based budding yeast. The patient was immediately started on Amphotericin B. Unfortunately, despite aggressive interventions, his clinical course acutely worsened and was further complicated by acute hypoxemic respiratory failure, multifactorial shock, and multisystem organ failure. He unfortunately passed away ten weeks after initial symptom onset.

**Discussion:** Blastomycosis is a known source of genitourinary pathology and may sometimes be the initial manifestation of disease. Fungal infections should be considered in patients with persistent prostatitis or epididymitis that have failed to improve after extensive antibacterial therapy. This is particularly true in endemic areas. Early diagnosis and treatment is essential in order to prevent further progression and severity of disease.

### **30) BILATERAL HIP AVASCULAR NECROSIS: MEDROL DOSEPAK RISK FACTOR IN AVID RUNNER**

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Avascular necrosis (AVN) of the femoral head is a progressive multifactorial disease that affects predominately youthful patients, most commonly between 40 and 50 years of age. Femoral head AVN can cause significant debilitation to athletes. Medrol dosepaks are the leading atraumatic risk factor for AVN, being that 1 in every 1000 applications results in manifestation of AVN. Despite being recognized as a clinical entity for many years clinician awareness for the risk of AVN with steroid treatment, particularly in the athlete population, remains lackluster. Here we present a case where treatment of sciatic pain with Medrol dosepak results in bilateral hip AVN requiring bilateral total hip replacement in a healthy 32 year old male.

## 31) HYPEREOSINOPHILIC SYNDROME PRESENTING AS WORSENING DIARRHEA

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**Introduction:** Hypereosinophilic syndrome (HES) is defined as an absolute eosinophil count of greater than 1500 and/or a greater than 20 percent eosinophils in bone marrow section. There must also be evidence of tissue infiltration by eosinophils and organ damage due to the heightened eosinophil count. Skin and lungs are most commonly affected. Less commonly the gastrointestinal tract may be affected by HES. Gastrointestinal tract involvement leads to esophagitis, gastritis, enteritis, or colitis with symptoms including abdominal pain and diarrhea.

**Case:** A 62-year-old male with a past medical history notable for type 2 diabetes mellitus, chronic kidney disease, hypertension and right hemicolectomy post ruptured appendicitis was admitted with increasing frequency of diarrheal episodes. Prior to admission he was having up to 10 loose bowel movements per day on a daily basis, which was increased over his baseline of 2-3. On complete blood count analysis, he was noted to have an absolute eosinophil count of 9330 with eosinophils comprising 54 percent of total leukocyte count. Other labs were notable for a creatinine of 4.94 and blood urea nitrogen of 111. Clostridium difficile, Rotavirus, fecal leukocytes, Norovirus, stool ova and parasites were all negative. Autoimmune labs including ANA, ANCA, IgE and tryptase levels were within the normal range. His celiac antibodies were normal. His blood was analyzed for BCR-ABL1, JAK2, FIP1L1-PDGFR and PDGFRB mutations which were all negative. Bone marrow biopsy was significant for eosinophilic predominance. He was started on Prednisone 40mg and by the next morning his absolute eosinophil count had dropped to 120, comprising one percent of total leukocyte count. After a four-week course of tapered Prednisone therapy his diarrheal symptoms had resumed their baseline status.

**Discussion:** Glucocorticoids are the mainstay of treatment for HES with most patients showing clinical improvement and resumption of normal eosinophil counts within four weeks. In less than 24 hours our patient's eosinophil count returned to the normal range with subsequent improvement in clinical symptoms. At present there are no studies looking at how quickly patient's eosinophil count returns to normal following steroid therapy. It would be beneficial to know if this is related to dosage of steroid or initial clinical presentation of HES. Other causes of hypereosinophilia must be ruled out first, but our case illustrates the need to consider hyper-eosinophilia as a cause of unexplained worsening diarrhea.

## 32) EVOLVING LABORATORY FINDINGS IN A PATIENT PRESENTING WITH LOW BACK PAIN

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**Introduction:** Acute myeloid leukemia is a rapidly-developing condition that can often present with nonspecific symptoms. A high index of suspicion should be present when a patient presents with refractory bony pain, cytopenia, and elevated inflammatory markers.

**Case Presentation:** A 58-year-old male presented to the emergency department with a chief complaint of low back pain. He was seen at an outside hospital one week prior for evaluation of lower chest pain that radiated to his left jaw. Workup was negative for acute causes, and esophagogastroduodenoscopy revealed gastric ulcers. Labs showed thrombocytopenia (110,000 per  $\mu\text{L}$ ) with elevated D-dimer and alkaline phosphatase. An outpatient MRI was recommended at the time to further evaluate the abnormal labs.

T-spine and L-spine MRI in the ED showed diffusely abnormal bone marrow signal intensity and enhancement concerning for a marrow process or infiltrative disorder. The patient was admitted to the medicine service reporting continued lower back, shoulder, and jaw pain. Physical exam was unremarkable with no hepatosplenomegaly. Labs showed continued thrombocytopenia (79,000), a white blood cell count of 5,000, and elevated lactate dehydrogenase. Hematology recommended an iron panel, peripheral blood smear, and HIV, hepatitis, and EBV serology.

On the second day of admission, ferritin was 9,911 ng/mL, platelets had fallen to 48,000, and white blood cell count had fallen to 2,200 with 750 segmented neutrophils. Hematology performed an urgent bone marrow biopsy. Biopsy and peripheral blood smear were consistent with a diagnosis of non-promyelocytic acute myeloid leukemia. The patient was transferred to the leukemia service, where he began evaluation for a bone marrow transplant and induction chemotherapy with CPX-351 (cytarabine and daunorubicin).

**Discussion:** This case illustrates the importance of maintaining a broad differential, even for common complaints such as back pain. Although it would have been impossible to make the diagnosis at first presentation, follow-up MRI and recognition of the significance of multiple cytopenias and a serum ferritin near 10,000 ng/mL facilitated a quick diagnosis of leukemia.



### **33) IMPROVING INPATIENT QUALITY OF SLEEP UTILIZING A SLEEP HYGIENE PROMOTIONAL CAMPAIGN**

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Hospitals are very noisy, making it difficult for inpatients to get a restful sleep. Fragmented sleep results in patients feeling exhausted, which has negative implications for their health including: increased rates of falls, decreased immune function, weakened memory and slowed recovery from illness. Awareness of the importance of sleep hygiene needs to be increased for patients to get needed sleep during their recovery from illness. This study aimed to improve the quality of sleep patients experience while in the hospital by offering patients sleep promotional resources and teaching patients effective sleep strategies using the SLEEP acronym, adopted from the City of Hope Medical Center. Quality of inpatient sleep was assessed using The SLEEP Hygiene Questionnaire, which was developed for this study and consists of 12 questions related to the subjective quality of sleep patients experience. Questions cover various domains of sleep including: falling asleep, sleep maintenance, awakening from sleep, sleep quality, and behavior/mood during daytime hours. A total of 30 patients participated in the control group and 31 patients participated in the SLEEP hygiene promotional period. Patients who participated in the SLEEP hygiene promotional period had significantly improved sleep scores ( $p < 0.05$ ) in the following domains: quickness of awakening from sleep, sleep quality, satisfaction with amount of sleep received, less daytime sleepiness, and had lower levels of irritability. Patients included in the sleep hygiene period had an improved sleep score during their hospital stay relative to their sleep prior to their hospital stay and had a significantly higher sleep score than patients in the control group.

### 34) A RARE CASE OF KETOSIS-PRONE FLATBUSH DIABETES IN AN ELDERLY MALE

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**Case:** A 64-year old male with a past medical history of gastroesophageal reflux disease, bipolar disorder, post-traumatic stress disorder, and obesity presented to the hospital with fatigue and polydipsia as well as significant weight loss over the past few months. He denied any abdominal pain, nausea, vomiting, diarrhea, or other complaints. Vitals were notable of tachycardia but were otherwise unremarkable and examination was also normal. Labs were obtained and notable for sodium of 131 mmol/l, glucose 471 mg/dl, anion gap 19, hemoglobin A1c was >14.0 and a urinalysis showed ketonuria of 80mg/dl, glucose >1000 mg/dl, and pH of 5.0 consistent with diabetic ketoacidosis. He had no history of diabetes and he had a hemoglobin A1c of 6.2 six months prior but given his presentation, a glutamic acid decarboxylase-65 antibody, TSH, CBC, and liver function tests were all obtained and normal. A CT abdomen was done which showed no evidence of malignancy or other abnormalities. Endocrinology was consulted and the patient started a subcutaneous insulin regimen for management of Flatbush diabetes. After insulin was started, he was later transitioned to oral medications and hemoglobin A1c 3 months later was 5.9.

**Discussion:** Ketosis prone diabetes, also known as Flatbush diabetes, is a rare disease process that is not well documented in the literature. This form of diabetes is most common in middle aged, overweight, male patients of African or Asian descent and commonly presents as diabetic ketoacidosis in patients with no prior history of diabetes. No other metabolic cause, infection, or other factor contributing to DKA can identified in these patients though it is thought there may be a genetic component. While this disease process may have some similarities with type 1 and type 2 diabetes it is important to recognize this as a distinct disease as the long-term treatment and prognosis is quite different. While these patients may temporarily be insulin dependent, many have preserved beta cell function and the majority eventually become insulin independent. Additionally, most patients in this group can go on to have good glycemic control with lifestyle changes. Being able to recognize patients with Flatbush diabetes is important so appropriate treatment can be initiated. Here we present an unusual case of ketosis prone Flatbush diabetes in an elderly African-American male.

## 35) AN ATYPICAL PRESENTATION OF METASTATIC TESTICULAR CHORIOCARCINOMA

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**Case:** A 29-year-old male with a past history of gastroesophageal reflux and epididymitis presented to the emergency department with a two day history of a band like abdominal pain associated with retching emesis that was yellow gastric mucous progressing to blood tinged. The patient denied any hematochezia, melena, or any recent weight loss but endorsed constipation. Home medications included ibuprofen and pantoprazole. Vital signs included temperature 98.5F, heart rate 105 beats per minute, blood pressure 131/72 mm Hg, respiratory rate 20 breaths per minute and oxygen saturation 95% on room air. Physical examination was significant for a healthy appearing male with café au lait lesions on his back. Abdomen was tender to palpation in lower quadrants, firm, normal bowel sounds with no rebound tenderness. The remaining exam was non-focal. Labs included white blood cell count  $14.8 \times 10^3$  u/L, Hgb 13.0 g/dL, platelet  $273 \times 10^3$  u/L, lipase 20 units/L, INR of 1.1 and basic chemistry within normal limits. Computed tomography chest and abdomen revealed a large central abdominal mass surrounding the inferior mesenteric artery and multiple lesions consistent with metastatic disease, compressing the distal inferior vena cava, abdominal aorta, common iliac artery, and the right ureter causing hydronephrosis. A testicular ultrasound revealed a punctate echogenic foci of the right testicle. Interestingly, the patient had a testicular ultrasound six months prior which showed a similar echogenic region on his right testicle which was lost to follow up. Tumor markers significant for Beta-hCG (human chorionic gonadotropin) 364,215 mIU/L and AFP (alpha fetoprotein) 15 ng/ml. Liver biopsy illustrated syncytiotrophoblast and cytotrophoblasts, confirming stage 3 nonseminomatous germ cell tumor. A right ureteral stent was placed to relieve the obstruction and the patient was emergently started on VIP chemotherapy (etoposide, ifosfamide, and cisplatin).

**Discussion:** Choriocarcinoma is a nonseminomatous germ cell tumor (NSGCT). It is seen in Caucasian males in a bimodal distribution, ages 15 to 25 and great than 60 years of age. Choriocarcinoma produces large amounts of hCG and greater than 50,000 mIU/L is associated with a poor diagnosis. In adults, choriocarcinoma most frequently spread hematogenously to the lung and lymph nodes. In advanced cases, it can spread to liver, brain, and skin. Choriocarcinoma responds well to chemotherapy and should be started as soon as the diagnosis is made. Early identification of testicular choriocarcinoma and initiation of chemotherapy is important in survival.

### 36) BLASTOMYCOSIS: TWO CASES MONITORED BY C-REACTIVE PROTEIN AND PROCALCITONIN

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**Introduction:** Blastomycosis is a rare, geographically constrained disease caused by the thermally dimorphic fungus *Blastomyces dermatitidis*. The clinical presentations are diverse, from asymptomatic infection and pneumonia to extrapulmonary disease spreading to skin, bones, and the genitourinary system. According to studies conducted before the development of successful therapy, more than 70% of patients had multiorgan spread with mortality rates as high as 90% [1]. However, these studies were mostly conducted on the autopsies; thus, multiorgan involvement was probably overrepresented.

**Case presentation:** We present two patients 2 years apart, whose conditions deteriorated during the hospital course until antifungals were initiated. Each patient was monitored by the serum Procalcitonin (PCT) and C - reactive protein (CRP) levels. Interestingly, while CRP levels were high for these patients, the PCT remained normal.

#### Case 1

A 16-year old immigrant male was admitted to the pediatric intensive care unit following 10 days of illness which included non-bloody diarrhea, intermittent fever, and cough. Initial blood workup showed a CRP of 29.60 mL/dL. Procalcitonin levels were 5.1 ng/mL. Throughout the next 3.5 weeks, the patient had both PCT and CRP levels measured regularly.

#### Case 2

2 years later, an 11-year-old Somali female presented to the ED with persistent cough for 3 days and mild fever for 2 days. Initial blood results showed a WBC of 23,600 cells/ $\mu$ L and a CRP of 12.0 mL/dL. PCT levels were less than 1 ng/mL. During the next 2 weeks, the patient had both PCT and CRP levels measured regularly.

**Discussion:** Blastomycosis can be difficult to differentiate clinically from bacterial pneumonia. As such, serum PCT and CRP can be utilized for early detection and differentiation of bacterial versus fungal pneumonia, thereby directing therapy earlier on in the hospital stay.

#### References

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## 37) AUTOIMMUNE ENTEROPATHY IN AN ADULT PATIENT WITH ULCERATIVE COLITIS

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**Introduction:** Autoimmune enteropathy is a rare clinical diagnosis whose pathophysiology and treatment is poorly understood. Limited case reports and series exist in the literature, with only 98 cases as of November 2018. It is more commonly seen in children with immunodeficiency and extra-intestinal involvement. It is most likely a result of dysregulation of intestinal epithelial immunity and permeability. While presentation is highly variable, patients usually have intractable diarrhea, severe weight loss, positive anti-enterocyte and anti-goblet cell antibodies, and partial or complete small intestinal villous blunting, especially proximally.

**Case:** A 45-year-old female with a history of ulcerative colitis s/p total colectomy with RLQ end ileostomy and Hartmann's pouch for fulminant colitis (2014) presented to the ED with nausea, vomiting, and increased non-bloody, watery ostomy output. She was admitted overnight 2.5 weeks prior for suspected viral gastroenteritis. On this admission, she developed hypovolemic hyponatremia and acute kidney injury which resolved with fluids, normocytic anemia from hemodilution, and leukocytosis from steroid administration. EGD with ileoscopy showed edema, erythema, and increased friability of the duodenum and ileum without ulceration. Pathology included duodenal and ileal subtotal villous blunting, expansion of lamina propria by mixed inflammatory cell infiltrate, and intraepithelial lymphocytosis, largely at crypt bases. Labs were unrevealing for celiac disease, Whipple disease, hypogammaglobulinemia, or other infectious processes. She had anti-goblet cell and anti-enterocyte antibodies. She received IV Solumedrol 20mg BID, which completely resolved symptoms within 24 hours. She was discharged on PO Prednisone 20mg BID and Pantoprazole 40mg BID. At her 10-day follow-up, she was asymptomatic and had gained 23 pounds. She began a 6-week steroid taper with plans to start Vedolizumab if symptoms reappear.

**Discussion:** Autoimmune enteropathy is commonly misdiagnosed as celiac disease due to similar histologic findings of villous atrophy and intraepithelial lymphocytosis. Anti-enterocyte and anti-goblet antibodies are generally present, but their significance in the pathogenesis is not clear. Although not specific, anti-enterocyte antibodies do not appear in celiac disease, Crohn disease, or ulcerative colitis, which can help distinguish autoimmune enteropathy. Anti-goblet cell antibodies are less specific and can be seen in chronic IBD patients and first-degree relatives. Most patients require maintenance steroids and immunosuppressives. Further research is needed to explain mechanisms and treatment of the disease.

### 38) TIMING OF RENAL ULTRASOUND FOR FIRST FEBRILE UTI IN YOUNG CHILDREN: SOONER OR LATER?

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**Introduction:** Urinary tract infections (UTI) are common in young children and are one of the most common pediatric admission diagnoses. The American Academy of Pediatrics has a well-established clinical practice guideline (CPG) for the diagnosis and management of the initial febrile UTI in children 2-24 months, and many institutions have adopted their own CPGs. Our institutional inpatient CPG recommends a renal and bladder ultrasound (RBUS); however, the timing of ultrasound in relation to initiation of antibiotics varies among our providers. The purpose of this study is to describe trends in our practice as well as to identify a difference in the rate of abnormal renal ultrasounds when performed within 24 hours of initiation of antibiotics versus later in the treatment course. Our hypothesis is that RBUS obtained less than 24 hours after initiation of antibiotics is associated with abnormal findings, prompting additional testing.

**Methods:** A retrospective chart review was performed, including all infants aged 2 to 36 months admitted to the hospitalist service at Children's Hospital of Wisconsin with their first febrile UTI from 2016 to 2018. Exclusion criteria included previously identified genitourinary abnormality, history of recurrent UTIs, positive blood culture, immunodeficiency, sepsis, shock, meningitis, or another serious comorbid condition. An abnormal ultrasound was defined as pyelonephritis, pelviectasis, hydronephrosis or any other finding that resulted in additional testing, either a repeat RBUS or voiding cystourethrogram.

**Results:** We reviewed 87 charts; 23 patients were excluded. Of the remaining 64 patients, 65.6% (n=42) had a RBUS within 24 hours of their first dose of antibiotics, while 34.3% (n=22) had a RBUS performed after 24 hours. There was no statistically significant difference in the rate of abnormal findings between patients who had a RBUS performed in <24 hours versus >24 hours (50% vs 41%; p=0.6683). There was also no significant difference in the rates of repeat imaging between the two groups (43% vs 32%; p=0.0348).

**Discussion:** We did not find a significant difference in the rates of abnormal RBUS performed within 24 hours of starting antibiotics versus those performed greater than 24 hours after starting antibiotics for treatment of a febrile UTI in young children. These findings suggest there is no need to delay RBUS for these patients. However, our study was limited by small sample size and, if repeated with a larger group, a difference may become apparent.

### 39) IMPACT OF PATIENT OPIOID AGREEMENTS IN SPINAL SURGERY

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Opioid use and abuse has increased dramatically in recent decades, garnering considerable attention as to best practices in management, treatment and prevention. This retrospective chart review investigated the effectiveness of the Patient Opioid Agreement (POA) in the context of post-operative recovery and opioid use for cohorts of elective spine surgery patients before and after POA implementation in a regional spine and neuroscience center.

There is a need to investigate the impact of POAs. The medical community at large is still determining the best practice for implementation and effectiveness. There are relatively few studies on how POA implementation affects clinical outcomes. POAs merit study as a potential low-cost method to improve patient outcomes with regard to opioid usage.

This retrospective chart review investigated opioid usage for 12 months following spinal surgery at Aspirus Wausau Hospital for 38 patients with no POA in place and 40 patients who signed a POA. Average daily morphine-equivalent opioid usage and the number of patients taking an opioid were quantified at 6 weeks, 3 months, 6 months, and 12 months post-surgery. Additionally, the average cumulative morphine-equivalent opioid usage over 12 months following surgery was quantified.

The results of this study suggest that patients under a POA take less opioids and for a shorter duration following surgery. The average daily morphine-equivalent dose was significantly less for POA patients 3 months following surgery (3.6mg vs. 9.1mg,  $p = 0.043$ ). There was a trend that at 12 months the average cumulative opioid was less for POA patients (2188mg vs. 3819mg,  $p = 0.059$ ). Fewer patients with a POA were taking any form of an opioid at all time points.

The data supports that POA usage after elective surgery can help reduce the amount and duration of opioid use. POAs could therefore help address opioid dependence. The exact mechanism by which POAs influence opioid use is not clear. Possibilities include improved patient education, increased accountability among clinical staff to increase the rate of medication weaning, and epiphenomenon related to increased public and professional awareness of the opioid problem. This study calls for continued attention to the use and benefits of POAs.

## 40) EMERGENCY TRANS CATHETER AORTIC VALVE REPLACEMENT IN SEVERE PROSTHETIC AORTIC VALVE STENOSIS ASSOCIATED WITH ACUTE DECOMPENSATED HEART FAILURE

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**Introduction:** Severe aortic valve stenosis (AS) with acute decompensated heart failure requires prompt treatment. TAVR is fairly new procedure approved by FDA for the treatment of symptomatic aortic valve stenosis. Recent evidence shows that TAVR is the treatment of choice in most patients with AS who are at high risk for mortality and major complications from conventional surgery.

**Case:** A 65-year-old gentleman with history significant for severe AS status post bio prosthetic valve placement, Congestive heart failure NYHA class III, coronary artery disease, and hypertension presented with acute cardiopulmonary decompensation.

Chest X ray was suggestive of pulmonary edema, BNP was 56000 pg/ml, Echocardiogram showed severe prosthetic AS with peak/mean transvalvular gradient of 95/70 mmHg and severe pulmonary hypertension. EKG was unremarkable. Patient was initiated on vasopressor and positive airway pressure therapy. Emergency TAVR was indicated given that patient was hemodynamically unstable and was deemed not a surgical candidate

An emergency TAVR procedure was performed via transfemoral access. A follow-up echocardiogram demonstrated improved transvalvular dynamic parameters with a residual peak aortic valve gradient of 55 mmHg and a mean gradient of 37 mmHg. Patient improved hemodynamically after TAVR procedure.

**Discussion:** Although SAVR used to be considered as gold standard for severe AS, but its early results for high risk surgical patients are not satisfactory, with a reported 30-day mortality of 10.1% . TAVR has become an alternative treatment option for high risk patients with severe AS; less is known about the utility of emergency TAVR in severe prosthetic AS in patients with acutely decompensated heart failure and cardiogenic shock.

**Conclusion:** We observed emergent TAVR can be a life saving option especially in critical bioprosthetic aortic valve stenosis. Further studies need to be performed to investigate the most effective treatment for severe stenosis in a prosthetic aortic valve with associated acute decompensated heart failure.



## 41) FACTORS INFLUENCING RESIDENT RESEARCH: EVIDENCE FROM A 10 YEAR COHORT

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**Background:** ACGME has put great emphasis on scholarly activity during residency, yet ACGME has not been able to identify gaps in achieving these goals. Studies conducted at different institutions failed to identify these gaps and no longitudinal data is available. We possess longitudinal data for the last 10 years across our residency training programs. With this, we can identify missing gaps as well as propose interventions to address gaps.

**Aims:** This projects aims to identify gaps in the knowledge, attitude and competencies of residents in the basic principles of research. Our aim is to develop interventions adapted to bridging the gaps identified above in resident research competencies,

**Methods:** The research design employs utilizing a standardized research instrument (questionnaire), answered by every resident at the onset and completion of residency training. This questionnaire assesses resident's comfort level, knowledge to critically appraise research and literature and knowledge of biostatistics, epidemiology etc. It also covers questions related to career goals, opinions on research environment, and opinions regarding the effect of research on future practice, time constraints etc.

**Results:** Less than half (44%) of the residents who took the pre-test passed the 11 basic statistical questions (e.g. null hypothesis, p-value). Preliminary analysis showed more than 8/10 residents wish to learn more about research and statistical methods at the onset of their residency training. This proportion drops to 7/10 at the end of residency. This trend probably illustrates the inefficiency of the current structure at improving resident clinical research skills. Worse still 9/10 residents acknowledge that possessing research skills is important to interpreting clinical research, less than 30 % of residents are comfortable with interpreting research findings in clinical journals at the end of their residency.

**Conclusion:** We not only have the data to identify some if not all those gaps but we also have the ability to utilize it to propose interventions that can help plug some of these gaps e.g. regular lectures by biostatistician, organized research electives, provision of research coordinator, mentorship, resident reward system to mention a few.

## 42) BIVENTRICULAR THROMBI: A DOUBLE SHOT OF DILEMMA

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**Introduction:** Intracardiac thrombi have been increasingly discovered with the advancement of cardiac imaging techniques. The finding of biventricular thrombi remains rare with optimal treatment unclear.

**Case Report:** A 30-year-old male with history of alcohol abuse and recent diagnosis of HFrEF (LVEF 18%), presented with complaints of worsening SOB and flank pain. CXR showed enlarged cardiac silhouette. ECG revealed sinus tachycardia without acute ST or T wave changes. CT abdomen/pelvis revealed splenic and renal infarcts. A TTE revealed LVEF 15% with multiple large masses to both the left and right ventricles, measuring as large as 2.5cm in diameter. These lesions were a new finding when compared with a TTE completed only one month prior. A heparin drip was started for treatment of infarcts. Cardiac MRI was completed with findings consistent with multiple intracardiac thrombi. It was felt that the likely etiology of substance-abuse dilated cardiomyopathy had led to formation of bilateral intraventricular thrombi, as the patient had no personal nor family history of venous or arterial clots. Percutaneous and surgical intervention were discussed but deferred due to risk outweighing the benefit. He was converted from heparin gtts to Warfarin. Upon hospital discharge, we strongly recommended cessation of alcohol use.

**Discussion:** The majority of intracardiac thrombi are detected on TTE, as TTE is low in cost and widely available. The use of contrast can help to nearly double the sensitivity of thrombi detection via echocardiogram (35% to 64%). Cardiac MRI is the most sensitive diagnostic imaging modality. When etiology of thrombi remains uncertain, a review of familial history for thrombophilic disorders should be investigated, as well as hypercoagulable work-up completed. As biventricular thrombi remain a rare finding, the ideal treatment modality remains elusive. Most commonly anticoagulation with warfarin is chosen. The use of; apixaban, rivaroxaban, percutaneous, and surgical intervention offer treatment options for clinical scenarios that deem them appropriate. As such, treatment plans should be individualized to reflect the patient's comorbidities, risk factors, and thrombi characteristics.

## 43) A RARE CASE OF SUPERIOR VENA CAVA SACCULAR ANEURYSM

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**Introduction:** Superior vena cava (SVC) aneurysms are a rare clinical entity. Diagnosis is completed with advanced imaging and treatment remains controversial; often dictated by the size and morphological classification of aneurysm, as either; saccular or fusiform.

**Case Report:** A 36-year-old Caucasian female with recent successful delivery of a healthy baby girl, presented with new onset SOB and chest wall discomfort. A Chest X-ray was obtained that revealed a large right perihilar mass. Subsequent chest computed tomography revealed right jugular vein and SVC thromboses in addition to the large trans-spatial hypervascular superior mediastinal mass with extension to the perihepatic region. A heparin gtts was started. Right upper extremity venogram revealed a large 5cm-wide-neck saccular aneurysm with mass characteristics representing a vascular anomaly. Resection of the large saccular aneurysm with partial excision of the low-flow peri-hepatic/right pleural cavity venous malformation on cardiopulmonary bypass was completed. She was discharged on Eliquis in stable condition. On follow up appointment in the vascular anomalies clinic, it was felt this lesion likely represented a veno-lymphatic malformation exacerbated during pregnancy. She was continued on Eliquis, family planning was discussed with copper IUD decided upon, and Sirolimus initiated for stabilization/potential reduction of the veno-lymphatic malformation.

**Discussion:** SVC aneurysms are classified morphologically as either fusiform or saccular, with the majority being fusiform. The exact mechanism of formation of these aneurysms has not been elucidated. Diagnosis often involves advanced imaging. Complications rarely occur with fusiform aneurysms, as compared to more problematic saccular aneurysms.

Treatment for saccular SVC aneurysms include anticoagulation and prophylactic surgical resection to prevent aneurysmal rupture. The classification of our patient's thoracic lesion was felt to likely represent a veno-lymphatic malformation. Such lesions are often present from birth, and grow dramatically during times of hormone excess, such as pregnancy. Other adjuvant treatment options include sclerotherapy and mTor inhibitors, such as Sirolimus.

#### 44) A CLASSIC CASE OF CARDIAC TAMPONADE WITH A RARE COMPLICATION OF PERICARDIAL DECOMPRESSION SYNDROME

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**Introduction:** Cardiac tamponade is a life-threatening complication of pericardial effusion frequently causing hemodynamic instability. Common etiologies include but are not limited to ruptured myocardium, pericarditis, and metastatic cancer. The condition is a medical emergency; therapy options include emergent pericardiocentesis or surgical drainage. A rare complication to pericardiocentesis is pericardial decompression syndrome (PDS).

**Case Presentation:** A 56-year-old man with a 35 pack year smoking history presented to the hospital with progressive dyspnea. On presentation, he had normal vitals and EKG revealed electrical alternans. Computed tomography of the lungs demonstrated a massive pericardial effusion as well as left sided lung masses. Echocardiogram showed a large pericardial effusion, classic signs of cardiac tamponade including swinging motion, and late diastolic right ventricular collapse.

Urgent pericardiocentesis drained 1.2 liters of blood tinged fluid. Cytology indicated metastatic adenocarcinoma. Post drainage he developed left ventricular dysfunction and pleural effusions resulting in PDS. After a thoracentesis and watchful waiting the patient symptomatically improved. Repeat echocardiogram showed normalized systolic function.

**Conclusion:** The mechanism of PDS is poorly understood, however, it is believed to be caused by biventricular or left ventricular dysfunction. Pericardial drainage should always be done gradually. Tachycardia or tachypnea post procedure should raise concern for ventricular dysfunction and PDS. Cardiac tamponade is a common cardiology emergency, hence it is important to keep in mind this rare complication.

## 45) FIBRILLARY GLOMERULONEPHRITIS & HASHIMOTO'S THYROIDITIS

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**Introduction:** FGN, a rare primary glomerular disease. Most previously reported cases were idiopathic. Underlying malignancy, dysproteinemia, or autoimmune diseases are not uncommon in patients with FGN. No fibrillary GN case report was found in association with Hashimoto thyroiditis.

**Case Description:** 41 y/o F of Micronesian descent. Recent URI, gestational DM and pre-eclampsia w/ SOB, found to have an acute onset grade III AKI & nephrotic syndrome requiring dialysis. Family hx- nephew w/ ESRD of unknown etiology; currently on dialysis. UA- 3+ protein, no RBC, no granular casts. ESR- 101, CRP- 2.1, mildly elevated LDH. Negative strep antibody, Cryoglobulins, HIV screening, ANCA panel, glomerular basement membrane antibody, Hepatitis panel and double stranded DNA antibody. Monoclonal workup negative. ENA panel positive for SmRNP ab. Normal C3, mildly elevated C4 levels. Normal renal U/S. **Biopsy-**90% of the glomeruli globally sclerosed. Mesangial hypercellularity, expanded matrix and thickened capillary basement membranes. Hyaline deposits within capillary loops and mesangium. Interstitium with inflammatory infiltrate (3+), of lymphocytes, plasma cells and neutrophils. Medium and large-sized vessels with marked myointimal sclerosis (3+). **Immunofluorescence-** non-specific deposits of IgM, C3, and C1q (2+). **Electron microscopy** -Thickened capillary basement membranes, focal loss of foot processes, isolated intramembranous deposits and large sub-endothelial/ mesangial fibrillary deposits. **Fibrillary deposits with thickness of 20.0 nm.**

CT chest- Multiple right thyroid nodules. No malignancy on Abd/pelvis CT and mammogram. **FNA thyroid-** "Cellular Changes Consistent With Lymphocytic (Hashimoto's) Thyroiditis".

**Therapeutic Intervention-** Considering observation of an active crescent, initially was given 3 doses of 1g Methyl prednisone and was discharged on prednisone taper. Now dialysis dependent.

**Discussion:** Association with autoimmune disorders and exact pathogenesis of the disorder is unclear. Further case series of such cases might indicate an association between autoimmune disorders and Fibrillary GN.

## 46) UNILATERAL POSTOBSTRUCTIVE DIURESIS IN A PATIENT WITH NEPHROLITHIASIS

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**Introduction:** Postobstructive diuresis after resolution of bilateral kidney obstruction is thought to be caused by volume expansion and solute retention. Cases of unilateral postobstructive diuresis with a normal contralateral kidney challenge current understanding of physiology.

**Case:** A 56 year-old female with recurrent nephrolithiasis presented with 1 week of fevers, rigors, weakness, and malaise. She endorsed abdominal and bilateral flank pain, but denied urinary symptoms. Vital signs included heart rate of 103, blood pressure of 101/57, and temperature of 38.2°C. Physical exam showed diaphoresis, tachypnea, right upper quadrant tenderness, and bilateral costovertebral angle tenderness. Serum sodium and potassium were 134mmol/L and 4.1mmol/L, respectively. White blood cell (WBC) count was 10.5K/ $\mu$ L, bicarbonate was 15mmol/L, and creatinine (Cr) was 2.11mg/dL. Urinalysis showed 2+blood, 100mg/dL protein, full field WBC, and bacteria. Urine sodium was 66mmol/L. Computed tomography abdomen showed obstructing staghorn calculus in the left kidney and non-obstructing stones in the right. She was diagnosed with sepsis and started on meropenem and vancomycin. Bilateral nephrostomy tubes were placed. On hospital day(HD) 1, the right kidney drained 335mL of urine and the left drained 1725mL. Potassium was 2.8. On HD3, tachycardia and fever resolved. Urine cultures grew E.Coli and ceftriaxone was started. The right kidney drained 575mL, left drained 4225mL. Drainage peaked on HD5 with 975mL from the right kidney and 5225mL from the left. Cr was 1.03. On HD6 the patient was discharged on oral ciprofloxacin with urology follow-up.

**Discussion:** While postobstructive diuresis is a common concern, objective unilateral postobstructive diuresis is rarely described. In this case, the nature of the interventions allowed clear delineation of asymmetric urinary output.

## 47) ATYPICAL ABSCESS: IT IS NOT ALWAYS MRSA

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The objective of this case study is to highlight this unusual abscess to avoid incorrect diagnosis and delay of appropriate treatment.

A 43-year-old male presented with a worsening right hip mass for three days. His past medical history included Factor V Leiden carrier, left-side thalamic syndrome cerebral vascular accident and multiple lower extremity skin infections as a child. The lesion appeared spontaneously, without history of trauma, and had increased significantly the last 24 hours. His vital signs were stable and he was afebrile. A 4 x 4 cm red, hot and fluctuant mass consistent with an abscess was noted over his right anterior iliac crest with 10 cm of surrounding erythema and induration. Serosanguinous drainage was present as well as a palpable, non-tender right inguinal lymph node. The abscess was incised and drained. A sample of the purulent drainage was obtained and sent to lab for culture. MRSA was highly suspected so he was started on trimethoprim/sulfamethoxazole 160mg/800 mg twice a day for 10 days. Final culture results showed a polymicrobial infection with *Proteus mirabilis*, *Morganella morganii* and *Actinomyces neuii*. Re-evaluation one week later found the abscess cavity open, 3 x 1.8 cm, with small areas of tissue necrosis and oozing serosanguinous drainage. The wound was explored which revealed tunneling 1.5 cm at 2 o'clock position with exposed fascia. The wound was debrided. CBC, CMP, ESR, CRP and UA were ordered as well as a CT of the abdomen/pelvis with contrast to evaluate for an intra-abdominal source. Infectious Disease was consulted and recommended IV ertapenem daily. Labs and CT were negative. He completed 2 weeks IV ertapenem daily followed by amoxicillin 875 mg BID x 3 months. The abscess was resolved completely at 3-month follow up with minor residual hyperpigmentation in the area.

*Actinomyces* species are gram-positive bacteria found only in humans and a variety of these species are being increasingly associated with infections at many body sites. The emergence of *Actinomyces neuii* as a pathogen in a variety of monomicrobial and polymicrobial infections merits an increase in recognition and understanding of this atypical abscess microbe. Standard treatment of low risk abscesses may not require culture. This case emphasizes the importance of culture, particularly when it is not responding after incision and drainage and initial antibiotic therapy.

## 48) EVALUATING SOCIAL SUPPORT OF BREAST CANCER PATIENTS: A RETROSPECTIVE CHART REVIEW

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**Background:** A cancer diagnosis comes with an abundance of treatment and support. Accurately defining social support in the context of cancer treatment and evaluating the effect of social support on patient wellbeing needs more research and is complicated by many independent factors such as cancer type and prognosis, length of treatment, and patients' social network.

**Purpose:** The aim of our project is to identify patient demographic information that puts patients at risk for a positive Supportive Care screening in the categories of emotional, social, and practical concerns.

**Hypothesis:** It is predicted that patients without a significant other or without private insurance are more likely to have positive Supportive Care screenings. Additionally, it is likely that there will be a discrepancy in positive screenings between different age groups, specifically in patients over the age of 65.

**Protocol:** We performed a retrospective analysis of the Supportive Care Screening Questionnaires that have been filled out since being implemented approximately three years ago. We limited our patient population to breast cancer patients excluding minors, deceased, and those without curative intent. We accessed registration information including age, sex, race, insurance status, marital status, diagnosis, and stage of cancer at the time of diagnosis. We accessed the data of any patient who scored higher than a 4 in the Emotional Concern Category, Social Concern Category, and/or Practical Concern Category, as well as the stage of treatment at the time of the positive survey. We used SPSS statistics software to analyze the data looking for statistically significant trends between the above-mentioned demographic and diagnosis information and the positive Supportive Care screens.

**Conclusions:** Roughly, 1 in 2 women will report distress, suggesting despite current support strategies there is still room for improvement. A significant relationship indicates younger patients as more likely to flag during treatment. Marital, insurance and work status did not influence the likelihood of a flagged distress screen. To continue this research, we would like to analyze the trends of the support scores throughout the duration of treatment, in addition to the average number of questionnaires completed per patient.



## **49) GROOVE PANCREATITIS AND GASTRIC GRANULAR CELL TUMOR**

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A 62-year-old male presented with several weeks of post-prandial vomiting and weight loss of forty pounds in five months. CT of the abdomen and pelvis in the emergency department demonstrated peri-duodenal mass. The patient was admitted for further workup and to address weakness and malnutrition.

Inpatient EGD and EUS did not reveal any gastric outlet obstruction to correlate with CT findings, but did reveal a gastric mass which was diagnosed as gastric granular cell tumor following biopsy. After the patient was stabilized from a nutrition standpoint, he was discharged to follow up with hematology/oncology and surgery in the outpatient setting. When the case was discussed at tumor board, it was concluded that the most likely explanation for the clinical scenario and imaging was groove pancreatitis. It was also decided that the granular cell tumor did not require removal.

Groove pancreatitis, also known as paraduodenal pancreatitis, is an uncommon focal chronic pancreatitis of the anatomic space or “groove” between the head of the pancreas, the duodenum, and the common bile duct. It can be misdiagnosed as pancreatic adenocarcinoma due to “pseudotumor” formation.

Granular cell tumors are uncommon neoplasms of soft tissue with an estimated incidence of 0.03%. Of those, up to 11% are found in the GI tract, and among those located in the GI tract only 9% are found in the stomach. Granular cell tumors are benign more than 98% of the time and are most likely to be found incidentally. When symptomatic, the most common presenting symptoms are abdominal pain, bleeding, or gastric outlet obstruction.

## 50) AN UNUSUAL CAUSE OF CHEST PAIN

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A 64-year-old male with a past medical history of coronary artery disease and hypertension presented with a one-month history of progressive exertional shortness of breath and chest pain. During this same period he also complained of persistently black but formed stools. Other than a daily baby aspirin, the he did not use any Non-Steroidal Anti-Inflammatory Drugs. Physical examination was unremarkable except for fecal occult blood testing was positive. The patient had a normocytic anemia with a hemoglobin of 4.3 g/dL, hematocrit of 15%, reticulocyte percentage of 4.9%, ferritin of 5.2 ng/mL, and a total iron binding capacity of 394 ug/dL. Troponin was elevated to 0.384 ng/mL and his electrocardiogram appeared non-ischemic without ST segment or T wave abnormalities. He was transfused with 2 units of packed red blood cells and was admitted for further workup of severe anemia likely secondary to a gastrointestinal bleed. Esophagogastroduodenoscopy revealed gastric varices and a red wale sign indicating recent bleeding. Bleeding varices in the context of normal AST, ALT, INR, and bilirubin, and no additional sequelae of cirrhosis prompted an evaluation of the cause of increased portal venous pressure. A computed tomography scan of the abdomen and pelvis revealed a 4.2 cm mass in the pancreatic tail encasing the splenic artery and vein. An endoscopic ultrasound with fine needle aspiration revealed pancreatic adenocarcinoma. Carbohydrate antigen 19-9 was 1 unit/mL and carcinoembryonic antigen was 1.3 ng/mL. The patient was stabilized and discharged home with outpatient follow up for staging and further management of pancreatic adenocarcinoma.

**Discussion:** Pancreatic adenocarcinoma classically presents with painless jaundice because most exocrine pancreatic cancers occur in the head of the pancreas and cause biliary duct obstruction. Pancreatic tail masses however often present with non-specific symptoms due to the lack of biliary duct obstruction. These symptoms include weight loss, non-specific pain, weakness, anorexia, nausea, and vomiting. Pancreatic tail masses often do not present until the mass becomes very large and there is locally advanced disease. Our patient's pancreatic tail mass encased the splenic vein, causing portal hypertension and gastric varices. These gastric varices slowly bled and the patient started to experience chest pain due to myocardial demand ischemia from severe anemia and underlying coronary artery disease.

## 51) TRAPPED INTO THINKING PERIPHERAL VASCULAR DISEASE

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A 32-year-old male with a past medical history of systemic lupus erythematosus and lupus anticoagulant presented with a one-month history of right lower leg pain with walking. His symptoms progressed until he was unable to walk 50 feet without his right lower leg becoming extremely painful. He reported that he used to walk a quarter of a mile without any issues. There was no history of tobacco use. During an outpatient encounter, he was found to have a moderate reduction in the ankle brachial index on the right and abnormal toe brachial indices bilaterally. He was diagnosed with peripheral vascular disease, prescribed atorvastatin, and instructed to follow up in Vascular Surgery clinic. Due to concern for a hypercoagulable state, subsequently he was admitted to the hospital for further workup. Upon admission, his physical examination was remarkable for his right foot being pale and cool to the touch while his left foot was warm and pink. The dorsalis pedis pulse was faint but detectable on the right and normal on the left, and the posterior tibialis pulse was non-palpable on the right and normal on the left. Laboratory studies were remarkable for hypocomplementemia but were otherwise negative for hypercoagulability. Angiography with provocative maneuvers of bilateral lower extremities showed occlusion of the right above knee popliteal artery, a patent left popliteal artery with a short segment of narrowing of above the knee that was more pronounced with plantar flexion, and medial deviation of bilateral popliteal arteries. These findings were consistent with bilateral popliteal artery entrapment syndrome. An outpatient popliteal release surgery was scheduled. Anticoagulation was started for occlusion of the right popliteal artery.

**Discussion:** Popliteal artery entrapment syndrome (PAES) is a rare but important cause of claudication in young patients without risk factors for peripheral vascular disease, especially in men. Reported incidence ranges from 0.16% to 3.5%. PAES is most commonly caused by compression of the popliteal artery by the gastrocnemius muscle. This can be due to a developmental abnormality or rapid muscle growth that results in compression that usually resolves with rest. Long term, repeated compression and decompression of the popliteal artery can cause permanent damage to the vessel wall and eventual stenosis of the artery. Other complications of PAES include popliteal artery thrombosis, distal arterial thromboembolism, arterial aneurysm, and ischemic damage to muscles and nerves.

## 52) SURVIVAL IN STREPTOCOCCAL SEPTIC SHOCK PRESENTING WITH EXTREME ACIDOSIS- A CASE REPORT

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Extracellular pH is maintained between 7.36 and 7.44 and is essential of normal cellular function. Severe acidosis, often defined as pH <6.8 has been known traditionally considered as incompatible with life. We present a rare case of group B streptococcal sepsis complicated by septic shock, acute kidney injury, hyperkalemia and profound metabolic acidosis with presenting pH<6.7.

**Case:** We present a case of 53-year-old female with past medical history of Metabolic Syndrome on metformin, hypothyroidism who presented as a transfer from outside hospital acute hypoxemic respiratory failure and encephalopathy to an outside hospital. She was transferred to our center after being intubated for higher level of care. Upon arrival to Intensive care unit, the patient was noted to hypothermic (33C), bradycardic (30s) and systolic blood pressure <70mm hg. Admission labs notable for ABG pH of < 6.7, lactic acid of 13.4mEq/L, anion gap 34, bicarbonate 5mEq/L, potassium 7.5mEq/L, and creatinine 7.94mg/dl. Remaining electrolytes and liver function tests were normal. Osmolar gap was normal. She was started on vasopressor support, bicarbonate infusion and urgent renal replacement therapy was initiated along with broad spectrum antibiotics and antifungal agents. Imaging including chest radiograph and CT scan of the head were negative. Patient's clinical status improved after 48 hours with resolution of acidosis and was weaned off invasive support including vasopressors and mechanical ventilation. Sputum and blood cultures grew Group B streptococcus and a course of Ceftriaxone was completed course during hospital stay. Hospital course was complicated by mild Clostridium difficile infection also treated during this stay. Patient discharged to home in stable medical condition.

We attribute the severe metabolic acidosis to lactic acidosis from metformin toxicity in the setting of acute renal failure from septic shock due to streptococcal bacteremia. Despite high mortality rates with severe acidosis in critically ill patients, this case illustrates that with prompt intervention and treatment of the precipitating cause, survival is possible even at extremes of acid-base disturbance and should not preclude intensive care treatment.

## 53) SYSTEMIC MASTOCYTOSIS AS A CAUSE OF ANAPHYLACTOID REACTION

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**Introduction:** Anaphylaxis is a life-threatening, systemic allergic reaction characterized by an acute onset of respiratory compromise or reduced blood pressure along with skin, mucosal, or gastrointestinal involvement. Patients with recurrent, unexplained anaphylaxis may require further evaluation.

**Case:** A 50-year-old female with a medical history of hypothyroidism presented for evaluation of witnessed syncopal episode. Upon presentation, she was hypotensive, hypoxic, tachycardic, and in respiratory distress. She reported chest pain, diaphoresis, and dyspnea. Initial work-up including cardiac enzymes, CXR, and TTE was unremarkable except for an EKG showing sinus tachycardia with ST depressions in leads II, aVF, V4-V6. Review of the patient's record revealed that she had history of mast cell dysfunction and was following up with Hematology/Oncology, but further confirmatory workup was pending. Her symptoms and EKG changes resolved after starting supportive care for anaphylaxis along with Benadryl, steroid, and ranitidine. She was discharged with an Epi-pen. One month later, she presented with a similar anaphylactic reaction. Given her history, she received IM Epinephrine, Benadryl, solumedrol, and famotidine. Serum tryptase was elevated to 170. She was discharged with plans to follow up with hematology for a bone marrow biopsy. In the following months, she followed up at a quaternary referral center and met the criteria for systemic mastocytosis with an elevated tryptase, positive D816V KIT mutation, and positive CD25 atypical mast cell in the bone marrow.

**Discussion:** Mastocytosis is a rare disorder that involves an abnormal clonal mast cell expansion with accumulation in various organs resulting in recurrent, unexplained, life threatening anaphylactoid reaction. If mastocytosis is suspected, serum tryptase levels should be measured during the symptomatic and asymptomatic period. Elevations of both are followed by a bone marrow biopsy for the D816V KIT mutation. Management is supportive with antihistamines, steroid, Epi-pen, and avoidance of triggers. Here we present a case of mastocytosis to increase awareness among clinicians to consider this in patients with unexplained anaphylactoid reaction.

## **54) A RARE CASE OF MICROSCOPIC POLYANGIITIS: WORKUP, DIAGNOSIS, AND MANAGEMENT**

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A 63-year old male with a past medical history of hypothyroidism, gout and benign prostatic hyperplasia presented with fatigue, generalized weakness, decreased appetite, and 15 kg unintentional weight loss. He was found to have a normocytic anemia and acute kidney injury and was transferred to Zablocki Veterans Affairs for further evaluation. Initial vitals were 98.8F, heart rate 93 BPM, blood pressure 127/81, respiratory rate of 20. Physical exam was noteworthy for numbness and tingling of his upper extremities and lower extremity pitting edema. Exam was otherwise unremarkable. Significant lab findings included hemoglobin 8.5 g/dl, white blood cell count 8.8 K/ul, MCV 84.1, urea 32 mg/dl, creatinine 2.56 mg/dl, sodium 130 mmol/L, albumin 2.2 g/dl, BUN/creatinine ratio 13, INR 1.18, CRP 152, urine protein to creatinine ratio 1249 mg/g, anti-MPO positive, and an iron panel most consistent with anemia of chronic disease. Urinalysis showed microscopic hematuria, granular casts and white blood cells. His 16-day hospital course was complicated by worsening anemia, requiring 3 blood transfusions. He progressed to oliguric acute kidney injury with a serum creatinine peak of 3.29. Empiric high dose intravenous methylprednisolone was started to cover for vasculitis. Renal biopsy revealed extensive crescentic disease with necrotizing arteries and a pauci-immune pattern confirming the diagnosis of MPO-ANCA associated vasculitis. Cyclophosphamide and chronic prednisone therapy were started. Creatinine at the time of discharge was 2.35, 1 month after discharge with cyclophosphamide treatment it was 1.54.

**Discussion:** ANCA-associated vasculitides (AAV) are rare systemic small vessel idiopathic autoimmune disorders. The incidence of AAV is estimated at 0.5-25 per million and prevalence of 2.3-160 per million. Symptoms include renal injury, peripheral neuropathy, diffuse alveolar hemorrhage, palpable purpura, abdominal pain, GI bleed, and ENT symptoms. This case presents a patient who presented with only two of these symptoms. Prognosis often depends on early diagnosis. It is therefore imperative to have a broad workup when symptoms are vague as in this case. Importantly, the workup should be inclusive of testing for antibodies to MPO/P-ANCA, PR3/C-ANCA. and GBM. Tissue biopsy is also critical to diagnose, stage severity of disease, and target treatment. Regardless of type, American college for rheumatology recommends treatment with glucocorticoids, cyclophosphamide, rituximab and other immunosuppression therapies.

## **55) DISSEMINATED CMV IN A RENAL TRANSPLANT PATIENT**

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A 29-year-old male with past medical history of a renal transplant due to cystinosis and ulcerative colitis presented to the emergency department (ED) after a two-day history of epigastric and right lower quadrant (RLQ) abdominal pain. Pain was sudden in onset that progressively became constant and worsened with movement. He denied any nausea, emesis, diarrhea bloody stools, fevers, chills or night sweats. The patient was followed with the transplant team as outpatient and endorsed compliance with his immunosuppressive regimen. In the ED, he was afebrile, heart rate 87 beats per minute, blood pressure 139/82 mmHg, respiratory rate 18 breaths per minute and was saturating well on room air. Pertinent abdominal exam findings included a non-distended abdomen with hyperactive bowel sounds. Abdomen was soft on palpation with moderate epigastric and RLQ tenderness with no rebound, guarding or rigidity. Remaining exams unremarkable. Basic metabolic panel, complete blood count, lactic acid, lipase and urine analysis were within normal limits. Liver function tests notable for aspartate aminotransferase (AST) 72 units/L and aspartate aminotransferase (ALT) 94 unit/L with normal alkaline phosphatase, total and direct bilirubin. A computerized tomography (CT) of the abdomen and pelvis revealed a mildly distended gallbladder without signs of ductal dilation or intestinal obstruction. Given history and presentation in an immunocompromised individual, gastroenterology performed an esophagogastroduodenoscopy (EGD) and flexible sigmoidoscopy. EGD revealed erosive esophagitis, Los Angeles classification grade B with a non-bleeding duodenal ulcer and gastritis. Flexible sigmoidoscopy demonstrated a normal rectum and recto sigmoid. Duodenal biopsies obtained during the EGD and serum nucleic acid amplification (NAAT) confirmed the diagnosis of disseminated cytomegalovirus (CMV). In addition to protonix, the patient was started on valgancyclovir with plan to monitor CMV quantitative NAAT. CMV is a DNA virus that is prevalent in half of North American adults. In addition to a primary infection, immunocompromised patients may present with reactivation of the disease. These individuals may experience viremia, hepatitis, colitis, esophagitis, gastritis or retinitis. Due to risk of CMV infection among donor positive recipient negative transplant patients, prevention of CMV infections with prophylaxis or preemptive treatment has been suggested in addition to use of CMV seronegative blood products. Due to extensive presentation of CMV infections, recognition of disease risk among immunocompromised patients is important for early identification and proper management.

## **56) DISSEMINATED HISTOPLASMOSIS IN A PATIENT FROM NORTHERN WISCONSIN**

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**Introduction:** Histoplasma infection is most common in the Midwestern states located in the Ohio and Mississippi River valleys. We present a rare case of disseminated histoplasmosis in a patient who is a resident of northern most part of Wisconsin where Histoplasma infection is not as common as other known fungal infections.

**Case Description:** A 65-year-old male was admitted to ICU on account of sepsis and hypoxic respiratory failure. CT scan chest was suggestive of diffuse ground glass opacity. The patient's respiratory status kept on deteriorating despite broad spectrum IV antibiotic administration. Bronchoalveolar lavage specimen cytopathology was unrevealing for malignant cells. Right lung biopsy revealed non-caseating granulomas. Bone marrow biopsy performed to rule out myelodysplastic process as the cause of thrombocytopenia and leukopenia revealed several small granulomas harboring yeast forms, consistent with histoplasmosis.

The patient was initiated on IV amphotericin with remarkable improvement in respiratory status within 3 days. After two weeks, he was switched to oral Itraconazole.

**Discussion:** Historically, the region surrounding Ohio and Mississippi River Valleys has been regarded as Histoplasmosis predominant endemic zone. However, locally acquired infections have been reported in other parts of the USA, indicating that the geographic range of Histoplasma is much wider than it always has deemed to be. This limited knowledge of geographical distribution could potentially lead to misdiagnosis and inappropriate therapy.

Only 1% of sporadic infections are estimated to be symptomatic. Most symptomatic infections involve primary pulmonary disease. Extrapulmonary and severe disseminated disease usually occur in immunosuppressed persons. However, in our patient no prior existing immunocompromised state was identified.

**Conclusion:** The diagnosis of disseminated histoplasmosis in a region where it is not the predominant fungal infection type requires a high index of suspicion. It is important to identify early as the treatment is highly effective and untreated acute infection can be fatal in a matter of few weeks.



## 57) A RARE CASE OF PARVIMONAS BACTEREMIA IN A PATIENT WITH COLONIC CARCINOMA

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**Introduction:** Parvimonas micra is a gram-positive anaerobe and a part of the normal commensal flora of the gastrointestinal tract. Factors predisposing to

anaerobic bacteremia include malignant neoplasms, periodontal disease, immune deficiencies, chronic renal insufficiency, decubitus ulcers and perforated abdominal viscus. Cases of Parvimonas bacteremia in a patient with esophageal carcinoma and in a patient following ERCP procedure have been reported but to our best

knowledge no case has been reported yet in which a patient had colonic carcinoma.

**Case presentation:** We present a rare case of a 94-year-old male who presented with chief complaint of fever and constipation. Complete blood count revealed normal white blood cell count and anemia. Urinalysis came out to be unremarkable for any evidence of infection. Two blood cultures grew Parvimonas micra and Gamella morbillorum and the patient was started on Ampicillin-Sulbactam as per blood culture susceptibility results. Echocardiogram came negative for any evidence of infective endocarditis. CT abdomen/pelvis showed soft tissue mass in the ascending colon just superior to the ileocecal valve (Fig.1, 2). Colonoscopy showed non-obstructing eccentric mass (Fig. 3). Biopsy of the mass revealed moderately differentiated adenocarcinoma. Because of lack of distant metastasis, surgical resection of the mass as definitive curative treatment was done.

**Conclusion:** Immune deficiency is a risk factor for anaerobic bacteremia. Apart from immediately initiating antibiotics, a thorough search for malignancy may be considered when a patient presents with anaerobic bacteremia, especially, when the source of infection is not known. Identifying malignancy in earliest stages may improve treatment outcome.

## 58) LEUKOCYTOCLASTIC VASCULITIS: A RARE SKIN MANIFESTATION ASSOCIATED WITH ULCERATIVE COLITIS

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**Introduction:** Leukocytoclastic vasculitis is an inflammation of small blood vessels with associated neutrophils in the blood vessel walls. It typically presents as palpable purpura on the lower extremities. The incidence of leukocytoclastic vasculitis is relatively unknown as it is so rare. Patients with inflammatory bowel disease have been observed to be at higher risk for leukocytoclastic vasculitis and skin manifestations can even precede a diagnosis of inflammatory bowel disease.

**Case:** A 20-year-old female with a past medical history of ulcerative colitis (UC) on budesonide and mesalamine presented to the ED with a progressive itchy and painful rash. The rash initially began on her feet and legs but would come and go. During the most recent flare, she was also having a UC flare, the rash was spreading up to her torso and arms, and she was having difficulty swallowing. On admission, she was febrile and noted to have numerous purple bullous lesions all over her body as well as mucosal lesions in her mouth and lower extremity edema. Her labs were positive for a leukocytosis, c-ANCA, atypical ANCA and an elevated CRP and ESR. Interpreting lab results proved difficult due to her underlying UC. Infectious disease, dermatology and rheumatology were all consulted. The patient was started on high dose prednisone during her admission. Biopsies were collected which confirmed leukocytoclastic vasculitis. Her symptoms improved after initiation of high dose prednisone. She was discharged home in improved condition on a prednisone taper and supportive cares for the bullae.

**Conclusion:** In conclusion, IBD should be kept in mind as a cause of leukocytoclastic vasculitis, although it is a rare occasion. A careful follow-up of such cases may improve both vasculitis and IBD. Diagnosis requires a biopsy which should occur early on in the presentation. Treatment involves high dose steroids and supportive cares.

## 59) CHARCOT NEUROARTHROPATHY ANKLE FIXATION

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Charcot Neuroarthropathy is one of the many complications of poorly controlled diabetes but can also be seen with alcoholism. Commonly this presents as a collapsed midfoot, but this case involved a collapsed ankle and hindfoot. The patient might not feel this due to their peripheral neuropathy, which diminishes their distal limb pain sensations.

A 65 year old man with history of alcoholism presents to orthopedics for bilateral ankle pain. Exam showed ulceration of the 5th metatarsal and bilateral Varus deformities of the bilateral feet. X-ray confirmed the varus deformity and a diagnosis of Charcot foot was made. Patient was placed in casts bilaterally and made non-weightbearing. Plan was made for surgical intervention pending further imaging. One-week later patient returned with increased erythema and drainage from the ulceration on the right foot. Local control options were pursued. One-week later patient presented to the ED for increased drainage and erythema and was admitted for osteomyelitis that was diagnosed via MRI. He was given Cefepime, IV Vancomycin and Metronidazole to control the infection. Upon visit three weeks later, the infection showed no drainage, erythema or malodor and the previously marked erythema has completely receded. Four months later, a left ankle fusion and supplemental ring external fixator procedure was done to fix the collapsed left ankle. Four days later, the right ankle was also operated on to fix the collapse of the right ankle joint. A similar procedure was done on the right ankle. Following surgery, the patient tolerated well but had a significant amount of swelling and presented with some color changes in his toes and irritation at pin sites, which was addressed with antibiotics. Future plans for the patient include a follow-up in another six weeks that will include a discussion about removal of the external fixators.

This case illustrates the potential complications and treatment plans for a patient that presents with Charcot neuroarthropathy of the ankle. Diabetic patients, or in this case, an alcoholic will present with altered autonomic tone resulting in high blood flow and their peripheral neuropathy will present as decreased sensation. Decreased sensation, ulceration and other trauma will not be noticed by the patient and may lead to serious infections. Trauma will also lead to inflammation and because of the increased blood flow there will be increased bone resorption and increased inflammation. Therefore, early recognition is key, as preventative measures could be taken to prevent advanced pathology.

## 60) RA, LOW COUNTS, FREQUENT BOUTS, FIGURE IT OUT (A RARE CASE OF LGLL)

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**Introduction:** Pancytopenia or neutropenia in an elderly patient carries a wide differential and requires careful evaluation, including a detailed history, exam, and analysis of lab results to determine the source. Despite its rarity, Large Granular Lymphocytic Leukemia (LGLL) is one such diagnosis that must be considered.

**Case Description:** We present an 87-year-old lady with rheumatoid arthritis (RA) and a four-year history of leukopenia, referred by her primary physician due to acute on chronic neutropenia (ANC<500) and recurrent UTI. She had no organomegaly, anemia, petechiae, or history of “B” symptoms. Further workup showed normal levels of folic acid and cobalamin, with an unrevealing peripheral blood smear. Given her characteristic history and presentation, blood immunophenotyping was ordered, which yielded 40% aberrant T cells that were CD3+ CD16+ and CD26+ with alpha-beta TCR, concerning for LGLL. Uniquely, these T cells were negative for CD57, which is normally positive in T cell variants of LGLL. Treatment was soon begun with low dose methotrexate (six 2.5mg tabs po once weekly) and within two months, ANC had returned to greater than 2000 and methotrexate was held.

**Discussion:** LGLL is a disease of peripheral blood and bone marrow, involving monoclonal proliferation of large granular lymphocytes. It classically presents in an elderly patient with RA, or other autoimmune disease, who has recurrent infections due to neutropenia, anemia, or thrombocytopenia. However, patients are often asymptomatic at diagnosis. Diagnosis is confirmed by cytology or immunophenotyping of blood or bone marrow, identifying elevated numbers of large granular lymphocytes. Most important for diagnosis via immunophenotyping is the identification of a clonally rearranged TCR gene, 90% of which are of the alpha/beta variant, while 10% are of the gamma/delta variant. Methotrexate with, or without, prednisone is the preferred initial course for patients with LGLL, especially those with neutropenia and/or autoimmune disease.

**Conclusion:** While it is uncommon, one must consider LGLL as a diagnosis in an elderly patient presenting with a history of autoimmune disease and neutropenia. When diagnosed early, methotrexate serves as a very effective treatment and these patients have an excellent prognosis.

## **61) ASEPTIC MENINGITIS AS AN ELUSIVE CAUSE FOR ENCEPHALOPATHY**

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An 89 year old male patient with a past medical history of COPD and stroke was admitted for altered mental status and shortness of breath to an outside medical facility. The patient and family described an acute mental status change over the prior 2 weeks. CT chest with contrast at the outside facility showed bilateral pulmonary emboli. Due to concern for stroke, MRI with contrast was ordered showing significant leptomeningeal enhancement consistent with aseptic meningitis and concerning for HSV. A lumbar puncture was performed and the patient was started on empiric acyclovir therapy. The CSF viral nucleic acid amplification test was negative for HSV or other common viral etiologies. Bacterial cultures were negative. He was transferred to Froedtert Hospital for further evaluation.

On admission, his neurological exam was significant for expressive aphasia, naming 0/3 objects presented, and oriented to person. Acyclovir initiated at the outside hospital was continued and he was monitored for seizures by EEG. In order to investigate broader CNS causes, another lumbar puncture was performed with CSF fluid sent for extensive viral panel, paraneoplastic panel, autoimmune panel, as well as cytology for neoplastic process. CSF fluid showed protein 124, WBC 198, RBC 13, glucose 57. The cultures and viral panel, including HSV, were negative. Cytology revealed no immunophenotypic evidence of a non-Hodgkin lymphoproliferative disorder but with reactive lymphocytic pleocytosis. Another MRI with contrast was performed, showing interval improvement in the FLAIR signal, consistent with a response to acyclovir. His neurological status gradually improved, specifically with resolution of his expressive aphasia and improvement in orientation.

This case describes encephalopathy as caused by aseptic meningitis of suspected viral nature. The variety of viruses that have been attributed to meningitis and self-limiting nature of this disease can make this diagnosis difficult. Prompt initiation of available therapies and appropriate diagnostic testing are necessary to exclude other diagnoses and allow potential clinical improvement.

## **62) EXCESSIVE DYNAMIC AIRWAY COLLAPSE: CONFOUNDING FACTOR IN PERSISTENT NOCTURNAL HYPERCAPNEA**

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**Introduction:** Excessive Dynamic Airway Collapse (EDAC) is a central airway disease characterized by exaggerated anterior movement of the membranous wall of the trachea during expiration, resulting in dynamic obstruction and impaired muco-ciliary clearance. Clinical manifestations of EDAC vary and often overlap with asthma, chronic bronchitis, obesity hypoventilation syndrome (OHS), and obstructive sleep apnea (OSA). We present a case of recurrent hospitalization for acute on chronic hypercapnic respiratory failure that highlights the importance of recognizing EDAC as a contributor to recurrent hypercapnia.

**Case:** A 74-year-old male with a history of COPD, 50 pack-year smoking history, and OSA on bilevel positive airway pressure (PAP) therapy (IPAP/EPAP 18/14 with 2L O<sub>2</sub>) presented with obtundation due to acute on chronic mixed respiratory failure, which was attributed to non-adherence to nocturnal bilevel PAP. He was placed on his home bilevel PAP settings and empirically treated with steroids and bronchodilators, but his hypercarbia and obtundation persisted. Bilevel support (□P) was titrated by maintaining IPAP and decreasing EPAP to 6-8, without improvement. Review of previous cross-sectional imaging of the chest revealed narrowing of the central airways suggestive of dynamic expiratory collapse. Based on suspected EDAC, bilevel support was increased to 20/16 with a goal to prevent dynamic central airway obstruction by optimizing end expiratory pressure. On these settings, the VBG normalized within 48 hours. The patient was discharged with the adjusted settings and was noted to be doing well at follow up.

**Discussion:** The prevalence of EDAC in the general population is not well defined due to its heterogeneous clinical manifestations and typically non-specific symptoms like dyspnea, wheezing, and cough. EDAC is frequently identified alongside asthma, COPD, and OSA, making it challenging to determine which specific entity to implicate. This case illustrates the importance of considering central airway obstruction when a patient fails to improve with treatment of prevalent small airway (COPD) or upper airway (OSA) obstructive diseases. Empiric or bronchoscopy-guided titration of PEEP or EPAP may aid ventilation by stenting physiologically collapsible airways to allow adequate expiration. As seen in this case, increasing EPAP beyond that required to treat OSA can rapidly improve ventilation in EDAC.

## 63) BK NEPHROPATHY IN A PATIENT WITH NATIVE KIDNEYS AND HISTORY OF ALLOGENEIC BONE MARROW TRANSPLANT

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**Introduction:** BK virus nephropathy is a known cause of allograft dysfunction in renal transplant patients. It is considered a rare cause of native kidney disease in those with solid organ or bone marrow transplants. In these patients, renal dysfunction is often initially thought to be due to the nephrotoxicity of anti-rejection medications.

**Case Description:** A 62 year old male with history of myelodysplastic syndrome status post allogeneic bone marrow transplant in 2018 (complicated by EBV viremia and BK cystitis and viremia) presented from clinic with tachycardia, hypotension, and acute kidney injury. He reported 6 months of fatigue and 16 pounds unintentional weight loss in the last 2 weeks. Physical exam on arrival demonstrated a chronically ill-appearing male with white plaques on his tonsils. He was tachycardic with crackles over the bilateral lung bases. Labs were notable for a creatinine of 3.48 mg/dL (from baseline of 1.1-1.2 mg/dL) and a serum quantitative BK virus level of 513,000 copies/mL. CT of the chest, abdomen, and pelvis showed marked interval progression in the size and number of spiculated pulmonary nodules from 3 months earlier and numerous new hypoattenuating liver, spleen, and right adrenal gland lesions suspicious for metastases. The patient underwent renal biopsy which revealed BK virus nephropathy. He also underwent liver biopsy, which revealed PTLD, specifically diffuse large B cell lymphoma. His mycophenolate and tacrolimus were held, and he remained on prednisone and was initiated on rituximab. Unfortunately, he developed progressive thrombocytopenia, for which he underwent bone marrow biopsy, which showed failure of his graft and return of myelodysplastic syndrome. In light of relapse of the myelodysplastic syndrome and worsening PTLD, he opted for hospice care.

**Discussion:** This case illustrates the importance of considering BK virus nephropathy as a cause for acute kidney injury in a patient with native kidneys and a history of bone marrow transplant and immunosuppression. Renal biopsy is required to make the diagnosis. The treatment is reduction of immunosuppression, which also happened to be part of the treatment for this patient's PTLD. Unfortunately, this led to graft failure and ultimately return of his myelodysplastic syndrome.

## **64) CONSTRICTIVE PERICARDITIS WITH TAMPONADE PHYSIOLOGY IN A PATIENT WITH TKI RESISTANT CML**

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Pericardial diseases associated with malignancy, including leukemia, have been reported in 1-20% of patients with cancer. In CML patients resistant to 1st line therapy with imatinib, other TKIs such as nilotinib and bosutinib are often used as second line agents. TKIs, however, are associated with cardiotoxic effects including pericardial effusion, arrhythmia, QT prolongation, myocardial ischemia/infarction and heart failure.

68-year-old female with hypertension and TKI resistant chronic myelocytic leukemia s/p bone marrow transplant on bosutinib with recent admission for shortness of breath and hypoxia, attributed to left sided malignant pleural effusion s/p 2 diagnostic and therapeutic thoracenteses was readmitted to general care 5 days after discharge for worsening shortness of breath. Shortly after admission, she was transferred to the ICU for worsening hypotension and hypoxia. On exam, she was noted to be in respiratory distress with significant JVD. ABG: pH7.02, pCO2 47, O2 saturation 98 on 100 FiO2. Patient was non-responsive to IVF boluses and pressor. She was subsequently intubated for worsening hypoxic respiratory failure. Cardiology attempted pericardiocentesis multiple times without success as the fluid collection was too loculated to drain. Thoracic surgery attempted subxiphoid pericardial window without success as there was extensive pericardial tumor encasing the myocardium, not amenable to drainage. From hematology's perspective, there was nothing left that could be done for a cure as she has been resistant to multiple TKI medications. Patient was then transitioned to comfort cares after discussion with the family, and shortly passed away after extubation.

The etiology of her pericardial disease was not able to be confirmed due to unsuccessful attempts at pericardiocentesis. However, multiple epicardial tumors were seen on her TTE, with evidence of constrictive pericarditis and tamponade physiology. Her pericardial disease is likely secondary to the underlying malignancy with superimposed TKI toxicity, given case reports of TKI induced pericardial effusion in the current literature. The exact mechanism for TKI induced pericardial effusion, however, is unclear. For TKI associated pericardial effusion, first step would be to discontinue, or dose reduce the TKI therapy until improvement of effusion. Supportive treatment with pericardiocentesis should be performed until improvement of symptoms and effusion.



## **65) COXSACKIE B PERICARDITIS COMPLICATED BY CARDIAC TAMPONADE**

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In pericardial diseases, 40-60% of cases are either idiopathic or viral in etiology. Coxsackievirus B and echovirus are the most common causes of viral pericarditis. Pericardial effusions are often asymptomatic unless it is associated with inflammation or tamponade physiology.

52-year-old female with seronegative inflammatory arthritis and tenosynovitis initially presented to PCP with one-week history of SOB associated with non-radiating chest tightness exacerbated by exertion and inspiration following a recent episode of viral GI gastroenteritis. She endorsed chills and sweats but denied fever. Clinic CXR showed a new small to moderate left pleural effusion with trace right pleural effusion, and plan for diagnostic thoracentesis was made for following day. However, her symptoms worsened overnight, and she was brought to the ED via ambulance. Exam was notable for tachycardia, elevated JVP and documented pulsus paradoxus, and echocardiogram showed pericardial effusion with cardiac tamponade physiology. CT angiography was negative for pulmonary embolism. Patient was otherwise hemodynamically stable and was taken to urgent pericardiocentesis, s/p placement of pericardial drain with removal of 420cc of serosanguinous fluid. Fluid studies including cytology, AFB, culture and smear were all negative. Repeat TTE showed minimal fluid accumulation and no constrictive physiology. Pericardial drain was removed on hospital day 2 after minimal drainage over 24 hours. She had improvement of her symptoms and was discharged on colchicine 0.6mg BID for 3 months and naproxen 500mg BID. On follow-up, Coxsackie B antibody returned positive with titers greater than 1:80.

Recommended treatment for acute pericarditis includes colchicine and NSAID. Steroids are usually associated with higher rate of recurrence of pericarditis. Some known complications include myocarditis, hemorrhagic pericarditis with cardiac tamponade, post viral fatigue syndrome. A rare but serious complication of coxsackie virus infection is acute myocardial infarction. Echocardiography is the diagnostic test of choice for pericardial effusion. Cardiac MR is recommended if there is concern for myocarditis.

## 66) RECURRENT BRONCHIECTASIS: A CASE OF LATE DIAGNOSIS OF CYSTIC FIBROSIS (CF) IN A 65-YEAR-OLD MAN

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**Introduction:** Though commonly diagnosed in childhood, 10% of CF patients are diagnosed after age 18. With new CF therapies, delays in diagnosis could lead to worse outcomes.

**Case:** A 65-year-old Caucasian man with h/o CAD, HFrEF, OSA presents with 3 weeks productive cough, exertional dyspnea, sinus pressure, and frontal headache. 18 months ago, he was treated for mucoid *Pseudomonas* and MSSA pneumonia with 6 weeks of ciprofloxacin and 3 weeks of piperacillin/tazobactam transitioned to 3 weeks of dicloxacillin. 8 months prior, he was again treated for mucoid *Pseudomonas*, MSSA, and *Aspergillus* pneumonia with 7 weeks of piperacillin/tazobactam, ciprofloxacin, and voriconazole. Currently, his CT shows bronchiectasis with extensive bronchial plugging and tree-in-bud nodules and sinusitis. Bronchoscopy with BAL showed pan-sensitive mucoid *Pseudomonas* and MSSA, treated with piperacillin/tazobactam and ciprofloxacin. Extensive workup uncovered Phe508del and Arg117His CF alleles; he was unable to produce enough sweat for a chloride test. Work-up was negative for immunodeficiency, alpha-1 antitrypsin deficiency (A1AD), and allergic bronchopulmonary aspergillosis (ABPA). Additional history revealed recurrent and prolonged sinus infections in his late 20s; his nephew was diagnosed with CF in childhood. He has no h/o pancreatitis and has never fathered. He was referred to the UW CF center for lumacaftor/ivacaftor.

**Discussion:** Bronchiectasis causes include CF, immunodeficiency, A1AD, ABPA, etc. Adult-diagnosed CF can present with milder disease and retain pancreatic function, or have classic symptoms of sinusitis, pancreatitis, heat prostration, intestinal obstruction, and male infertility. CF-approved CFTR modulators, including lumacaftor/ivacaftor, improve lung function and respiratory QOL. Internists can recognize CF manifestations in older adults presenting with bronchiectasis, tree-in-bud nodule CT findings, and mucoid *Pseudomonas* pneumonia, particularly recurrent episodes.

## 67) COST ANALYSIS OF TABLE-TOP VS SMARTPHONE FUNDOSCOPY FOR DIABETIC RETINOPATHY SCREENING

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**Background:** Diabetic retinopathy (DR) is the leading cause of adult blindness in the United States. Diabetics should be screened yearly, but economic barriers to healthcare access mean that compliance can be as low as 18% in some rural and inner-city communities. Stereoscopic dilated eye exam is the gold standard for evaluating retinas but is very expensive and time consuming, requiring an on-site eye specialist. Technological advances in the last decade have led to more efficient and cost-conscious methods of screening. Increasingly powerful tabletop digital cameras (TDCs) allow high quality retinal images to be obtained by on-site technicians, which can be evaluated remotely by a physician at a later time. Nonetheless, the cameras that exist now are very expensive and bulky, which preclude their use in economically disadvantaged communities that would benefit the most from their use.

**Methods:** We explore smartphone funduscopy (SF) as a low cost screening alternative. Cost-benefit analysis was performed using a decision tree model. Empiric data for disease prevalence, screening device sensitivity, specificity, as well as Medicare payment rates, were used and results plotted against each other graphically.

**Results:** Baseline DR prevalence of 28% was used. For TDCs, data for test validity was obtained from two large metaanalyses and found to be 84% for sensitivity and 92% for specificity which resulted in a cost of \$571.61 spent for each case of DR diagnosed. For smartphone funduscopy, 2 studies were used returning a sensitivity of 72% and specificity of 75%, resulting in \$366.61 per case diagnosed. Sensitivity analyses showed that the smartphone camera remained the less costly choice over a wide range of sensitivity and specificity as well as disease prevalence.

**Conclusion:** Based off of Medicare payment rates, current smartphone camera technology is capable of providing cost-effective screening compared to existing tabletop digital cameras, despite falling short of the minimum 80% sensitivity recommended by the British Diabetic Association.

## **68) CASE OF CEFEPIME INDUCED ALTERED MENTAL STATUS**

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Cefepime is a fourth generation cephalosporin antibiotic with broad spectrum coverage against gram positive and gram negative organisms and is typically reserved for treatment of severe, multi-drug resistant organisms. This report highlights a case of suspected cefepime induced encephalopathy, a rare side effect with few mentions in the literature.

Our patient was a 70 year old male with a complex medical history including morbid obesity (BMI=44kg/m<sup>2</sup>), type 2 diabetes mellitus (A1C=10.9mg/dL), hypertension, chronic kidney disease (stage III), coronary artery disease (on clopidogrel and ASA), hypertension with systolic heart failure (EF=30%), left leg amputation (past the knee) and status post colostomy. He presented to the emergency department (ED) with a chief complaint of weakness and malaise, with a new ulcer on his right plantar foot, for the past week. On physical examination he was alert, oriented (x4), and afebrile. His labs showed leukocytosis but no other signs of sepsis. The patient also denied any fever, chills, nausea, vomiting, chest pain or shortness of breath. CT evaluation of his foot was negative for osteomyelitis or abscess. The patient was diagnosed with cellulitis. Blood and wound cultures were drawn. He was started on empiric treatment with IV vancomycin and cefepime. The patient began exhibiting a mental status decline over the course of several days. He started off “somnolent but arousable” and progressed to almost completely unresponsive, localizing to pain, but not following any commands. After day 5 of antibiotics, the erythema in his leg had subsided, but his mental status remained poor. A full workup, including CMP, blood cultures, and head CT were unrevealing. After day 6 of hospitalization, the patient’s cefepime was switched to piperacillin-tazobactam. The following morning his mental status started to improve as he was able to answer questions, and follow commands again. He returned back to his baseline over the course of a few days. The rapid resolution of symptoms after cessation of the drug, coupled with the lack of other explanation made this case highly suspect for cefepime induced encephalopathy.

Cefepime induced encephalopathy is a relatively rare or underappreciated finding according to a literature search. This case report serves to add to the literature on this condition.

## **69) CALCIUM CHANNEL BLOCKER TOXICITY CAUSING ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS); A COMMONLY USED DRUG TRIGGERING A LIFE THREATENING CONDITION**

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**Introduction:** Calcium channel blockers (CCB) are classified into dihydropyridine calcium channel blockers and non-dihydropyridine calcium channel blockers. They are commonly used drugs with potentially life threatening toxic effects. One such underreported toxicity of calcium channel blocker use is the development of Acute Respiratory Distress Syndrome (ARDS).

**Case presentation:** A 44 year old ambulatory female presented to the emergency department after ingesting 60 tablets of Verapamil ER 125 mg and 90 tablets of 0.25 mg clonazepam with the intent to commit suicide. Upon presentation to an outside ED she was intubated for airway protection and subsequently transferred to our facility for further care. Hospital course was complicated by worsening hypoxia with chest-X-ray showing bilateral patchy geographic areas of airspace opacities consistent with ARDS. Echocardiography revealed normal LV systolic function, ejection fraction of 62% and normal LV end diastolic filling pressures, ruling out cardiac causes of pulmonary edema. The patient received aggressive supportive care with fluid resuscitation followed by multiple doses of glucagon and calcium gluconate, atropine and calcium chloride. Insulin and IV dextrose were followed by IV intra-lipid emulsion therapy was used to combat the CCB overdose. She required vasopressor support and temporary transvenous pacing support during her hospital course. The patient was ventilated using low tidal volume mechanical ventilation. At about 5 days into her hospital course her clinical status improved significantly and she was subsequently weaned off vasopressors and extubated.

**Discussion:** CCB toxicity is reported to have caused hyperglycemia, acidosis and acute kidney injury and very rarely ARDS. A proposed mechanism for the development of ARDS includes inhibition of surfactant secretion by type II pneumocytes by calcium channel blockers. Another possible mechanism is the selective pre-capillary vasodilation causing excessive transudation of fluid from the pulmonary capillaries into the alveoli.

**Conclusion:** Calcium channel blockers are commonly used in clinical practice and can have serious repercussions. Cautious use of these drugs by clinicians can ensue by increasing awareness of calcium channel blockers intoxication being a possible trigger of ARDS, a potentially life threatening condition.

## **70) EVALUATION OF A COMPLEX RENAL CYST IN A 57-YEAR-OLD**

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A 57-year-old Caucasian male with a past medical history of plaque psoriasis, asthma, and hypertension was transferred to our institution with worsening fatigue, anorexia, nausea, vomiting, diarrhea, abdominal pain and abdominal distension for the past few months. He reported no significant family history, denied recreational drug use and smoking, and reported only occasional alcohol use. He was diagnosed with a renal cyst incidentally via imaging in September 2017 and no intervention was planned at that time. CT of the Abdomen/Pelvis with contrast performed at the outside hospital showed a 20 x 15 x 4 x 21 cm right upper pole complex cystic renal mass with mass effect. Here, we present a review of cystic renal masses and their categorization, prognostication, and management according to the Bosniak renal cyst classification system with tables and its application to a specific case vignette. Our patient presented with a Bosniak category IV renal cyst. In accordance with the most recent Bosniak algorithm and considering the presenting symptoms the patient was surgically managed with right radical nephrectomy. Cytology confirmed the diagnosis of clear cell renal carcinoma. Samples of the patient's ureter and vascular margins were negative for metastatic disease. A biopsy of the contralateral kidney showed only simple cysts and an incidental nephrogenic adenoma. The patient's prognosis was complicated by the fact that he was diagnosed and treated late in the disease course, as the cyst had been detected almost a year prior to the current presentation. Unfortunately, in the interval following his discharge, the patient's condition rapidly worsened and he succumbed to metastatic disease six weeks after his nephrectomy.

### **Learning Point:**

1. Bosniak renal cyst classification may help risk stratification and further management decision in renal masses.

## 71) IMPROVING THE QUALITY OF CARE OF WOMEN IN THE EMERGENCY DEPARTMENT: A SURVEY OF BATTERED WOMEN

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**Study Objectives:** *Domestic Violence (DV) is a continuous problem defined as physical, sexual, and/or mental abuse used by one person in a relationship in order to gain control over the other. Over 10 million in the US will experience DV, and 34% will seek medical care for their injuries. The Joint Commission, the American College of Emergency Physicians, and the US Preventive Services Task Force strongly encourage screening for DV. However, only 30% of women who present to the Emergency Department (ED) are screened. To gain better understanding of patient screening and treatment in the ED, we conducted a pilot survey of DV patients in a shelter, seen in an ED. We are not aware of prior studies examining care of DV patients in an ED.*

**Methods:** The survey was conducted during the women's initial visit to Sojourner Family Peace Center in Milwaukee, WI. It includes 22 questions measuring responses of women's encounters with screening and treatment for DV in the ED. The women provided opinion on improvements they believe could be made.

**Results:** Sojourner Family Peace Center collected 24 surveys over 7 months. Thirteen women presented to an ED for treatment of injuries related or not related to abuse. Problems with abuse-related care they received were identified. For example, 31% of women presenting with obvious signs of abuse, such as human bite wounds or head injury, were not screened. Four of 11 women were screened with family or law enforcement present. Nine of 11 were screened by a nurse, social worker, or police officer, not a physician. Four women felt rushed by healthcare professionals and that they did not genuinely care. Most noticeably, women were not screened at all.

**Conclusion:** We gained valuable insight on interactions between healthcare personnel and DV victims. DV screening must be done with no family or those who may influence response present. Removing law enforcement from patient rooms is noted to make women feel more comfortable. If a family member or abuser is adamant remaining with the patient, the patient can be removed for an x-ray, blood draw, or sensitive exam to attain privacy. Most screening is done by a nurse, social worker, or law enforcement, not a physician. Standardizing screening could aid in making DV victims feel less rushed and more at ease. We desire to expand upon this pilot study. The courageous women sharing personal stories help pave the way to better treatment for future victims of DV presenting to the ED.

## 72) KEEPING UP WITH THE JONESES: AN UNEXPECTED CAUSE OF POLYARTHRITIS

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**Case Description:** A 30-something year old woman was hospitalized with acute inflammatory polyarthritis. She had a preceding two-week history of ascending symmetric polyarthritis with associated polymyalgias and low-grade fevers, which resolved within 48 hours of starting antibiotic therapy and NSAIDs. An exhaustive autoimmune workup was negative. She was discharged from the hospital and completed a two-week course of antibiotics for the remote possibility of a tick-borne illness, given a borderline elevated *Anaplasma* serology. Fortunately, her polyarthritis completely resolved. However, two months later she was hospitalized for community-acquired pneumonia. She underwent TTE to investigate her sinus tachycardia, which showed mitral and aortic insufficiency. Although her admission blood cultures were negative, there was concern for endocarditis, so she underwent TEE, which confirmed the findings. Her valvular disease coupled with her unexplained illness months prior raised the possibility of acute rheumatic fever. Her ASO and anti-DNase antibodies were markedly elevated, confirming the suspicion. She was later seen in ID clinic, where she was prescribed lifelong penicillin for rheumatic prophylaxis.

**Discussion:** Acute rheumatic fever occurs several weeks after infection with group A *Streptococcus*. The Jones Criteria aids in this difficult diagnosis, and includes the five major manifestations including carditis and valvulitis, arthritis, CNS involvement, subcutaneous nodules, and erythema marginatum. The minor criteria include arthralgias, fever, elevated acute phase reactants, and prolonged PR interval on EKG. The patient in this case exhibited the more common presentation of febrile illness with arthritis and valvulitis, namely the mitral and aortic valves as seen here, without neurologic involvement. Unexplained sinus tachycardia, which prompted cardiac evaluation and ultimately led to the diagnosis in this patient, is an additional feature. This case demonstrates a delayed diagnosis of acute rheumatic fever, an important component of the differential diagnosis of arthritis and unexplained valvular abnormalities.



### 73) HYPONATREMIA IN NEUROMYELITIS OPTICA: INTERNISTS SHOULD BE HYPERVIGILANT FOR SIADH

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**Introduction:** Neuromyelitis optica (NMO) is an immune-mediated inflammatory disease afflicting the central nervous system, particularly the spinal cord, brainstem and the optic nerves. It is associated with defects in the aquaporin-4 antibody (AQP4-Ab) on astrocytes, pia in the brain and spinal cord, and the glial lamellae of the supraoptic nucleus in the hypothalamus. The prevalence and incidence of NMO in the United States is reported to be 3.9 per 100,000 patients. Syndrome of Inappropriate Anti-Diuretic Hormone (SIADH) may occur when NMO lesions affect the hypothalamus. Recognizing SIADH as a potentially serious consequence of NMO is crucial in ensuring proper treatment.

**Case:** A 21-year-old female with past medical history of NMO (diagnosed 4 years prior) presented with acute diarrhea, nausea and vomiting. Initial labs significant a serum sodium of 125 mmol/L. Infectious work-up was non-elucidating. KUB showed significant stool burden and diarrhea improved with lactulose. Hyponatremia was noted upon admission from a baseline serum sodium of 140 mmol/L and clinically appeared euvolemic. Serum and urine osmolalities were 244 mOsm/kg and 698 mOsm/kg, respectively, and urine sodium was 206 mmol/L. Correspondingly, she was diagnosed with SIADH. Treatment was initiated with salt tablets and fluid restriction. Serum sodium improved from a nadir of 119 mmol/L to 128 mmol/L at discharge. Brain MRI was performed and revealed a new demyelinating lesion in the hypothalamus consistent with spread of her NMO as the likely underlying etiology of SIADH. She received both one dose of rituximab infusion and cosyntropin to treat an NMO flair with further treatment on an outpatient basis. Her serum sodium returned to normal limits upon treatment completion.

**Discussion:** The hypothalamus maintains water balance through antidiuretic hormone (ADH) secretion. Since AQP4 is highly expressed in the hypothalamus, AQP4-Abs in NMO are thought to cause leakage of ADH, leading to SIADH. The incidence of SIADH in NMO patients is estimated to be 15%. Furthermore, SIADH has been reported as the initial manifestation of NMO. While hyponatremia common, the etiology should be carefully elucidated in patients with NMO to ensure prompt treatment of an underlying NMO flare.

## 74) UTILIZATION OF THYROID TRANSCRIPTION FACTOR-1 FOR NON-OVERT LUNG ADENOCARCINOMA METASTASIS

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**Introduction:** The recurrence rate after tumor resection for non-small cell lung cancer (NSCLC) is estimated to be as high as 33.1% in patients with negative margin resections. About 20% of patients with NSCLC develop CNS metastases, which will be the first site of relapse in 30% of these cases. Neurocognitive changes may be the initial manifestation of such metastases and in an older population this may be difficult to distinguish from other causes such as dementia. In patients with a history of lung malignancy presenting with neurological symptoms, thyroid transcription factor-1 (TTF-1) immunohistochemistry can be useful in differentiating between recurrent disease and other neurocognitive etiologies.

**Case:** A 59-year-old woman with a history of resected NSCLC presented to the ED with acute confusion, left sided weakness, and slurred speech. History of present illness included a 6-month decline in functional status, a 35lb weight loss, and gait abnormalities. Initial CT findings suggested stroke but subsequent MRI was negative for acute intracranial disease. Neurology was consulted and a lumbar puncture was performed. The CSF was positive for 8 WBC, protein 64 a glucose of 21 and a cytospin was done. Autoantibody and paraneoplastic panels for lung cancer were negative. However, TTF-1 staining was positive in rare cells in the cytospin, suggesting lung adenocarcinoma recurrence. A subsequent MRI demonstrated concerning findings for leptomeningeal disease versus inflammatory polyneuropathy due to a small enhancement in the cauda equina. A follow-up PET showed no signs of recurrent lung disease or metastasis. MRI findings coupled with positive TTF-1 in CSF suggested that the etiology of neurological decline was likely due to leptomeningeal disease from recurring lung adenocarcinoma. Pembrolizumab was then started.

**Discussion:** TTF-1 is commonly used to distinguish between lung adenocarcinoma and small cell lung cancer, as it is highly specific (95-100%) for lung adenocarcinoma. Published literature shows the value of TTF-1 in determining brain metastasis origin when there are visible intracranial lesions on imaging. Our case demonstrates how TTF-1 can differentiate neurological symptoms caused by CNS metastasis of lung adenocarcinoma from other neurocognitive disorders. Furthermore, TTF-1 is useful in likely patients when imaging does not show overt metastasis.

## **75) CALCIFIC UREMIC ARTERIOLOPATHY IN A PATIENT WITH END STAGE RENAL DISEASE**

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Calcemic Uremic Arteriopathy (CUA), commonly known as calciophylaxis, is a rare and serious complication associated with End State Renal Disease and long-term hemodialysis. It represents a lethal sequelae of renal disease with high morbidity and mortality.

A 76-year-old female with a past medical history significant for End State Renal Disease on long-term peritoneal dialysis, diabetes mellitus type 2 complicated by polyneuropathy and retinopathy, below the knee amputation, peripheral angiopathy, and obesity, was admitted to the Internal Medicine service for abdominal pain, nausea and vomiting felt to be related to constipation. Serial peritoneal dialysis studies were negative for spontaneous bacterial peritonitis. Her abdominal pain resolved with a bowel regimen. However, pain control then became a challenging problem. She complained of diffuse, 10/10, superficial pain in her buttocks, stump, and chest wall in locations that varied and was marginally relieved by a myriad of different pain regimens including opioids, neuropathic agents, and ketamine infusion. The pain severely limited her ability to work with therapy and impacted her appetite such that her nutritional status declined. Physical exam showed a 3x2 cm firm subcutaneous nodule, tender to palpation, on the right buttock, raising concern for CAU. In the setting of poor pain control, deteriorating nutritional status, and deconditioning, the decision to pursue comfort cares was made. The presumed diagnosis of CUA added to the discussion that this patient was suffering from end-stage complications of her renal disease with limited options for treatment. Though diagnosis of CUA can be established with tissue biopsy, the biopsy itself carries risk of creating necrotic ulcers and is therefore reserved for ambiguous cases. Standard treatment is IV sodium thiosulfate for a duration of 3-6 months, however response has poor documentation in the literature. Definitive diagnosis was not pursued in this patient for risk of further harm. Treatment was not pursued in the setting of a terminal patient on comfort cares. She ultimately passed weeks later, following withdrawal of dialysis.

CAU is a serious complication of ESRD. It is difficult to diagnose and treat and carries a high mortality. Risks of interventions must be weighed against benefits in a patient with a poor prognosis.

## **76) “WAITING ON A MIRACLE”: A CASE OF GUIDING A FAMILY THROUGH END-OF-LIFE DECISIONS**

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**Introduction:** While cancer is a common diagnosis, patient preferences and family interactions are often unique. We present a case where a family member was placed in a difficult position of deciding when to extubate a loved one with a terminal diagnosis.

**Case Description:** A 63-year-old female with a history of endometrial cancer with lung and bone metastasis presented with worsening shortness of breath and productive cough. Her physical exam was remarkable for hypoxia, bilateral diffuse crackles of the lungs, and a large hard mass in the lower abdomen. CT scan showed a 14 cm uterine mass and innumerable bilateral metastatic pulmonary nodules. She had been diagnosed with uterine cancer 2 years prior but opted for a non-medicinal approach, believing her cancer would be cured if she became vegan and had strong religious faith. She was admitted to the floor but rapidly deteriorated requiring ICU 3 days later. Despite declining medical treatment previously, the patient requested aggressive interventions including intubation and asked that her sister, the power of attorney, to decide when to transition her to comfort care. While the family respected her wishes, not all of the family members were comfortable with her decision. The power-of-attorney was activated and struggled to make decisions for sister who opted for an alternative approach to treating her cancer but still wanted other forms of aggressive medical therapy while balancing the influence of discordant family members.

**Discussion:** This complex case presents how integral family is in end-of-life medical care of a patient whose choices of medical treatment may differ from what is recommended by traditional medicine. With the help of the medical team, including palliative care specialists, the family was able to reach a consensus about the trajectory towards the end of her life.

## **77) DISSEMINATED BLASTOMYCOSIS IN AN IMMUNOCOMPETENT PATIENT**

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Disseminated blastomycosis dermatitidis is an uncommon fungal infection especially when present in immunocompetent hosts. Blastomycosis will typically involve the lower respiratory tract yet it can manifest in extrapulmonary sites such as the skin, bones and joints.

A 27 year-old incarcerated male presented with a 2-month history of hemoptysis and cough. He denied any symptoms of weight loss, night sweats or fatigue. He could not recall whether anyone in jail had similar symptoms as his own and he denied any travel prior to incarceration. Patient was complaining at admission of bilateral headache, neck pain along with light sensitivity. Upon examination, it was noted that he also had cutaneous lesions on his forehead, on his cheeks bilaterally as well as on his forearm. On presentation, vital signs were stable; labs were remarkable for leukocytosis. Due to concern for tuberculosis, patient was placed in isolation until further work-up could be done. CT of chest was obtained along with a LP. Quantiferon tb, sputum cultures, and skin biopsy were also obtained. Patient was initially started on vancomycin and ceftriaxone. CT of chest revealed a right lower lobe consolidative opacity with areas of cavitation as well as bilateral diffuse centrilobular nodules. Infectious work-up was negative for quantiferon TB. Urine histo and blasto resulted positive and sputum cultures were positive for blastomyces. CSF protein 170, glucose 21, wbc 371. Skin sample under direct microscopy revealed broad based budding yeast. Tissue punch biopsy from left ear lesion was also positive for round yeast forms consistent with cutaneous blastomyces.

Disseminated blastomycosis can involve any organ system with a presentation that may mimic other infections such as tuberculosis. To diagnosis this infection, *Blastomyces* spp. must be isolated in culture or observed in tissue sample. The treatment of choice is based on the presenting symptoms. In moderate disease itraconazole is the preferred treatment whereas amphotericin is the favored antifungal choice in more severe infections such as those with CNS involvement. Although uncommon, it is important to maintain a high degree of suspicion for blastomyces dissemination regardless of the immunological status of a patient. It is also important to manage the infection with the appropriate antifungal to avoid progression of disease.

## **78) JAUNDICE AND ABDOMINAL PAIN IN AN ADOLESCENT**

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An 18-year-old man with no significant past medical history presented to the emergency department with complaints of 1 week of right upper quadrant abdominal pain, fever, chills, myalgias, sore throat, nausea, and vomiting with jaundice appearing on the day of presentation. He also noted dark orange urine for 5 days prior to presentation. He reported smoking marijuana weekly, and also reported being sexually active with females with consistent condom use. He had 2 tattoos, reporting the most recent one had been done approximately 1 month prior to presentation.

At presentation, he was febrile to 101.2, otherwise his vitals were within normal limits. On physical exam, he had posterior cervical lymphadenopathy, scleral icterus, diffuse jaundice, RUQ abdominal tenderness, and mild splenomegaly.

Initial labs were significant for a total bilirubin of 19.5 with a direct bilirubin of 15.7, elevated AST and ALT of 374 and 242 respectively, and lipase of 65. His labs also showed evidence of hemolysis with a hemoglobin of 11.1 (13.4 a week prior to presentation), MCV of 91, platelet count of 147, LDH of 1453, and haptoglobin less than 10. HIV was nonreactive and acetaminophen level was within normal limits. A right upper quadrant ultrasound was done, which did not show any evidence of biliary obstruction or other pathology.

Further workup revealed low C3 and C4, 67 and 2 respectively. The direct antibody test (DAT) was found to be positive with cold antibodies. Epstein-Barr virus (EBV) IgM was positive. Mycoplasma was negative. The diagnosis of cold autoimmune hemolytic anemia (AIHA) secondary to acute EBV was made. A thermal amplitude study later confirmed the diagnosis. His bilirubin downtrended rapidly and his hemoglobin improved, thus he only required supportive treatment.

This case illustrates that acute EBV can have a variety of presentations, including AIHA. EBV is classically associated with cold AIHA. Management of cold AIHA secondary to EBV is primarily supportive, with instructions given for cold avoidance. Glucocorticoids are not typically effective in cold AIHA like they are in warm AIHA, and either plasmapheresis or IVIg may be used in the setting of severe hemolysis.

## 79) ABNORMAL MARROW SIGNAL ON MRI AND THE DIAGNOSIS OF METASTATIC PROSTATE CANCER

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The increased use of MRI has resulted in incidental reports of abnormal bone marrow signal. These are primarily benign and when a malignant process is found, it is usually due to an infiltrative process from a hematological malignancy. Metastatic prostate cancer usually presents with blastic appearing spinal lesions, but here we demonstrate a case of widely metastatic prostate cancer presenting only with abnormal bone marrow signal on MRI.

An 89-year-old male presented to the hospital with gait disturbance and urinary retention in the setting of longstanding lumbar canal stenosis and degenerative joint disease. In recent months, he had a melanoma treated with resection and was evaluated by his primary care physician for a 20-pound unintentional weight loss. The initial workup had been unrevealing. On admission, a Foley catheter was placed and a CT chest, abdomen, and pelvis were obtained given the weight loss. An MRI of the lumbar spine was also ordered to evaluate the new focal neurologic findings. The CT did not display evidence of a primary neoplasm, however an abnormal bone density suggestive of an infiltrative marrow process was noted. The MRI confirmed these findings and demonstrated progression of his previously noted degenerative disease without any compression fractures, bony lesions, or evidence of cord compression. The post contrast images showed diffuse marrow enhancement that correlated with the abnormal bone density seen on CT. On T1 weighted images, the marrow had diffusely decreased enhancement and patchy marrow edema was also noted. Due to the concern for an infiltrative marrow process, he was evaluated for hematological malignancies including plasma cell dyscrasias with a review of his peripheral smear, blood counts, chemistries, and serum electrophoresis, all of which were unrevealing. A bone marrow biopsy was considered, however given the lack of cytopenias and patchy nature of the marrow involvement there was concern for a false negative test. A PSA was obtained and elevated to 812. Subsequent bone scan revealed numerous, multifocal areas of increased uptake consistent with his MRI findings leading to the diagnosis of metastatic prostate cancer. The patient was started on androgen deprivation therapy given his age and comorbidities.

With age, there is natural transition from predominantly hematopoetically active red marrow to a yellow marrow with increased fat content. This fat typically appears bright on T1 weighted imaging. Disorders in which normal marrow is replaced by tumor, T1 weighted enhancement is decreased due to displacement of the fat. In our patient, there was no evidence of a prostatic mass, enlarged lymph nodes, or bone lesions on CT or MRI to suggest a metastatic solid tumor. Therefore, an abnormal bone marrow signal may be the harbinger of a metastatic process outside the typical hematological malignancies.

## 80) GRANULOMATOUS MENINGIOENCEPHALITIS IN HUMANS: A RARE PRESENTATION

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**Introduction:** Granulomatous meningoencephalitis is an important cause of idiopathic encephalitides of the canine and feline species. It is a very rare entity in humans with only two known cases reported so far. Hence the pathogenesis, diagnosis, management and treatment are unknown in humans.

**Case:** We present a unique case of 22-year-old gentleman, a gardener by profession, presented with recurrent headaches, confusion and progressive generalized weakness of 4 months duration. Imaging workup showed severe hydrocephalus and leptomeningeal enhancement. Full work-up on blood and CSF was negative for any bacterial, viral, parasitic, and tickborne infections. Autoimmune and vasculitis panels were also negative. Arachnoid membrane biopsy showed necrotizing granulomatous inflammation with negative staining for fungal microorganisms and acid-fast bacilli. Blastomycosis was the primary differential per histopathology of granulomas, as well as the fact that patient belonged to endemic area and had professional exposure to plants and soil handling. His neuro function continued to decline and developed neurological complications. Patient was empirically treated with IV liposomal amphotericin B, later switched to Voriconazole. Patient showed progressive improvement on antifungals. Repeat meningeal biopsy showed burnt out granulomas. Patient had complete neurological recovery after 6 months of antifungal therapy.

**Discussion:** It is important that the physicians should consider a broad range of etiologies when evaluating patients who present with symptoms concerning for meningoencephalitis. Suspicion should be kept high for fungal infections in endemic areas. Empiric therapy should not be delayed while awaiting conclusive evidence as the delay in treatment can result in permanent neurological deficits.



## **81) CONCURRENT CARDIO-CEREBRAL INFARCTION: A MANAGEMENT CHALLENGE**

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**Abstract:** A cardio-cerebral infarct is an event witnessed very rarely and reported infrequently so that there are no clear recommendations or treatment guidelines.. Both acute ischemic stroke and acute myocardial infarction especially STEMI are medical emergency conditions requiring timely management. It becomes especially challenging for physicians when both of them occur at the same or nearly same time. We encountered this challenging situation at our tertiary center when a 63-year-old male with no prior cardiac or cerebral history came with acute left-sided weakness and slurring of the speech. He also had chest pain on again off again before the time of presentation. CT scan showed dense MCA sign on the right side and EKG showed STEMI. He also developed atrial fibrillation and ventricular arrhythmias requiring defibrillation and amiodarone. With NIH score of 13 he was given TPA for the stroke.

He went on to develop mild hemorrhagic conversion of his ischemic stroke after TPA. He also developed sustained monomorphic ventricular tachycardia requiring amiodarone, lidocaine and multiple defibrillations. He ultimately got a percutaneous catheterization 48 hours after the TPA, which showed complete occlusion of the right coronary. Significant amount of thrombus was obtained via an aspiration catheter. Despite multiple passes, his RCA continued to remain occluded with new thrombus being formed while attempting to recanalize the artery.

The patient developed ventricular fibrillation and that is when the family decided to withdraw care and make him palliative. The patient survived his ventricular fibrillation and passed away a few days from aspiration pneumonia likely from the stroke.

## 82) SHINING A LIGHT ON “LUMONOL”

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### **Learning Objectives:**

1. Recognize the importance of supplements when evaluating a presenting symptom
2. Consider medication side effects when determining alternative etiologies for atypical presentations of disease

**Case:** A 69-year-old male with past medical history of type II diabetes mellitus and benign prostatic hypertrophy with chronic indwelling urinary catheter presented to the emergency department complaining of two episodes of “full-body” weakness and slurred speech. The first episode occurred five days prior to presentation, during which the patient woke up unable to move all extremities, with full resolution of symptoms four to five hours later. The day of presentation, the patient again developed similar weakness and slurred speech upon waking, an hour prior to calling emergency services. Prior to presentation to ED, he regained movement in all limbs and strength returned to baseline within six hours. On initial evaluation, the patient admitted to several falls over the last few days.

On further questioning, the patient revealed that he had started taking a supplement for “brain energy” called Lumonol, which he started the day prior to initial onset of symptoms. The active ingredient in Lumonol is listed as the peptide “noopept” (N-Phenylacetyl-L-prolylglycine ethyl ester), which acts similarly to GABA agonists and may result in sedation and could result in sleep-wake cycle abnormalities. The patient was counseled on cessation of the supplement and had no recurrence of symptoms.

**Discussion:** Supplements are often assumed to be benign and noncontributory to a medical history. Lumonol, with its active peptide “noopept”, is purported to enhance memory and focus, and to increase “brainpower in the long-term by clearing the brain of toxins.”. Noopept has been studied as a potential compound to prevent the progression of Alzheimer’s disease. As more supplements flood the market and patients turn to over the counter, non-FDA approved medications, it is imperative that physicians consider both OTC and prescribed medications in our histories. Supplements must be taken into consideration when evaluating an atypical presentation of disease with no clear etiology.

### **83) MUSCLE WEAKNESS IN A MIDDLE AGE MALE**

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Several conditions are associated with muscle weakness. True muscle weakness must be differentiated from lassitude. Those with lassitude general complain of generalized weakness while those with true muscle weakness often complain of inability to perform specific tasks. History and physical examination are great first steps at narrowing the differential diagnosis.

A 44 year old African American male with a history of recurrent pulmonary embolisms on lifelong anticoagulation was admitted to the Internal Medicine service with generalized weakness of 2-month duration. Weakness was diffused, but most prominent in proximal muscles of the legs and arms. He was unable to fully raise his arms above head and had difficulty rising from a seated position. Patient also reported an intermittent erythematous rash on his cheeks. Lab work revealed significant CK elevation to 6500 without history of recent trauma, injuries, or heavy exercise, and inflammatory markers were elevated. Physical exam showed mildly decreased muscle strength in bilateral thighs, and skin exam was normal at the time of admission. He was treated with intravenous fluids with mild improvement in CK level, but no change in his symptoms. An ANA panel was obtained and positive for speckled pattern. Further evaluation with MRI of the thigh showed significant inflammation to muscle fibers with surrounding edema. Patient was then started on oral daily prednisone and discharged with rheumatology follow up.

At outpatient follow up, a myositis panel was positive for Mi-2 antibody, a marker specific for the diagnosis of dermatomyositis. Prednisone was continued with plan of starting mycophenylate.

This case illustrates that muscle weakness has a broad differential diagnosis, but history and physical exam can help to narrow diagnoses and guide further workup.

## **84) DIFFUSE MACULOPAPULAR RASH IN A FEMALE WITH BIPOLAR DISORDER**

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Drug-induced adverse cutaneous reactions are common and can be found in approximately 2% of hospitalized patients. The majority of cases are exanthematous drug eruptions, but a small subset may experience urticaria, anaphylaxis, or exfoliative dermatitis like Stevens-Johnson syndrome (SJS) and drug reaction with eosinophilia and systemic syndrome (DRESS).

A 59 year old female with a history of chronic livedo reticularis and bipolar disorder was admitted to the Internal Medicine service with a 1 week history of a red, blanching, erythematous maculopapular rash over her body. The rash involved bilateral hands, upper arms and legs with associated hand swelling. There was no pruritis, respiratory complaints or mucosal involvement. Patient denied any recent changes to home environment, soap use or clothing. She denied recent addition of new medications, but did note an increase in her dose of lamotrigine about one week prior to onset of the rash. Lamotrigine was started about two months prior to hospitalization for bipolar disorder. Lab work did not show eosinophilia, elevated creatinine or transaminitis, suggesting that there was no systemic involvement. These findings argued against DRESS and SJS and made benign drug rash a more likely diagnosis.

Lamotrigine was held on admission and topical corticosteroids were started. Marked improvement in rash was observed at 2-week outpatient follow up upon discontinuation of lamotrigine.

Exanthematous drug eruptions are thought to be delayed T cell mediated immune reactions. Lack of findings such as transaminitis, eosinophilia and mucosal involvement favors the diagnosis of drug exanthem over more severe forms of reactions like SJS and DRESS. Prompt drug withdrawal is the mainstay of treatment, and patients should be counseled to avoid the offending drug in the future.

## 85) AN UNUSUAL PRESENTATION OF DISSEMINATED HERPES ZOSTER

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Disseminated herpes zoster is a severe complication of herpes zoster more common in immunocompromised hosts. However, it is still infrequent in this population, making it difficult to experience. Abnormal symptoms can also present before the typical herpes zoster rash, complicating diagnosis.

A 72-year-old man was admitted to the Veterans Affairs Medical Center for diffuse abdominal pain that became increasingly severe with time. His medical history is significant for prostate cancer treated with abiraterone, prednisone, and androgen deprivation therapy, esophageal cancer treated with neoadjuvant chemotherapy, chemotherapy, and x-ray therapy, renal cell carcinoma surgically excised, gastroesophageal reflux disease, type II diabetes mellitus, and hypertension. Etiology was unclear, supported by CT abdomen/pelvis, kidney/ureter/bladder x-ray, and abdominal ultrasound reporting unremarkable findings. While his abdominal pain was being worked up, he had two febrile episodes during his first two days of admission. Blood cultures, urinalysis, and chest x-ray were unremarkable. On the third day of admission, his abdominal pain significantly improved, but several non-painful, nonpruritic rashes appeared over his body including his chest, back, axilla, and groin. They were vesicular lesions with an erythematous base later confirmed varicella zoster virus positive. Intravenous acyclovir was started and switched to oral valacyclovir on the eighth day of admission. He developed an acute kidney injury, managed with intravenous fluids and renal dosing of the antiviral medications. All lesions fully crusted over after ten days of admission, and he was discharged on valacyclovir.

This case illustrates the higher incidence and prevalence of atypical generalized varicella zoster virus infection immunocompromised patients have. Although delayed cutaneous dissemination and visceral organ involvement like pneumonia, hepatitis, and encephalitis are common, this patient unusually presented with only severe abdominal pain. It is important to consider herpes zoster on the differential when an immunocompromised patient presents with diffuse abdominal tenderness.

## **86) A CURIOUS CASE OF HEMATURIA IN A RENAL TRANSPLANT PATIENT**

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69 Y female with history of ESRD from ADPKD s/p living related kidney transplant 2014 presented with dysuria and hematuria that started 12 days prior to admission. Outpatient urinalysis was consistent with infection and was started on nitrofurantoin by primary care provider. Symptoms persisted so she was switched to ciprofloxacin, again without improvement.

Initial inpatient workup was notable for AKI with Cr of 2 mg/dL (baseline 0.8 mg/dL). Urinalysis was again positive for nitrite, leukocyte esterase, and blood, but subsequent urine culture was negative for bacteria. CT abdomen showed edematous left pelvic kidney with perinephric stranding and a questionable punctate mid-ureteral calculus, suggestive of pyelonephritis and/or mild degree of obstruction. It also showed under-distended thick-walled bladder, possibly related to cystitis.

Patient was started on cefepime and IV hydration. Urology and infectious disease were consulted to further evaluate hematuria and culture negative UTI/pyelonephritis. Her AKI improved with hydration, however hematuria persisted despite antibiotic treatment. Viral workup including BK virus, adenovirus, and CMV, were also completed. Patient also underwent cystourethroscopy with biopsy of a suspicious bladder lesion. It was determined the mild obstruction was likely not clinically significant.

Patient's hematuria improved after cystourethroscopy. Subsequent urinalysis remained positive for blood and leukocyte esterase, but culture was negative for bacteria. BK and CMV were not detected, and biopsy results were negative for urothelial carcinoma. However, patient's adenovirus was positive, suggestive of hemorrhagic cystitis secondary to adenovirus.

Adenovirus is a double-stranded DNA virus with 52 different serotypes that infect humans, with serotypes 7, 11, 34, and 35 having been isolated in hemorrhagic cystitis. In transplant recipients, the virus may target the graft organ, resulting in graft failure and high mortality.

Urinary tract involvement by adenovirus in renal transplant recipients is typically seen as acute hemorrhagic cystitis. Renal transplant recipients most often present with infection within weeks to months of transplant surgery, suggesting reactivation of the latent virus in the immunosuppressed host. Our patient's infection 5 years after transplant was most likely a new infection with adenovirus.

Our case highlights adenovirus hemorrhagic cystitis and the importance of clinical suspicion in evaluating hematuria in a renal transplant patient.

## **87) ALCOHOL AND CANCER: A NOVEL APPROACH TO MISUSE SCREENING**

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Alcohol, even in moderation, has been found to have a linear risk relationship with several types of cancer – a fact 70% of Americans are unaware of. If brought up by primary care providers this could lead to a new educational deterrent to alcohol misuse, similar to the realization that tobacco lead to lung cancer had on smoking rates.

A five-question survey was sent to 33 primary care providers within the Bellin clinic system to gauge their knowledge on the subject. 70% of providers did not correctly identify that there was a linear relationship between alcohol consumption and several types of cancers. This mirrors ASCO's 2017 finding that 70% of Americans were unaware of this fact.

There is a significant knowledge-deficit concerning the cancer-risks of alcohol usage. Educating providers and patients about the relationship between alcohol and cancer could provide an important and needed deterrent against alcohol misuse.

## 88) TAKOTSUBO CARDIOMYOPATHY IN THE SETTING OF INCREASED INTRAOCULAR PRESSURE: A CASE REPORT

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**Introduction:** Takotsubo cardiomyopathy (TTC) remains an under-diagnosed form of cardiomyopathy typically induced by emotional, physical, or neurologic triggers. Atypical triggers can be difficult to recognize making the ultimate diagnosis elusive. Arriving at an accurate diagnosis is essential as recent literature suggests that these patients can have equal or poorer prognosis compared to acute coronary syndrome dependent upon the inciting event for TTC.

**Case:** An 83 year old woman with past medical history of non-ischemic cardiomyopathy with recovered ejection fraction, hypertension, diabetes mellitus, migraines and polymyalgia rheumatica, presented to the emergency department with acute onset left eye pain. She awoke from sleep with headache, left temporal pain, left eye pain, decreased vision and left red eye. She also reported dizziness and nausea without shortness of breath, chest pain or palpitations. She was evaluated for acute angle closure glaucoma and treated empirically for such as the left ophthalmologic exam revealed increased intraocular pressure (IOP), pupillary dilation and non-reactivity to light when compared to the right eye. A cardiac workup was performed and revealed elevated troponins, new inferior and anterolateral T wave inversions with QT prolongation and decreased left ventricular ejection fraction of 28%. She was placed on a heparin drip and given both aspirin and Plavix due to concern for acute coronary syndrome. Repeat echocardiogram on hospital day two demonstrated improved ejection fraction to 38% along with hypokinesis of mid wall segments. Left heart catheterization with right and left coronary angiography revealed normal coronaries and again improved ejection fraction to 50%. The patient's eye pain resolved and she was diagnosed with Uveitis-hyphema-glaucoma syndrome as well as mid-wall variant Takotsubo cardiomyopathy.

**Discussion:** This case demonstrates an uncommon presentation of Takotsubo cardiomyopathy in the setting of severe eye pain and elevated intraocular pressure. Etiologies of TTC can be wide-spread including emotional and physical stress, acute medical conditions or procedures as well as neurological disorders and should remain on the differential for individuals with cardiac-related symptoms in the setting of a stressful event. While prior case reports have displayed an association between injection or administration of certain intraocular medications and TTC, to our knowledge, this is the first described instance of TTC in association with elevated intraocular pressure.



## **89) INTERNATIONAL STUDY ON MEDICAL STUDENTS SLEEP HABITS**

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Inadequate sleep plays a role in the functioning, alertness and attention, interfering with brain's cognitive processes. The prefrontal cortex makes up >10% of the brain and is therefore linked to a multitude of functions. The most notable, being the executive center that controls intelligence, decision making, problem solving, self-control and other higher cognitive behaviors. This study sought to identify factors impacting the sleep hygiene and subsequent day-to-day lives of medical students and compare the sleep habits between The Medical College of Wisconsin (MCW) and international medical students.

An anonymous 55 question survey was administered to MCW, University of Split School of Medicine, and the Josip Juraj Strossmayer University of Osijek School of Medicine medical students. MCW (N=92) and Croatia (N=157) students surveys were collected. Analysis was done using SAS Version 9.4, t-test and chi-squares.

We found that 63.3% MCW students woke up feeling refreshed vs. 78.9% Croatian students feeling refreshed on days without class. 26.4% MCW students report napping during the day vs. 62.2% Croatian medical students. Overall, more Croatian students (65.4%) were satisfied with the amount of sleep they got per night than MCW students (32.2%); though only 41.3% of Croatian medical students' vs 58.4% of MCW students report chronic fatigue. This observational study found that Croatian medical students take less stimulants, less depressants, spend less time on their computers, consume less coffee and alcohol and exercise less frequently than their MCW counterparts.

## 90) URTICARIA & ANGIOEDEMA SECONDARY TO CLINDAMYCIN USE

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**Introduction:** Clindamycin is a semisynthetic lincomycin antibiotic with activity against aerobic Gram positive and anaerobic Gram-negative bacteria. Clindamycin inhibits bacterial protein synthesis by binding the 50S ribosomal subunit. It may be bactericidal or bacteriostatic depending on the organism and drug concentration. Common side effects include diarrhea, thrombocytopenia, granulocytopenia, pseudomembranous colitis, metallic taste in mouth, transient transaminitis and rash. The literature from two prior small studies showed a 10% incidence of cutaneous eruption to Clindamycin. According to a larger study with 3,896 Clindamycin administrations from a single U.S. hospital, Clindamycin induced hypersensitivity reactions have decreased in frequency and are relatively uncommon with an incidence of <1% of adverse drugs reactions.

**Case:** A 46 y.o F with PMHx of HTN and Anxiety presented to the Emergency Department with diffuse hives. The patient had a tooth infection for which she had taken a 9-day course of Clindamycin. The day prior, she noted hives and pruritis around 11 am after having taken Clindamycin an hour before. Earlier that day, she presented to Urgent Care and was given Prednisone and Pepcid. Later that day, she took 2 Benadryl. Due to the progression of the rash, she went to the ED. On arrival, she complained of shortness of breath (SOB). O2 sat in triage was 94%. On Physical exam, large diffuse, confluent hives were appreciated on her face, neck, back, and buttocks.

She endorsed dizziness, dysphagia, fullness and pain in her lower throat with nausea and vomiting. However, no stridor, airway compromise, tachypnea or signs of respiratory distress was appreciated on physical exam. She denied fever, chills and diarrhea. The patient reported multiple anaphylactic reactions in the past to other medications but stated that this was the worst it had been.

Given history of GI symptoms in addition to diffuse rash, SubQ Epi, Benadryl and Pepcid were given. Diagnostic examinations included CBC which showed Calcium of 6.9, Potassium 2.9, WBC count of 25.1 with a neutrophil predominance. CXR showed no radiographic evidence of cardiopulmonary disease. ABD KUB showed a non-obstructive bowel gas pattern. She was then transferred to the observation unit for further monitoring and treatment. She initially showed improvement, but on reassessment showed subsequent relapse in symptoms with rash spreading to scalp, ears and extremities and development of periorbital edema. Reglan and Solumedrol were added. She was seen by dermatology to rule out DRESS and SJS/TEN despite normal LFTs and CBC without Eosinophilia. Dermatology noted the large diffuse, confluent, annular edematous plaques as likely a hypersensitivity reaction secondary to Clindamycin. Treatment was continued with Prednisone, Cetirizine, Diphenhydramine and triamcinolone/calamine ointment for symptomatic relief. Patient was advised to carry a card noting allergy as subsequent exposure may be severe and f/u with PCP.

**Discussion:** The most common presentation for Clindamycin induced rash is a delayed macular or maculo-papular rash exanthem (MPE) 7-10 days after use. The pathogenesis for the delayed maculopapular exanthem has not been well studied. However, patch skin tests have been shown to be positive, suggesting a non-IgE mediated Type IV hypersensitivity reaction possibly involving T-cells. Combined skin tests and subsequent challenge tests appear to be essential to definitely confirm or rule out the presence of allergic clindamycin hypersensitivity. Most MPE do not require treatment and self-resolve upon cessation of the drug.

## **91) MYASTHENIA GRAVIS, A SLEEPER CELL: PRESENTING WITH PHARYNGEAL MUSCLE WEAKNESS**

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Myasthenia gravis (MG) is an autoimmune neuromuscular junction disorder characterized by fluctuating fatigable weakness in variable muscle groups including ocular, bulbar, limb, and respiratory muscles. The variability in presentation makes MG an arduous diagnostic challenge. A 70-year-old female was admitted for progressive dysphagia, dehydration, and hypoglycemia due to oral thrush. Patient began outpatient treatment for suspected oral candidiasis a week prior with oral fluconazole. On admission, she received IV maintenance fluids, fluconazole, and prednisone. The following day the patient's speech improved; however, she continued having difficulty swallowing liquids. On physical exam the patient was alert and oriented x4 with 5/5 bilateral upper and lower extremity strength. Sensation was intact on bilateral upper and lower extremities. Cranial nerve exam showed extra-ocular movements intact without nystagmus, facial symmetry, mild bilateral ptosis, midline tongue, and no decreased eyebrow lift. An EGD revealed pharyngeal edema without candida or herpetic esophagitis. A swallow evaluation indicated weakness of initiation, significantly decreased pharyngeal wall motion, and laryngeal elevation. The patient failed an attempted videofluoroscopy. On exam the following day, the patient's oral thrush was successfully treated with fluconazole but the pharyngeal weakness progressed. The presentation was noted to wax and wane throughout the day. Physicians in the morning indicated better muscular strength. However, due to concerns of neuromuscular disease, the patient underwent an MRI. During which she experienced acute hypoxic respiratory failure leading to resuscitation and intubation. Patient within minutes made a neurologic recovery. The MRI indicated no signs of mass, infarction, and inflammation. Lyme Disease and Tick-Borne panel were unremarkable. At this point, it was determined to place the patient on empiric 5-day IVIG 2g/kg treatment course for presumptive myasthenia gravis. Additional tissue samples were sent for botulism as patient had a complicated leg wound. Three days later the patient was extubated. She completed her final fifth dose of IVIG and had complete recovery. Her repeat videofluoroscopy was conducted with normal motor results. She was discharged on pyridostigmine bromide. This case highlights the importance of considering neuromuscular junction disorders in cases of dysphagia and pharyngeal muscle weakness. MG is a rare disorder. While early recognition of these disorders is critical to prevent ultimate mechanical ventilation, the goal is to decrease morbidity and provide quality of life for these patients. Early diagnosis impacts patients' health outcomes.

## **92) INVESTIGATING FACTORS OF REPEAT DOMESTIC ABUSE VICTIMS**

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There has been a vast amount of research conducted on domestic violence and the risk factors associated with domestic abuse. Publications often focus on characteristics of both the abuser and the victims, including an individual's history of childhood victimization, psychopathology, socioeconomic status, race, religion, and other demographic information.

However, there is little research into specific risk factors and demographic information for women who become victims of multiple abusive relationships, and even less research into how to break the cycle of abuse that they repeatedly return to.

This research aimed to determine common factors that may predispose victims to repeatedly enter abusive relationships. Additionally, we sought to identify what tools and strategies provided by The Women's Community survivors found useful in recognizing violence and removing themselves safely from a situation. Finally, we hoped to aid the Women's Community in preventing victims from entering multiple abusive relationships and provide feedback on how the organization can better assist its clients. Potential participants were determined based on pre-existing documentation owned by The Women's Community. Survivors were contacted by advocates of the organization and informed about the research opportunity.

To gather data, both a modified Danger Assessment Scale (DAS) survey and an optional open-question interview were used. Despite several changes to research methods and incentivization, we were only able to obtain three participants, all of whom completed the questionnaire and one participant who completed the interview. Due to this small sample size, we were unable to draw conclusions or inform the Women's Community on their programming.

Due to the sensitivity and stigma surrounding domestic violence, we faced many challenges in recruitment of participants. We made several revisions to the protocol in order to address barriers to participation. These strategies included first incentivizing participants with gas cards by offering different values for completion of the survey and the survey with the interview. We then began offering phone interviews with mailing the consent form and survey.

This research highlights the different challenges researchers face when studying domestic violence. We hope our different strategy implementations will provide flexible options for researchers in the future.

### 93) LUPUS CEREBRITIS IN COGNITIVE DELAYED PATIENT RENDED NON-VERBAL WITH SYSTEMIC LUPUS EREYTHEMATOSUS

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**Introduction:** Lupus cerebritis is a serious autoimmune subset of neuropsychiatric systemic lupus erythematosus (NPSLE). It most commonly affects females of reproductive age. The inflammatory response of the immune complexes formed disrupt the blood brain barrier.

**Case Description:** 26yo female with a past medical history of seizure disorder and development delay rendering her non-verbal was admitted for abdominal pain and encephalopathy. Patient was hospitalized for several weeks showing signs of focal neurological compromise (bilateral arm and leg twitching, bilateral facial twitching, and increasing frequency of seizures) before being diagnosed with systemic lupus erythematosus. EEG initially showed diffuse slowing with no evidence of seizure activity but later showed a cluster of seizures from right occipital lobe. MRI showed abnormal signal and restricted diffusion throughout bilateral parahippocampal gyri without hemorrhage or mass effect and subacute infarcts in the left caudate and left deep white matter. CT showed evolving ischemic changes adjacent to the left lateral ventricle and left basal ganglia. Lumbar puncture was considered to look for NPSLE specific antibodies but could not be done due patient's renal failure and severe thrombocytopenia. Rheumatology who was already consulted to managed her SLE recommended plasma exchange. Shortly after, patient presented with status epilepticus and on exam was unresponsive with dysconjugate gaze and exhibiting generalized myoclonic activity. Throughout this prolonged hospital stay, multiple anti-seizure medications were trialed such as Clobazam, Lacosamide, Keppra, Phenobarbital, and Dilantin to which none showed significant change in seizure activity. The patient was ultimately diagnosed with Lupus cerebritis and put on comfort cares shortly after.

**Discussion:** Although Lupus cerebritis is present in a large number of SLE cases, it is quite difficult to diagnosis therefore it is a diagnosis of exclusion. Diagnosis is based on clinical evaluation (autoantibody profile, diagnostic imaging, and assessment of cognitive performance) with the latter being difficult to assess in a non-verbal patient with cognitive delay. If the patient is stable enough, lumbar puncture should be considered if clinical suspicion is high. Prior studies have shown in patient with lupus cerebritis, CSF should contain higher protein levels, higher IL-6 and INF $\alpha$  levels and in severe cases show higher levels of nitric oxide whose levels can be used to monitor the progression of cerebritis.

## 94) ASYMPTOMATIC CARBON MONOXIDE RHABDOMYOLYSIS

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**Introduction:** Rhabdomyolysis is a rare consequence of carbon monoxide poisoning that is noted periodically in the literature. Typically, it presents as myonecrosis after a significant exposure to carbon monoxide – typically resulting in a coma and with rapidly progressive edema that can go to compartment syndrome. Outcomes are typically good with the myonecrosis resolving with prompt usage of hyperbaric oxygen and alkalization of the urine and fluids. Most negative outcomes result from other complications of carbon monoxide exposure. This case focuses on an asymptomatic individual that developed rhabdomyolysis multiple times after exposure to carbon monoxide.

**Case Description:** A 46 yo man with a history of schizophrenia, HTN, anxiety, and depression presented to the ED from prison after having routine labs drawn that resulted with a CK of 7734. The patient was acutely psychotic and unable to provide an accurate history. But based on collateral from the accompanying officers, chart, and physical exam, there was no concern for fatigue, weight gain, increased exercise, prolonged cold exposure, pain, or any episode of catatonia. UDS, serum EtOH, lithium, and acetaminophen were all negative. Carbon monoxide levels were at 1.2. Chart review showed that two months prior to this admission he presented to an OSH with a CO level of 5.7 and a CK of 1439. That made his history of recent arson critical and without any other etiology he was likely suffering from asymptomatic rhabdomyolysis secondary to carbon monoxide exposure. He was placed on IV fluids and improved prior to discharge.

**Discussion:** Rhabdomyolysis is commonly associated with drug interactions, trauma, hypothermia, or coma/catatonia. Other common diagnoses include an associated with recent increase in exercise and hypothyroidism. Carbon monoxide has been shown to have occasional presentation of late onset myonecrosis in severe exposures. This case shows that it should also be included on the differential for asymptomatic rhabdomyolysis without other cause. Additionally, this shows that CO rhabdomyolysis does not necessarily present with associated necrosis and significant tissue injury. Although it is not the most common cause of rhabdomyolysis, including CO poisoning on your differential, especially in asymptomatic patients is important.

## 95) CLEANSING THE PALATE: DIAGNOSING ENKTL IN THE SETTING OF LACTIC ACIDOSIS

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**Introduction:** Extranodal NK/T-cell lymphoma (ENKTL), nasal type is one of the more common presentations of primary nasal lymphomas. It has a predilection for Asian and Latin patients and has a high association with EBV infection. About 25% of people have extranasal presentation, and that cohort has a 5-year survival rate <10%. Primary nasal lesions are typically chemo and radiation sensitive, but disseminated disease typically is less responsive.

**Case Description:** A 77-year-old Filipino man presented to outside hospital with fever, found to have lactic acidosis to 6.9. Admitted with concern for sepsis, stabilized, and treated with broad spectrum antibiotics but lactic acid persisted, peaking at 11. He underwent extensive workup that was negative for pathology including HIV, influenza, TB, RSV, RPR, Toxo, CMV, TSH, INR, IgM, IgA, IgG. CXR, CT C/A/P/sinus, MRI of the brain, and lumbar puncture showed only chronic sinusitis. Marrow biopsy was normal. Of note, he was treated for an oral candidiasis with nystatin rinses. His fever resolved and he was discharged. Four days later, he presented with similar symptoms and a lactate of 5.9. On exam, he had a 2 x 3 cm ulcerating lesion on his hard palate. ENT biopsied and showed ENKTL. Erythematous patches on leg showed the same on biopsy. He was EBV IgG (+) with viral load of 2 million. He transferred to the oncology service and began chemotherapy.

**Discussion:** ENKTL is a rare but concerning diagnosis due to the rapid progression of disease. Diagnosis is generally not suspected until presentation of an ulcerative or tumorous palate lesion. There are some early but nonspecific signs and symptoms including chronic sinusitis and EBV infection. Additionally, extensive investigation has gone into correlating type B lactic acidosis with tumor growth and burden. Initially, the only signs of ENKTL in our patient were chronic sinusitis and lactic acidosis which later developed into a large palate lesion. This case showed that in a patient of Asian descent with chronic sinusitis, EBV positive, and a lactic acidosis, it is important to keep ENKTL on your differential and do a thorough ENT exam to look for lesions. Even less suspicious lesions may warrant biopsy given clinical context outlined above.

## **96) AN UNUSUAL CASE OF METASTATIC ADENOSQUAMOUS CHOLANGIOCARCINOMA PRESENTING AS HYPERCALCEMIA REFRACTORY TO PAMIDRONATE**

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Humoral hypercalcemia of malignancy is infrequently associated with cholangiocarcinoma, which is also infrequently metastatic.

A 68-year-old Caucasian male presented to the ED with a three-day history of ataxia and falls. He endorsed progressive weakness over the past month, restlessness, memory problems, abdominal pain, and lower extremity paresthesia. Past medical history was notable for nutritional deficiency secondary to collagenous colitis and significant alcohol and tobacco use. Labs were notable for a macrocytic anemia (10.4 g/dL), hypercalcemia (13.2 mg/dL), hypophosphatemia (2.2 mg/dL), hypomagnesemia (1.2 mEq/L), and elevated AST (54 U/L) and alkaline phosphatase (163 U/L). CT of head was negative, but MRI of spine revealed multiple thoracic and lumbar vertebral body lesions without spinal cord compression. Patient was admitted for treatment of Wernicke's encephalopathy/alcohol withdrawal but became increasingly somnolent and disoriented overnight despite scoring 0s on CIWA protocol. His hypercalcemia proved refractory to treatment with aggressive IVFs and multiple doses of calcitonin and pamidronate. The patient's mental status continued to decline, becoming more disoriented and developing dysarthria and dysphagia. CT A/P revealed a posterior right hepatic mass with adjacent satellite lesions and additional bony lesions in the ribs, pelvis, and femur. PTHrP (parathyroid hormone related peptide; 60.3, ref. 0.0-2.3 pmol/L) and 1-25 dihydroxycholecalciferol (83.2, ref. 19.9-79.3 pg/mL) were elevated; PTH was low (3.5 pg/mL). Biopsy of the liver revealed adenosquamous intrahepatic cholangiocarcinoma, while biopsy of T5 vertebral lesion revealed squamous cell carcinoma. Patient was started on a gemcitabine and cisplatin chemotherapy regimen that was eventually transitioned to 5-fluorouracil with leucovorin. The patient's hypercalcemia would remain obstinate to pamidronate over the next several months, with progression of therapy to include zoledronate and denosumab. Ultimately, the patient died seven months following diagnosis with a stable mild hypocalcemia (8.4 mg/dL).

This case illustrates an unusual case of metastatic adenosquamous cholangiocarcinoma causing hypercalcemia of malignancy refractory to pamidronate. Furthermore, it demonstrates multiple possible mechanisms of hypercalcemia, including secretion of PTHrP, calcium release from bone by skeletal metastases, and elevated 1-25 dihydroxycholecalciferol.



## **97) BAD NEWS WITH A DIAGNOSIS OF SCAD (SPONTANEOUS CORONARY ARTERY DISSECTION)**

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A 54 year old with a history of hypertension presented with a one day history of chest pressure, dyspnea and nausea that occurred while in the shower. She did not have a history of angina prior to this event. She immediately presented to the emergency department, where she was noted to have ST elevations in inferior leads on electrocardiogram (ECG). She did not have improvement in her symptoms with sublingual nitroglycerin. Upon transfer to a cardiac catheterization-able institution, she underwent emergent cardiac catheterization that showed tortuous vessels, no significant atherosclerotic disease, and a right coronary artery (RCA) with severe tortuosity to the mid distal segment. The RCA also had diffuse narrowing between 50-70%, with a focal 99% stenosis suggestive of spontaneous coronary artery dissection. Her renal arteries also had an appearance consistent with fibromuscular dysplasia (FMD) Percutaneous coronary intervention (PCI) was attempted, but not successful. Her post catheterization course was complicated by complete heart block, for which she received a temporary, trans-venous pacemaker. Her labs were notable for a troponin peak of 79 ng/mL.

SCAD is a rare cause of acute myocardial infarction in the general population, though more common in female patients.

The mechanism of SCAD is likely related to intimal tearing or bleeding vasa vasorum, creating a lumen with a hematoma. Both atherosclerotic and non-atherosclerotic versions of SCAD exist. Some studies indicate that vessel tortuosity is associated with SCAD. Disease associations include FMD, multiparty, connective tissue disorders, inflammatory conditions, and hormonal therapies. Stressors such as intense exercise, labor, and drug use are thought to provoke SCAD. Clinically manifestations can be very similar to ACS (Acute Coronary Syndrome). Diagnosis is made by coronary angiography findings of dissection in absence of atherosclerosis (dye staining of arterial wall with radiolucent lumen), diffuse and long stenosis, and tortuous vessels. Optimal medical management is unclear, but patients are often managed with dual antiplatelet therapy for at least one year. Additionally, some studies showed that the additional of a beta blocker reduced the risk of recurrence of SCAD. Some studies showed the rate of recurrence of MI (myocardial infarction) was as high as 10%.

## 98) A LESSER KNOWN CAUSE OF LACTIC ACIDOSIS: THIAMINE DEFICIENCY

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**Case Presentation:** A 70-year-old malnourished woman was admitted to ICU because of septic shock. Source for sepsis was thought initially to be clostridium difficile infection however patient later was found to have MRSA bacteremia secondary to infective endocarditis. She was treated with IV vancomycin. She got better and was transferred to floor where she was doing well until the third day of her hospitalization when she complained of abdominal pain. She was tachycardic (112), diaphoretic and mildly hypothermic (95F). She was tachypneic (25) but was saturating well on room air (96%). BP (119/61) was normal. She had chronic RUQ tenderness which was worse that day with no guarding or rigidity. On examination of chest, she had bilateral crepitation. Laboratory findings were remarkable for leukocytosis (24.6) and lactic acidosis (Figure: 1). CXR showed bilateral interstitial infiltrates suggestive of heart failure. X-ray abdomen showed somewhat gassy distension of the stomach. With concern for intestinal ischemia, CT abdomen and pelvis was ordered and patient was transferred back to ICU. By the time patient came to the ICU her lactate rose to 10.2. CT abdomen didn't show any evidence of intestinal ischemia. Clinically, thiamine deficiency was suspected after ruling out other causes of hyperlactemia including bowel ischemia, tissue hypoperfusion, hepatic failure and hypoxia. After administration of 200 mg of intravenous thiamine, lactate levels decreased rapidly in the next few hours. (Lactic acid trend 10.2->8.9->3.9->2.3).

**Discussion:** Elevated lactate levels are used as a prognostic tool in hospital medicine. Thiamine deficiency as a cause of lactic acidosis is often undiagnosed or misdiagnosed as a symptom of sepsis or hypoperfusion. Thiamine is essential for producing energy from glucose in the glycolytic pathway, but if a deficiency exists, pyruvate is instead converted to lactate (Figure: 1). our patient was malnourished which is one of the risk factor for thiamine deficiency. Other risk factors include alcoholism, persistent vomiting, anorexia nervosa, starvation and total parenteral nutrition without added vitamins. Thiamine deficiency can manifest as either wet beriberi (cardiac) or dry beriberi (neurologic). Our patient exhibited signs of wet beriberi including heart failure and lactic acidosis. Our patient had sepsis but the rapid drop in lactate level after IV thiamine supplementation is consistent with other cases in the literature.

**Conclusion:** Clinicians need to be aware of the many potential causes of elevations in lactate. In unexplained cases of lactic acidosis in a patient not responding as expected, consider thiamine deficiency. It is inexpensive and easy to treat.

## **99) PURPLE TOE SYNDROME: A RARE DIAGNOSIS BUT IMPORTANT DIFFERENTIAL IN THE PATIENT WHO PRESENTS WITH ULCERS**

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A 79-year-old male with a history of congestive heart failure, hyperlipidemia, well-controlled type 2 diabetes mellitus, and venous insufficiency presented for leg ulcers. His ulcers began after starting warfarin six weeks prior for newly diagnosed atrial fibrillation, which was then discontinued for gastrointestinal bleeding. On examination, the patient was diffusely covered in petechiae. His extremities had multiple ulcerations ranging from 0.5 – 5 cm in diameter on bilateral shins and dorsum of his feet. The leg ulcers had serous drainage, an irregular border, and the surrounding skin was erythematous and dry. We offer a complete discussion of the differential diagnosis to allow for a more expeditious diagnosis in the future. Well described ulcerative diseases include diabetic ulcers, venous stasis ulcers, warfarin induced necrosis, and purple toe syndrome. Diabetes mellitus leads to ulceration from neuropathic and microvascular complications. These ulcers tend to appear as a sharply demarcated ulcer encircled by thickened skin. Venous insufficiency ulcerations are formed by elevated venous pressure leading to increased oxidative stress, which causes tissues necrosis. They typically occur in the lower leg and ankle. Warfarin induced necrosis occurs after large doses of warfarin and presents within 3-5 days. Deficiency in protein C or other coagulation factors causes an inability to downregulate thrombin production, leading to microvascular thrombus, tissue ischemia, and necrosis. It has a black/blue appearance and occurs in areas of high adipose tissue such as breast, abdomen, and thigh. Purple toe syndrome is a form of cholesterol embolization that is induced by anticoagulation therapy. Plaque formation and weakening of fibrin cause cholesterol emboli, which occlude distal vessels leading to ischemia and necrosis. Our patient's symptoms were most consistent with purple toe syndrome due to the timing of his warfarin therapy, symptom onset, ulcer location, and petechiae. The location and lack of resolution after warfarin discontinuation makes warfarin induced necrosis less likely. The sudden onset of symptoms is not as consistent with diabetic ulcers, and the lack of edema makes venous ulcers less likely. This case emphasizes the need for obtaining a strong, detailed patient history in order to make a prompt diagnosis.

## 100) VALLEY FEVER ON MY MIND: A CASE OF COCCIDIOIDAL MENINGITIS

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**Introduction:** Coccidioidomycosis or “Valley Fever” can be caused by one of two species of dimorphic fungi endemic in the Southwest United States. Inhaling arthrospores typically causes a pulmonary infection, although 1% of patients develop disseminated disease. Coccidioidal meningitis is a rare manifestation of disseminated disease that is complicated by hydrocephalus in 40% of cases and is universally fatal if untreated.

**Case:** A 70-year-old gentleman with a past medical history of Neurofibromatosis Type 1 and childhood epilepsy presented to the emergency department with altered mental status, hypersomnolence, and gait instability. He had normal vitals, imaging, and labs. History obtained from his family was notable for rapidly progressive memory loss, personality changes, and neurologic deficits. He was also noted to spend his winter months golfing in Arizona.

A lumbar puncture was obtained for further workup and the spinal fluid analysis was notable for: colorless fluid, 106 WBC, 28 RBC, 10 % neutrophils, 55% lymphocytes, glucose 23, protein 230, with no malignant cells. Coccidioides antibody was identified by complement fixation in his serum in a 1:64 titer indicating disseminated disease. It was also identified in the CSF (0.12 ng/mL) confirming the diagnosis. He was initially treated with high dose fluconazole, but his mental and functional status continued to decline. Intravenous liposomal amphotericin was added for six weeks with improvement in CSF profile. He continued to require serial LPs to alleviate elevated ICP throughout his three-month hospital stay and following discharge. He was discharged to a short-term nursing facility where he continues to undergo occupational and physical therapies, with LPs every two weeks. His mental status and personality have not returned to baseline, but he is slowly gaining strength and increased mobility. He remains on lifelong fluconazole therapy.

**Discussion:** The most common presenting symptom of Coccidioidal meningitis is headache, although others may have non-specific cognitive or neurologic dysfunction. Exposure and travel histories were particularly important in this case. High dose fluconazole therapy is the recommended initial therapy due to its high bioavailability and CSF penetration. Amphotericin B may be added as “rescue therapy” if indicated. Treatment response is often slow and all patients with Coccidioidal meningitis should continue lifelong treatment.

## 101) ACUTE TONGUE ABSCESS: A RARE AND SERIOUS INFECTION

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An acute abscess of the tongue is a rare but potentially life-threatening infection that poses a diagnostic challenge for clinicians. Maintaining a high index of suspicion is key for a successful outcome.

A 48-year-old male with a history of Klinefelter's syndrome, recurrent DVTs, current smoking habit, and a family history of glossal cancer in his mother was evaluated in an urgent care clinic for two weeks of tongue swelling. His illness progressed to cause odynophagia, dysphagia to solids, and began to affect his speech. He had no difficulty breathing or recent trauma to the area. A neck CT showed a prominent left side of his tongue base, uvula, and tonsillar tissue with preserved airway, though images were affected by dental artifact. He was then sent to the Emergency Department and admitted to the ICU for close airway monitoring. Laboratory studies were unremarkable, and his vital signs were normal.

A neck MRI was obtained which showed a 2.7 x 2.1 cm peripherally enhancing cystic lesion at the base of the tongue with no surrounding lymphadenopathy. On hospital day two, the patient experienced worsening dysphagia and tongue swelling. He was then started on broad-spectrum antibiotics and IV steroids. ENT performed a bedside aspiration, incision and drainage, and biopsy of the cystic lesion, obtaining purulent material. Cultures confirmed a polymicrobial infection. The patient's symptoms improved with a significant reduction in tongue swelling.

Most case reports of tongue abscesses have been associated with tongue piercings, retained food products (bones), or odontogenic infection. Our patient did not have these risk factors. Although abscesses typically present as a cystic lesion with peripheral enhancement on MRI, it can also present as a solid mass mimicking malignancy. This was a major concern in our patient given his family history and smoking habit. However, a neoplastic process is typically more indolent and about 2/3 of patients with primary glossal cancer have radiographic cervical adenopathy on presentation. This case illustrates the importance of maintaining a wide differential diagnosis, a thorough history and physical exam, and prompt treatment. His duration of symptoms and MRI findings were most beneficial in differentiating between infection and malignancy. Urgent surgical evaluation for local control of infection is paramount to prevent dissemination, as is obtaining culture data, and the early, appropriate use of antibiotic usage.

## 102) ACQUIRED PURE RED CELL APLASIA CAUSING SEVERE ANEMIA IN JEHOVAH'S WITNESS

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**Introduction:** Pure red cell aplasia (PRA) is a condition characterized by profound anemia with a suppressed reticulocyte count, but other cell lineages are present and morphologically normal. We present a case of a Jehovah's Witness who developed acquired PRA secondary to mycophenolate sodium.

**Case Vignette:** A 48-year-old man with a significant history of a kidney transplant on mycophenolate, tacrolimus, and prednisone for immunosuppression and gastric bypass surgery presented with lightheadedness and dizziness. Physical exam was normal except for pallor of conjunctiva and mucus membranes. Laboratory evaluation revealed hemoglobin of 5 g/dl, white blood cell count of 5.8 K/uL and platelet count of 318,000/uL. Further laboratory workup revealed an extremely low absolute reticulocyte count of 1 K/uL, normal B12, folate, iron, erythropoietin levels, LDH, and haptoglobin. Infectious workup was negative for EBV, CMV, parvovirus, HIV, and hepatitis infections. Peripheral flow cytometry showed no evidence of paroxysmal nocturnal hemoglobinuria or large granular lymphocyte leukemia. A tagged RBC scan was completed, which showed active bleeding at the site of his bypass anastomosis. IR completed an embolization of his left gastric artery, but severe anemia persisted with a hemoglobin drop to 3.6 g/dl. Bone marrow biopsy showed mildly hypocellular marrow with marked decrease in erythroid lineage. A CT chest was negative for a thymoma or other malignancy. He consistently refused blood transfusions and IVIG, even with life-threatening anemia leading to one episode of acute hypoxic respiratory arrest. Mycophenolate was stopped, and high dose prednisone plus danazol was initiated. With all other workup negative, this was labeled as a case of acquired pure red cell aplasia secondary to mycophenolate. After this was held, his reticulocyte count started recovering within a week, followed by improvement in hematocrit with complete normalization in 6 weeks.

**Discussion:** PRA is an uncommon cause of severe anemia that can be seen in solid transplant patients. Medications, infections and malignancy are important considerations in this population. A thorough work up is important to identify and treat this condition in a timely fashion. If found, management of the primary cause is a mainstay of treatment, along with blood transfusions. This case proved to be especially challenging as blood transfusions could not be given to support the patient.

## 103) BILATERAL FACIAL NERVE PALSY AS AN INITIAL MANIFESTATION OF GAIANT CELL ARTERITIS

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**Introduction:** Bilateral facial nerve palsy is a rare clinical manifestation which can present as either synchronous or asynchronous. Common causes of bilateral facial nerve palsy are Lyme disease, Guillian-Barre syndrome, leukemia, infectious mononucleosis, trauma, HIV and tumors. We present a patient with bilateral facial nerve palsy as an initial presentation of Giant cell arteritis.

**Case Presentation:** An 83-year-old male with Polymyalgia Rheumatica, Myelofibrosis presented with left-sided facial droop, inability to close his left eye, and difficulty chewing for one day (House-Brackmann grade 5/6), left-sided, intense (10/10) throbbing headaches for one month without photophobia/ phonophobia that was relieved with NSAIDs. Lab work was unrevealing including inflammatory markers. He was evaluated with MRI and MRA of the brain which revealed no acute cerebrovascular disease, no pathological enhancement in left internal auditory canal. He was diagnosed with idiopathic left sided Bell's palsy. Subsequently he presented again with similar complaints of right sided facial weakness (House-Brackmann grade 4/5) and severe right sided, throbbing headaches after 1 month. His left facial droop was unresponsive to a regimen of prednisone and valacyclovir though it mitigated his headaches. Neurological examination revealed deficits in facial function indicative of bilateral infranuclear seventh nerve palsy. Additional diagnostic work up revealed no cerebrospinal abnormalities, no infectious or inflammatory cause except elevated levels of antinuclear antibody (ANA; 1:640) and weak positive ANCA. Giant cell arteritis was suspected and underwent bilateral temporal artery biopsy which revealed vasa vasorum vasculitis of right temporal artery. He was discharged with prednisone. Follow-up after 1 year showed complete resolution of right facial weakness, headaches except mild persistence of left facial weakness.

**Discussion:** Bilateral facial nerve palsy is often a diagnostic challenge. Asynchronous facial palsy is typically associated with granulomatous disease and autoimmune diseases. Since the patient had no evidence of infection and his headaches responded to NSAIDs, we suspected Giant cell arteritis and performed bilateral temporal artery biopsy which confirmed vasculitis. Isolated vasa vasorum vasculitis is considered as a histopathological variant of GCA. An extensive workup is needed for the evaluation of bilateral facial nerve palsy to exclude intracranial mass, infection. Giant cell arteritis should be considered as a one of the differential diagnosis.

## 104) RECURRENT PNEUMOTHORACES IN AN ELDERLY FEMALE: WHAT'S MORE THAN THAT?

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**Introduction:** Lymphangioliomyomatosis (LAM) is a rare multisystem disease. Patients often present with cystic lung disease while extrapulmonary involvement is also common.

**Case Presentation:** A 70-year old female presented with dyspnea and right-sided chest pain. Her medical history includes hysterectomy at age 36 and recurrent spontaneous pneumothoraces. Prior pneumothoraces were at age of 35 and 43. She reported that the etiology of pneumothoraces was determined to be pulmonary endometriosis. Her vital signs were normal on admission, chest x-ray revealed pneumothorax and a chest tube was placed. On physical exam, the patient was thin, in no acute distress with a chest tube secured in the right third intercostal space at the mid-axillary line. CT scan of the chest demonstrated diffuse thin wall bullae throughout the lung. Cardio-thoracic surgery proceeded with right middle lobe wedge resection and TALC pleurodesis. Further in-depth chart review revealed that she was never diagnosed with endometriosis and her hysterectomy was done due to menorrhagia. Her second pneumothorax happened years after the hysterectomy, which is not consistent with pulmonary endometriosis. Her alpha-1 antitrypsin level was negative. Vascular endothelial growth factor (VEGF) level was obtained for the concern of LAM, and it was borderline elevated. Surgical pathology revealed possible LAM, while immunostaining for HMB-45, a monoclonal antibody often present in LAM, was negative. Patient was referred to the LAM clinic at Loyola University for second opinion before starting Sirolimus.

**Discussion:** This case illustrates a patient who was diagnosed with LAM based on pulmonary manifestations, typical radiographic features, questionable uterine involvement, and borderline elevated VEGF level. While the definitive diagnosis is made by the identification of LAM cells pathologically or cytologically in lung, lymph node, or body fluid, the lack of these changes does not exclude the diagnosis. The final diagnosis is essential as prompt treatment is the key to prevent further pneumothorax.



## **105) THE METAMORPHOSIS OF THE URINARY CATHETER BAG**

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Hereditary hemorrhagic telangiectasia (HHT) is a rare condition that affects approximately 1:5000 – 1:8000 individuals world wide. Classic clinical features of HHT include epistaxis and GI bleeding often with resultant iron deficiency anemia. Identification and treatment of this anemia is essential to management. Studies have demonstrated that more than 80% of individuals with HHT could not meet their iron requirements by dietary sources alone, and many require chronic iron transfusion therapy. While typically well tolerated, iron transfusion therapy is not without adverse effects. We describe a 46 yo male who presented with multiple pathologic fractures secondary to bone demineralization.

A 46 yo male was admitted by the orthopedic service for planned femoral head pinning secondary to femoral neck fractures seen on x-ray. Medical history was significant for HHT with chronic epistaxis causing iron deficiency anemia treated with chronic ferric carboxymaltose transfusions and osteoporosis. One year prior to presentation, he developed bilateral foot and ankle pain and intermittent lower extremity swelling. X-rays of ankles and feet were interpreted as normal. Nine months prior to presentation he was diagnosed with presumed rheumatoid arthritis and treated with steroids without improvement. Subsequent MRI of his feet and ankles revealed bilateral stress fractures in bilateral tibias. Two months prior to presentation, labs showed hypophosphatemia to 1.3, normal intact PTH, and significantly decreased vit D 1.25. Endocrinology evaluation at that time diagnosed possible tumor induced osteopenia (TIO). He then developed new right hip and thigh pain. Right hip x-rays confirmed right hip femoral neck fracture with globally decreased bone mineralization. Further evaluation for malignancy via PET scan was negative. He refused further iron transfusions and was started on phosphate supplementation. Within one month, plain films showed improved mineralization of bilateral femurs. Given the lack of tumor identification and improved mineralization with discontinuation of iron transfusions, the most likely cause of severe hypophosphatemia, bone demineralization, and subsequent fracture was phosphate chelation from chronic ferric carboxymaltose infusions.

While hypophosphatemia is a known complication of ferric carboxymaltose transfusions it has typically been describes as relatively clinically insignificant. Our patient not only had severe and persistent hypophosphatemia but had multiple stress fractures secondary to the hypophosphatemia and subsequent bone demineralization. He demonstrated radiographic improvement with cessation of ferric carboxymaltose transfusions. Clinicians must be aware of the possible complications related to hypophosphatemia when patients are receiving chronic iron transfusions.

## 106) 'BRAIN ON FIRE' IN THE NORTHWOODS: A CASE OF NMDA RECEPTOR ENCEPHALITIS

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Altered mental status due to NMDA-receptor encephalitis (NRE) was thought to be rare. However, due to enhanced NRE characterization, the occurrence has increased in the past decade<sup>1</sup>. NRE causes brain inflammation due to idiopathic production of antibodies against neuronal NMDA receptors<sup>2</sup>, and causes acute behavioral changes, seizures, language dysfunction and dystonia<sup>3</sup>. Recognizing and treating NRE quickly by Hospitalists are crucial to avoid alternative workup such as infection, which is the typical source for altered mental status in the acute hospital setting. This clinical case describes an afebrile 22-year old female who originally presented to ER with acute altered mental status. The week leading to ER admission, the patient appeared to be mildly confused and exhibited excessive sleeping. That morning, the patient had 'accidentally' bit herself and spread blood throughout her face. This alarmed the patient's parents to admit to St. Mary Ascension ER. The patient had a history of hypertension, depression and anxiety that was treated for a few years, until recently stopping psychiatric medications. Otherwise, patient was healthy with no health conditions. The patient was a college student, living with best friend and roommate. Patient's hearing was intact but speech production was difficult and responses to questions were nonsensical. Given the difficulty of taking a history from the patient, the roommate provided a history that included a null history of drug, alcohol or tobacco use. Cranial nerves and motor activity was normal. Patient underwent an extensive workup to test for infection, which was ruled out by a normal CBC with differential, negative CSF cultures for bacteria, and negative for HSV viral load and negative for Lyme antibody/Western blot and negative for Cryptococcus and a wide panel of fungal PCR. A CT scan was normal but MRI showed inflammation and a 4-cm lesion in right temporal lobe. Patient was rapidly deteriorating and continued delirium. A paraneoplastic antibody test was negative, but eventually, titers resulted in positive antibodies for NMDA receptor. In summary, the patient was diagnosed with anti-NMDA receptor encephalitis which had caused altered mental status, seizures and emergent symptoms. Once diagnosed, the patient left the hospital against medical advice without starting immunotherapy. Unfortunately, nearly 24% of encephalitis cases relapse, with higher rates occurring in patients which do not participate in immunotherapy<sup>4</sup>. Patient will be followed with Neurology outpatient and was made aware of possible future episodes.

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## 107) CLOSTRIDIUM DIFFICILE LIVER ABSCESS: AN UNUSUAL PRESENTATION

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**Learning Objectives:** To report a case of *Clostridium difficile* liver abscess in a patient without history of *C. difficile* colitis. Review diagnosis and management of *C. difficile* liver abscess.

**Introduction:** The spore-forming ability of *C. difficile* may contribute to its ability to form an abscess. Liver abscess due to *C. difficile* is rare. Here we present a case of *C. difficile* liver abscess with pleuro-pulmonary complication after needle instrumentation.

**Case presentation:** An 83-year-old woman with history of appendicitis, renal stones and cholecystitis (with prior cholecystectomy) presented to an outside hospital for right upper quadrant pain 4 months ago and was found to have a 6.7 cm liver abscess on imaging. Liver biopsy was done and cultures confirmed liver abscess with *C. difficile* growth. She denied previous history of *C. difficile* colitis. She was treated with 7 weeks of oral metronidazole, with much difficulty taking the medication. She reported 17 pound weight loss. About 2-3 months ago she began to develop pleuritic chest pain and cough. Imaging showed pleural effusion and possible empyema. Pleural biopsy showed organizing pneumonia with negative special stains. She was admitted to our hospital with 3 weeks of right-sided chest pain and cough with yellow sputum. Vitals were stable on presentation. Physical exam was notable for decreased breath sounds at posterior right lung base. Admission lab results were unremarkable. Imaging notable for right lower lobe lung consolidation and possible empyema. ID was consulted, and patient was treated with IV vancomycin. Cardiothoracic surgery was consulted for empyema. Pleuro-pulmonary complication was deemed secondary to needle manipulation during trans-pleural approach of liver biopsy.

**Discussion:** In contrast to typical *C. difficile* infection (CDI), extra-intestinal manifestation of CDI has been rarely reported. The frequency of extra-intestinal CDI comprises approximately 0.17% to 0.6% of all CDI. Long-term metronidazole therapy (6-8 weeks) is considered to be effective because of excellent penetration to the liver and susceptibility of isolated *C. difficile* strains. CDIs are becoming more frequent worldwide, however, the precise trend of extra-intestinal CDI is unclear. Our case is unique as the patient does not report history of *C. difficile* infection. This case further warns the treating physician of the possible risk of seeding an infection elsewhere during needle aspiration.

## **108) A CASE OF IMMUNOTHERAPY-INDUCED HYPOPITUITARISM IN PATIENT WITH MALIGNANT MELANOMA**

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Immunotherapy has changed the course of cancer treatment, with drugs like nivolumab and ipilimumab used as systemic therapy in malignancies like melanoma, non-small cell lung cancer, and renal cell cancer. Like other cancer regimens, immunotherapy is not without side effects.

A 50 year-old male diagnosed with malignant melanoma underwent initial excision and chemotherapy for stage IV melanoma. As part of his treatment plan, immunotherapy with nivolumab was discussed. He was started on nivolumab approximately 19 months after diagnosis, and a short course of ipilimumab was added on due to disease progression 18 months later. Around that time patient was hospitalized due to nausea, vomiting, and hyponatremia. He was found to have hypophysitis with adrenal insufficiency and hypothyroidism. A PET scan completed near the time of admission revealed increased uptake in the sella. MRI of the brain was performed which did not reveal any intracranial metastatic lesions, and pituitary stalk was normal. He was subsequently was started on steroids and levothyroxine. Follow-up MRI 8 months later demonstrated metastatic lesions in the frontal and parietal lobe, but no pituitary abnormalities. However, he was unable to recover his baseline hormonal function and needed lifelong treatment

Like the patient in this case, those who develop immunotherapy-induced hypophysitis and hypopituitarism may need to be treated indefinitely for acquired endocrinopathies. While hypophysitis alone did not impede our patient's current management plan for his malignancy, it is important to monitor patients for the development of these side effects, as endocrinopathies can be lethal if left untreated.

## **109) ADOLESCENT HEALTH MANAGEMENT PSYCHOLOGY**

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Psychological health is strongly correlated with health habits and outcomes. Adolescents is a critical time period for psychological development and habit formation. The aim of our study was to improve psychological health to prevent chronic diseases in adults that are related to poor health habits. Emotional-intelligence (EI) and self-esteem (SE) are psychological measurements that correlated with health outcomes. A curriculum to improve EI and SE was created that involved cognitive behavioral therapy techniques, introspection, and health management. This was implemented in a single experimental health class at the Wausau East High School and not given to a control health class. We measured EI with the Schutte Self Report Emotional Intelligence survey and SE with a modified Self-Perception Profile for Adolescent survey. Responses were recorded from both experimental and control before and after the intervention to measure the before and after change. The paired t-test data shows for the intervention group's EI and SE inventory scores had no change with a p-values of 0.13 (n= 12) and 0.24 (n= 18) respectively versus the control which had p-values of 0.053 (n=12) and 0.027 (n=18). Our novel approach to health psychology as an intervention did not show a statistically significant effect in this pilot study but an increase in mean scores for both EI and SE was seen in the experimental group. The mean increased from 63.3 to 66.4 on the EI scores and 49.2 to 49.9 for the SE scores. This approach to improve students EI and SE is worth revisiting with some changes to the mechanisms of curriculum delivery and content. There is also potential for long-term follow up to better illuminate the relationship between improved EI and SE with health outcomes.

## 110) PRIMARY PRESENTATION OF HSV2 AS MENINGOENCEPHALITIS

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**Introduction:** Herpes Simplex 2 infection typically manifests as genital lesions, but there is some debate regarding the possibility of “asymptomatic” HSV2 infection. Neuropresentation of HSV2 is classically meningitis, but this is a case showing the primary presentation of meningoencephalitis in a person without risky sexual behavior.

**Case Description:** A 74 yo woman presented with one week of headaches in bilateral temples radiating to her occiput and behind her eyes. She also had memory loss, personality changes, photophobia, and nausea. EKG and CT head were normal. LP was positive for WBC of 473, protein 190, and HSV2. Cultures were negative. Acyclovir 10 mg/kg was started. After a day of treatment, she spiked a fever and the headache worsened. With her personality changes, a repeat LP and MRI were performed to rule out encephalitis and false positive NAAT. MRI was negative and CSF showed WBC to 786 and confirmed HSV2. She was discharged with a PICC to finish a course of 8 days IV acyclovir and then 17 days of PO valcyclovir.

**Discussion:** HSV2 meningitis typically manifests in younger patients with known genital herpes. There is some potential she had a history of genital herpes that she didn’t recognize, but the primary presentation of meningoencephalitis speaks to the chameleon nature of HSV2 infection. Generally, HSV1 is associated with encephalitis type presentation, but this patient fell into the <2% of HSV2 infections causing encephalitis. This is an important reminder of the diverse pathology of HSV2. In all patients, regardless of the paucity of risk factors (age, sexual activity, known HSV2 infection), HSV2 should be included on the CSF workup even if the presentation is more encephalitic rather than the more common meningitic. Identifying HSV2 as the source of infection is important with its association with Mollaret meningitis and the patient will need to be monitored in the future for potential recurrence of the meningitis.

## 111) CARBOPLATIN-INDUCED HYPERSENSITIVITY REACTION IN METASTATIC PROSTATE CANCER

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**Introduction:** Medical treatment for advance prostate cancer have evolved in recent years, including the use of carboplatin. Previous studies have demonstrated the incidence of nephrotoxicity and neurotoxicity related to carboplatin is low. Serious carboplatin toxicity including hypersensitivity reactions have been well documented, however this usually occurring after more than 5 or 6 cycles of treatment.

**Case presentation:** We describe a 58 year old male with history of metastatic prostate cancer HFrEF who was treated with carboplatin and developed toxicity during the 9th cycle. Patient previously tolerated 8 treatments of carboplatin one year prior. He was at cancer clinic for chemotherapy infusion of Taxol/Carbo Cycle Day 2. Six minutes into carboplatin infusion, he developed lip tingling, tongue discomfort and throat swelling. The infusion was promptly stopped. Patient became unresponsive and pulseless for which the code team was activated, ACLS protocol was initiated. He was treated with 2 doses of IM Epi and underwent cardiac resuscitation. He additionally received dose of solucortef given angioedema and rash. He was transferred to the ED where he had V-fib/V-tach and received shocks from his own device. He was intubated and transferred the ICU and placed on multiple vasopressors for distributive shock. Patient quickly recovered and was extubated the following day.

**Discussion:** Carboplatin is used as a second-line drug in metastatic prostate cancer. Hypersensitivity reactions to chemotherapeutic agents, including carboplatin and docetaxel have been well described, however the use of carboplatin in prostate chemotherapy is relatively new. Although initial studies suggested that negative skin prick testing for the carboplatin agent may have a high negative predictive value, subsequent studies have shown that many patients with initially negative tests go on to develop reactions with subsequent exposures. Previous studies have suggested that reactions develop due to a type I response mediated by the release of histamine and cytokines as well as the involvement of a type IV reaction with T cell-mediated production of cytokines. Our patient developed hypotension, angioedema with respiratory failure and dyspnea during the ninth cycle of carboplatin administration, six minutes after the infusion was started. This led us to conclude that carboplatin induced a hypersensitivity reaction in our patient who received this drug due to a relapse of metastatic prostate cancer.

## 112) ALVEOLAR RHABDOMYOSARCOMA IN AN ADULT

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**Introduction:** Alveolar rhabdomyosarcoma (ARMS) is an aggressive, rare cancer with an annual incidence of 1 per million. Most commonly seen in children and young adults, ARMS represents 1% of all childhood and adolescent malignancies. Typically arising in the trunk and upper and lower extremities, ARMS is also seen in locations where skeletal muscle is minimal or absent, such as the middle ear, prostate, and bile duct system. Twenty-five to thirty percent of ARMS patients will have metastases at the time of diagnosis.

**Case Presentation:** A 28 year old female presented with acute onset RUQ pain, jaundice, pruritus, and vomiting. She reported an intentional 60 lb. weight loss over 6 months. Mild RUQ tenderness with negative Murphy's sign and frank jaundice was seen on exam. Labs: Alk Phos: 682; AST: 116; ALT: 208; Bilirubin Total: 7.1; Direct Bilirubin: 5.6 mg/dL. Abdominal ultrasound showed a hepatic hypoechoic lesion measuring 5 cm, in addition to a retroperitoneal mass measuring 15 x 10 cm. Peri-biliary adenopathy with common bile duct dilation was also noted. CT abdomen further confirmed a large (17.5 x 11.1 x 7.3 cm) primary soft tissue mass in the mid and upper/right abdominal mesentery with peritoneal carcinomatosis, multiple hepatic lesions, mild hepatomegaly, and moderate splenomegaly. Ultrasound guided biopsy of the liver confirmed alveolar rhabdomyosarcoma. ERCP with stenting was pursued, and LFTs improved. A chemotherapy regimen consisting of VDC/IE chemo (vincristine, doxorubicin and cyclophosphamide with alternating ifosfamide and etoposide was initiated.

**Discussion:** The exact etiology and risk factors for developing ARMS are unknown. Almost all cases are diagnosed in the 6-18 year old age group. ARMS is remarkably uncommon in older individuals, such as this patient. While it is noted to occur in (regions where skeletal muscle is minimal or absent, like the...) sinuses, the nasal cavity, middle ear, and preauricular area, this patient has a mesenteric soft tissue mass, which is not reported in the medical literature. Tissue biopsy is required to determine the tumor type, followed by PET/CT scan for staging. Depending on tumor size and extent of disease, treatment may include a combination of surgery, radiation, and chemotherapy. Prognosis depends on multiple factors, such as disease extent, nature of tumor, and age of the patient, with 5-year survival rates as high as 90% for low-risk patients, and as low as 20% for patients with high-risk characteristics.



## 113) HOSPITALIZATIONS FOR HEART FAILURE EXACERBATIONS FOLLOWING TRANSCATHETER AORTIC VALVE REPLACEMENT (TAVR)

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**Background:** Severe aortic stenosis commonly presents with angina, syncope and symptoms of heart failure. Heart failure in severe aortic stenosis patients could be a result of systolic dysfunction, diastolic dysfunction, other concurrent valvular abnormalities or a combination of these. The incidence of hospitalizations for heart failure exacerbation (HHFE) following transcatheter aortic valve replacement (TAVR) for severe symptomatic aortic stenosis is unknown; and it is unclear if number of HHFE changes following TAVR by valve type. We hypothesize that HHFE decreases following TAVR in both balloon-expandable valves (BEV) TAVR and self-expandable valves (SEV) TAVR.

**Methods:** We examined hospitalization data in 269 patients who underwent TAVR for high-risk inoperable severe aortic stenosis. We computed counts of HHFE in the one year before and after TAVR from the Marshfield Aortic Valve Experience (MAVE) study database; and categorized these by valve types.

**Results:** Of the 183 patients who received BEV TAVR, there were 35 patients with 104 HHFE in the year prior to TAVR and 55 patients with 160 HHFE in the year following TAVR. Among the 86 patients who received SEV TAVR, there were 18 patients with 43 HHFE in the year prior to TAVR and 17 patients with 67 HHFE in the year following TAVR.

**Conclusion:** Contrary to our hypothesis, among those that survived, our study shows that HHFE following TAVR increases among patients who received both BEV and SEV. These findings suggest that TAVR does not improve hospitalizations for heart failure and will need to be confirmed in other studies.

## 114) FAVORABLE OUTCOMES AMONG IBD PATIENTS UNDERGOING BARIATRIC SURGERY

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**Background:** The prevalence of obesity is rising worldwide. Co-morbidities such as type 2 diabetes and cardiovascular disease are increased in individuals with Class II obesity (BMI greater than or equal to 35) and greater. Bariatric surgery is the most effective and durable weight loss method in individuals with a BMI  $\geq 40$  or BMI  $\geq 35$  with an obesity-related comorbidity. The rate of obesity among IBD patients parallels that of the general population and is approaching 30% in the United States. Nevertheless, bariatric surgery is seemingly underutilized in the IBD population.

**Methods:** Patients with a pre-operative diagnosis of IBD (Crohn's disease or ulcerative colitis) who underwent bariatric surgery between 2013 and 2018 at a large, tertiary care, midwestern hospital were identified using ICD-9 and -10 codes. Patients with a diagnosis of IBD that were not followed by a gastroenterologist or whose diagnosis could not be confirmed were excluded. Demographic information, IBD-related factors, operative type, peri- and post-operative complications, and overall excess weight loss (%EWL) at 6-months follow-up was abstracted from the electronic medical record.

**Results:** Five patients with confirmed IBD (3 Crohn's disease, 2 UC) who underwent bariatric surgery were identified. Bariatric surgical procedures included sleeve gastrectomy and Roux-en-Y. Mean age at time of referral was 43 years  $\pm$  12. Only one patient suffered a major perioperative complication, a pulmonary embolism complicated by splenic infarct. %EWL at 6-month follow-up was 35.4%  $\pm$  12.8. No patients required rehospitalization and mean length of hospital stay for the operation was 2.5 days  $\pm$  1.7. No IBD-related complications (including corticosteroid use for IBD flare or rehospitalization for an IBD-related indication) occurred within 30 days of surgery and no major complications (including small bowel obstruction) were noted within a median follow-up of 54 months. Conclusions: At a high volume IBD and bariatric surgery center, very few bariatric surgeries are performed on IBD patients. This is despite favorable outcomes in these patients, especially those who have undergone sleeve gastrectomy. Further understanding of the attitudes and preferences of IBD patients who are eligible for bariatric surgery, referring physicians, and bariatric surgeons are needed to elucidate the rationale for low-rates of weight loss surgery in this population.

## **115) SCHISTOSOMIASIS: LIVER MASS PRESENTATION IN A NON-ENDEMIC AREA: A CASE REPORT**

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Schistosomiasis is considered the second most impactful parasitic disease behind malaria and according to the WHO, over 200 million people are infected worldwide, with 600 million at risk. Endemic regions include 52 countries across sub-Saharan Africa, South America, China and Southeast Asia. This is a challenging and unusual presentation of schistosomiasis in a non-endemic area with the appearance of malignancy on imaging.

This is a case of a 42-year-old Wisconsin residing male with symptoms of abdominal pain, anemia, weight loss, and fever for 3 weeks. GI clinic evaluated and found he had a normal EGD and colonoscopy. Subsequent CT imaging showed a 3.5x4.4 cm liver mass and multiple peritoneal masses highly suspicious for malignancy. Patient was worked up for suspected carcinomatosis. All imaging, cancer markers, and biopsy results were inconclusive or negative. Infection disease workup discovered patient traveled to rural Liberia two months before the onset of symptoms and reported swimming and bathing in the local freshwater lagoons. An extensive workup was done for infectious causes and patient was treated empirically with antibiotics. Lab results were previously negative for eggs in stool and urine but came back positive for *Schistosoma* IgG antibodies. Treatment with Praziquantel was initiated and symptoms resolved.

Schistosomiasis is an underdiagnosed and undertreated disease in non-endemic countries. Cases diagnosed in the United States are predominantly from travelers to endemic countries where prevalence can be up to 40%, and infection can occur with minimal exposure to contaminated water. It is important for clinicians to be aware of typical patient history and presentation, appropriate diagnostic workup, treatment, and recommendations for follow-up. Many patients with *Schistosoma* infection are asymptomatic but chronic infection without treatment can lead to irreversible calcification, fibrosis, and organ damage. Per CDC recommendations it is reasonable for any patient with a history of travel to an endemic region have a serological screen for *Schistosoma* antibodies and examination of urine and stool for eggs. Schistosomiasis can be a diagnosis of exclusion but anyone with positive serology should be treated with a course of Praziquantel. We present this case to increase awareness among medical practitioners to consider this diagnosis in patients after ruling out other causes.

## 116) SPLENIC MARGINAL ZONE LYMPHOMA: A CASE REPORT

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**Introduction:** Splenic marginal zone lymphoma (SMZL) is rare and makes up less than 2% of lymphoid malignancies. The most common presentation is massive splenomegaly. Lymphocytosis is also a classic characteristic. Weakness can be caused by anemia and thrombocytopenia; however, these findings are present in only 20% and 10% of patients. Due to lack of randomized clinical trials, there is no standard treatment for SMZL. We present a case of an elderly gentleman who was diagnosed with SMZL after multiple emergency department trips and a hospital admission.

**Case:** A 68-year-old male with a past medical history pertinent for type II diabetes, hyperlipidemia, hypothyroidism, benign prostatic hyperplasia, and chronic back pain presented to the emergency department with weakness that started about three weeks prior and a 30-pound weight loss. The weakness has been increasing and progressing to falls. Notably, he visited an outside hospital (OSH) multiple times within the past 3 weeks. There, his symptoms were attributed to many etiologies including vertigo and Bell's palsy. On initial evaluation, patient's vital signs were stable, and organomegaly was present on abdominal exam. A computerized tomography (CT) of the abdomen revealed a 25.4cm spleen, which two years prior had been measured to be 15.8cm. His labs showed anemia (hemoglobin 11.9 g/dL) thrombocytopenia (platelet count  $145 \times 10^3/\mu\text{L}$ ), and his smear revealed absolute lymphocytosis with atypia. Patient was subsequently admitted. With the help of hematology oncology, a bone marrow biopsy was obtained and the diagnosis of SMZL was made. Patient was discharged and recommended to follow up outpatient for rituximab therapy.

**Conclusion:** Despite this patient presenting multiple times, he did not receive timely and adequate care. This stresses the importance of a broad differential that includes rare etiologies such as SMZL. Though splenectomy is the traditional treatment and may improve symptoms of splenomegaly and cytopenia, recent literature supports the effectiveness of rituximab therapy as it has been shown to demonstrate hematologic recovery and spleen regression on average of 3-4 weeks after initiation of therapy, and remission is recorded in greater than half of patients. The addition of chemotherapy to rituximab did not improve efficacy.

## 117) CEREBRAL CHAGAS DISEASE IN AN HIV-NEGATIVE INDIVIDUAL

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**Case Presentation:** An 88-year-old female from Peru with history of hypothyroidism, rheumatoid arthritis treated with oral methotrexate, and multiple recent transient ischemic attacks presented with altered mental status, difficulty speaking, and right sided weakness. The patient was unable to fully participate in any examination or conversation. Initial labs, including HIV tests, were unremarkable and head MRI demonstrated bilateral white matter lesions with thick, peripheral enhancing located within the frontoparietal regions causing extensive edematous changes. At this point, the differential included bacterial or fungal infections, primary CNS lymphoma, metastatic disease, multiple sclerosis, posterior reversible encephalopathy syndrome, or acute disseminated encephalomyelitis. A lumbar puncture found elevated lymphocytes, no oligoclonal bands, and negative bacterial and viral serology; brain biopsy demonstrated intracellular parasites which prompted PCR of the sample for *Trypanosoma cruzi* (*T. cruzi*.) After confirmation with the CDC, the patient received two weeks of benznidazole therapy before dying of respiratory failure.

**Discussion:** Diffuse, enhancing lesions on MRI with edematous changes requires a broad differential with a plan to differentiate between malignancy and infections. Specifically, primary CNS lymphoma and bacterial abscesses should be considered. In the absence of obvious infectious signs, brain biopsy may be required. Despite their infrequency, intracellular parasitic infections must be considered once other, more common, diagnoses are ruled out. Chagas disease is due to a secondary reactivation of *T. cruzi* and is most frequently seen in individuals from Latin America. While commonly causing cardiac and intestinal complications, *T. cruzi* has also been known to cause cerebral illness, most notably in immunosuppressed patients. Diagnosis of cerebral Chagas necessitates ruling out more common pathologies and a high clinical suspicion.

**Conclusions:** If *T. cruzi* is identified, it is necessary to begin directed anti-parasitic medications despite limited effectiveness against chronic disease. Perhaps due to this patient's methotrexate history, *Trypanosoma cruzi* was able to indolently reactivate. This case exemplifies the necessity of a broad differential, a thorough history, and the diagnostic difficulties of imaging changes.

## 118) RARE CAUSE OF ALTERED MENTAL STATUS AFTER A CAR COLLISION: REMEMBER TO KEEP AN OPEN DIFFERENTIAL

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**Introduction:** Thrombotic thrombocytopenic purpura (TTP) is caused by a deficiency in ADAMTS13 leading to an inability to break down von-willebrand factor. As such, small thrombi form across blood vessels and shear passing red blood cells. This leads to a treacherous triad of thrombocytopenia, anemia, and organ ischemia.

**Case:** A 49-year-old female with no medical history was brought to the emergency department after being found in a car collision. Due to a slight facial droop, she was presumed intoxicated. A head and neck CT angiogram demonstrated neuro-vessel occlusion with a left-punctate cerebellar infarct. Labs were significant for a hemoglobin of 8.4 and a platelet count of 9. At this point, differential diagnosis included hemolytic uremic syndrome (HUS), atypical HUS, disseminated intravascular coagulation, and TTP. Upon further testing, her ADAMTS13 was found to be <5% and a blood smear demonstrated 6-10 schistocytes per high-power-field. She was admitted to the neuro-intensive care unit and, after hematology consult, was treated with plasma exchange (PLEX) and prednisone. Her TTP was found to be refractory to PLEX and steroids; however, her platelet count stabilized with reinitiating of PLEX with rituximab. She was discharged with a mahurkar catheter in place for ongoing PLEX. Last seen, her catheter has been removed and she continues on prednisone.

**Discussion:** Whenever a patient presents after a car collision, it is imperative to determine if an acute medical illness may have contributed. Although intoxication frequently plays a role, when one of these patients has an altered mental status, a thorough evaluation is necessary to evaluate for other possible contributing factors. In previous publications, medical conditions most associated with car collisions included mental, circulatory, and respiratory disorders. This case demonstrates the importance of a broad differential and careful analysis of patient presentation in order to find the root cause of an emergency. TTP is a rare and dangerous thrombotic microangiopathy with thrombocytopenia, microangiopathic hemolytic anemia, and organ ischemia. Although this can be inherited, it is most often diagnosed in adulthood with acquired autoimmune ADAMTS13 auto-antibodies. Our patient was found to have auto-antibodies which complicated treatment and lead to the required use of rituximab. Survival with TTP necessitates timely diagnosis, an interdisciplinary approach, and long-term follow up to monitor for recurrence.

## 119) IRON REPLACEMENT: A CAUTIONARY TALE

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**Case:** A 68-year-old healthy male was found to have progressively decreasing mean corpuscular volume (MCV) on routine labs. Patient was asymptomatic. Vitals were unremarkable. Labs revealed a low MCV of 68.9 fL (from 90.6 fL three years ago), hemoglobin (hgb) of 15.8 g/dL, platelets (plt) of 445 K/ $\mu$ L, white blood cell (WBC) count of 12.8 k/ $\mu$ L. Electrolytes and creatinine were unremarkable. Iron studies were consistent with pure iron deficiency. He was referred to gastroenterology given his progressive microcytosis and iron deficiency, concerning for occult bleed. EGD and colonoscopy were unremarkable, but did reveal a Billroth II anatomy, which was initially thought to be the etiology of his low iron. He was transfused with twelve doses of IV ferric gluconate 125mg. Post-transfusions, he was noted to have elevated hgb of 18.8 g/dL. WBC and plt remained unchanged. Repeat iron level decreased to 37  $\mu$ g/dL. Patient was then referred to hematology. Serum erythropoietin was low at 1.0 mU/mL. Ultrasound revealed splenomegaly and he was found to be positive for the JAK2 mutation. He was diagnosed with polycythemia vera (PV) and started on aspirin for prevention. Treatment was initiated with phlebotomies and hydraea.

**Impact/Discussion:** PV is a rare, chronic myeloproliferative disease characterized by clonal proliferation of myeloid cells causing increased red cell mass. Symptoms include pruritus, headache, paresthesia, dizziness, visual disturbance and bleeding. Serum erythropoietin (epo) can be obtained to differentiate between primary and secondary polycythemia, with low epo pointing towards PV. Diagnosis is made by fulfilling all major criteria or two major and the minor criteria. Major criteria include hemoglobin >16.5 g/dL in men and 16.0 g/dL in women, bone marrow biopsy demonstrating hypercellularity with trilineage growth and presence of JAK2 V617F mutation or other functionally similar mutations. The minor criteria is subnormal serum erythropoietin. Currently there is no cure for PV. Management is based on risk stratification and can include starting aspirin for primary prevention, phlebotomy to maintain hematocrit <45% and use of cytoreductive agents.

PV can be difficult to diagnose due to confounding factors. Our patient had a classic presentation of PV that was initially mistreated due to concern for occult bleed based on his age, microcytosis and iron deficiency. Platelets are also frequently elevated in iron deficiency, making his diagnosis less apparent. Physicians should consider PV as a differential for patients who present with iron deficiency and inappropriately normal or elevated hemoglobin.

## 120) SPONTANEOUS CORONARY ARTERY DISSECTION: A UNIQUE PRESENTATION OF ACUTE CORONARY SYNDROME

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**Introduction:** Coronary atherosclerotic disease is the most common etiology for acute coronary syndrome (ACS). A rare cause of ACS is spontaneous coronary artery dissection (SCAD). SCAD is more common in women with risk factors such as pregnancy, fibromuscular dysplasia, connective tissue disease, or systemic inflammatory disease. We present a case of a young female with ST elevation myocardial infarction (STEMI) due to multivessel SCAD.

**Case Description:** A 35-year-old Hispanic woman with no medical history presented with a two day history of exertional chest pain that was worse with lifting heavy objects. Her vitals and physical exam were unremarkable. Her labs were significant for troponin of 8.10 and her EKG showed ST segment elevations in the inferior and anterior leads. Emergent coronary angiogram demonstrated mid left anterior descending (LAD) artery and distal left circumflex artery (LCX) dissections. A stent was placed in the distal LCX due to limited flow past the lesion. A transthoracic echo showed an ejection fraction of 25% with akinesis of the basal-to-mid inferior walls. The patient was discharged home on optimized medical therapy.

**Discussion:** Our patient presented with a STEMI secondary to SCAD and had no known risk factors other than gender. It is a unique case in that two coronary vessels were affected simultaneously. Multivessel disease has only been reported in only 9-23% of cases<sup>1</sup>. This case demonstrates the importance of recognizing the underlying cause of ACS in order to treat the patient appropriately.

### References:

1. Hayes SN, Kim ES, Saw, J, et al. Spontaneous coronary artery dissection: current state of the science. *Circulation*. 2018 May 8; 137:e523–e557.



## **121) ABUSE POTENTIAL IN A COMMONLY PRESCRIBED BLOOD PRESSURE MEDICATION**

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Clonidine is a commonly used drug to control blood pressure through agonistic effects on alpha 2 adrenergic receptors which has been on the market for over fifty years. Other uses of clonidine include treatment for ADHD, Tourette Syndrome and opioid withdrawal. Interestingly, clonidine may also have the potential to become a drug of abuse. We present a case of a 79 year old female prescribed clonidine for blood pressure control, fulfilling DSM criteria for substance use disorder by taking larger amounts of clonidine than prescribed, spending a great deal of time attempting to obtain this medication, and continued self-administration of extra doses of clonidine despite being informed it was potentially hazardous for her health.

## 122) AN ATYPICAL CASE OF HEPATIC ENCEPHALOPATHY PRESENTING AS MULTIFOCAL DYSKINESIA

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**Case Description:** The patient is a 66-year-old female with a PMH of cirrhosis secondary to NASH, chronic kidney disease, restless legs syndrome, Castleman's disease, coronary artery disease, and diabetes presenting with acute multifocal involuntary movements of upper limbs and neck with associated fatigue, mood changes, and confusion. Examination was notable for random, slow to rapid, involuntary flexion, extension, and rotation of head, neck, and shoulders in addition to disorientation and euphoria. No asterixis noted. Ammonia was elevated to 128 on admission without prior baseline. Neurology consulted and noted mild edema of the basal ganglia on CT head. MR brain was obtained without other abnormalities. She did not respond to a trial of benzodiazepine or diphenhydramine. Her symptoms resolved with optimization of lactulose and rifaximin, with ammonia of 66 on discharge.

**Discussion:** Hepatic encephalopathy (HE) is described as a spectrum of reversible neuropsychiatric abnormalities seen in patients with cirrhosis or portosystemic shunting. More typically, neuromuscular impairment manifests as bradykinesia, asterixis, slurred speech, and hyperreflexia due to the direct toxic effect on neurotransmission. However, non-classical symptoms of HE can present as hyperkinesia due to possible direct effects on the basal ganglia as seen in our patient.

## 123) CMV PNEUMONIA IN IMMUNOCOMPETENT HOST

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**Introduction:** Cytomegalovirus is an important cause of morbidity and mortality in lung transplant recipients and infects 38%-75% of patients in the absence of prophylaxis. While 50% of adults in the United States are infected with CMV, severe disease is not common in immunocompetent adults. In immunocompetent patients, CMV often goes unrecognized because it typically presents as a subclinical or self-limited viral illness. Lung involvement is rare and can range from a dry cough to severe pneumonia. We present a unique case of CMV pneumonia in an immunocompetent host.

**Case:** A 61-year-old female presented to the ED with a 1-week history of fever, headache and chills without improvement on levofloxacin. Chest x-ray revealed diffuse bilateral multi-lobar ground-glass opacities/nodules and she was admitted. She had no history of immunodeficiency, but did provide a history of heavy organic dust exposure due to Raid flea killer. Admitting exam was remarkable for minimal crackles heard bilaterally on pulmonary auscultation in the setting of hypoxia. Repeat chest x-ray showed no improvement with antibiotics. CT chest showed extensive ground glass changes/nodularity with interlobular septal and bronchial wall thickening. Given these findings, the patient underwent a bronchoscopy with broncho-alveolar lavage and trans-bronchial lung biopsy. CMV qualitative NAAT was positive for CMV and a quantitative viral load resulted as 60,347 IU/mL. Biopsy specimens showed evidence of CMV. Serum CMV IgG and IgM were both negative. The patient was treated and discharged with IV ganciclovir. On follow-up, her symptoms had improved and she was transitioned to oral Valganciclovir.

**Discussion:** Cytomegalovirus pneumonia is a disease marked by respiratory failure. It commonly presents in immunocompromised individuals, often following solid organ transplantation. Although rare, immunocompetent patients can develop CMV infection with severe respiratory involvement. In these cases, a definitive diagnosis is made using histological identification of cytomegalic inclusion bodies. However, an earlier diagnosis is possible using serologic testing including CMV PCR and CMV IgG and IgM titers and avidity assays. Early detection of CMV pneumonia, given clinical suspicion, is vital as patients treated with anti-viral therapy sooner may experience increased survival rates. Clinicians should be aware of this rare clinical presentation, consider appropriate testing and start anti-viral treatment in those suspicious for CMV pneumonia.

## 124) CANINE THERAPY IN ADDRESSING PHYSICIAN BURNOUT IN THE HOSPITAL

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Physician burnout (PB) is a current major issue. The rate of burnout and dissatisfaction has risen in the past few years and estimated to be between 25% -60%. In Wisconsin, the rate of dissatisfaction in the workplace is over 60%. Major consequences of PB include *compassion fatigue* and patient *depersonalization*. Although promoting wellness is popular, cost-effective methods to minimize burnout in the clinical setting are currently lacking. This project proposes the presence of therapy dogs during normal working hours, to interact with the medical staff at the general hospital.

A single therapy dog session produced increases in dopamine, oxytocin, beta-endorphin serum levels in healthcare professionals and significantly decreased serum cortisol levels. Salivary cortisol levels were also significantly decreased after 45 min after a therapy dog session. The findings suggest that interaction with canines may help reduce the biological effects of stress. The presence of dogs may stimulate memories of pets at home, detachment of stress and promote feelings of well-being. Having a pet in the workplace also allows staff to interact with each other and patients on a more personal level.

The objective of this project is to analyze the effect of physicians & other healthcare staff after single session with a canine in the inpatient hospital setting. The sessions last ~5-min and subjects complete a questionnaire immediately before and after the dog session. The questionnaires are validated measures of wellbeing, feelings of anxiety and depression and burnout. Baseline demographics, results and statistical analyses are reported. Having dogs in the inpatient setting is a low-cost and valuable tool to improve wellness for physicians and healthcare staff.

## 125) SCALLOPS AND RICE: A CASE OF A CONSERVATIVELY MANAGED ESOPHAGEAL PERFORATION

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Esophageal perforation is a relatively rare and potentially life-threatening condition that is most commonly due to iatrogenic causes (endoscopic instrumentation), spontaneous rupture (Boerhaave's syndrome), foreign body ingestion or food impaction, and trauma. A high rate of morbidity and mortality has been described due to associated mediastinitis and sepsis. While this condition is classically managed with emergent surgical or endoscopic repair, there are situations where no intervention is required and may actually confer a higher risk to the patient.

We present a case of a 75-year-old woman with a history of dysphagia who presented to her local ED shortly after sudden onset severe chest pain while eating dinner (scallops, rice, corn, carrots) associated with retching and a small amount of blood tinged sputum. Food bolus impaction was suspected and patient was treated with nitroglycerin and glucagon, later vomiting the food bolus. However, she was febrile, hypertensive, tachycardic and had persistent severe upper back pain. Chest CT showed marked mediastinal emphysema from the neck to the stomach. She was then transferred to our institution for surgical correction of presumed esophageal rupture.

Further workup with water-soluble contrast esophagram revealed intramural esophageal dissection and evidence of severe GERD, but no extramural extravasation. We concluded this was most likely a mucosal tear with submucosal tracking of air into mediastinum and any overt esophageal perforation that was present was no longer clinically significant - most likely caused by food impaction and retching. She was at higher risk of complication given chronic dysphagia and mucosal erosion from poorly controlled GERD. Thus, surgery was not indicated and EGD for further workup was acutely deferred due to high risk for conversion into full perforation.

She was medically managed with piperacillin/tazobactam, fluconazole, pantoprazole and PRN medications for nausea and pain. Her fever and leukocytosis improved by day 2. During hospitalization she experienced insomnia, diarrhea, and difficult pain management, but was ultimately improved and discharged on day 4 on PO antibiotics, antifungals, PPI, and follow-up with GI for elective EGD.

## 126) HEPARIN INDUCED HEMORRHAGIC BULLOUS DERMATOSIS

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**Introduction:** Heparin is extensively used in the inpatient setting as prophylaxis against thrombosis. There are several well described dermatological side effects of heparin, many of which are injection site reactions such as hematoma, skin necrosis, and hypersensitivity reactions. A lesser known dermatologic side effect that has been reported in rare cases is the systemic side-effect bullous hemorrhagic dermatosis. A recent wide-scope literature review found 90 reported cases of this side effect worldwide from 2004-2017.

**Case:** An 85 year old male with a PMH of HTN, prostatic hypertrophy and unclear diagnosis of polyneuropathy and AMS, thought to possibly be secondary to myasthenia gravis (positive ACh R binding Ab but with little improvement with serial IVIG treatments and pyridostigmine) presented with worsening mental status, hallucinations, weakness, and AKI. He was started on heparin 5000 units SubQ injection TID for DVT prophylaxis upon admission. Four days after admission, the patient was noted to have new lesions on his hands. He denied any injury or history of similar lesions. Physical exam revealed lesions on the dorsum of the hands bilaterally, primarily over the digits, 2-10mm non-inflammatory firm superficial hemorrhagic bullae with coagulated blood within. The lesions were not tender or painful. A shave biopsy was initially performed, showing a possible intraepidermal or sub corneal hemorrhagic bullae. Punch biopsy was subsequently performed 2 days later due to inadequate sampling of other dermis, showing intracorneal hemorrhage and crust with mild hemorrhage in the dermis, without any evidence of vasculitis or thrombi.

The lesions were not bothersome to the patient, and his platelet count remained stable. Heparin was continued throughout the patient's admission which lasted 10 days.

**Discussion:** The most likely diagnosis is a rare dermatosis known as heparin induced hemorrhagic bullous dermatosis. The bullae typically develop within 7 days after initiation of therapy and are asymptomatic. Heparin can be continued, as this is not a dangerous complication of therapy, and no specific treatment is indicated. Biopsy shows intraepidermal blister filled with red blood cells, without findings of vasculitis or vessel thrombosis.

## 127) TWIDDLER ON THE ROOF

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### Learning Objectives:

1. Identify the clinical signs and importance of Twiddler's Syndrome
2. Emphasize the importance of patient communication

**Case:** Patient is a 72 year old male with a history of heart failure with preserved ejection fraction, atrial fibrillation, and sustained ventricular tachycardia with a pacemaker and implantable cardiac defibrillator. He was found to Twiddler's syndrome. He underwent an elective pacemaker revision. He was unable to be extubated due to volume overload which was complicated by his worsening renal function and unresponsiveness to high doses of diuretics. He was started on bumetanide boluses with metolazone and was eventually uptitrated to a bumetanide drip and high doses of chlorothiazide. He had consistent urine output but was not adequately diuresing. He required slow continuous ultrafiltration to remove volume and improve cardiac output and relieve renal congestion. Once his fluid status was optimized he was successfully extubated. During this time he also became febrile and went into shock. He was suspected to have sepsis but the source was never determined. He was placed on broad spectrum antibiotics and all lines and catheters were removed. His fever curve returned to normal and hypotension resolved. Lastly his course was complicated by severe deconditioning leaving the patient unable to stand or ambulate on his own. He inevitably required discharge to subacute rehabilitation to return to his functional baseline.

**Discussion:** This case demonstrates two learning points, the first – Twiddler's syndrome, the second – the importance of patient education. Twiddler's syndrome is one of several long term complications of placement of cardiovascular implantable electronic devices. It results from the patient rotating or “twiddling” the pulse generator which may result in lead migration or lead damage. Though this can be an incidental finding on follow up, some patients who are dependent on their device will present with bradycardia, dizziness, syncope, or in the worst scenario, with . Other patients are found on follow up due to increased lead impedance, such was the case for this patient. This case also demonstrates the importance of patient communication. The patient “twiddled” his pacemaker pulse generator subconsciously. If better educated this may have been avoided and the subsequent complications would not have happened.

## **128) HYPERPROGRESSION WITH IMMUNOTHERAPY: A NOVEL CASE OF DRUG-FUELED TUMOR EXPLOSION**

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Immune checkpoint inhibition (ICI) has resulted in an unprecedented change in the outlook for those patients with progressive cancers. ICI is currently FDA approved for more than a dozen of clinical indications, primarily in the relapsed/refractory setting. However, a paradoxical rapid increment in tumor burden is noted in a subset of patients. This evolving phenomenon is now referred to as “hyperprogression,” and is reported in 9%-29% of all patients receiving ICI. Although there is no consensus definition of hyperprogression, it is investigationally defined as greater than 2-fold increase in progression rate and a >50% increase in radiographic tumor burden within 2 months of initiating immunotherapy. A few groups have identified amplification in MDM gene family and alterations in EGFR as the underlying driver of this paradoxical response. MDM2 is a negative regulator of p53 and hence lead to the exorbitant tumor growth in the immediate post-ICI setting. Macrophages reportedly play a critical role and may lead to fever via cytokine release, in the absence of an infection. Herein, we present a 45-year old patient with Li Fraunmeni syndrome and Breast cancer with extensive metastasis to liver, brain and bones, who developed worsening fatigue and fevers after starting anti-PD1 immunotherapy, pembrolizumab. Extensive microbiological investigations remained negative. A CT scan performed within 3 weeks of initiating ICI showed fulminant progression of her primary tumor as well as several fold increase in her metastatic deposits.

This case not only highlights hyperprogression as a possible cause of fevers after ICI but also underscores that there might be other genes involved in hyperprogression. Robust, multicenter studies are needed to address this unmet need to better identify potential markers of ICI responses and to classify patients who may have a paradoxical progression.



## 129) MALIGNANT MIMICRY: A STEROID A DAY KEEPS THE DOCTOR AWAY

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**Case:** A 58-year-old male with a history of hypertension and gastroesophageal reflux disease presented with six weeks of painless jaundice and six months of episodic right upper quadrant abdominal pain, bilateral cervical lymphadenopathy, fatigue, cold intolerance, and anorexia with weight loss. Prior work-up included a CT abdomen/pelvis showing intrahepatic ductal dilation and possible stricture or mass at the hilum, and a cervical lymph node fine needle aspirate was negative for malignancy. Upon presentation, labs were significant for creatinine of 1.7, total bilirubin of 8.5, AST of 289, ALT of 231, alkaline phosphatase of 1033, and lipase of 26. Physical exam was notable for scleral icterus, bilateral cervical lymphadenopathy, a benign abdomen, and jaundiced skin. The patient underwent endoscopic retrograde cholangiography with findings of strictures and beading; a stent was placed with improvement in his biliary obstruction and symptoms. Brushings obtained were negative for malignancy on cytology. Given concern for malignancy, further evaluation was performed including tumor markers, which revealed an elevated CA 19-9. Staging CT of the chest revealed adenopathy concerning for metastasis. Subsequent excisional biopsy of an enlarged cervical node was surprisingly negative for malignancy, but revealed a non-caseating granuloma. A second ERCP revealed an inflammatory stricture with brushings again negative for malignancy. Given the lack of evidence of malignancy, an IgG4 level was checked and found to be elevated at 386. His presentation was thus thought to be most consistent with IgG4 sclerosing cholangitis, and he was started on systemic corticosteroids.

**Discussion:** IgG4-related disease is a chronic relapsing fibro-inflammatory syndrome with multi-organ system involvement characterized by increased serum levels of IgG4 and infiltration of tissues by IgG4+ plasma cells. Histological findings include dense lymphoplasmacytic infiltrate rich in IgG4+ plasma cells, storiform fibrosis, and obliterative phlebitis. IgG4-related disease can mimic primary sclerosing cholangitis and cholangiocarcinoma when presenting in the gastrointestinal tract as autoimmune pancreatitis or autoimmune sclerosing cholangitis. Steroids are the first-line treatment with refractory cases requiring more aggressive immunosuppressive agents.

## 130) UNCONVENTIONAL APPROACH TO TREAT PERIOPERATIVE HYPOTHERMIA

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**Introduction:** Perioperative hypothermia is not an uncommon complication after surgery. Hypothermia after intrathecal analgesia has been reported in animals and in very few human cases.

**Case Presentation:** We present a 24-year-old female who developed hypothermia of 89.8 °F after she underwent a cesarean section (CS) with intrathecal fentanyl 20 mcg for regional anesthesia. After 8 hours of failed trial of rewarming with Bair Hugger and warm IV fluids infusion, 1 mg Lorazepam administration subsequently improved her core temperature to 97.5 °F within one hour. The differential diagnoses for post-operative hypothermia include infection, hypovolemia, endocrinopathy, environmental conditions, iatrogenic causes and the administration of anesthetics. It is imperative to rule out other causes before assuming spinal anesthetic as a cause of the hypothermia. Hypothermia results due to generalized vasodilation transferring heat from core to periphery where it is lost through multiple mechanisms including, sweating due to increased perception of heat at the periphery and sympathectomy that affects the shivering mechanism. It has been noted that pretreatment with benzodiazepine prevents the hypothermia effect of intrathecal morphine in rats while benzodiazepine antagonist worsens the hypothermia. Lorazepam was recently shown to reverse hypothermia after morphine spinal intrathecal anesthesia in humans. Few case reports indicated that patients who were given lorazepam for post CS hypothermia secondary to intrathecal morphine responded faster than conventional treatment.

**Conclusion:** We have presented the first case of successful reversal of post-operative hypothermia as a complication of intrathecal fentanyl with oral lorazepam.

### 131) MYCOTIC ANEURYSM MASQUERADING AS STEMI

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A 60-year old male with ESRD, IV drug abuse and recent massive GI bleed was found unresponsive after completing an outpatient hemodialysis session. EMS was dispatched, discovered an inferior STEMI on EKG and transported him to hospital. On arrival, patient's MAP was 30-50mmHg. Inferior STEMI was confirmed. Troponins were elevated to 0.138. IV fluids, vasopressors and naloxone were administered, normalizing the patient's somnolence, hemodynamics and derangements on EKG. Soon after, the patient's mental status again waned, requiring intubation. Repeat EKG again showed inferior STEMI. He was then taken to the cardiac cath lab on vasopressors. His left coronary circulation revealed atherosclerosis without acute plaque rupture. Angiography of the RCA revealed a 2cmx3cm aneurysm near the ostium of the artery which was occluded distally and prevented contrast filling of the RCA. STAT TTE revealed a perforated mitral valve and a possible fistula between the left ventricular outflow tract and left atrium. The patient's MAP dropped to 30mmHg and CPR was initiated. A multidisciplinary conference was held at bedside and the patient was ultimately deemed a poor candidate for further interventions. He died soon after CPR was discontinued due to medical futility. A subsequent review of records from an outside hospital revealed a history of infective endocarditis (IE), severe mitral valve regurgitation and blood cultures positive for *Streptococcus pneumoniae* 6 months prior to presentation.

This case highlights the extraordinarily high risk of IE in hemodialysis patients with a history of IV drug use and bacteremia.

Bloodstream infections are the second most common cause of mortality amongst ESRD patients. Such patients are 25 times more likely to develop bacteremia compared to the general population. Furthermore, the severity of illness in ESRD patients is significantly higher often resulting in prolonged hospital stays. IE is a serious complication of bacteremia, for which dialysis and IV drug use are independent risk factors. Mycotic coronary aneurysms (MCA) are an extremely rare complication of IE, occurring in less than 0.5% of such cases. Various mechanisms may lead to its development: infarction of the vasa vasorum, immune complex deposition, and bacterial invasion of the vessel wall. The prognosis is grave, characterized by high morbidity and mortality. In this patient who presented with an inferior STEMI, we suspect a MCA located in the RCA compressed the arterial lumen leading to acute myocardial ischemia in the setting of decreased preload after a dialysis session, further exacerbated by severe mitral valve regurgitation.

## 132) A PUZZLING CASE OF POLYARTHRALGIA

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**Introduction:** Disseminated gonococcal infection results from bacteremic spread of *N. gonorrhoeae* and occurs in 0.5-3% of gonorrhea infected patients. It presents with polyarthralgia, tenosynovitis, and dermatitis.

**Case:** A 42-year-old woman was admitted for 5 days of migratory polyarthralgia. Symptoms began with 2 days of isolated sore throat, after which she suffered right elbow pain. Over a few days, she developed fever and chills as elbow pain improved and migrated to both wrists and right thumb. Patient denied recent travel or tick bites. Only STI history was trichomonas. She also had history of Hepatitis B, which she claimed she was treated for. Although monogamous, her fiancé had multiple partners. Vital signs were unremarkable. Physical exam showed minimal bilateral elbow flexion contractures that were tender to palpation. Bilateral wrists and right MCP joint were erythematous, swollen, warm, and tender with palpable joint effusions. Remainder of exam was normal. The patient was anemic with a neutrophilic leukocytosis. ESR and CRP were markedly elevated. Rapid flu, rapid strep, ASO and Anti-DNAse B were negative. Rheumatoid factor was elevated, while anti-CCP was normal. ANA screen was positive, while ANA panel was significant only for anti-dsDNA. C3 and C4 were elevated. Patient was positive for Hepatitis B surface and envelope antigens, but negative for all tested antibodies. She was also negative for Hepatitis A and C, but positive for Parvovirus IgG and Epstein-Barr IgG. She was weakly positive for Lyme IgM, but negative on confirmatory testing. NAAT of pharyngeal swab was positive for *N. gonorrhoeae*, while urine was negative for *N. gonorrhoeae* and *C. trachomatis*. HIV NAAT was negative. Voided urine was persistently positive for blood. Arthrocentesis was attempted but unsuccessful. Blood cultures were negative throughout admission. The patient received 3 doses of ceftriaxone due to concern for urinary tract infection. She was simultaneously given 1000 mg naproxen daily after which joint pain and swelling rapidly improved. She was discharged on doxycycline.

**Discussion:** Disseminated gonococcal infection is diagnosed by positive blood, synovial fluid, skin specimen, or other non-mucosal site using cultures or sensitive molecular techniques. If negative, a presumptive diagnosis can be made with positive mucosal specimen as in this patient. There are conflicting reports regarding an association between systemic lupus erythematosus (which may present similarly) and disseminated gonococcal infection. This is thought to be due to complement deficiency and immunosuppressant use, neither of which are seen in this patient.

### 133) REVASCULIZATION AND DEATH RATE WITHIN ONE YEAR AFTER CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY (CCTA) RESULT IN PATIENTS WITH NONOBSTRUCTIVE DISEASE AND NORMAL CCTA

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**Background:** Coronary computed tomography angiography (CCTA) is a noninvasive imaging modality used to assess the significance of coronary artery disease (CAD). One year after a CCTA, in patients with nonobstructive disease ( $<50\%$  stenosis) or a normal CCTA, the rate of revascularization and death is currently unknown.

**Methods:** We obtained data from 2649 patients, with a mean age of 58 years, enrolled in the Marshfield Clinic Health System (MCHS) CCTA registry from 2009 to 2017. Information regarding revascularizations including percutaneous coronary intervention (PCI) and coronary artery bypass graft (CABG), and all-cause mortality was collected at one year of following a CCTA. Patients with CCTAs used to evaluate non-CAD, high calcium scores or moderate to severe stenosis ( $\geq 50\%$  stenosis) were excluded. We computed the number of events in those with nonobstructive versus a normal CCTA result.

**Results:** 2649 patients had a CCTA from 2009 to 2017. 1533 patients were included in the study. 1289 patients demonstrated a normal CCTA result whereas 244 patients demonstrated nonobstructive disease. The revascularization and death rate was observed in 11 patients (0.9%) in normal CCTA group and 8 patients (3.3%) in nonobstructive disease group ( $p=0.284$ )

**Conclusion:** In this single center retrospective cohort study, we found that one year after a CCTA, there was no difference in combined revascularization and death rate between patients with nonobstructive disease and normal CCTA result.

### 134) SERIAL DOPPLER ECHOCARDIOGRAPHY RESULTS DURING PREGNANCY AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT OF A SEVERELY STENOTIC FREESTYLE AORTIC ROOT BIOPROSTHESIS: EXPECTATIONS AND UNEXPECTED FINDINGS

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**Background:** Little is known regarding the Doppler echocardiographic changes that occur in pregnant women who have had TAVR due to severely stenotic Freestyle aortic root bioprosthesis.

**Methods:** Doppler echocardiography (DE) was done throughout pregnancy on a symptomatic 29 year-old woman presenting at 6 weeks gestation with severely stenotic heavily calcified 27 mm Freestyle aortic valve. A TAVR 26 mm Evolute bioprosthetic valve was placed at 12 weeks gestation. At 36 weeks, abdominal delivery resulted in substantial hemoglobin (Hb) drop. The patient remained asymptomatic and hemodynamically stable post-delivery and at 1 month follow-up.

**Results:** Immediate improvement in all DE parameters occurred after TAVR in the severely stenotic Freestyle aortic valve until 1 day post-delivery. At that time aortic valve velocity and gradients markedly increased. The DVI and EOA were unchanged but Hb had decreased substantially. No additional cardiac treatment was initiated. 1 month follow-up showed velocity and gradients improved to pre-delivery state and Hb improved

**Conclusion:** In pregnant women presenting with severely stenotic Freestyle aortic root valve, DE parameters can markedly improve after TAVR. Serial DE during gestation shows stability of the valve. Immediately after delivery the marked increase in velocity and gradients with normal DVI, EOA and AT suggests the valve is functioning normally. Other etiologies are implicated and supported by decrease in velocity and improvement of Hb at 1 month.

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