

Acute Flaccid Paralysis Accompanying West Nile Meningitis

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Introduction: West Nile virus is an RNA virus that was first isolated in a patient in the West Nile province of Uganda 1937 and has since then spread to the Middle East, Europe, and found its way to the United States in 1999 when the first case of West Nile Virus was reported in Queens, NY. From 1999 to 2008, there have been a total of about 29,000 cases of which about 12,000 had neuroinvasive disease.

Case: 36 year old Hispanic male no significant past medical history presented to the ER with fever and headaches for 2 days. Headache was located all over his head, that came about suddenly and progressively got worse. The pain was a dull throbbing pain, consistent 8/10, non-radiating with no alleviating or exacerbating factors. Patient denies aura, lacrimation, facial drooping, and history of migraines. The patient was in his usual good health the night before. Patient denied any recent sick contacts or but did state he traveled to Ecuador 4 months ago to visit family. Vital signs on presentation temperature of 103F, Blood pressure of 150/83, pulse 94, respiratory rate of 18, and pulse ox of 94% on room air. Physical exam findings showed nuchal rigidity and positive Brudzinski and Kernig sign. Patient's basic metabolic panel and CBC were within normal limits. A lumbar puncture was performed and the patient was started on Vancomycin and Rocephin. The findings on the lumbar puncture were consistent with viral meningitis and WNV IgM returned positive. Antibiotics were discontinued and supportive measures were continued but on day five of patient's hospital course, he developed increased weakness in left upper extremity consistent with acute flaccid paralysis due to WNV (CT and MRI were negative for infarcts and bleeding). Physical therapy was started, patient was closely monitored for possible respiratory failure, and patient was discharged to follow up with physical therapy and Neurology.

Discussion: Our patient presented with West Nile meningitis complicated with acute flaccid paralysis which is asymmetric much like poliomyelitis. It is important to make this recognition since dysphagia along with flaccid paralysis indicates a high risk of possible respiratory failure and these patients should be monitored closely.

An Anxiety Reaction Requiring ICU Level of Care: Serotonin Syndrome

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INTRODUCTION: The diagnosis of serotonin syndrome can be life-threatening, as well as difficult to diagnose due to its variability of presentation, spectrum of severity, and unpredictable rate of progression. Acquiring a thorough history, developing a firm foundation of knowledge in psychiatric medications, having a high index of suspicion, early discussion with your regional Poison Control Center, and a low threshold for administration of cyproheptadine are all important aspects for the management of this devastating reaction. Today we present a case in which a 50 year-old male presented to a community hospital emergency department complaining of “the worst panic attack of my life”.

CASE: A 50 yr old man presented to the emergency department with the “worst panic attack of my life.” The man stated he had been increasingly anxious over the past three days. He reported a history of anxiety and panic attacks, but stated he declined the use of benzodiazepines due to a history of alcohol abuse and subsequent benzodiazepine dependence after alcohol detoxification. He reports that earlier that evening he had been in the shower and heard his sister calling for him multiple times, but later discovered his sister was not present in the house. It was these auditory hallucinations which prompted him to come in and be evaluated. At this time, it was also elicited that the patient had recently had two changes in his medications. A few weeks prior to presentation the patient had been started on Cymbalta 60mg daily, in addition to his buspirone 15mg BID and Mirtazipine 50mg QHS. He reported that the addition of Cymbalta had been causing him GI upset and vomiting every morning, so he was subsequently instructed to attempt taking this medication at bedtime, which he began with success 5 days prior to presentation. The patient also reported a recent “pinched nerve” in his left shoulder, for which he was seen 3 days prior to presentation in the same ED and started on cyclobenzaprine (Flexeril) 10mg every 8 hours. At the time of presentation the patient had a heart rate varying from 110 up to the 140. His presenting blood pressure was 162/97, but at the time of initial exam by the resident, he was normotensive. He was afebrile, and aside from his tachycardia he had no abnormal findings on physical exam. He received an IV fluid bolus, but refused benzodiazepines to treat his anxiety due to his history. Therefore, he was initially given 12.5mg quetiapine IV to treat this symptom. He had no resolution of his anxiety approximately 30 minutes after this, and remained tachycardic in the 130's. The diagnosis of serotonin syndrome was brought up discussion, but his only sign of autonomic instability was his tachycardia and he had no clonus or altered mental status. Of note, there was still some suspicion, despite his adamant refusal, that this was alcohol withdrawal. After no improvement with quetiapine, he agreed to 1mg of IV lorazepam. Approximately 30 minutes after this, he became more altered and developed spontaneous clonus. At that time, the diagnosis was made and the patient was treated with a loading dose of cyproheptadine, admitted to the ICU, and the regional Poison Control Center was consulted, who agreed with this plan. Once in the ICU, the patient's temperature rose to 39°C and he became more altered, requiring sedation and mechanical ventilation. He was continued on cyproheptadine until his fever and clonus resolved, on ICU day 4.

DISCUSSION: As stated above, knowledge of the pharmacology of psychiatric medications is essential. While none of the patient's medications were specifically SSRI's, all three have serotonergic properties. Cyclobenzaprine is structurally similar to TCA's, which have weak serotonergic properties, while Cymbalta (which had been being thrown up, but was now tolerated with bedtime dosing) and buspirone both also carry weak serotonergic properties. A thorough history noting the addition of two of these medications should have, and did, raise the suspicion of serotonin syndrome. However, as previously mentioned serotonin syndrome is a spectrum of clinical presentation and should have been suspected at the earliest signs of autonomic instability, hyperreflexia, or altered mental status. This case also emphasizes the importance of listening to the patient. His anxiety, disorientation, and delirium were early indicators of the impending development of serotonin syndrome, not alcohol withdrawal.

Adult Typhilitis Associated With Lymphoma and Steroid Use

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INTRODUCTION: Typhilitis is a necrotizing inflammatory condition usually involving the terminal ileum or ascending colon. Typhilitis was first described in children with leukemia and severe neutropenia. It most commonly occurs in the setting of immunocompromise, chemotherapy, and or chronic steroid use with a mortality rate approaching 50%.

CASE: A 69-year-old white male presents to the Emergency Department with the acute onset of diffuse abdominal pain progressive for six hours. He describes a moderate to severe pain that worsens with minimal movement. He reports associated subjective fever, four episodes of nonbloody diarrhea with nausea, and mild shortness of breath. He denies trauma to his abdomen. He reports mild episodes of similar abdominal pain over the past year. The patient was suspected to be experiencing abdominal pain upon initial evaluation likely from perforated appendicitis or perforated small bowel obstruction with sepsis.

Portable chest X-ray, laboratory studies, and an abdominal flat and upright X-ray series were initially ordered. Following review of his laboratory findings, his profound neutropenia was thought to be due to profound sepsis. The patient was placed on monitoring and given oxygen by nasal cannula. Intravenous (IV) access was established and the patient was given empiric broad spectrum antibiotics. Morphine pain medication was additionally given along with Acetaminophen for fever and fluid resuscitation was initiated with normal saline(NS). After reviewing the nonspecific findings on the abdominal X-ray series with the consulting surgeon a CT of the abdomen with oral and IV contrast was ordered to better define the diagnosis and assist with planning a surgical procedure.

Computerized Tomography(CT) results revealed evidence small bowel perforation at the distal ileum with ileocolonic wall thickening suggestive of bowel necrosis and typhilitis. The consulting surgeon took the patient to the operating room following stress dose steroid administration for possible adrenal insufficiency. A small bowel resection was performed and an ileostomy was created. He remained in the Intensive Care Unit for two days and was discharged to a rehab facility following a 10 day hospitalization.

DISCUSSION: This perforation was thought to occur from a process known as typhilitis, a necrotizing inflammatory condition usually involving the terminal ileum or ascending colon. The exact cause of typhilitis remains unknown however the mechanism is thought to be due to a combination of inflammation and possible acute infection (Cytomegalovirus, *Pseudomonas aeruginosa*), mucosal hemorrhage, and possible neoplastic infiltration.

Typhilitis is usually seen at the neutropenic nadir, usually 7 to 14 days following chemotherapy. These patients will present with abdominal pain, usually right lower quadrant in nature, and fever. Differentiating typhilitis from other infections such as appendicitis is nearly impossible without imaging.

The cause of our patient's typhilitis is unclear; however he was at great risk given his history of chronic steroid use for ongoing ileal inflammation, his relative immunocompromise, and his prior history of chemotherapy.

Epidural Spinal Cord Compression Secondary to Stage IV Esophageal Squamous Cell Carcinoma

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Introduction: The incidence of epidural spinal cord compression (ESCC) can only be estimated as many cases are asymptomatic. However, it is important to recognize new cases of ESCC promptly because it may lead to irreversible loss of neurologic function. Our patient presented with ESCC after being recently diagnosed with stage IV esophageal squamous cell carcinoma.

Case: A 60-year-old gentleman with past medical history of alcohol abuse and hypertension presented to our hospital with complaint of backache, bilateral leg pain, and generalized weakness for three days. He admitted to a fifteen pound weight loss over the past three months but denied loss of appetite. Patient has had a Cat Scan (CT) of the abdomen which indicated the lesion at esophagogastric junction, a pancreatic body lesion, right adrenal enlargement, and a pancreatic body lesion which were new findings. Esophagogastroduodenoscopy was performed and indicated the presence of an ulcerating mass at distal esophagus. Pathology result has come back as stage IV esophageal squamous cell carcinoma. Oncology consultation was obtained, and patient was discharged with arrangements for an outpatient follow up. He was readmitted two weeks later with a complaint of inability to move his lower extremities bilaterally, unable to stand or walk, with associated urinary incontinence and dribbling. Magnetic resonance imaging (MRI) of the lumbar spine indicated the presence of bony metastatic lesions, 2.6 x 1.1 cm epidural mass lesion at the level L4-L5 compressing the thecal sac and nerve roots from posterior aspects. Patient was diagnosed with ESCC and started on IV decadron with complete bed rest. Radiation oncology consultation was obtained, and patient underwent a few sessions of RT (radiation treatment). He was subsequently cleared for discharge with arrangements for outpatient follow up, with RT as outpatient.

Discussion: While many cases of ESCC are asymptomatic, it is important to promptly diagnose them and initiate immediate treatment in order to avoid complications and preserve or improve neurological functioning. The most frequent symptom at presentation is back pain. The majority of cases arise from epidural extension of vertebral body metastases.

Acute Interstitial Nephritis Secondary To NSAID Use in A Patient With Concurrent Streptococcal Infection

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Introduction: AIN (acute interstitial nephritis) constitutes 10-15% of kidney disease. It is described as abrupt deterioration in renal function characterized histopathologically as inflammation and edema in the renal interstitium, with involvement of the renal tubules. Etiologies include, hypersensitivity reaction, infection, systemic disease, and transplant rejection. This patient presented with AIN subsequent to use of non steroidal analgesic use, and streptococcal infection.

Case: 24 year old African American Female with a past medical history of childhood asthma presented to our hospital with a several day history of diffuse body aches and decreased urination, with associated abdominal pain, nausea, emesis and diarrhea. Her pain was located in the right upper quadrant and epigastric area; and described as a sharp pain that came and went. It was rated at a 6/10 on the pain scale. The emesis was described as non bloody, non bilious, occurring after ingestion of food, and consisting mostly of undigested food particles. Her diarrhea was watery, profuse, non bloody, and not black in color. She stated that each year around the same time she develops a sore throat with cough requiring treatment with antibiotics. She could not recall exacerbating or relieving factors. Several weeks prior, she had participated in heavy ingestion of alcohol on several occasions. At that time she did not feel well and began self medicating over the counter cold medication and non steroidal anti-inflammatory medications, which she admitted to taking on a regular basis. Labs on admission showed acute kidney injury with a blood urea nitrogen and creatinine of 25 and 3.4 respectively, no eosinophilia was noted, and the urinalysis showed red color, 3 plus blood, 3 plus protein, 2 plus leukocyte esterase, and greater than 50 white blood cells. Soon after admission the patient became tachycardia and tachypneic, and began to desaturate. She was subsequently intubated secondary to fluid overload. At that time chest x-ray showed frank pulmonary edema and cardiomegally. An autoimmune work up was negative. Streptozyme was found to be positive. Renal function rapidly continued to decline. A CT guided renal biopsy was done and the results showed acute interstitial nephritis. The patient was started on steroids and hemodialysis and her condition improved.

Discussion: The presentation of AIN can vary somewhat depending on the particular cause. The classic presentation is symptoms of acute renal failure, with the triad of fever, skin rash, and arthralgias. Labs will most often show acute renal failure with a urinalysis showing increased leukocytes, eosinophiluria, proteinuria, red blood cells, white blood cells, and white blood cell casts. Because presentation can vary, a thorough investigation for cause of acute renal failure is necessary. Often times, when caused by NSAIDs, the the classic triad is not seen. The gold standard for diagnosis of AIN is renal biopsy.

Vertebral Osteomyelitis

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Introduction: We encountered a case of vertebral osteomyelitis that proved profoundly challenging due to the vague history provided by the patient and her multiple underlying co-morbidities. Osteomyelitis is one of the oldest recorded diseases with descriptions dating back to the time of Hippocrates (460-370 BC). Vertebral osteomyelitis is fairly rare and has an incidence of 2.4 cases per 100,000 population. It is typically a diagnosis of older adults and is part of a large differential diagnosis for back pain.

Case: Our case was a 64 year old female who presented to the Emergency Department from home with a chief complaint of abdominal pain for the past 7 days. Pain was described as gradual onset, achy, constant, localized to the RLQ with radiation to right flank, associated with nausea without emesis. The patient had been evaluated for similar abdominal pain in the past, most recently 2 months ago, at which time she was diagnosed with right ovarian cysts. Review of systems was positive for proximal RLE pain and weakness as well as lower back pain seemingly chronic in nature. The patient had history of a remote appendectomy. Vital signs were normal except for mild tachycardia. Her physical exam revealed RLQ tenderness, right CVA tenderness, and right adnexal tenderness on pelvic examination. These findings were most consistent with kidney stones, pyelonephritis, bowel obstruction, or ovarian cysts, all of which were at the top of our working differential. Initial lab work revealed a WBC of 21.6. CT scan of the abdomen and pelvis was performed showing no acute intra-abdominal process but revealing a nonspecific lumbar spine lesion. MRI was advised to further visualize the lumbar region if clinically correlated, it was performed and definitively diagnosed osteomyelitis of the lumbar spine.

Discussion: Osteomyelitis is an acute or chronic inflammatory process of the bone secondary to infection with pyogenic organisms. Spinal osteomyelitis most often results from hematogenous seeding, direct inoculation at the time of spinal surgery or contiguous spread from an infection in the adjacent soft tissue. Our case demonstrates the need for a thorough differential diagnosis in an elderly patient with back pain. Making a prompt diagnosis of vertebral osteomyelitis remains challenging particularly due to the insensitive and nonspecific clinical presentation of this disease process and its insidious course. Treatment and reliable follow up are crucial components for the resolution of osteomyelitis, and understanding the route and mechanism of infection helps dictate treatment regimens. Treatment consists of IV antibiotics that penetrate bone and joint cavities as well as a referral to an orthopedist or neurosurgeon and a possible ID consult.

Atypical Presentation for Complex Regional Pain Syndrome

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Introduction: Complex Regional Pain Syndrome (CRPS) is a rare disorder, usually of the extremities, that is often difficult to diagnose and can pose a therapeutic challenge for physicians. An inciting event such as trauma, surgery or vascular injury can predispose someone to develop this syndrome. Pain, swelling, skin changes, limited range of motion, and patchy bone demineralization in the affected extremity are symptoms characteristic of this disorder.

Case Description: A 22 year old female presented to Kent County Hospital complaining of a painful blue right foot that started on the day of admission. The patient was involved in a motor vehicle accident several months prior that resulted in a torn right gluteal muscle and lumbar disk herniation and developed progressive complications. For the past month she had swelling of the right foot and ankle with worsening pain. Upon presentation to the emergency department her right foot was cyanotic with mottling of the right lower leg, pitting edema and a thready dorsalis pedal pulse. She underwent emergent angiography by interventional radiology due to concern for acute arterial occlusion. Angiogram of right lower extremity showed normal arterial anatomy from the renal arteries to the distal calve arteries with profound distal vasospasm involving all three calf vessels. Intra-arterial nitroglycerin was infused revealing underlying normal anatomy. Bony demineralization of the tarsal bones was noted as well which suggested a diagnosis of complex regional pain syndrome. The patient was admitted following the procedure and it became a challenge throughout the hospital stay to control her pain. In addition, the patient had multiple imaging modalities in the hospital to rule out other diagnoses which were unrevealing. After appropriate workup, she was discharged from the hospital with a follow up appointment with a specialist in Boston.

Discussion: Complex regional pain syndrome is a challenge to diagnosis and treat. It typically involves an extremity following trauma with pain out of proportion to the injury. CRPS is progressive and occurs in three stages with poorer response to therapy in later stages. The first stage is commonly associated with abnormal vasodilation and a warmer affected extremity. In contrast, our patient presented with a cold extremity and decreased perfusion which is only seen in 30% of cases during the acute phase. Prompt recognition and appropriate intervention including early mobilization can improve the overall outcome in people with this disorder. While not particularly effective for our patient, pharmacologic modalities such as anticonvulsants and certain antidepressants can be helpful in management. Further treatment options for those nonresponsive to medications include more aggressive measures such as sympathectomy. The overall goal of treatment in complex regional pain syndrome is to restore movement and strength in the area involved. It is, therefore, important to keep in mind complex regional pain syndrome as a potential diagnosis so early intervention and appropriate therapy can be initiated.

Acute Superior Mesenteric Artery Thrombus in a 39 Year Old Female

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Introduction: It is crucial to evaluate and recognize patients clinically and historically at increased risk for acute ischemic bowel. In this particular case, although rare, ischemic bowel must be considered in high risk as well as lower risk patients and therefore necessitates further evaluation in any patient that presents to the emergency room with nausea, vomiting, abdominal pain out of proportion to exam, and/or patients that do not respond to typical therapy.

Case: An otherwise healthy 39 year old female presented to the emergency department with a chief complaint of new onset vomiting and abdominal pain for the 8 hours prior to arrival. Emesis described as only appearing like what she has attempted to eat or drink, is non-bloody, non-bilious, and non-feculent. Vital signs, laboratory evaluations including CBC, CMP, Lipase, Lactic Acid, UA were all within normal limits. CT of the abdomen and pelvis were completed showing complete opacification within the proximal 3cm of the superior mesenteric artery from its origin. The patient was taken to the operating room emergently by vascular surgery and underwent a failed thrombectomy and subsequent SMA bypass utilizing a reverse greater saphenous vein graft. Repeat CTA of the vasculature was obtained and demonstrates successful reprofusion of the proximal SMA via bypass graft.

Discussion: The four major causes of acute mesenteric ischemia are superior mesenteric artery embolism (50%), superior mesenteric artery thrombosis (15 to 25%), mesenteric venous thrombosis (5%), or non-occlusive ischemia (20 to 30%) [2,5]. One theory that may apply to this specific case involving an apparent lower risk patient is non-occlusive mesenteric ischemia (NOMI). NOMI is thought to occur as a result of splanchnic hypoperfusion and vasoconstriction [24]. Although the “typical” comorbidities seen in acute mesenteric ischemia are also prominent in the diagnosis of NOMI, several cases resulting from cocaine use have been described [8,9]. This is thought to be secondary to the vasospasm classically seen with cocaine use. Although no drug screen was conducted, it could serve as a potential source for this otherwise healthy female. NOMI accounts for 20 to 30 percent of patients with acute mesenteric ischemia, when it occurs, NOMI results in mortality of nearly 70 percent of cases because of the difficulty in making the diagnosis and reversing the ischemia once it has started [10,11]. The severity and location of the abdominal pain that accompanies NOMI is usually more variable than the classic severe pain of acute occlusive mesenteric ischemia. A high index of suspicion in elderly patients, those with increased risk factors contributing to this diagnosis, or those with risk factors for NOMI is imperative for prompting further evaluation and making a prompt diagnosis.

Ptosis As A Variant Presentation of Mounier-Kuhn Syndrome

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Introduction: Less than 100 cases of Mounier-Kuhn syndrome or tracheobronchomegaly, a congenital disorder characterized by chronic dilatation of the trachea and main bronchi, have been reported. The resulting atrophy of the elastic and smooth muscle tissue of the tracheobroncheal tree reduces mucus clearance and increases the risk for bacterial infections predisposing patients to bronchiectasis. The following is a case of a patient with recurrent lower respiratory bacterial infections and a facial anomaly, a combination described in two other case reports.

Case: Mr E.H. is a 60 year old male with history of chronic obstructive lung disease on home oxygen who presented to the emergency room complaining of worsening shortness of breath, especially on exertion. He had a chronic productive cough with no associated fever, chest pain, abdominal pain, or diarrhea. He was compliant to his medications, which included albuterol, fluticasone-sameterol, and montelukast. His smoking history was significant for 1.5 cigarette packs/day for 30 years, which he quit seven years prior. Of note, the patient admitted to myasthenia gravis workup in the past, which was negative. His vital signs on admission were increased heart rate of 105 bpm, rapid respiratory rate of 22 bpm, and an oxygen saturation of 95% on 2L oxygen. Physical exam findings were significant for bilateral ptosis, bibasilar crackles on the right more than left side, and clubbing of the extremities. Laboratory studies showed leukocytosis (10.6k/ μ L), anemia (hemoglobin 10.7g/dL), thrombocytosis (450k/ μ L), and elevated creatinine (1.8mg/dL). Chest x-ray revealed hyperinflated lungs, dilation of the trachea and both bronchi, and infiltrates in the bilateral lower lungs. The patient was started on intravenous antibiotics and bronchodilators. A high resolution CT scan was done the following day showing bullous disease, and bilateral chronic parenchymal and airway changes, suggestive of bronchiectasis. The diameter of the trachea was noted to be enlarged with a maximum transverse diameter of 42mm and anteroposterior diameter of 39mm. Given the tracheomalacia and bronchiectatic findings on CT a bronchoscopy was performed and revealed diffuse dilation of the trachea (larynx to carina), and severe diffuse dilation of the entire bronchial tree with profuse secretions present. Bronchioalveolar lavage showed markedly reactive bronchial cells in the background of acute and chronic inflammatory cells and no malignant cells. The patient continued to improve clinically and was discharged on oral antibiotics.

Discussion: In patients with recurrent lower respiratory tract infections, chronic bronchitis, or bronchiectasis, Mounier-Kuhn syndrome should be considered as a possible etiology. The diagnosis of Mounier-Kuhn syndrome is made on imaging when the trachea, right main bronchus, and left main bronchus diameter exceeds 30mm, 24mm, and 23mm, respectively. Tracheobronchomegaly has been associated with Ehlers-Danlos syndrome and cutis laxa or elastolysis, thus bilateral ptosis may provide an early indicator of this rare syndrome. Literature search revealed two other Mounier-Kuhn syndrome cases with a combination of recurrent lower respiratory tract infections and ptosis. In conclusion, we suggest that the clinical observation of bilateral ptosis may help in early recognition of this syndrome and thus prevent complications associated with intubation in these patients.

Staphylococcus Aureus Bacteremia from Sternoclavicular Septic Arthritis

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Introduction: Septic arthritis of the sternoclavicular joint is rare in otherwise healthy adults. Classic risk factors include intravenous drug use, diabetes mellitus, rheumatoid arthritis and other immunocompromised states. In the general population less than 1% of septic arthritis is attributable to sternoclavicular septic arthritis, however is as high as 17% in intravenous drug abusers. It is thus important to have a high suspicion in individual that present with sepsis syndrome and ill-defined upper extremity pain. Septic arthritis of the SCJ is a true medical emergency as worsening infection and abscess development increases the risk for involvement to surrounding structures such as the great vessels, trachea and esophagus.

Case: A 67 year old white male with a history of paroxysmal atrial fibrillation and hypertension presented to our emergency department (ED) with right shoulder/neck pain, fever and generalized weakness. This was his third visit to the ED in three days for the shoulder pain. He developed a fever of 103.4 degrees F at home with progressive generalized weakness prompting his return to the ED. Pain began four days ago while driving. No recent trauma. No complaints other than a mild cough and sore throat. Previous work-ups in the ED including negative shoulder and chest x-ray, WBC 16.4, and a normal ekg.

Initial vitals were BP 147/49, HR 108, RR 17, 89% on RA, T 37.1 degrees C, later developed fever of 39 degrees C. He was ill-appearing in NAD. Lungs were diminished at the right base. Heart was tachycardic but regular. RUE had decreased ROM secondary to pain worse with shoulder adduction and tenderness over the right mid trapezius. No deformity at right shoulder. Skin was cool and diaphoretic, no clear skin changes at the shoulder joint, no crepitus. There was also a well healed scar on right pretibial area. He was alert and oriented x 3 without focal deficits.

Given his ill appearance, tachycardia and hypoxemia, he was started on a heparin drip by protocol for the possibility of pulmonary embolism. He was also given 2 liters of normal saline and empirically started on Zosyn, Vancomycin and Ciprofloxacin for possible septic arthritis of the glenohumeral joint.

Labs were significant for WBC 17.6, SED rate 80 mm/hr, CRP 46.7 mg/dL, BUN 18 mg/dL, creatinine 1.79 mg/dL, troponin-I 0.12 mg/mL, INR 1.4, and negative rapid strep. EKG revealed sinus tachycardia with a rate 103 with no ST changes. Initial imaging including chest x-ray and KUB were only remarkable for minimally dilated loops of bowel. A non-contrast CT of the chest/abdomen/pelvis was done to evaluate for other causes of his sepsis syndrome. Except for minimal bibasilar atelectasis, the CT was negative. After the CT he became increasingly toxic appearing and the ICU team was called for admission at which time he was noted to have more localized tenderness in the area of his right SCJ. With the full clinical picture, he was thus presumed to have septic arthritis of the right SCJ. The next day he had skin changes at the right SCJ and a CT neck showed inflammatory changes at the right SCJ, both of which further supported the diagnosis. Five blood cultures later grew Oxacillin sensitive *Staphylococcus aureus*. He did not undergo joint aspiration because he responded well to intravenous antibiotics.

It is likely that our patient developed bacteremia related to seeding of his SCJ from a previous lower extremity abscess which required local incision and drainage and took a total of 8 weeks to drain and heal.

Discussion: Patients with SCJ septic arthritis will complain of poorly localized pain in the neck, chest or shoulder region which is accompanied by fever. Onset is often sudden but can vary from days to weeks. There is often no clear history of trauma to the area. Diagnostic imaging includes CT or MRI to confirm the diagnosis, as well as to evaluate for potential complications. Definitive diagnosis is based on culture results of aspirated joint fluid. The most common cause of infection is *S. aureus* which accounts for 50% of cases. Other organisms such as *Pseudomonas* have been implicated in immunocompromised hosts. Initial treatment should include anti-staphylococcal penicillins.

Initial diagnosis of SCJ septic arthritis may be difficult in an otherwise healthy individual. If not treated early and aggressively with antibiotics, there is a greater risk for the development of a local abscess, mediastinitis, osteomyelitis and the requirement of joint debridement. These life threatening complications make it imperative to have a high suspicion for SCJ septic arthritis when a patient presents with sepsis syndrome and ill-defined upper extremity pain.

Isolated Gastric Varices as an Etiology of Upper Gastrointestinal Bleeding

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Introduction: Gastroesophageal varices are a well known etiology of upper gastrointestinal bleeding in a patient with hepatic cirrhosis. When an EGD is performed with the finding of isolated gastric varices with a normal esophagus, attention should be turned to a segmental obstruction of the splenic vein.

Case: The patient is a 40 year old Portuguese Male with PMHx of peptic ulcer disease (dx 15 years prior via EGD) and Myelofibrosis, JAK 2+ (dx 3 years prior on hydroxyurea and ASA), who presented with 1 day of lightheadness. According to the patient, he had one large, dark, tarry stool on the morning of admission. While driving later in the day, he became lightheaded with no associated LOC, palpitations, SOB, headache, or CP. No loss bowel/bladder. No seizure like activity. Lightheadness lasted for several minutes and was self limited. He called his hem/oncologist and was sent to the ER, where he c/o nausea, but no hematemesis, emesis, change of appetite, weight loss, hx of blood in stool or dark tarry stools. The patient was hemodynamically stable at the time with BP 113/76 Resp 18 Temp 98.2 HR 88 O2 sat of 99%. Physical exam was remarkable for a thin male with mild conjunctival pallor, + splenomegaly 2 cm below the costal margin and a positive guiac with no hemorrhoids. A CBC demonstrated a hgn/hct of 13.6 and 39.0 respectively, with a leukocytosis of 15.7 and platelet count of 987. Two weeks previously the hgn/hct was 15.8/45.9. There was a persistent macrocytosis at 107. The patient was placed NPO, & started on IVF and a protonix drip. The hydroxyurea and ASA were placed on hold. An abdominal US demonstrated splenomegaly at 20cm in length. An EGD was performed demonstrating a normal esophagus and duodenum, with + varices in the cardia and the fundus of the stomach. Multiple clots and oozing blood was seen from the varices. The isolated gastric varices prompted for a Doppler US of the splenic artery to be done to rule out splenic vein thrombosis. It was found to be patent. The risks and benefits of performing a splenectomy in a high-risk myelofibrosis patient were discussed and a splenectomy with devascularization of the greater curvature of the stomach was performed.

Discussion: Segmental portal hypertension due to obstruction of the splenic vein is managed differently than a gastroesophageal varix secondary to hepatic cirrhosis. An EGD, therefore, demonstrating isolated gastric varices, should direct the differential diagnosis towards splenic obstruction. This includes splenomegaly from myeloproliferative disorder, pancreatitis, LUQ trauma or splenic vein thrombosis. A duplex US of the spleen should be ordered and management should be guided accordingly.

The Curious Case of a Post-Partum Fever

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Introduction: Herpes Simplex Virus (HSV) hepatitis is a rare condition that is uncommon in immunocompetent patients, but is being increasingly reported in pregnancy. Because the signs and symptoms of HSV are non-specific, the diagnosis is often delayed or missed, with 58% of HSV hepatitis cases being diagnosed at autopsy. HSV hepatitis, if left untreated in the pregnant patient, has approximately 39% mortality rate for both mother and fetus.

Case: A 33-year-old female, three days post-partum, presented to the ED with a three-day history of persistent fevers that began intra-partum. Her newborn son was also febrile. She had a spontaneous vaginal delivery at 37² weeks after premature rupture of membranes and was treated with five doses of ampicillin given concern for chorioamnionitis, as her GBS status was unknown. The patient was otherwise asymptomatic and had been treating her fevers with acetaminophen at home. On initial evaluation she was found to have a fever of 39.6C with a benign physical exam. Initial work-up, including CBC, CMP, and pan-culturing, were negative. She was admitted for presumptive endometritis and started on clindamycin and ampicillin. Two days into her stay she continued to spike fevers up to 39.2C despite antibiotic coverage. She remained asymptomatic. Further work-up to rule out abscess in the setting of vaginal delivery and fevers, including abdominal ultrasound and CT of the abdomen and pelvis, were unremarkable. On day three of hospitalization, the patient's AST rose to 171 and ALT to 126. She was also noted to have a 20% bandemia. On day four, the patient's AST climbed to 428 and ALT to 283. That same day it was reported that her newborn infant, who was also hospitalized, was septic and was diagnosed with pneumonia. HSV-1 was isolated from his endotracheal tube. At this time, empiric acyclovir was added to the patient's regimen. On day five, her AST peaked at 728 and ALT at 481. Her bandemia also increased to 35%. Approximately 36 hours after initiation of acyclovir, on day six of admission, her AST and ALT dropped significantly and continued to trend down each day. Her fevers also subsided. The endometrial biopsy that was performed on day four of admission revealed HSV, although her IgG and IgM serum antibodies were negative for HSV-1 and HSV-2. Nine days after delivery her infant passed in the NICU thought secondary to disseminated HSV. The patient was discharged home to grieve the loss of her son. She completed a ten-day total course of acyclovir outpatient and had return of normal LFTS sixteen days after admission.

Discussion: Our patient was sero-negative for HSV when she was initially evaluated, and instead suspicion was made for the infection when her son was found to have HSV-1 on his endotracheal tube (until later confirmed by her endometrial biopsy). Only 50% of HSV cases present with the classic mucocutaneous lesions, with the most common presentation being fever. During pregnancy, T-cell mediated immunity is suppressed which can promote systemic effects of infections like HSV. The greatest risk for poor outcome is thought to be associated with primary infections towards the end of pregnancy. Typically HSV-2 infections are a more common cause of HSV hepatitis, however, our patient likely had HSV-1. Given the potentially dire consequences of HSV hepatitis, including need for liver transplant and death, it is important to have a high clinical suspicion for the condition in the right clinical setting, such as a pregnant patient with fever and transaminitis in the third trimester with unclear source. Mortality rates, for both mother and fetus, are substantially decreased when acyclovir therapy is initiated.

A Case of Idiopathic Pulmonary Artery Hypertension causing Severe Right Heart Failure

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Introduction: Idiopathic pulmonary artery hypertension (IPAH) has been a medical enigma since it was first described in medical literature in 1891 by German physician Ernst von Romberg. Since its discovery, modest progress has been made in the pathophysiology and treatment of this grim condition. Purely idiopathic pulmonary artery hypertension is thought to be a rare disease, with an incidence of 2-6 cases per million in the United States. Due to the severely elevated pressures in the pulmonary artery, right-sided heart failure ensues and leads to a cascade of multi-organ failure. This case describes a patient with severe right-sided heart failure secondary to IPAH.

Case: Patient is a 67 year old Portuguese non-smoker female with a past medical history of right heart failure, atrial fibrillation and anemia presents with shortness of breath and worsening abdominal distension for the past few weeks. Pt has been repeatedly admitted for similar complaints in the past and symptomatically managed and discharged. Physical exam was significant for prominent P2, fluid wave, and edema. A transthoracic echocardiogram was performed which showed a D-shaped septum, severely dilated right ventricle, severely enlarged right atrium, severe tricuspid regurgitation and normal left ventricular function. Pulmonary artery hypertension was also appreciated but pressure was unclear. A right heart catheterization was performed to confirm the diagnosis of pulmonary hypertension and rate severity. The severe nature of the patient's pulmonary artery pressures caused pulsatile venous backflow and pressures were not measurable by the flexible catheter. Although it was likely an effect of the IPAH, the severe tricuspid valve regurgitation was considered for surgical replacement to improve the patient's symptoms. Unfortunately, the patient was deemed a high mortality risk and symptoms were likely to recur. Therefore, in discussion with the patient and family, it was decided that surgery was not to be performed at this time. Subsequently the patient was discharged to a subacute rehabilitation facility and was to follow-up as an outpatient with the medical teams.

Discussion: Pulmonary hypertension (PH) has been divided into 5 subcategories depending on cause. Most patients diagnosed with pulmonary hypertension will have group 2-5 PH with obvious risk factors such as severe left heart disease, thromboembolic causes, long standing hypoxia, or systemic disease. The mysterious group 1 PH, also known as idiopathic pulmonary arterial hypertension, is relatively rare cause of PH and until recently was poorly understood.

IPAH is likely a proliferative vasculopathy involving complex mechanisms leading to cell proliferation and vasoconstriction. In general, patients may present with symptoms of heart failure such as exertional dyspnea, lethargy and fatigue. Once pulmonary artery pressures are noted to be elevated above >25 mmHg at rest, a right heart catheterization is required for diagnosis. During the cath, a vasoreactivity test which involves the administration of epoprostenol is often done to see if patients will respond to certain medications such as calcium channel blockers (CCB). Severe cases may be sent for heart-lung transplant although the prognosis at this stage is likely dismal.

Combined Hepatocellular-Cholangiocarcinoma: A Rare Primary Liver Cancer

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Introduction: In 1949, the first comprehensive study of combined hepatocellular-cholangiocarcinoma (HCC-CC) was described by Drs Allen and Lisa in New York. It is a rare form of primary liver carcinoma with histopathological characteristics of both hepatocellular carcinoma and cholangiocarcinoma. The incidence of HCC-CC can range from 1.0% to 14.2% of all primary liver cancers with 5 year survival rate of 6% in unresectable cases. Contrary to Asian case studies, those in the Western hemisphere have weaker association with viral hepatitis and chronic liver disease. This is illustrated in the following case study.

Case: An 82 y/o Portuguese male presented to our hospital with sharp and severe right upper quadrant pain for five days. His medical history comprised of coronary artery disease, congestive heart failure, diabetes mellitus, gout and hypertension. No inciting event such as food, alcohol or physical activity. He denied any history of alcohol, tobacco or illicit drug use. Vitals on presentation were unremarkable. Physical exam was significant for right upper quadrant tenderness. Laboratory studies were remarkable for hemoglobin of 12.2, platelets of 134, albumin of 3.6, total bilirubin of 1.3, alkaline phosphatase of 354, AST of 62, ALT of 68 with normal coagulation studies, lipase and amylase. Serum alpha fetoprotein was elevated at >2500, CA-19-9 >700, CEA >225 with a negative hepatitis panel. Abdominal ultrasound revealed hypoechoic lesions throughout the liver. A subsequent CT scan with IV contrast showed a hepatic mass of 7.0cm x 3.3cm with multiple satellite lesions without cirrhosis, ascites or hepatomegaly. CT guided biopsy of the dominant mass was performed. Tumor staining was positive for AE1, CA19-9, Hepar 1, AFP (patchy), Glypican3, p-CEA, CK7, CK20, CK19, CD10, MOC31 and Villin. Final histopathological diagnosis was hepatocellular carcinoma and focal features of cholangiocarcinoma. Patient was a poor surgical and chemotherapy candidate due to functional status and received home hospice care. He subsequently passed one month after.

Discussion: Cases of HCC-CC in Hong Kong and Japan have shown strong correlation with cirrhosis and viral hepatitis. This belief does not hold true for our case. Consistent with studies in Western institutions, particularly at Memorial Sloan Kettering in New York, weak association with cirrhosis and viral hepatitis have been discovered. This makes the etiology unclear but may involve a unique disease process in the West. Clinical presentations typically overlap hepatocellular carcinoma therefore diagnosis is difficult without immunohistochemical staining along with histomorphological examination. The histological architecture based on the Allan-Lisa classification was Type C which fits into the category of a true combined tumor. Our staining patterns featured both hepatocellular carcinoma (CK19, AFP, p-CEA) and cholangiocarcinoma (CK7, AE1) which correlated with studies in United States and Korea. With regards to treatment, no specific regimen exists. Many are mistakenly treated as pure hepatocellular carcinoma with resection, chemoembolization or liver transplantation yielding poor outcomes due to high recurrence rates (in comparison to the individual cancers alone). Overall, HCC-CC has unique geographical variations, etiologies and immunohistochemical findings which may help to assist in better diagnostic criteria and treatment options in the future.

Diagnosis and Management of Meningitis with a Mixed Clinical Presentation

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Introduction: Meningitis is a significant cause of mortality with approximately 423,000 deaths globally in 2010. In addition, complications among survivors may persist as neurologic sequelae, such as hearing loss, epilepsy, hemiplegia, and neuropsychological impairment. As such, the importance of timely diagnosis and initiation of treatment is paramount. Appropriate antibiotic and/or antiviral coverage must be largely based upon the history and presenting symptoms. This can be particularly challenging given the numerous etiological agents that can cause meningitis. This point is demonstrated in this case, where a patient with multiple risk factors presented with symptoms of meningitis and atypical laboratory findings.

Case Description: A 48-year-old Caucasian male with a medical history significant for asthma presented to his primary care physician for congestion, purulent sinus drainage, and low-grade fevers. He was given a 7 day course of levofloxacin for presumed sinus infection. After completion of this course of antibiotics he was symptom free for 9 days. Thereafter, the patient experienced low-grade fevers, photophobia and headache. He took ibuprofen and acetaminophen with limited relief and presented to the hospital seven days later for worsening symptoms. At the time of presentation his vital signs were: blood pressure 152/94, pulse 112, respiratory rate 17, oxygen saturation 98% on room air. Physical examination was remarkable for horizontal nystagmus, double vision, and headache in the frontal and parietal regions exacerbated by palpation. Complete blood count revealed thrombocytopenia with a platelet count of 120. Due to suspicion for meningitis lumbar puncture was performed and CSF fluid analysis demonstrated WBCs 1440, glucose 41, and protein 220. Initial antibiotic regimen included intravenous vancomycin, ceftriaxone, and doxycycline to cover for bacterial meningitis, Lyme disease, and ehrlichiosis respectively. On the day following admission, Lyme antibody testing was positive, and was confirmed by western blot. Subsequent studies revealed an elevated Lyme index of 1.5 to confirm CNS Lyme disease. CSF and blood cultures showed no growth for 5 days and smears for acid-fast bacilli, babesia, ehrlichia, and fungus would all be negative. The patient was discharged on a 15 day course of intravenous ceftriaxone for CNS Lyme disease, and an 8 day course of oral doxycycline for concerns of ehrlichiosis given the patient's low platelet count. Ultimately, the patient had resolution of symptoms except for mild left facial weakness, and follow-up laboratory studies indicated a chronic thrombocytopenia of unclear etiology.

Discussion: This case illustrates a complex meningitis scenario with the possibility of three or more separate ongoing processes. This includes Lyme meningitis, Ehrlichiosis, bacterial meningitis, and aseptic meningitis. Tick-borne diseases are extremely prevalent in the Northeast regions of the U.S., and patients with Lyme disease can and often be concomitantly infected with Ehrlichia. Ehrlichia is notoriously difficult to identify by blood smear, particularly early in the disease course, but should always be considered in the setting of thrombocytopenia. Additionally, CSF findings showed patterns suggestive of bacterial meningitis, yet all cultures, smears, and serologies for infectious agents other than Lyme disease were negative. This may be explained by the patient's use of levofloxacin for presumed sinus infection, thus raising the possibility of a partially treated bacterial meningitis at the time of presentation. A drug-induced aseptic meningitis must also be considered at the time of presentation given the patient's heavy use of ibuprofen.

Pre-eclampsia, HELLP Syndrome and DIC

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Introduction: Disseminated Intravascular Coagulation (DIC) is a systemic process that results from an uncontrolled and excessive production of thrombin which can lead to life threatening thrombus and bleeding. There are many clinical conditions that can lead to DIC, one of which is HELLP syndrome. HELLP complicates 1 in 1000 pregnancies, and DIC occurs in up to twenty percent of patients with this disorder. Our case is a 45 year old female who presented with mild Pre-eclampsia that rapidly deteriorated to HELLP and DIC.

Case: A 45 yo F G2P0010 at 32 weeks and 2 days with a twin pregnancy presented to the hospital after spontaneous rupture of her membranes. She was not in labor or in any distress but had several elevated blood pressures in the 130/90 range. Pre-eclampsia labs at that time were normal. Due to premature rupture of membranes, she was treated with latency antibiotics and betamethasone to enhance fetal lung maturity. On day 6 of her hospital stay she went into labor, now at 33 weeks and 1 day. She was delivered via cesarean section without complications and minimal blood loss. Several hours after surgery she developed a blood pressure of 178/95 and a heart rate of 102. At that time labs were again sent which revealed: creatinine 1.13 mg/dl, AST 57 lu/L, ALT 43 lu/L, platelets $93 \times 10^3/\text{mcl}$, p/c ratio: 5.3. She was diagnosed with pre-eclampsia and treated with labetalol for blood pressure control and magnesium for seizure prophylaxis. The next morning she became hypotensive with a blood pressure of 70/40 and with a heart rate of 121. Labs were notable for a coagulopathy with a hemoglobin of 6.3 g/dl, platelets of $126 \times 10^3/\text{mcl}$, undetectable fibrinogen and elevated fibrin split products. DIC was diagnosed and treated with blood transfusions and FFP. A CT of her abdomen and pelvis done to evaluate for bleeding revealed free fluid, creating concern for hemorrhage. Her renal function continued to worsen with a peak creatinine of 1.52 mg/dl. Despite multiple blood transfusions her hemoglobin level remained unstable. She eventually required bilateral uterine artery embolization which resulted in stabilization of her hemoglobin and vital signs. After 48 hours her clinical picture improved and laboratory abnormalities returned to normal.

Discussion: DIC is a life threatening disorder that can be caused by multiple obstetrical conditions. Most commonly during pregnancy it occurs in the setting of amniotic fluid embolism, abruptio placenta or septic abortion, but can also be seen with both pre-eclampsia and HELLP syndrome. In our case, a patient with HELLP syndrome quickly developed severe DIC with hemorrhage. Twenty percent of patients who are diagnosed with pre-eclampsia go on to develop HELLP syndrome, and up to 84% of those with HELLP syndrome develop renal failure. In addition, pre-eclampsia can be complicated by DIC in 7% of cases. Maintaining a high index of clinical suspicion for DIC in patients diagnosed with pre-eclampsia and HELLP syndrome can greatly decrease associated morbidity and mortality.

Surveillance for an Indeterminate Hand Mass

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Introduction: Here presented is the case of a 19 month old male with a hypothenar mass who after appropriate work-up and consultation and following surgical excision and immunohistochemistry was found to have a spindle cell tumor with myofibroblastic and neuroectodermal elements.

Case: 19 month male presents with a palpable neoplasm of the right hypothenar eminence. A MRI of the right hand revealed an oval heterogeneous mass in the volar aspect in the hypothenar region of the hand. It measured 3.8 x 2.2 x 1.5 cm. It was volar to the flexor tendons and just distal to the Guyon's Canal. The mass was heterogeneous, dark and bright on T2 weighted imaging and homogeneous, dark on T1 weighted imaging. There was a small projection of approximately 6mm extending between the heads of the 4th and 5th metacarpals. There was very minimal enhancement of this lesion on post-contrast imaging. The MRA revealed widely patent radial and ulna arteries with this mass displacing the vessels. The mass demonstrated no evidence of vascularity and no aneurysm. Complete excision of the mass and immunohistochemical analysis revealed the lesion to be a spindle cell neoplasm with myofibroblastic and neuroectodermal elements. The vast majority of soft tissue mass lesions of the wrist and hand are benign. In the pediatric hand and wrist, foreign body, ganglion cyst and vascular malformation are the most common soft tissue masses (7).

Evaluation begins with a detailed history that includes any pertinent medical conditions. The history should also include information regarding the lesions rate of growth, any changes in consistency or color, associated pain or neurologic symptoms, or prior trauma to the area. Conventional radiographs should always be obtained, even for soft tissue masses. They may show calcific densities within the lesions, such as phleboliths in a hemangioma or changes in the cortex because of pressure from an overlying mass (3). More specialized imaging, such as MRI, often is indicated when doubt still exists as to the true nature of the mass. Excisional biopsies can be safely performed for small tumors (< 2cm) and for some larger tumors (such as lipomas) that have both the clinical and radiographic features of benign lesions. For most tumors or when the diagnosis is in doubt, an incisional biopsy should be done before excision (3).

Discussion: For most benign lesions, surgery alone is the preferred treatment; for malignant lesions this strategy can be accompanied by chemotherapy or radiotherapy on an adjuvant or neoadjuvant basis, depending on the particular tumor (6). In the case of an indeterminate lesion, as in the one presented in this case study, literature regarding the optimal treatment and surveillance of these patients is scarce. If the lesion were to recur, if our surveillance protocol was modeled after surveillance protocol for a lesion with a very high recurrence rate, the lesion should be discovered during that surveillance period. Giant-Cell Tumor of the Tendon Sheath, as described earlier in this monograph, is the second most common tumor of the hand. It has a very high recurrence rate, in some series as high as 44% (9, 10). The recommended follow-up period is 5 years, with most recurrences occurring between 2-4 years later). Further studies would have to be performed to evaluate for the optimal treatment and surveillance regimens for indeterminate hand lesions in the pediatric population.

ED Bounceback: A Rare Case Of Wallenberg Syndrome

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Introduction: Wallenberg syndrome, also known as lateral medullary syndrome, has been described in the literature for over a century, but is a rare form of stroke on the spectrum of cerebrovascular accidents (CVA). The circulation involved in Wallenberg syndrome affects the vestibular system thus leading to the common presenting symptoms of nausea, vomiting, and vertigo. Our patient presented to the ED with dizziness for the second consecutive day and on physical examination was determined to have a central cause of her vertigo as opposed to a peripheral etiology. On admission, an MRI confirmed our suspicion with visualization of a lateral medullary infarct secondary to thrombosis of the left posterior inferior cerebellar artery (PICA).

Case: A 49 year old female with a PMHX of IDDM and hypertension presented to the ED with a 2 day history of hypertension and dizziness. Patient described the dizziness as the "room spinning". Patient denied focal neurological deficits, dysarthria, dysphagia, tinnitus, ear fullness, hearing loss, or otalgia. Positional changes did not exacerbate or alleviate the symptoms. Initial set of vitals; T: 97.3^oF, BP: 144/75, P: 108, RR: 22, 100% RA. Her physical exam was unremarkable except for decreased sensation to the left side of her face and right upper extremity along with mild dysmetria with finger to nose testing on the left. Patient did not demonstrate any abnormalities with head impulse testing, test of skew, rapid alternating movements, or heel to shin. Patient demonstrated physiologic horizontal nystagmus and no vertical nystagmus. Lab results were within normal limits and EKG showed sinus tachycardia and diffuse T wave flattening. Patient had CT Head without contrast during ED visit, which revealed mild atrophy and old lacunae in the left cerebellum. Neurologist admitted the patient for further work-up. She had an MRI of Brain performed upon admission, which was positive for a lateral medullary infarct secondary to thrombosis of the left posterior inferior cerebellar artery (PICA). This was consistent with a Wallenberg syndrome. Patient's hypercoagulable work up and transesophageal echocardiogram were within normal limits. Patient's symptoms improved with physical and occupational therapy allowing her to be discharged home on hospital day 4 with only mild deficits.

Discussion: It is important for the medical provider to differentiate between peripheral vertigo and central vertigo. This begins with a thorough history and ends with the most important part of the patient visit, the physical examination. In 2009, *Stroke* published a landmark article about the "HINTS" neurological examination, which can be used to help differentiate central from peripheral vertigo. HINTS exam includes head impulse, nystagmus and test of skew. This bedside three step oculomotor examination is more sensitive than MRI in early diagnosis of vestibular stroke according to a study by *Newman-Toker et al.* in 2009. In order to prevent ED bouncebacks and more importantly, further infarctions or secondary injuries related to neurological deficits from CVA, clinicians must pay particular attention to detail when examining patients with the complaints of "dizziness" or "vertigo." Any abnormalities noted on cerebellar testing, "HINTS" exam, or crossed sensory deficits affecting one side of the face and

contralateral trunk/extremities should raise concern for the possibility of posterior circulation CVA or Wallenberg syndrome.

Anti-Arrhythmic Induced Jaundice: A Case Report

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Introduction: Amiodarone is a highly lipophilic, iodinated benzofuran derivative and a class III antiarrhythmic agent. Used routinely for management of atrial fibrillation, amiodarone inhibits adrenergic stimulation by its action in blocking membrane ion channels, decreasing AV nodal conduction through disruption of the lipid membrane bilayer. It is concentrated in many tissues and cells including hepatocytes in the liver where it is metabolized extensively. Amiodarone is a common cause of elevated aminotransferases, but an uncommon cause of drug induced liver injury (DILI). We present a case of amiodarone-induced cholestatic hepatitis with a rare pattern of injury for this medication, which most often causes a steatohepatitis.

Case: An 80-year-old white male with history of atrial fibrillation and systolic heart failure presented with three days of yellowing skin, pruritus and dark urine. Five months prior to his presentation, he was hospitalized for treatment of a retroperitoneal abscess in which he received a six-week course of rifampin and nafcillin. The only other new medications included amiodarone, which was started eight months prior. On exam, he was in no acute distress with normal vital signs. Pertinent findings included jaundice and scleral icterus. He had no hepatosplenomegaly, abdominal distension, tenderness, asterixis, or signs of chronic liver disease. His initial laboratory studies demonstrated a pattern consistent with cholestasis: alkaline phosphatase 1166 U/L, AST 273 U/L, ALT 209 U/L, total bilirubin 16.6 U/L, and direct bilirubin 9.46 U/L. Upon review of his history, it was noted that his liver enzymes had begun to increase prior to the addition of antibiotics five months prior. Amiodarone was discontinued upon admission however his enzymes continued to rise over the next two days. Hospital work-up revealed a sedimentation rate >120 and a positive CMV IgM antibody. Given the continued rise in liver enzymes, a liver biopsy was obtained revealing cholestatic hepatitis consistent with drug-induced hepatic injury; there was no evidence of viral hepatitis or cardiac cirrhosis. Over the course of his admission, the patient's liver enzymes improved, as did his clinical cholestatic picture. By discharge, laboratory abnormalities and clinical exam had returned to normal.

Discussion: Up to fifty percent of acute jaundice presentations are caused by drugs, however the specific offending agents are not always as common. Acetaminophen and antibiotics, especially amoxicillin-clavulanate, are the two most common culprits of DILI with injury patterns ranging from cholestatic to hepatocellular, or mixed patterns. While DILI is a common problem, amiodarone is not a common drug to be implicated. Clinically significant liver disease occurs in 1% of patients on amiodarone therapy, however with the growing number of elderly patients on amiodarone for atrial fibrillation, there is even more reason for diligent monitoring and attunement. The most feared complication of DILI is fulminant hepatic failure or slow progression to cirrhosis that has variable resolution with removal of the offending agent. It is imperative to recognize the potential for hepatic toxicity caused by amiodarone as well as the fact that the pattern for enzyme elevations and histologic appearance of liver biopsy can vary in amiodarone-induced liver injury such that the typical transaminitis and hepatocellular steatohepatitis will not always be seen.

An Unexpected Course of Rhabdomyolysis

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Background: Rhabdomyolysis is a clinical syndrome that results from acute necrosis of skeletal muscle fibers and leakage of cellular contents into circulation. Aggressive treatment and monitoring are required as in some cases injury is irreversible, potentially leading to significant morbidity including chronic renal insufficiency and even death. This otherwise healthy patient presented in acute renal failure secondary to rhabdomyolysis, without a clear cause, and had a quickly declining course.

Case: A 32 year-old male presents to the emergency department with inability to void, decreased urine output and tea colored urine. The symptoms began 2 days prior. He complains of associated fever, chills, abdominal pain, low back pain, and nausea and vomiting. A Foley catheter is placed in the ED with 300ml of dark urine output. Pt denies any trauma, recent injury, drug use or strenuous exercise. Past medical history includes anxiety, depression, ADHD, GERD, and opioid abuse. Pt is a smoker, denies alcohol use, and denies recent illicit drug use. On admission vitals include temperature of 37.1, BP 141/81, Pulse 120, respirations 15, and oxygen saturation of 95% on room air. Patient is alert and oriented in mild distress due to pain. Physical exam is benign except for tachycardia and mild abdominal distention with tenderness in the RUQ and lower quadrants bilaterally. Lab results include CK 73,859, Creatinine 3.06, AST 1548, ALT 421, troponin .05, UA 3+ Blood, 100-299 protein, and trace ketones. EKG shows sinus tachycardia. CXR and CT are normal. Toxicology screen is positive for opiates. Patient is admitted for rhabdomyolysis and acute renal failure and started on IV fluids. On hospital day two a rapid response is called when patient was found sedated. At this time he was found to have oxycontin pills in his hand. He was transferred to ICU step down on non-invasive positive pressure ventilation due to respiratory distress. On hospital day three the patient became anuric with creatinine elevating to 6.46. He was transferred to the Intensive Care Unit where he was subsequently intubated and emergent hemodialysis was performed. Repeat chest x-ray showed extensive bilateral pulmonary infiltrates. Despite hemodialysis his renal function worsened and he remained difficult to oxygenate. On hospital day six he suffered cardiac arrest and expired.

Discussion: This young, otherwise healthy male presented with rhabdomyolysis resulting in acute kidney injury. History and toxicology make opioid abuse the likely culprit. Rhabdomyolysis is most often thought of in the ED after crush injury or trauma. When the history or physical exam does not match the diagnosis medications, both illicit and prescription must also be considered as an underlying cause. A patient presenting in acute renal failure is more likely to need dialysis and is at an increased risk for mortality.

Delayed Paclitaxel-Induced Interstitial Pneumonitis With Impressive Resolution

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Introduction: Drug Induced Lung Disease (DILD) often due to medications, herbals, or illicit drugs. Common offenders include NSAIDs, ACE Inhibitors, Methotrexate, and Amiodarone. Patterns of DILD include diffuse alveolar hemorrhage, hypersensitivity pneumonitis, interstitial lung disease, etc. The chemotherapy agent, Paclitaxel, is a rare cause of DILD. It's a serious condition that can lead to acute respiratory failure requiring mechanical ventilation. We have a case of a 48 year old female with history of recurrent stage IIIA ovarian cancer receiving paclitaxel chemotherapy presenting with hypoxia.

Case: A 48-year-old female with a history of recurrent stage IIIA ovarian cancer was admitted to the hospital with worsening abdominal pain and plan for laparotomy. She had completed her last of three cycles of Paclitaxel over three weeks prior to presentation. Unfortunately, on exploratory laparotomy she was found to have extensive abdominal metastatic disease, so the plan was medical management only. Postoperatively she was hospitalized for decreased urine output and abdominal pain requiring a patient-controlled analgesic pump. On postoperative day three, her oxygen saturation was found to be low at rest and 70% with ambulation. At this time she admitted to a two to three week history of dyspnea on exertion, but denied any sensation of acute shortness of breath. At that time she was febrile at 38.4C and tachycardic at 112bpm. Her exam was significant for bilateral lower extremity edema and right sided expiratory wheezing. A chest radiograph was performed revealing bilateral diffuse infiltrates without effusions. Her labs revealed a normal leukocyte count, normal B-Natriuretic Peptide, and negative blood cultures. The surgical team diuresed the patient based on radiology report. Twenty four hours later, she had a second hypoxic episode while on oxygen. At this time, pulmonary embolism was ruled out with a chest CT scan, but results revealed impressive symmetric bilateral ground glass opacities sparing the peripheral lung fields. The radiology report communicated concern for pulmonary edema versus bilateral pneumonia. At this point medical consultation was obtained. Although there is a broad differential for ground glass opacifications, the diagnosis was most consistent with interstitial/hypersensitivity pneumonitis with evidence of alveolar filling defects. Intravenous steroids were initiated and within 48-72 hours the patient's clinical picture markedly improved. Due to the patient reported chronicity and the CT findings we had come to the conclusion that this was unlikely infectious and more likely a Paclitaxel-induced hypersensitivity interstitial pneumonitis. Repeat chest CT one month later revealed complete resolution of the pneumonitis.

Discussion: DILD secondary to Paclitaxel dosed every three weeks as in this case occurs in less than 1% of patients. Case reports have indicated the importance of recognizing and treating this condition early. Although most cases have documented pulmonary toxicity within minutes to hours after Paclitaxel infusion, the rarer delayed hypersensitivity effects can manifest weeks following treatment. Keeping this in mind, physicians must recognize that DILD can occur long after Paclitaxel administration and intravenous steroids need to be administered immediately. This case also emphasizes the importance of reading one's own radiological images and generating a differential diagnosis regardless of the official report.

Severe Autoimmune Hemolytic Anemia with Renal Neoplasm

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Introduction: Hemolytic anemia is a process by which the destruction of red blood cells (RBCs) causes an abnormally low level of hemoglobin. Autoimmune hemolytic anemia (AHA) is a type of hemolytic anemia characterized by autoantibodies directed against red blood cells shortening their survival. When autoimmune hemolytic anemia is secondary to a paraneoplastic process, severe anemia can occur leading to significant morbidity and even mortality. Here we discuss the literature and present the case of a child with autoimmune hemolytic anemia from a paraneoplastic syndrome secondary to renal cell cancer.

Case: A four year old male presented to the emergency department with three days of vomiting, fever, and upper respiratory symptoms. He had scleral icterus, jaundice, delayed capillary refill and soft, and a non-distended abdomen. Laboratory evaluation revealed a white blood cell count of 62,500 (bands of 9%), hemoglobin of 2.6 g/dL, hematocrit of 6.8% and platelets of 569,000. A bone marrow biopsy performed on admission yielded results consistent with hemolytic anemia; furthermore, testing revealed that this anemia was consistent with an autoimmune type based on cold agglutinins. Abdominal MRI demonstrated a large right midpole kidney lesion. The patient underwent intraoperative biopsy of the right renal mass. After pathologic analysis of frozen specimen, it was likely that this was a malignancy and a right radical nephrectomy with en bloc resection of surrounding tissue was performed. The final pathology was renal neoplasm with predominately cystic growth pattern and possible blastoma components suggestive of a well differentiated Wilm's tumor.

Discussion: AHA is well documented in lymphomas and ovarian dermoid cyst, but rarely reported in solid tumors. A recent study subdivided solid tumor AHA into occurrence before, concurrently, and after cancer treatment. Results of the study showed that AHA after resection can be followed for both remission and recurrence. Although extremely rare as an entity, we believe that AHA can be used as a marker for recurrence/remission. We also believe that because AHA can occur after tumor resection, it is underreported and misdiagnosed.

Gallbladder Duplication with Dual Cholecystitis

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Introduction: Gallbladder duplication, or dual gallbladder, is an uncommon entity encountered by surgeons. The approximate incidence of dual gallbladders is 1/4000; however, most are never seen due to their asymptomatic nature. When problems arise, such as cholecystitis, these anomalies are uncovered. Here we present the case of a female with gallbladder duplication along with dual cholecystitis, an exotic condition rarely seen in literature.

Case: A 26 y/o female with 1 day of RUQ pain, intermittent in nature, associated with nausea/vomiting presented to the emergency department. After further work up, an ultrasound was done which was consistent with cholecystitis. Following this, an MRCP showed no distal obstruction. Next a HIDA scan was done in lieu of a dilated common bile duct on ultrasound, along with elevated liver function tests. The HIDA showed delayed gallbladder filling consistent with chronic cholecystitis. In the operating room, 2 gallbladders were seen on examination. Each had a separate cystic duct and arterial supply and did not share a common wall. Both showed evidence of cholecystitis and were therefore removed. On final pathology one gallbladder showed evidence of acute inflammation while the other was identified as having chronic inflammation.

Discussion: This case represents a rarity in the medical field. The patient had imaging not consistent with the actual disease. Imaging modalities can lead a surgeon astray if not taken within clinical context. With careful planning, a surgeon can be prepared for much of the aberrant anatomy encountered with typical preoperative symptoms.

An Uncommon Cause of a Common Symptom

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Introduction: In both the inpatient and outpatient setting, chief complaints of weakness and falls are a common encounter. However, when a previously healthy young male presents with these complaints, a broad differential must be considered.

Case: A 28 year old Caucasian male with a past medical history of lumbar spinal schwannoma presented as a new patient to his primary care physician's office with complaints of progressively worsening bilateral thigh weakness with multiple falls. Over the two weeks prior to presentation, he had been seen at an urgent care as well as the ED two separate times for evaluation of his symptoms. His work-up, including head CT and laboratory data, had been interpreted as normal and he received no treatment, with the exception of a referral to an outpatient primary care physician. At his new PCP's office, he complained of headaches, difficulty with vision out of his left eye with associated tearing, as well as hand tremor. Further review of systems revealed shortness of breath and palpitations. His family history was significant for hyperthyroidism in his mother. On exam his vitals were unremarkable, with the exception of a pulse rate of 121 beats per minute. While he was noted to have 5/5 strength throughout his upper and most of his lower extremities, he had only 4/5 strength in his proximal thigh muscles. His laboratory data from his previous ED visits were reviewed, including a thyroid stimulating hormone (TSH) level that was mildly decreased at 0.09 mIU/ml (normal 0.30-5.60) and a serum potassium level of 3.4 mmol/L (normal 3.6-5.0). A follow-up free thyroxine level was ordered and was found to be 2.85 ng/ml (normal 0.58-1.64), consistent with hyperthyroidism. Taking into consideration his weakness and hypokalemia, the suspicion for thyrotoxic periodic paralysis was raised. He was started on methimazole and atenolol and was referred to endocrinology and neurology for further evaluation. Diagnosis of thyrotoxic periodic paralysis was confirmed. The patient continued to have debilitating weakness despite increasing doses of methimazole and potassium replacement. He eventually underwent radioactive ablation of the thyroid under the care of endocrinology and was started on thyroid replacement therapy with levothyroxine. His symptoms significantly improved.

Discussion: This patient was diagnosed with hyperthyroidism and thyrotoxic periodic paralysis (TPP). Hyperthyroidism can present in many ways and with different constellations of symptoms. Our patient's presenting symptom of weakness, combined with hypokalemia and hyperthyroidism, led to a diagnosis of TPP. The prevalence of TPP in the Caucasian population is not well documented and there have only been a limited number of case reports in the literature. TPP is more common in the Asian population where up to two percent of patients diagnosed with hyperthyroidism also have TPP. The mechanism of hypokalemia is not well understood. It has been suggested that thyroid hormone could have an effect on calcium channels or sodium-potassium pumps. Therapy includes treating the underlying hyperthyroidism, using potassium supplementation as needed, and following a low carbohydrate diet. Diagnosis is critical as proper treatment usually ensures complete recovery.

Diffuse large B-cell lymphoma in peritoneal fluid

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Introduction: Diffuse large B-cell lymphoma (DLBCL) represents the majority of Non-Hodgkin's lymphoma. Any organ in the body can be involved. The primary site can be a primary lymph node or extra-nodal tissue. However, it is uncommon to identify DLBCL in a body cavity with the absence of any tumor mass lesions. The pleural, pericardial or peritoneal cavity may be affected. The following case discusses an atypical presentation of new-onset ascites.

Case: A 74-year-old male with a past medical history of diabetes mellitus type II, hypertension, liver cirrhosis, history of Hepatitis C and history of alcohol abuse was admitted for abdominal distension for three week's duration. Physical examination was significant for only massive ascites. Complete blood count on admission revealed a WBC 4.9 k/uL, Hb 12.1 g/dL, HCT 36.9%, Plt 127 k/uL and MCV 98.5. Other pertinent laboratory studies included alkaline phosphatase 192 IU/L, AST 52 IU/L, ALT 42 IU/L, LDH 197 mg/dL. HIV and Hepatitis B serology were negative, whereas Hepatitis C was positive. Hepatitis C viral load was undetectable. HHV-8 serology was negative. During the hospital course, a 6-liter abdominal paracentesis was performed on which cytology was positive for malignant lymphoid cells. Flow cytometry analysis revealed cells positive for kappa light chain, CD10 with CD19, CD20 and CD22. Immunoperoxidase analysis showed positivity for CD79a, CD10, bcl-6, bcl-3, CD20 and negative for bcl-1. Additionally, ki-67 showed high proliferative index. Fluorescence in situ Hybridization showed no rearrangements of the MYC gene. Bone marrow biopsy revealed normocellular marrow for age and no other abnormalities. Staging studies including a CT scan of the chest, abdomen and pelvis was performed with no evidence of lymphadenopathy. A PET-scan was done which was unremarkable. Two months after discharge the patient was started on R-CHOP chemotherapy. After receiving chemotherapy, repeat peritoneal fluid cytology was negative for malignant cells. Despite chemotherapy, patient still had recurrent ascites.

Discussion: We present a case report of DLBCL identified in peritoneal fluid with no evidence of solid tumor lesions. The diagnosis is solely made on the fluid analysis. Therefore, body cavity fluid should always include cytology and cell count with differential. Although the patients' ascites did not improve after receiving chemotherapy, DLBCL usually has a favorable response to chemotherapy.

Implications of Epidemiology in Breast Cancer Mortality

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Introduction: The Incidence of breast carcinoma in the African American population has been climbing from 2004-2008, along with mortality rates from 2003-2007. Recent statistics from CDC reveal that the incidence of breast cancer in African Americans in NJ is slightly lower than whites but, the mortality rates are higher than both Whites and Hispanics. The mortality difference may reflect greater mammography use by whites and differences in access to new treatments and follow up.

Case: 55 year old AAF with history of asthma and smoking presented to the ER with complaints of low back pain, shortness of breath, and weakness for 1 week. She was discharged home the same day with a diagnosis of bronchitis/muscle pain after being given Ciprofloxacin, Prednisone, and Percocet. She returned 3 days later with complaints of dizziness/fatigue/worsening low back pain. This time her vitals were 120/77 / 116 / 20 / 97.9 / 94% on RA. She had absent breath sounds in left lung and severe asymmetric breast findings with diffuse induration, discoloration, and retraction of the nipple of the left breast. CXR revealed large left pleural effusion and labs showed BUN/Cr 187/14.6, potassium 6.0, bicarb 22, and troponin of 0.15, Amylase 1302, lipase 5164, wbc 18.7, hemoglobin 12.6, and platelets 188. CT chest/abdomen/pelvis showed large left pleural effusion, metastatic bone disease of ribs and spine, and left breast infiltration with axillary lymphadenopathy. MRI spine to rule out cord compression was ordered which revealed diffuse osseous spinal disease without retropulsion. Patient was admitted to MICU with diagnosis of acute respiratory failure secondary to likely metastatic Breast CA, stage 4, acute renal failure, and pancreatitis. She was placed on aggressive IV hydration, pain control, and IV steroids. Thoracentesis revealed serous fluid, cytology showing poorly differentiated malignant cells with breast primary. Her acute renal failure was thought to be due to prerenal vs ATN and acute pancreatitis likely from steroid use. During her stay, she improved symptomatically, renal function improved with temporary HD, and pancreatitis resolved. Bone marrow biopsy was done to evaluate for pancytopenia which revealed diffuse infiltration by metastatic breast carcinoma with area of necrosis in background of hypocellular trilineage hematopoietic cells. After discussion with patient and family, she continued on to have palliative radiation and agreed to a DNR/DNI status.

Discussion: Since 1975, breast cancer's 5 year survival rate has increased for all races; however there is still a substantial racial gap. In more recent periods, the 5 year survival rate was 77% for AA and 90% in white women. This can be attributed to additional comorbidities, unequal access to medical care, and disparities in treatment which can lead to later stage at diagnosis and poorer stage specific survival. In addition, aggressive tumor characteristics associated with poorer prognosis are more common in AA. Our patient exhibited ER/PR positive and HER2 negative cancer which has a more favorable prognosis. This leads us to believe that if she followed up earlier, her outcome could have been different. With better education of both patients and health care workers in affected areas of this population, we hope to close the disparities seen in mortality of this disease.

Adjusting the Therapeutic Threshold: An Evolving Target in Carotid Stenosis Severity?

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Introduction: Carotid stenosis, previously deemed worrisome as it reached severe criteria, is now increasingly a concern in those with mild to moderate stenosis. Recent studies have shown that the majority of patients with transient ischemic attacks and minor strokes have a non-severe degree of stenosis with ulceration of the carotid atherosclerotic plaques. Ulceration adds a degree of instability and necessitates further attention.

Case: A 62 year old male with past medical history of atrial fibrillation on Coumadin with therapeutic INR, hypertension and hyperlipidemia presented to the ER for several recent episodes of slurred speech, drooling, right-sided facial asymmetry, and confusion, each lasting 5-10 minutes. Patient denied any sensory loss or similar episodes in past. His medications included Coumadin, Atenolol and Crestor. Physical exam was benign except for an irregularly irregular heart rhythm. There were no derangements in laboratory data. EKG showed rate controlled atrial fibrillation. Echocardiogram revealed a LVEF of 50% without mural thrombus. MRI of the brain showed 3 areas of acute infarction in the territory of the left middle cerebral artery. MRA of the carotids revealed a 50% left carotid stenosis with an ulcerated plaque. Given the unilateral pattern and known atrial fibrillation on therapeutic anticoagulation, the ulcerated carotid plaque was deemed the etiology of his cerebrovascular accident. Left carotid endarterectomy was performed with Hemashield carotid patch angioplasty, and intraoperative evidence of ulceration extending through the wall of the internal carotid artery and into the adjacent soft tissue. The patient was discharged without residual focal neurological deficit.

Discussion: Severe carotid artery stenosis has long been known to be a cause of TIAs and stroke. However, in the recent past, several cases of TIAs and strokes have been reported in people with mild to moderate degree stenosis. Further research has shown that 90% of patient with TIA, amaurosis fugax and minor stroke have stenosis < 50%. Two-thirds of such patients were found to have a plaque ulceration. Presence of ulceration was directly proportional to the amount of lipid rich necrotic core and plaque volume. Echolucent plaques, i.e., those with higher levels of lipid and hemorrhage have been linked to an increased risk of CVA.

Ulceration within a stenotic carotid artery is more prevalent in areas of chronic high shear stress and sudden changes in intra-arterial pressures as these areas are more prone to plaque erosion, which in turn cause focal inflammatory changes leading to degradation of plaque wall and subsequent ulceration. A flow dynamics study further explained that a slipstream flow is disturbed immediately distal to stenotic area, allowing a backward slipstream to enter the ulcer in diastole, creating a potential for platelet aggregation. Furthermore, at peak systole, a whirlpool like circulation was noticed, which had the potential to suck those aggregates from the ulcer, leading to frequent small embolizations.

Diagnosis can be established with the help of a two-dimensional echo, which can detect stenosis and an MRA, which detects both stenosis and presence of ulceration. Additionally, convergent color doppler has been shown to be the best non-invasive and feasible diagnostic modality for diagnosis of ulcerative lesions with atherosclerotic lesions. Treatment involves carotid endarterectomy to prevent recurrence of TIAs or stroke. During carotid endarterectomy, plaque area is cut in full length and not mobilized much due to fear of embolization, thus explaining the reason for lack of connection between ulceration and symptomatic patients until recently.

Methicillin-Resistant Staphylococcus Aureus Bacteremia Secondary To Right Gluteal Abscess

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Introduction: Bacterial pyomyositis classically was described in tropical climates among those who were immunocompromised, with HIV/AIDS or liver disease. The incidence of pyomyositis is increasing in the United States, perhaps due to the era of community acquired methicillin resistant Staph. aureus (MRSA) infections.

Case: A 20 year old male with a history of ADHD, anxiety, and depression presented to the Emergency Department (ED) one day after being assaulted. He stated he was beat with baseball bats by several males while attending a college party the night before. He denied any drug abuse. On arrival to the ED, his vital signs were normal and his physical exam did not reveal any contusions, deformities, or abrasions however he had limited range of motion of his right hip due to pain. Radiographic studies of the right hip did not reveal any fractures or subluxations. He was sent home with anti-inflammatory medication and was instructed to follow up with his orthopedic doctor. The following day he visited his orthopedic physician, and after a second unremarkable exam, he was sent home with Vicodin and instructions to rest. He returned to the ED three days later with worsening right hip pain, vomiting, and diffuse body aches. He stated Vicodin made him nauseated and he had been vomiting 5-6 times a day for the last 3 days. He was still complaining of pain in his right hip, but now also had diffuse abdominal pain and dysuria. On this second visit to the ED, his vital signs were abnormal; rectal temperature 38.6, heart rate 125, blood pressure 85/52, respirations 22, and oxygen saturation 98% on room air. Again, physical exam did not reveal any contusions or old ecchymotic areas to coincide with his original story of being assaulted, but he was tender to palpation over the right hip, buttock, and flank areas. Given his trauma history, a FAST exam was done initially at the bedside; no free fluid was visualized. Knowing the patient had a negative x-ray of his right hip 4 days prior, a CT scan was ordered to look for an occult fracture, however this was unremarkable. His labs revealed a WBC 5.3 with 26% bandemia. His BUN and Cr were 38 and 3.05, respectively. A renal ultrasound excluded urinary obstruction or parenchymal abnormality. The patient's vital signs did not improve after hydration and without a clear source of infection, the patient was admitted to the intensive care unit with sepsis of unclear etiology and acute renal failure secondary to acute kidney injury. Broad spectrum antibiotics were initiated and further lab work including tick-borne illnesses and HIV testing were negative. Throughout the next several hours, his fever spiked at 40.0°C. Within 12 hours, blood cultures revealed MRSA. His urine also isolated MRSA. An MRI of the right hip was ordered to further investigate his significant pain. The images revealed a large right hip effusion and a 5x2 cm intramuscular collection adjacent to the right iliac bone. It was around this time the patient revealed he had a "pimple" on his right buttock several weeks prior that he had squeezed, but the area had been painful since, possibly the initial source of infection. Arthrocentesis of the right hip revealed greater than 50,000 WBC's and cultures isolated MRSA. The gluteal abscess was accessed by interventional radiology and was also found to be colonized by MRSA. A transesophageal echo was negative for any valvular vegetative lesions. His blood cultures remained positive until hospital day (HD) 10. The patient ultimately went to the operating room for a formal incision and drainage of the right hip joint and gluteal abscess. On HD 16, nuclear imaging and weighted MRI showed marrow edema and non-enhancement suggestive of osteomyelitis or osteonecrosis. A follow up MRI on HD 26, revealed some improvement in the size of the abscess collection and areas of possible devitalized bone in the right pelvis. He was discharged on HD 28 with a PICC line for daptomycin treatment and instructions to follow up with Infectious Disease and Orthopedics. Unfortunately, despite nearly 6 weeks of IV daptomycin, a repeat MRI showed a persistent abscess in the musculature lateral to the right ischium. There was also surrounding edema and involvement of the iliac bone and bilateral sacro-iliac joints suggestive of sacroiliitis. At this time, the patient is being closely followed as an outpatient.

Discussion: The stages of bacterial pyomyositis progress from local pain, to fever and abscess formation, and eventually to septicemia and shock if left untreated. Combining a high clinical suspicion with a thorough physical exam, laboratory results, and imaging studies can prevent serious sequelae.

Seizure: Delayed Presentation of Sturge-Weber

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Introduction: Sturge-Weber syndrome is a sporadically occurring and uncommon Neurocutaneous syndrome (on the order of 1:50,000 persons) marked by leptomenigeal angiomas, facial capillary malformations, glaucoma, seizures, and mental retardation that is normally diagnosed at birth. Early diagnosis is usually possible due in part to physical findings. Delayed diagnosis may occur in those persons that do not have facial stigmata in a subtype of the disorder known as Sturge-Weber Type III.

Case: A 16-year-old female presented to the St. Barnabas Pediatric Emergency Department(ED) with 3 syncopal episodes today. The last one occurred 30 minutes prior to arrival, witnessed by a friend. In the ED she was initially somnolent, but would follow all commands and answer questions succinctly. She did not recall any pre-syncope symptoms of dizziness, chest pain prior to the events. The observed event lasted 30 seconds, and did not result in injury or loss of bowel/bladder function. In the ED she complained of a mild frontal headache and nasal congestion for the last 5 days. Abnormal vitals in the ED included a tachycardia of 113. Physical exam was within normal limits, except for the aforementioned somnolence. Lab studies were significant for a hemoglobin of 9.8, hematocrit of 31.0, and a leukocytosis of 14.4. A non-contrast head CT scan was performed which showed gyriform calcifications in the white matter of the right temporal/parietal lobe that is consistent with Sturge-Weber syndrome. An MRI performed reaffirmed the working diagnosis. The patient was admitted to the Pediatric floor where her hospital stay was complicated by witnessed epileptic seizures on multiple days, and an EEG that confirmed abnormal electrical activity. Optimal management of the patient's seizures was finally achieved using 1000mg of levetiracetam twice a day and phenytoin 300mg once a day. The patient was discharged from the hospital after 7 days to follow-up.

Discussion: Sturge-Weber is classified into 3 types. Type I, the most common, has the aforementioned physical findings and leptomenigeal angiomas resulting in mental retardation and seizures in the majority of those affected. Type II involves the facial nevus and glaucoma, but has no leptomenigeal involvement. Type III only has leptomenigeal association. As of 2005 only 24 cases of Type III Sturge Weber have been reported. Our patient suffered from the rare Type III and presented late in life for her diagnosis because she had no known seizures prior to her arrival into the ED. This case reflects the necessity to maintain a wide differential diagnosis when evaluating syncope and seizures in the pediatric population in the ED.

An Unusual Electrocardiogram Presentation of Right Coronary Artery STEMI

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Introduction: Myocardial infarctions with ST elevation (STEMI) on electrocardiogram (ECG) have different characteristic ECG changes that localize the region of infarction. In anterior MI, ST-segment elevation occurs in lead V2-4. Larger MI may have ST elevation that extends to V5-6. The infarct is almost always related to the left anterior descending coronary artery (LAD). In inferior MI, ST-segment elevation occurs in leads II, III, aVF, and the infarct is related to the right coronary artery (RCA) or less commonly a dominant circumflex

Case: Patient is a 58 year old female, with PMHx of multiple sclerosis and hypertension, who was being treated for lower extremity weakness at a different hospital, when she developed chest pain and hypotension. EKG showed ST-segment elevations of V1-4. Patient became unresponsive, and code blue was called for a ventricular fibrillation arrest. Patient required intubation and blood pressure support with levophed and dopamine before being transferred for emergent cardiac catheterization. Heart rate was 114. Cardiac cath showed a dominant RCA and eccentric hazy looking plaque rupture in the mid distribution with 85% stenosis of the RCA. The left coronary showed non-obstructive coronary artery disease. Bare metal stent was placed in the RCA. Post-cath troponin was 7.50. Left ventricular ejection fraction was 70%.

Discussion: Patient had ECG localization suggestive of LAD disease with ST-segment elevations in V1-V4 on consecutive ECGs. Clinical presentation of tachycardia and hypotension is also typical of an LAD lesion. However, patient's lesion was to the RCA, which would commonly present with ST-segment elevations in II, III, avF and bradycardia. Therefore, this is an unusual presentation for RCA STEMI.

Osteopathic Manipulative Treatment and Adjunctive Kinesiotaping: A Retrospective Utilization Study

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Introduction: The purpose of this study was to retrospectively assess the utilization of kinesiotape as an adjunctive treatment with osteopathic manipulative treatment (OMT) for various musculoskeletal problems in an Osteopathic Manipulative Medicine (OMM) Specialty clinic. To improve pain, mobility and quality of life OMM specialists often use adjunctive treatments with manipulation such as medication, joint and soft tissue injections, physical therapy, heel lifts, and others. Kinesiotape is another adjunctive therapy that is a safe, non-invasive treatment for musculoskeletal pain, joint pain and lymphatic/vascular congestion. Kinesiotape works by aligning fascial tissues and lifting skin. This action improves lymphatic and vascular circulation, and stimulates mechanoreceptors and proprioceptors to facilitate weak or injured muscles as well as to reduce muscle spasm and pain while providing psychological and structural support. OMM specialists use kinesiotape in practice; however there have been few studies analyzing the frequency of its use. The aim of this research was to identify practice patterns of physicians using kinesiotape, the frequency of its use, and to better understand how kinesiotape and osteopathic manipulative medicine can be used together in treating various conditions. Data collected includes the number of providers using kinesiotape in the Specialty clinic, the number of patients treated with the tape, and the age and gender of each patient. Additional information obtained included the type of diagnoses made in conjunction with kinesiotaping, and identified the somatic dysfunction associated with the primary diagnosis.

Methods: This retrospective chart review subject population consisted of a cohort of non-pregnant adult patients' ages 18 years or older who were evaluated and treated by 5 physicians in an Osteopathic Specialty clinic with osteopathic manipulation and kinesiotape over the period of January 1, 2012 to October 31, 2012. After UNECOM IRB approval, medical charts were collected from the electronic medical record via billing and coding record queries for strapping/taping procedures. Personal identifiers were removed from all progress notes and then reviewed by the researcher. Patient gender, age, body region taped, diagnosis/condition, and somatic dysfunction diagnosis by body region were recorded into an Excel spreadsheet. Simple tabulations of data were performed using the Excel program.

Results: This utilization study revealed that women were taped more often than men. The age ranges of patients most frequently taped were 40-49 and 70-79 years old. The areas most frequently treated with OMT and adjunctive kinesiotape were the knee and shoulder. The most common diagnoses treated were osteoarthritis of the knee/knee pain, and rotator cuff syndrome/shoulder pain. Somatic dysfunction regions associated with areas taped were variable from patient to patient.

Conclusion: These data illustrates that adjunctive kinesiotaping is being used with OMT for various conditions, and with various patients age ranges and genders. Kinesiotaping may be an effective non-invasive complement to OMT. This retrospective utilization study warrants further research. Possible future studies include multi-center retrospective utilization reviews and also prospective studies analyzing the effectiveness of adjunctive kinesiotaping with OMT for treating specific diagnoses or conditions.

Using NSQIP and Zynxhealth™ to Build and Assess a Fast Track Colon Surgery Program

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Introduction: A fast track colon surgery program was initiated in July 2009 at our institution using an evidence based decision support system. Quality improvement efforts required the measurement of results of our new program.

Methods: Our program was built by a multidisciplinary team using clinical decision support and standardized order sets from Zynxhealth™. The National Surgical Quality Improvement Program (NSQIP) database was used to identify patients undergoing elective colon surgery prior to the fast track program (8/1/2006-1/31/2009) and following implementation of the program (6/1/2009-9/30/2012). Data were compared using two sample % defective and standard deviation tests.

Results: There were 69 patients available for analysis undergoing traditional care and 157 patients underwent surgery using the fast track program. The mean age was 63.6 (63% female) in the fast track group and 66.1 (55% female) in the traditional group. The patients in both groups were similar in terms of race, ethnicity, body mass index, co-morbid conditions and ASA status. There was one death in the traditional group. Common complications and length of stay are shown in Table 1.

Table 1. Outcomes for fast track versus traditional colectomy

	Overall complications* p=0.036	Respiratory complications* p=0.004	Urinary tract complications* p=0.037	Wound occurrences* p=0.85	Length of stay† p=0.030
Traditional (n=69)	26 (37.6%)	11 (15.9%)	7 (10%)	12(17.4%)	8.9
Fast track (n=157)	37 (23.5%)	6 (3.8%)	4 (2.5%)	26 (16.3%)	5.4

* using two sample % defective test

† using two sample standard deviation test

Conclusion: Implementation of our fast track colon surgery program resulted in a reduction in length of stay, urinary tract complications, respiratory complications and overall postoperative occurrences. NSQIP provided accurate data to assess the results of our program. The combination of a clinical decision support system (Zynxhealth™) and NSQIP allowed accurate assessment of rapid improvement in colon surgery patients at our institution.

Does Academic Detailing Increase Use and Documentation of Clinical Decision Rules for Pulmonary Embolism?

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Introduction: The Well's Criteria for Pulmonary Embolus and the Pulmonary Embolism Rule Out Criteria (PERC) are two clinical decision rules that have been prospectively validated to guide the diagnostic work up of pulmonary embolism. Emergency Department physicians commonly do not document the use of a clinical decision rule for the work-up of pulmonary embolism, whether they use a rule or not, possibly leading to inappropriate ordering of diagnostic testing and exposing patients to certain unnecessary risks such as contrast dye and radiation. We hypothesize that academic detailing does increase documentation and use of clinical decision rules for pulmonary embolism in the evaluation of patients in the emergency department.

Methods: A retrospective and prospective chart review was conducted over two three-month periods. The study was performed at a single urban regional emergency medical center with over 140,000 visits/year and an emergency medicine residency training program. Charts included were all charts with an order of D-dimer in the chart, any order of CT angiogram chest and charts with a final diagnosis of pulmonary embolism. Exclusion criteria included patients who did not have the CT angiogram chest done in the ED or had an order of D-dimer in the chart for evaluation of other diagnoses rather than pulmonary embolism. In addition, the Well's score and PERC rule were calculated for all charts, regardless if the clinical decision rules were documented in the charts. Academic detailing was implemented through several mechanisms. A grand rounds lecture on clinical decision rules for pulmonary embolism focusing on the Well's Criteria and the PERC rule was given to attending physicians and residents. A diagnostic algorithm was also developed to help guide physician diagnostic workup of pulmonary embolism. The PERC rule was also added to the electronic medical record as the Well's Criteria was already available for use in the documentation system. The rates of use and documentation of the Well's Criteria and the PERC rule were then analyzed pre and post academic detailing.

Results: The total number of charts reviewed were 258 retrospectively and 316 prospectively. Overall, ten charts had documentation retrospectively and 40 charts had documentation prospectively. This was an increase from 4.03% documentation retrospectively to 14.49% prospectively. The odds ratio was 3.59 (95% CI: 1.76 - 7.34, $p < 0.005$). In the D-dimer cohort, one chart had documentation retrospectively and 24 had documentation prospectively. Documentation rates retrospectively were 0.87% and prospectively were 15.29%. The odds ratio was 20.57 (95% CI: 2.74 - 154.45, $p < 0.005$). In the CT angiogram cohort, 8 charts had documentation retrospectively and 13 charts had documentation prospectively. Documentation showed an increasing trend from 6.96% retrospectively to 9.09% prospectively. The odds ratio 1.34 (95% CI: 0.54-3.35, $p = 0.533$). The pulmonary embolism cohort revealed one chart with documentation retrospectively and 3 charts prospectively. Documentation was 3.575% retrospectively and 18.75% prospectively. The odds ratio was 6.23 (95% CI: 0.59 - 65.85, $p = 0.092$).

Conclusion: Overall, it was found that documentation of the Well's Criteria for Pulmonary Embolism and the PERC rule did increase after academic detailing. The greatest increase in documentation of Well's criteria and the PERC rule were noted in patients who were low pretest probability, primarily those in the D-dimer group with a Well's score < 2 . These are the patients who are at low pretest probability for pulmonary embolism and may benefit the most from the use of such clinical decision rules guiding their diagnostic work-up.

Resident-Run OMM Skills Clinic: Does It Change Residents' Comfort Towards The Use Of OMM? A Survey-Based Quality Improvement Study

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Introduction: Osteopathic Manipulative Medicine (OMM), a series of manual techniques aimed at improving homeostasis and physiologic function is a mainstay of osteopathic medical education. However, research has shown that many physicians do not feel they receive enough training in OMM in residency. A quick review of PubMed shows that in the past 5 years there have been at least 49 research projects investigating teaching OMM to medical students and residents. These studies reveal that the more exposure medical students have to OMM, the more comfortable they feel using it. We posited that the more OMM exposure Family Medicine Residents in our program had, the more comfortable they would feel with it and the more likely they would be to use it in their future practices. Our hypothesis was that family medicine residents will have higher scores on the survey regarding their comfort performing OMM following the additional curriculum intervention.

Methods: We used a Pre-Post Survey Model to evaluate resident's comfort with OMM before and after the intervention. Two residents (PGY2 and PGY3) within Rhode Island's Kent Hospital Osteopathic Family Medicine Residency Program created an additional monthly hour of OMM curriculum to review techniques, anatomy, diagnosis, and exercise therapy. The residents taught this for an hour to the class of the same 5 Family Medicine residents every month for 6 months. The family medicine residents were given a survey to evaluate their comfort with OMM at the beginning of the academic year in July 2012. They were given the same survey as a follow up half-way through the additional curriculum after 6 months, in December 2012. The survey evaluated their comfort with performing OMM in both hospital and office settings, interest in continuing OMM in their future practice and if they felt there was enough OMM training in medical school and residency. The survey also evaluated how comfortable they felt performing and documenting a Osteopathic structural exam, billing, giving exercise therapy, explaining OMM and adjusting their techniques to less hospitable environments.

Results: We used a paired t-test to evaluate the change in resident's comfort with OMM. In general, we found a trend towards improvement without statistical significance with the exception of how comfortable residents feel performing osteopathic structural exams, which degraded over the 6 months. We found statistical significance at the level of $p=0.10$ on 2 questions. We found an improvement significant at $p=0.0497$ on the question of how comfortable residents are doing OMM in an office setting. We also found an improvement significant at $p=0.089$ on the question of how comfortable residents are explaining OMM to their patients. We did not use a t-test to evaluate whether residents felt they got enough OMM training in medical school and residency due to the nature of the questions.

Conclusions: This study was designed to look at the benefit of adding an additional hour of OMM curriculum per month to resident's schedule based on previous studies with medical students suggesting that increased education improves comfort with OMM. Despite a very small number of participants, we were able to show a statistically significant improvement in residents' comfort using OMM in an office setting and explaining OMM to patients. We also demonstrated a statistically insignificant trend towards improvement for all questions with the exception of residents' comfort performing osteopathic structural exams (OSE). In the future, if we were able to increase the number of participants, we may be able to demonstrate statistical significance.

Current Practices in Airway Training: An Analysis of Airway Curriculum Across AOA & ACGME Accredited Emergency Medicine Residency Programs

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Introduction: Emergency physicians are experts in airway management. We examine current practices in United States emergency medicine residency airway training in order to understand the training practices that create experts in our field of medicine.

Methods: An electronic survey was emailed to program directors of AOA and ACGME accredited emergency medicine residency programs. Email contact information for a total of 188 programs was obtained directly from the AOA and ACGME match websites or by following links from these websites. This electronic survey was emailed to all 188 of these programs and made available for completion from July 30, 2011 to December 20, 2011. Results were kept anonymous.

Results: We received 64 electronic responses for a response rate of 34% (64/188). Responses were obtained from ACGME, AOA, and ACGME/AOA dual accredited programs with percent responses of 73% (47/64), 23% (15/64), and 3% (2/64) respectively. Programs typically placed strong emphasis on dedicated airway training lecture hours. The mode range for annual dedicated lecture hours was greater than 10 hours but less than 20 hours, with 31% (20/64) of programs within this range.

A minority of programs, 28% (18/64), reported the utilization of a formal airway course which was typically an in-house course or one sponsored by an educational consortium between the program and a medical school. Notably, over 50% of the programs utilized cadaveric labs including human, porcine, or sheep. In keeping with the increased role of simulation training within medical education, 81% of programs reported that their program or institution has a simulation lab, with 73% (47/64) requiring residents to complete simulation curriculum.

Programs were also surveyed regarding the approximate numbers of airway procedures completed by typical residents within the program. The full results are available within the comprehensive result section. Notably, 84% (54/64) of programs reported that their typical resident will only perform 20 or less pediatric intubations during their training with 38% (24/64) performing 10 or less pediatric intubations. Rather alarmingly, 41% of programs (26/64) reported that a typical resident will complete one or less cricothyrotomies, and 48% (31/64) will perform one or less fiberoptic intubations.

Conclusion: There is variation in airway curriculum across emergency medicine residency programs. Common themes across most programs include, a respectable number of dedicated lecture hours, supplementation of airway training within the operating room, use of cadaveric labs, and use of simulation training.

Target areas for improvement in emergency medicine resident training include placing more emphasis on pediatric airway management, requiring all residents to complete a targeted number of fiberoptic intubations, and requiring all residents to complete simulation training especially with airway training techniques that are infrequently utilized within each respective program such as cricothyrotomies.

Waves of Health Evaluation of Diabetes Control and Education Study

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Introduction: Diabetes Mellitus type II is an under diagnosed and under treated disease in Dajabon, Dominican Republic and surrounding rural areas. Several factors contribute to the high percentage of patients that suffer from this illness. A diet high in animal fat and refined sugar and a lack of aerobic exercise may contribute to this problem. Patients in this area often purchase generic medications by the week in pill blister packs and frequently skip doses due to financial hardship. Patients do not have the tools to monitor their blood sugar on a daily and monthly basis. Waves of Health, a group of primary care physicians, nurses, and pharmacists has been traveling to the small border town of Dajabon for the last several years. We are now traveling twice yearly and have incorporated into our supplies a machine that rapidly tests glycosylated hemoglobin [HbA1c] HbA1c values are now used as the definitive test to diagnose diabetes. Additional studies indicate that even in non-diabetic patients, an elevated HgbA1c portends a greater risk of morbidity and mortality. We hypothesized that by providing patients with free diabetes medications; education; glucometers; and biannual physician exams that we could better control their diabetes as evidenced by HgbA1c. We hope that this objective data will help to prove that short-term medical missions can have an impact in the community they serve when a team works with local community leaders and has a clear commitment to return to the same clinics at regular intervals to achieve these goals.

Methods: Waves of Health clinicians will flag diabetic patients with random fingersticks of 200mg/dl or greater or any patients already on Metformin or Glyburide to the designated clinician in charge of the study. Patients will participate in a short survey that seeks to identify access to healthcare, medicines, diet compliance, and access to quarterly lab work. While in the waiting area the patients will receive educational videos/presentations on the following topics including but not limited to diet and exercise, understanding the importance of blood pressure control, checking sugar real time with a glucometer, and warning signs of hypoglycemia. Height, weight, and blood pressure will be recorded and the patient will have a monofilament foot exam. We will ensure the pt is on an ACEI if hypertensive. Patients will receive identification cards with their HgbA1c printed on the card to identify them as a study participant. At the conclusion of the visit patients will proceed to the pharmacy to receive a six-month supply of oral hypoglycemic medications.

Results: We enrolled 229 patients over four data collection periods that occurred at the same medical clinics every six months over a two year period in 2010 and 2011. Over four hundred HgbA1c diagnostics were performed and the data was analyzed. Of our patients that followed up at least once (108/229 or 47%) we saw more than half (67/108 or 62%) of the patients able to achieve either a failure of progression of their Diabetes (HgbA1c change of 0.4 or less) or an improvement in their blood sugar control. 37 (37/108= 34%) patients had an absolute improvement in their HgbA1c readings while 30 patients achieved control of the progression of their disease. We also noticed a progressive drop in the average HgbA1c of all of our patients tested on each mission from 9.05 to 8.50 to 8.48 to 8.42 on our last follow up mission. These values were the average of (71, 124, 133, and 73 readings respectively.) A smaller proportion of patients (approximately 20% or n=22) were not able to improve their HgbA1c even with free medicine and an additional subset were excluded on the basis of needing to advance to insulin therapy (approximately 14% or n=15). These patients had a HgbA1c greater than 10 on maximum oral therapy and would qualify for insulin by US standards of care. Due to refrigeration requirements and excessive cost of using insulin our organization is not able to provide this service at this time. However our study did allow us to quantify the number of patients that would benefit from insulin therapy in this community.

Conclusion: Our hope was to see a flat or slightly decreased HgbA1c of 0.5 over a six-month period. In looking at the average HgbA1c tested we saw a drop of 0.63 over a two year follow up period. One additional unexpected benefit of our study was on the basis of our testing we were also able to exclude approximately eight patients who did not meet the diagnostic criteria for diabetes yet believed they were diabetic and were seeking treatment. We will hope to maintain our "prediabetics" (HgbA1c not on medication of between 5.8-6.4) on Metformin 500mg daily while adding an ACEI such as lisinopril or enalapril for renovascular protection.

Self-Perceived Opioid Prescription Habits in Residents

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Introduction: The objective of this study is to assess residents' current prescribing habits and confidence in prescribing opioids in the emergency department, inpatient, and outpatient setting. In 2012 a community warning was issued by Kent Hospital in response to a dramatic increase in drug overdoses, specifically after seven cardiac arrests over an eight-week span due to drug overdoses from narcotics, heroin, and/or synthetic marijuana, five of which resulted in deaths. According to the CDC, in 2009 more than 15,500 overdose deaths in the US were from prescription pain killers. Misuse and abuse of these medications accounted for more than 475,000 emergency department visits in that same year, nearly double the amount of visits from five years prior. Studies have shown that there are gaps in residents' confidence and knowledge in managing chronic nonmalignant pain. Previous studies have been done to assess the differences between prescription practices of residents versus attendings and also how different interventions affect residents' beliefs and concerns, as well as their knowledge about using opioids. Interventions have included workshops as well as web-based training versus reviewing the current guidelines from the Veterans Affairs/Department of Defense.

Methods: A voluntary survey questionnaire was administered to emergency medicine, internal medicine, and family medicine residents. A total of 28 residents (17 emergency medicine, 6 internal medicine, and 5 family medicine) completed the survey.

Results: A minority (N=7, 25 percent) of residents stated that they were aware of their department having a written policy on opioid medications, 5 of which were family medicine residents, and 6 of the total residents surveyed (21 percent) stated that they had received training regarding this policy. 14 respondents stated that they felt very comfortable or comfortable managing patients' non-cancer chronic pain with opiate medication. 50 percent of these respondents correctly knew that there are different cutoff levels for abuse versus therapeutic use on lab screenings and 50% knew the appropriate urine opiate level cutoff the therapeutic use of opiates. 14 residents stated that they felt uncomfortable managing a patients' non-cancer chronic pain with opiate medication, 43 percent of which stated that they always communicate with an attending prior to prescribing opiates to a chronic pain patient. When asked about whether opioids were appropriate for specific diagnoses; metastatic bone cancer (100 percent), closed metacarpal fracture (75 percent), and shingles (50 percent) were most common whereas chronic low back pain (29 percent), abdominal pain (25 percent), and migraine (4 percent) were less common.

Discussion: Our survey showed that half of residents surveyed (50 percent) did not feel comfortable managing chronic nonmalignant pain. The habits that residents develop in training are maintained as they move into private practice. These results show that, with this cohort, curricular interventions need to be made and reinforced to improve residents' preparedness to manage pain in both the inpatient and outpatient setting. This should include reviewing safer opioid prescribing practices and alternatives to opioids. A randomized trial showed that an interactive web-based training that was focused on shared decision-making and communication skills was more effective than simply reviewing compatible guidelines for both knowledge and self-reported competence in the management of chronic nonmalignant pain¹. While the majority of residents in our study reported that they mostly or always (79 percent) communicated with their attendings prior to prescribing opioids to a chronic pain patient, supervision should continue to be stressed in order to provide effective and safe care for patients.

1. Sullivan MD, et al. Randomized trial of web-based training about opioid therapy for chronic pain. Clin J Pain. 2010 Jul-Aug;26(6):512-7.

A Comparison of Temporal Thermometry to Rectal Thermometry in the Adult Emergency Department Population.

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INTRODUCTION: Temporal artery thermometry has become a popular, convenient, and non-invasive way of obtaining critical vital signs in the emergency department (ED). However, speculation still exists regarding its accuracy in comparison to a more invasive, “gold standard” measurement: the rectal temperature. The aim of this study is to determine the accuracy of temporal artery thermometry compared with rectal thermometry in an adult ED population, and to evaluate a number of variables that may affect temperature differences, should they exist.

METHODS: This prospective randomized study enrolled 200 adult ED patients presenting to a community teaching hospital in a four month period. Temperature recording was obtained from a patient population that met our inclusion criteria. Temperatures from the temporal artery and rectum were measured no more than five minutes apart. We tested the correlation between multiple variables and their effect on both methods of measurement using Bland-Altman plots and Spearman Rho correlations. T-test was utilized for direct comparison of the two methods of thermometry in the entire sample size.

RESULTS: The mean temporal artery temperature across the entire sample size was $36.66^{\circ}\text{C} \pm 0.56^{\circ}\text{C}$, and the mean rectal temperature statistically higher, at $37.31^{\circ}\text{C} \pm 0.92^{\circ}\text{C}$, $p\text{-value}=0.001$. We found that rectal temperatures were consistently higher than temporal wand temperatures, especially in febrile patients. In the febrile group, every single rectal reading was higher than its temporal wand counterpart and over 50% were at least 1.5°C higher. Spearman-Rho analysis did not exhibit any statistical correlation between temporal artery measurement and age, sex, BMI, or time of measurement. There was poor correlation between rectal temperature and temporal artery temperature.

CONCLUSIONS: We have demonstrated that temporal artery thermometry has poor accuracy for detecting fever and is a poor measurement of core temperature in an adult emergency department population.

Barriers to the use of tissue Plasminogen Activator in the Emergency Department Setting: Survey of Rhode Island EM Physicians

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BACKGROUND: Although the use of tPA in the setting of acute ischemic stroke is currently the only therapy available to be given in the ED, it is still controversial (due to risk of hemorrhage) in the emergency medicine community as to whether tPA is the standard of care. The objective of this study was to determine the potential barriers to the use of tissue Plasminogen Activator (tPA) in the emergency department (ED) setting for the treatment of acute ischemic stroke. The goal was to identify areas where educational efforts should be focused in order to increase tPA use in the ED and address bias on the part of practicing emergency physicians towards administration of tPA in the setting of acute ischemic stroke.

METHODS: Two hundred three (203) emergency physicians in the state of Rhode Island were sent an electronic survey. A confidential, self-administered, pilot-tested survey assessing demographics, practice environment, attitudes, and beliefs regarding tPA use in acute ischemic stroke were used. Descriptive statistics was used as the method for data analyses. Main outcome measures assessed belief in a legal standard of care, clinical experience with tPA, likelihood of use in an ideal setting, comfort in use with and without a neurologist, typical reasons for reluctance of the use of tPA and thoughts for the increase use of tPA in the ED setting.

RESULTS: Forty-two surveys were completed (gross response rate 20.7%). Ninety-seven percent indicated access to using tPA in the acute ischemic stroke setting. Eighty-seven percent indicated use of tPA is the standard of care. Eighty-five percent indicated they are comfortable using tPA, with fifty-nine percent indicating previous experience influences their decision to use tPA. Major reasons for reluctance of the use of tPA were the risk of hemorrhage (62%), followed by family reluctance (18%), lack of clinical experience with tPA (13%) and lack of proven neurologic benefit (13%). Twenty-six percent indicated no reluctance to the use of tPA. Thirteen of the forty-two (31%) respondents are not at a designated stroke center and of that, 62 % have access to a stat neurologic consult.

CONCLUSIONS: Our survey, even with a small rate of return, was able to reproduce similar responses about the major barrier to the use of tPA, risk of hemorrhage. The next step in facilitating the use tPA in the ED is to understand what prevents its use. We have identified multiple barriers during this survey. The most common responses included having more involvement of neurology, lowering the hemorrhagic risk and more research.

Lactation Assessment Standardized Tool (LAST)

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Introduction: The benefits of breastfeeding are well supported by evidence. A standardized, validated latch and breastfeeding assessment tool utilized by trained lactation consultants would help to identify babies which might benefit from interventions to improve breastfeeding success rates and measure the success of such interventions. Our hypothesis is that this lactation assessment tool will provide a reproducible method for evaluating lactation in neonates, independent of operator, among board certified lactation consultants.

Methods: The LAST study is an ongoing randomized, blinded pilot study approved by the MaineGeneral Medical Center IRB. In a rural community hospital setting, board certified lactation consultants independently use a latch assessment tool to evaluate breast feeding success. Mother baby pairs are chosen who meet the following inclusion criteria: term infants (38 to 42 weeks), 12-96 hours old, with well mothers (no illness that would interfere with breastfeeding), who desire to breastfeed. Exclusion criteria include: any infant with orofacial deformity (including short frenulum), any infant on the Neonatal Abstinence Scoring Protocol, and any maternal breast deformity or previous breast surgery. The tool obtains ratings on six metrics derived from existing International Lactation Consultant Association Guidelines. Kappa values were applied to these metrics for statistical analysis. To date 15 mother baby pairs have been assessed with a goal of 20 pairs.

Results: Preliminary results of inter-rater reliability were obtained from three lactation consultants' observations of 15 mother-infant dyads. Kappa values from 12 of the 15 dyads based on six measures were as follows: Feeding Cues (0.55, moderate agreement by Landis and Koch criteria); Latch Time (0.75, Substantial agreement); Latch Quality (0.61, substantial agreement); Suck Swallow Pattern (0.63 substantial agreement); Type of Nipple (0.77, substantial agreement); and Nipple Appearance (0.52, moderate agreement).

Conclusions: This pilot study suggests to date that the Latch Assessment Tool can be used to assess latch in a standardized fashion. It could then be used to measure success of interventions such as osteopathic manipulation of neonates. Continued study is needed to better characterize this tool.

Evaluation and Treatment of Low Back Pain : Training for Family Medicine Residents

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Introduction: Acute low back pain is primarily managed in the family medicine office; it is the fifth most common reason for an office visit in primary care and the most common reason for referral to a musculoskeletal practice. As much as 97% of low back pain is caused by an anatomical or functional abnormality, defined as a somatic dysfunction and not an underlying disease process. The use of Osteopathic Manipulative Medicine (OMT) has been found to make significant differences in the acute management and treatment of low back pain in order to prevent progression.

With low back pain afflicts 5% of the population and one half of those seeking care in the primary care setting, it not only affects the individual's lifestyle, but has a significant economic impact. Total annual medical care costs for musculoskeletal care are approximately \$240 billion, with low back pain accounting for \$100 billion per year. Despite clearly defined guidelines, providers continue to overspend and over-treat; with minimal outcome difference and little understanding from the patients' perspective on the pathophysiology and healing process of low back pain.

These concerns have lead to more research regarding the application of evidence based management of both acute and chronic low back pain. Early recognition and the use of evidence based management leads to less unnecessary investigation, less healthcare expenditures, less medication and better outcomes. Despite proven healthcare improvements, there have been little advancement in the training of practitioners, residents or students in these management guidelines. There is also a lack in research around the assessment of physicians' knowledge and comfort in low back pain management, diagnostic skills and patient education. Teaching skills training for family medicine residents is exceedingly important since family physicians are primary providers and are often the only providers of patient education and public education.

Methods: Development and validation of an assessment instrument and before and after study at a Family Medicine Residency in Maine; Residents years 1-3. Administered a resident training educational intervention consisting of a multifaceted approach focusing on more than just guidelines but the necessity to educate on knowledge, skills and teaching abilities and how to provide guideline based care. Outcomes were measured by self-assessment of skills, clinical skills assessment exam and written tests.

Results: Anticipate and increase in knowledge and skill set in residents who undergo an educational intervention.

Conclusion: Pending

Use of Opioids in Management of Chronic Pain in Non-Cancer Patients

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Introduction: Past research has shown that the long-term use of opioids within the structure of strict treatment guidelines, is successful in reducing pain and improving functionality of patients. Establishing the goals of treatment is essential to successful pain management with opioids. Periodic review of a patient's care is essential, using appropriate medication adjustments with assessment of activity level and pain levels. Goals of treatment center on improved pain control with improved functionality and quality of life. These goals will ideally be mutually arrived at, by patient and provider, with periodic visits using opiate treatment guidelines.

Our research involves the implementation of such guidelines at the Sister Rose Vincent Family Medicine Center at the St. Elizabeth Medical Center in Utica, NY; these aim to direct opiate prescription in treatment of chronic pain to both reduce pain and to increase functional status and quality of life. We aim to demonstrate that adherence to opiate treatment guidelines, even if and when it calls for reduction in dosages of opiates prescribed over a three month period, will produce either no change or a possible improvement in patient functionality, without a corresponding increase in reported pain levels by patients. At the same time, we expect that at the time of initial implementation of guidelines, patient's satisfaction may decrease or levels of reported pain may increase, due to the patient's initial response to the change in their treatment.

Methods: Subjects have included pain patients from the Sister Rose Vincent Family Medicine Center over the age of 18, both male and female. The patient pool included those with chronic, noncancerous pain (such as chronic neck pain, chronic back pain and fibromyalgia) who had been prescribed opiate pain medications for six months prior to the study; those from this pool who volunteered to participate in the study were included. While our initial aim was to have a sample size of 100 patients, we have found significant resistance to participation from many patients. After a research participation agreement was introduced and accepted, participating subjects were administered a 4-question questionnaire, asking their assessment of pain since last visit, current pain level, perception of functional status in relation to pain since last visit and current functional status; this assessment took place monthly. Additionally, the type and dose of opioid medication used, date of starting medication, date of exam, age, sex, and any adverse events were recorded. Three months after initial data was collected, new pain management guidelines are being implemented for the subjects. These guidelines include instructions on approaches to stratifying patients in terms of opiate risk potential, and adjusting the type and dosage of opiate medication accordingly. Subjects then are assessed monthly with the same questionnaire as they did for their earlier visits to the clinic once these guidelines are in place.

The level of pain, functional status, and medication dosage will be compared before and after applying the guidelines. Improvement will be determined to have occurred: 1) if pain and functional status decrease and increase, respectively, with correlating dosage staying the same pre and post guideline implantation, or 2) if pain and functional status either remain the same or improve when opiate dosage decreased after the guideline implementation.

Trend analysis and t-tests will be used for analysis of collected data.

Results: Currently data is being collected as the study will run until April 15, 2013

Conclusions: Not available at this time

Prozone Phenomenon

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Introduction: Nontreponemal tests are useful screening tests for syphilis infection. RPR is 70-80% sensitive for syphilis and can be falsely negative in patients with secondary syphilis. This case illustrates prozone phenomenon masking a syphilis infection.

Case: A 28-year-old homosexual male with no prior medical history presented to an ambulatory clinic for an annual checkup and had a 3 week history of a grey rash that began on his thighs, spread to his upper arms, and has been resolving on its own without any treatment. His last sexual encounter was 8 months ago. Physical examination showed a macular, nonpruritic rash that was grey in color and involved the thighs and proximal upper extremities bilaterally as well as a 1 cm x 0.5 cm ulcer on the dorsal shaft of the penis with a granulomatous base. The skin was otherwise intact without lymphadenopathy and the remainder of the examination was otherwise unremarkable. Serum chemistry, liver function tests, and a hepatitis panel were unremarkable. HIV test was negative, and RPR screen was nonreactive. Given the high index of suspicion for secondary syphilis, RPR was repeated in higher dilution and found to be positive at 1:512. The patient was treated with intramuscular Benzathine Penicillin G injected weekly for 3 weeks. This therapy was tolerated well and his rash resolved over this period of time.

Discussion: The prozone phenomenon is a rare but important entity to recognize to avoid missing the diagnosis of secondary syphilis. Prozone phenomenon is not routinely ruled out in all laboratories. Thus, when serology is not consistent with the clinical presentation of syphilis, it should be repeated in higher dilution.

Not All Anterior Wall ST Segment Elevations Indicate a Left-sided Lesion.

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Introduction: Electrocardiograms (EKG) are the basis of diagnosing acute myocardial ischemia. Knowledge of patterns and changes in specific EKG leads may guide the physician to the coronary vessel being affected. ST segment elevations on 12-lead electrocardiograms are often used in localizing the culprit lesion. Although certain patterns are indicative of certain lesions, they are not always specific. One must also look at other aspects of the EKG, for example, the rhythm, to further help with the identification of the site of acute ischemia. Our patient presented with what appeared to be a left-sided lesion, which turned out to be right-sided.

Case: We present a case of a 51-year-old African American male, with past medical history significant for hypertension. He complained of chest pain lasting 2 hours prior to presentation at the Emergency Room. Patient described the pain as sharp, substernal, and radiating to the left chest. The pain began while he was walking to the train station and grew in intensity as he arrived at the hospital for evaluation. Associated symptoms included diaphoresis, but he denied shortness of breath, dizziness, or palpitations. Patient denies prior episodes of chest pain. His initial electrocardiogram revealed ST segment elevations in leads V1-V5, with reciprocal ST depressions and T-wave inversions in leads I and aVL. A repeat EKG also showed a second degree heart block, Mobitz Type 1. Patient was given sublingual nitroglycerin and IV morphine for pain control, and was started on a nitroglycerin drip for symptom control. He was also started on the standard Acute Coronary Syndrome protocol including a loading dose of aspirin, Plavix, Lipitor, Metoprolol, and Heparin. Code STEMI was activated so the patient would be taken for immediate cardiac catheterization. Cardiac catheterization revealed a 100% occlusion in the mid-segment of the right coronary artery; the left main, left anterior descending artery and the left circumflex arteries were without disease. He underwent angioplasty with stent placement of RCA, with subsequent resolution of chest pain and ST changes on EKG.

Discussion: ST segment elevations in the anterior leads usually suggest left-sided coronary involvement. However, elevations in V1-V3, as our patient had, may suggest a right-sided lesion, since the right ventricle is the most anterior chamber. It is crucial to look at all the aspects and changes on the EKG. Putting all the information together will help pinpoint the affected lesion with more accuracy. The rhythm on the EKG may have been the clue to localizing the culprit lesion, rather than the ST segment elevations alone.

Benefits Of Resident-Researched Resource Manual In An Outpatient Resident Clinic- A Survey Based Quality Improvement Project

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Introduction: One of the great challenges for a resident entering a family medicine residency program in a new area is quickly developing familiarity with local resources and ancillary services available to deliver the best care possible to their patient panel. Being a relatively new residency program our continuity clinic has limited resources and no personnel with training in resource counseling. As family practice interns entering a suburban program practice in Rhode Island with no dedicated on site social services or coordinated care support, our research focused on improving access to those resources. Historically, residency practices tend to have more chronic illnesses and less health insurance than the larger population. We hope to be community-responsive primary care providers with the ability to see the socio-cultural needs of the patient and connect them with community health resources as this is a method of training recognized to help create physicians capable of serving underserved populations. Providing patients with more health education material and greater access to care also improves their quality of care.

Methods: Our initial investigation involved our local health department to determine if there was a consolidated resource available; there was no single resource to be found. We set out to create a resource manual to be used in the family and internal medicine residency practice to aid residents and attendings in connecting patients with appropriate resources as well as decreasing time to find these materials. A pre and post development survey was conducted of the family medicine and internal medicine residents, attendings, and staff members of our outpatient office.

Results: Of those questioned, it was felt that patients would be happier if their physician was more resourceful and that more than half surveyed felt their current knowledge was inadequate to guide their patients with resources. Most people felt they did not know enough about resources for the elderly, pediatrics, uninsured, pain management, victims of abuse, or other free services. The majority of people surveyed felt that a consolidated resource manual would help them be better providers. The post survey was performed 6 weeks after the pre survey and all participants felt that a trained personnel would be of most benefit to the practice compared to a written manual.

Conclusion: Our desire to improve what we saw as a gap in care for our patients was driven by a need for improved access to resource identification and utilization. The identification of healthcare support services and disease management as crucial to improving the health of the general population has spurred federal and local investment in these services in several communities and pilot studies. However, many primary care providers still do not have the financial ability to access resource experts. A manual that is easy to access has proven helpful, though not ideal, in our office setting. Moving forward other point of care resources that we see as helpful to develop and investigate would be a mobile smartphone application that would provide a similar service on a very local level. The need for health care and human resources is an international one, with studies showing that the more resources for health, the lower the morbidity and mortality for patients. We hope that in creating this resource manual we will improve our care of, and the health and wellness of our patients.

A Case of Sudden Monocular Blindness

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Introduction: A wide variety of causes exists for monocular vision loss. Retinal artery occlusion, retinal vein occlusion, acute angle glaucoma, corneal abrasion, endophthalmitis, episcleritis, Foreign Body, intraocular giant cell arteritis (temporal arteritis), migraine, trauma/hyphema, optic neuritis, compressive papilledema, retinal detachment, scleritis, sickle cell disease, and corneal ulcer are a few of the possibilities. Retinal vein occlusion is the second most common cause of vision loss worldwide second to diabetic retinopathy. Our patient presents with evidence of central retinal vein occlusion (CRVO) secondary to noncompliance with glaucoma medication.

Case: An 87 year old female presents to the emergency department with sudden onset painless left eye blindness. She slept unusually late and this was present upon waking. She had no light perception in her left eye. Her past medical history included diabetes, hypertension, hypothyroidism, and mild dementia. She mentioned a vague history of using “eye drops” for glaucoma but has not seen an ophthalmologist in over four years. On exam the patient’s vital signs were stable. She had exophthalmos of the left eye. Visual acuity was 20/30 in the R eye with no light perception in the left. Intraocular pressure was 29 in the right eye and 82 in the left. Fundoscopic exam revealed blurring of the optic disc with a diffuse retinal hemorrhages consistent with central retinal vein occlusion. The patient was given aspirin and consultation with ophthalmology was obtained. Unfortunately for this patient, nothing further could be done acutely and follow up was arranged for the following day.

Discussion: The etiology of this patient’s central retinal vein occlusion (CRVO) is likely secondary to noncompliance with glaucoma medication. Conversely CRVO can cause glaucoma if not already present. Many patients will recover some amount of vision. However, the prognosis for our patient is poor due to the complete lack of light perception.

Chronic Sinusitis and Pott's Puffy tumor

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Introduction: Pott's Puffy Tumor was first identified in 1760. It is an unusual complication of acute or chronic bacterial sinusitis, leading to osteomyelitis of the frontal bone, with associated subperiosteal abscess. Since 1990, literature reports only 32 cases of adult Pott's Puffy Tumor; male gender predominates. Common causes are head trauma, acute/chronic bacterial sinusitis, intranasal cocaine use. It is noticed predominantly in the adolescent age group, 15-17 year olds, and not in adults. MRI is the gold standard imaging. The following is the unique case of an older female patient, initially exhibiting signs of simple chronic sinusitis and headache. A series of imaging studies demonstrated infection of the skin and frontal subcutaneous tissue involving the bone, extending to the dura, with the final diagnosis of follicular B cell lymphoma.

Case: This is a 63 year old female presented to the ear nose throat (ENT) specialist in May 2012. She complained of frontal headaches, and an episode of right-side forehead swelling, with radiation of pain to the top of the head and eye region. She denied any periorbital swelling; and the headache was somewhat controlled. During this time, the forehead swelling subsided without antibiotic treatment. PMHx is positive for chronic sinusitis characterized by chronic nasal congestion, rhinorrhea, hypothyroidism, asthma, GERD, sinus surgery, C-section, cholecystectomy. Denied any alcohol, smoking, drugs and any trauma or history of coronary artery disease, hypertension, bleeding disorder, diabetes, seizures, weight loss, night sweats, fever, chills, travel. Within a couple of weeks in June, swelling in the same area returned with an intensity of pain 10/10 that was not controlled with narcotics. The subsequent 8 weeks the patient was treated with multiple courses of antibiotics, including amoxicillin/clavulonic acid and levofloxacin. CT of sinuses in July showed some frontal and maxillary sinus disease without infectious symptoms. Patient was afebrile, vital stable, CBC, BMP normal. On physical exam, a right forehead tender lump noted. In 09/2012 CT and MRI of sinuses was again recommended. due to minimal improvement. Imaging still showed mucosal thickening and the left frontal sinus completely blocked, with no intracranial fluid. MRI revealed infection over the frontal bone with thickening of the subcutaneous tissue and inflammation extending to the dura. This was identified as Pott's puffy tumor. Surgical intervention was necessary in 10/2012 to drain the affected sinus and excise the infected bone. Bicoronal craniotomy was performed, purulent material removed from the frontal sinus, an epidural abscess drained and biopsy and cultures were obtained and sent to pathology. Cultures were negative and Gram stain showed no organisms, 2+ WBC. Pathology results with immunohistochemical stains showed low grade follicular B cell lymphoma. Because of the epidural abscess and cancer diagnosis, the patient is closely followed by infectious disease and hematology/oncology

Discussion: This unique case of Pott's Puffy Tumor helps illustrate the importance of the clinician's understanding of the pathophysiology of this rare condition. Timely referral, high index of suspicion, and close observation are crucial for a good clinical outcome. The lymphoma led to the obstruction of ventilation of the sinus cavity which led to the sinusitis extension into osteomyelitis hence the finding of Pott's puffy tumor.

Can Name Recognition Allow for More Efficient Dynamics in the Emergency Setting?

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Introduction: The emergency department is a unique setting in the world of medicine where not uncommonly, chaos abounds. Certain emergent situations create an atmosphere of high tension where teams of healthcare workers must come together and provide efficient, safe and rapidly delivered care. During such events, such as a major trauma or a pediatric cardiopulmonary resuscitation, a team leader ideally can quickly organize a team and maintain control over the situation while simultaneously making critical clinical decisions.

Within all emergency departments, healthcare personnel with different training and skill sets must work together cohesively to deliver patient care. This teamwork can be compromised because the turnover rate of personnel in the emergency department is comparatively high and it is often difficult to learn the names of new personnel in this high-stress, fast-paced work environment. When the need arises for a group of healthcare providers to work together as a team, we believe it would be more efficient and build stronger teamwork within the department if name recognition of all co-workers existed. We postulate that the creation of an easily accessible photo composite including all emergency department employees would improve teamwork in the emergency department.

Methods: The study design consisted of an online survey provided to all members of the emergency department staff before and after the photo composite was created and distributed. The survey consisted of thirteen questions answered using a numbered scale. Three of the questions required a written answer. A color photo composite was then distributed in the department available for all staff members to view, which included the full name and job position of each staff member. The follow-up online survey was then sent out which included the same initial thirteen questions with the addition of two new questions.

Results: We found that the majority of employees (61.5%) used the photo composite and that 64.2% of them found it useful. After the release of the composite, the sense of "strong teamwork" improved by 30%. It is reasonable to conclude that a large number of employees are not comfortable with the names of at least a portion of their coworkers. Our goal was to find a way to make it easier for staff to learn the names of all coworkers in the department and ultimately allow for improved teamwork and group dynamics. We were able to achieve this goal by creating an easily accessible photo composite of emergency department staff. In conclusion, our small study investigated the impact of a photo composite on the teamwork within the emergency department and found it to be a beneficial tool.

Conclusion: By providing employees with a photo composite of emergency department staff we found that teamwork and group dynamics were improved.

Current use of Point-of-Care (POC) Ultrasound in the Family Medicine Setting

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Introduction: In the past 10 years, the utility and benefits of point of care (POC) ultrasound have been thoroughly documented and studied in the emergency, anesthesia, obstetrics and intensive care settings. The clinical utility of POC ultrasound has been identified for diagnosis and screening in trauma, renal, biliary, aortic, cardiac, pulmonary and gynecological/obstetrical complaints. As a result, ultrasound techniques and competencies have been added to the curriculum in all of these residency programs. Currently only a minority of FM residency programs include POC ultrasound in their standard educational curriculum. The University Of Minnesota and University of South Carolina both have a strong ultrasound component to their family medicine residency programs. This might partly be due to the rural based practice setting that residents are transitioning into after residency. As the field of POC ultrasound expands, ultrasound education at medical schools is on the rise. This project was developed in order to determine the current use of POC ultrasound in the family medicine (FM) setting.

Methods: This literature review started with a PudMed search combining FM/primary care/general practice (GP)/office with bedside/POC ultrasound. The search was limited to institutional full text availability, and publication dates back to 2002.

Results: Research in POC ultrasound in the FM setting is limited compared to the other commonly accepted application settings, ie. emergency medicine and anesthesia. The multiple combined searches resulted in over one-thousand articles. Article titles were then reviewed for inclusion of the above key words. Ten articles were selected for review; the articles were focused on abdominal (3), cardiac (1), breast (1), musculoskeletal (2) and educational/usage trends (3). Six of the ten articles were from international sources.

Conclusions: The ten articles reviewed provided a snap shot of the current utilization of POC ultrasound in the FM setting and its effect on patient outcomes. One study showed anticipated patient management by the GP changed in 64% of patients following upper abdominal ultrasound in the office setting. POC abdominal ultrasound substantially reduced the number of intended referrals to a medical specialist, and more patients could be reassured by their GP. With limited training GPs were able to rule out or exclude fluid collections, aortic aneurysm and common gallbladder disease. An office based ultrasound study showed abdominal aortic aneurysm screening can be safely performed in the office by family physicians who are trained to use POC ultrasound technology. The screening test can be completed within the time constraints of a busy family practice office visit. Breast ultrasound imaging by GPs was preferred over mammography for image guided intervention such as biopsy and localization. GPs identified ultrasound as the breast imaging test of choice for young women and women who are pregnant or lactating. The articles demonstrate there are many different types of clinical scenarios where utilization of POC ultrasound in the FM setting can improve the patient experience and outcome. Office based ultrasound was shown to reduce the need for radiographic studies thus reducing the patient's life time radiation exposure. A particularly promising development in the care of sports injuries is the expansion of injection therapies, and in-office ultrasound provides assurance that prolotherapy, platelet-rich plasma, dry needling, corticosteroid, and viscosupplementation are delivered accurately and safely. As studies continue to validate ultrasound's effectiveness in diagnosing injuries to the upper and lower extremities compared with more costly magnetic resonance imaging and more invasive exploratory surgery, its promise as a cost-effective diagnostic tool is growing. However the paucity of articles found on the topic clearly shows a need for further review. Even when noncardiac POC ultrasound by nonradiologist physicians was found to be increased by 11% in the primary care setting another review article of POC ultrasound utilization failed to name primary care on their list of specialties using POC ultrasound. Further research is needed to validate the utility of the broad spectrum of POC ultrasound usage in the family medicine setting.

Developing a Treatment Plan for a Combined-type Retroperitoneal Liposarcoma

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Introduction: Liposarcomas, although rare, are the most common type of soft tissue sarcomas, affecting approximately 5,000 Americans per year. Patients typically present with a palpable mass in the extremities or abdomen, with 10-15% occurring in the retroperitoneum. Abdominal and retroperitoneal sarcomas commonly grow to great sizes before they are noticed and diagnosed. This patient presented to her primary care physician with a six-month history of progressive abdominal distension, and recent onset of urinary incontinence and right flank discomfort. On CT scan she was found to have an extensive retroperitoneal mass that completely surrounded her right kidney, and compressed her abdominal and pelvic contents onto her left side. After a percutaneous biopsy, she was treated by surgical excision alone, including a right nephrectomy. This case study explores the process of forming a cohesive treatment plan for a rare disease using evidence-based diagnostic and treatment methods.

Case: A 69yo female presents on referral from her PCP for evaluation and treatment of a large retroperitoneal mass. Her initial complaint was a 6-month history of increasing abdominal distension, despite dieting and an intentional 6 lb weight loss. She also had a 2-3 week history of urinary incontinence and right flank discomfort. She denied fever, chills, nausea, vomiting, constipation, and changes in appetite. Her family history is significant for multiple cases of breast and lung cancer. The patient has worked as a hairdresser for 47 years, quit smoking 36 yrs ago, and denies using alcohol or drugs. On physical exam her abdomen was soft, non-tender, and distended with dullness to percussion. She had a small umbilical hernia, and enlarged veins over her anterior abdomen. A contrast enhanced CT scan of her abdomen and pelvis showed an extensive retroperitoneal mass surrounding the right kidney, with areas of variable enhancement with no liver lesions and CT scan of chest showed no lung lesions. Radiation oncology was consulted regarding neoadjuvant radiotherapy, but due to the size and extent of the tumor, and suspected minimal clinical benefit, it was not advised. The results of an initial percutaneous biopsy showed a low-grade, well-differentiated liposarcoma, and the TNM clinical staging at that time was T2bN0M0. A complete surgical resection was then performed, including a right nephrectomy. Wide margins of 2cm were unachievable, due to the tumor's proximity to the IVC, aorta, and other vital structures. Because the current data does not support any survival benefit for using adjuvant radiotherapy to prevent recurrence of retroperitoneal liposarcomas, this treatment was not elected. Pathology classified the tumor post-operatively as combined-type; primarily well-differentiated, with areas of dedifferentiated liposarcoma. Her expected 5-year survival is between 60-100%. Metastasis is unlikely, although recurrence is not uncommon. For this reason, the patient will be followed with physical exams and CT scans of chest, abdomen and pelvis every 3-6 months for 2-3 years, and then annually if there is no recurrence.

Discussion: Liposarcomas, like all sarcomas, are rare. However, because they can be locally invasive and occasionally metastatic, proper diagnosis, treatment and follow-up procedures are imperative. Depending on the location, grade and stage, treatment protocols for these tumors may include neoadjuvant radiotherapy and/or chemotherapy, surgical excision, adjuvant radiotherapy for preventing recurrence, and frequent follow-up exams. This case demonstrates how to proceed through various evidence-based risk analyses in order to develop an appropriate diagnostic and treatment plan for a patient with a rare, low-grade, combined-type well-differentiated/dedifferentiated retroperitoneal liposarcoma.

Thoracic Mycotic Aneurysm

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Introduction: A mycotic aneurysm is rare and represents 1-1.8% of all aortic aneurysms. It is a life-threatening condition with high morbidity and mortality rates. The standard management of infected aneurysms is surgical resection and debridement, with or without revascularization procedures, followed by long-term antibiotic treatment. However, this conventional treatment carries a high surgical morbidity and mortality rates. The use of endovascular aortic repair may provide a good alternative for infected aneurysms.

Case: A 62 year-old male from Guatemala presented to the ED with black stool and lightheadedness. His past medical history is significant for diabetes mellitus, TURP for bladder outlet obstruction, hyperlipidemia, acute renal failure, hypertension, and a stroke in 2010. On admission, the patient reported experiencing weakness, abdominal pain and rectal bleeding, but no nausea, vomiting, diarrhea, or constipation. Vital signs were significant for a blood pressure of 87/48, respiratory rate of 12, and pulse rate of 105. Physical exam was remarkable for right and left abdominal tenderness, maroon stool, and a positive guaiac test. Lab studies showed WBC 17.1, hemoglobin 5.8, hematocrit 17.3, platelets 249. Sodium was 124, potassium 4.3, chloride 93, bicarbonate 20 with anion gap of 11, glucose was 600. Lactic acid is 1.6. Chest x-ray showed no pulmonary infiltrates. Urinalysis showed white blood cells. Gastroenterology was consulted to assess for a gastrointestinal bleed and they recommended that he receive blood resuscitation, Protonix drip at 8 mg/hour after an 80, and that he get an endoscopy to identify the source of bleeding once he was resuscitated. His gastrointestinal bleed appeared to be stabilized by a transfusion of 2 units of packed red blood cells. 48 hours after admission, the patient developed a fever of 38 degrees Celsius, tachycardia, and an increased WBC of 16. Urine cultures showed Staphylococcus aureus, Methicillin-sensitive Staphylococcus aureus, extended-spectrum beta-lactamase producing Escherichia coli. The patient was given imipenem and oxacillin. He was transferred to ICU for the treatment of sepsis. An abdominal/pelvic computed tomography scan with oral contrast was performed to investigate his fever and abdominal pain. The scan showed a large retrocardiac soft tissue structure per radiology. Interventional radiology and general surgery were consulted to review the CT scan. It was recommended to obtain a chest CT Angiogram to further investigate the esophageal mass and rule out an aortic leak. CTA showed a large lower middle mediastinal mass measuring 8.2 cm by 6.7 cm and associated with a large lower thoracic aortic pseudoaneurysm secondary to a probable ruptured mycotic aneurysm. The endoscopy the patient was supposed to receive was not performed for fear of rupturing the pseudoaneurysm. As the patient was not stable enough to be transferred, he was taken emergently to the Operating Room at our hospital for an endovascular stent repair. The patient was returned to the ICU and was initially stabilized. Ultimately, the infected pseudoaneurysm will need to be drained and eventually be resected after bypass or he will need life-time antibiotics.

Discussion: Mycotic aneurysms are a rare subdivision of aortic aneurysms. Current management strategies are primarily based upon clinical experience guided by case studies. The standard treatment of most mycotic aneurysms is surgical resection and debridement followed by antibiotic therapy. During the past decade, endovascular repair of aortic aneurysms has demonstrated satisfactory results and has the potential to become mainstay alternative strategy for managing infected aortic aneurysms.

Post-polypectomy Syndrome In A Patient After Colonoscopy With Multiple Polypectomies

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Introduction: The most common complications of colonoscopic polypectomies are bleeding and colonic perforation. However, post-polypectomy syndrome is a rare, but known, complication that should be recognized.

Case: A 79-year-old woman, with multiple medical problems, presented to the hospital with metabolic encephalopathy secondary to severe hyponatremia from excessive fluid intake. Hyponatremia had successfully resolved with fluid restriction. During the hospital stay, her hemoglobin dropped from 11.8 gm/dL to 7.7 gm/dL, and guaiac stool test was positive. Physical examination was benign, and no evidence of upper gastrointestinal bleed or gastrojejunostomy tube aspiration or blood was noted. After one unit of blood transfusion, hemoglobin stabilized. Colonoscopy showed multiple diverticula in the sigmoid colon without any evidence of bleeding. Multiple polyps ranging from 8 mm to 12 mm in size were also observed in the cecum, ascending colon, transverse colon, sigmoid colon, and rectum. Most of these polyps showed evidence of bleeding from the surface. Multiple polypectomies were performed to remove these polyps, and multiple endoclips were placed in the cecum and transverse colon. Biopsy of the polyps revealed tubular adenomas in the cecum, ascending colon and transverse colon, and tubulovillous adenomas in the sigmoid colon and rectum. Twelve hours after the procedure, the patient complained of severe diffuse abdominal pain. Physical examination revealed diffuse abdominal tenderness even with light palpation and no guarding. White blood cell count was normal (10,400 cells per mL) and hemoglobin was stable (11.7 gm/dL). Abdominal radiograph did not show free air. Computed tomography of the abdomen revealed no free air, but wall thickening of the cecum and proximal ascending colon. Based on imaging and laboratory testing, usual complications of colonoscopy, including colonic perforation and bleeding, were excluded. Because of persistent abdominal pain, treatment with ciprofloxacin and metronidazole for five days was started for post-polypectomy syndrome. The patient improved clinically.

Discussion: The most common complications of colonoscopic polypectomies are bleeding and colonic perforation. Post-polypectomy syndrome is also a complication present in about 0.5% to 2% patients.¹ The thermal energy that is used during polypectomy sometimes extends beyond the mucosa deep into the serosa leading to localized peritoneal inflammation, and consequently, local peritonitis.¹ The patients usually present between 12 hours and five days after polypectomy with localized abdominal tenderness, guarding, fever, and leukocytosis.² The risk increases with polyps greater than 20 mm in size due to increased amount of energy used.¹ Based on this case, large size of polyps seemed to be a risk factor. Post-polypectomy syndrome clinically presents similarly to perforation², but management and prognosis are different. Perforation presents with free air on abdominal radiograph and computed tomography. Post-polypectomy syndrome lacks presence of free air, but can present with focal colonic wall thickening on abdominal computed tomography.² Treatment for post-polypectomy syndrome includes broad-spectrum antibiotics, intravenous hydration, and bowel rest.³ Diagnosis of post-polypectomy syndrome should not be missed because, although, an uncommon complication of colonoscopic polypectomy, it can cause significant distress to the patient, and also has a definitive treatment without long-term sequelae.

Elephantiasis Nostras Verrucosa: A Dermatological Manifestation of Obesity

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Introduction: It is well known that there are many concerning medical conditions associated with obesity. Often underappreciated at the bedside are its dermatological manifestations. Considering the rise in the number of obese patients today, it is logical to speculate that primary care providers will start seeing a larger spectrum of such dermatoses in the future, particularly if these patients do not receive regular preventative health screenings aimed at controlling their BMI. One such cutaneous manifestation of obesity is elephantiasis nostras verrucosa (ENV). Here we examine the presentation of an obese woman with bilateral lower extremity hyperkeratosis, lichenification and verrucous eruptions with a cobblestone-like appearance.

Case: An 85-year-old obese (BMI 32.5) Caucasian woman was found to have lower extremity skin deformities upon presentation to the emergency department for acute mental status change. She did not receive regular medical care and was unable to recall when the leg changes began. Examination of the lower extremities revealed malodorous, significantly enlarged, non-pitting, hyperpigmented, verrucous, cobblestone-like lesions extending from the anterior surface of the distal dorsum of the foot to the tibial plateau, bilaterally. The right leg was more edematous than the left and contained multiple, depressed, excoriated ridges embedded within the hyperkeratosis. Foot examination revealed bilateral dorsal hyperkeratosis with discoloration and hyponychium of the toenail plates. There was a positive Kaposi-Stemmer sign bilaterally. Remaining dermatologic full-body exam revealed multiple abdominal striae and several axillary acrochordons. Lower extremity venous duplex Doppler ultrasound revealed normal duplex waveforms, compressibility and augmentation during calf compression with normal color flow. Relevant laboratory findings included a urinary analysis, which revealed a concurrent urinary tract infection demonstrated by a urine culture of 4+ *E. cloacae*. The patient was treated for her urinary tract infection and discharged to a skilled nursing facility. She refused any type of intervention for her lower extremity deformities.

Discussion: Elephantiasis nostras verrucosa (ENV) is one of four subtypes of elephantiasis characterized by dermal fibrosis and epidermal changes consisting of verrucous, hyperkeratotic and papillomatous lesions. Its unique pathophysiology has been linked to chronic lymphedema, which in itself has multiple etiologies; one of which is obesity. Based on the clinical presentation and ultrasoundography, we were able to conclude that obesity was the driving factor behind the pathogenesis of ENV in our patient. Her poor hygiene served as a catalyst.

It is important for practitioners to familiarize themselves with not only the common dermatoses of obesity, such as striae, acanthosis nigricans or acrochordons, but also those whose incidence may be on the rise. A thorough dermatological evaluation of obese patients should be encouraged at all routine physical examinations to protect and prevent physiological alterations from occurring in the skin.

A Classical Misnomer To Consider: Gallstone Ileus

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Introduction: Resulting from a biliary-enteric fistula, gallstone ileus is an infrequent complication of cholelithiasis. Due to its high morbidity and mortality, it must be included in the differential diagnosis of small bowel obstruction. Gallstone ileus accounts for 1 to 4 percent of all cases of mechanical obstruction and 25 percent of non-strangulated small bowel obstructions in patients over 65. Our patient presented with acute abdominal pain, after 3 weeks of constipation, and was found to have a 3.5cm gallstone in the ileum.

Case: A 69 year-old female presented to the Emergency Department with acute onset sharp abdominal pain that awoke her from sleep the night prior. Pain was reported as diffuse and 10/10 in severity, with mild improvement upon administration of medication in the Emergency Department. Associated symptoms included nausea, vomiting, and dry heaving. Last bowel movement was 3 weeks prior, which was a large volume diarrhea. The past medical history included hypertension, hyperlipidemia, and diabetes; past surgical history included hysterectomy, bilateral tubal ligation with appendectomy, and L5-S1 laminectomy. Vital signs on admission were 97.7 F, heart rate 88, blood pressure 102/59 mmHg, respiratory rate 20, oxygen saturation 98% on room air. On abdominal exam, patient was non-distended, with positive bowel sounds. There was diffuse tenderness on palpation, yet rebound or guarding was not appreciated. Remainder of the exam was normal. Laboratory data included leukocyte count 9500/mm³, hemoglobin 15 g/dL, hematocrit 46%, platelets 271, 000/mm³, sodium 134 mEq/L, potassium 5.2 mEq/L, carbon dioxide 23 mmHg, blood urea nitrogen 27 mg/dL, creatinine 0.7 mg/dL, glucose 337 mg/dL. With the exception of an alkaline phosphatase of 110 U/L, liver function tests were normal. Due to concern for small bowel obstruction, CT scan of the abdomen and pelvis with contrast was ordered. Imaging revealed dilated stomach and bowel loops and an intraluminal filling defect in the right lower quadrant consistent with a gallstone. The gallbladder was decompressed with gas extending from the adjacent duodenum through a fistulous connection. A diagnosis of small bowel obstruction with gallstone ileus was made and the patient was taken to the operating room for an exploratory laparotomy in which the stone, 3.5cm in length, was easily identified 1 foot from the ileocecal valve and removed with an enterotomy. The fistulous connection between the gallbladder and duodenum was left intact. The degree of inflammation was so great that disruption of the fistula would have resulted in a large hole within the duodenum that would have been problematic to close; these fistulous connections often close spontaneously.

Discussion: While small bowel obstructions are most commonly caused by adhesions or hernias, patients over the age of 65 presenting with severe abdominal pain must have gallstone ileus included in the differential diagnosis. The most common accompanying symptoms are nausea, vomiting, and constipation, all of which can be intermittent as the gallstone travels through the small bowel before becoming impacted in the ileum. Although our patient presented acutely and was diagnosed within 24 hours, more often diagnosis is made 3 to 8 days after the onset of symptoms.

A Case of Sandifer Syndrome in a Four Month Old Infant

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Introduction: Gastro esophageal reflux is very common in infants and can occur in up to 50% of children aged 0-3 months. Manifesting as spitting up, it is most often a benign condition managed with conservative therapy. However, approximately 1 in 300 children develop GERD, requiring medical treatment. GERD commonly presents with poor weight gain and esophagitis causing irritability, pain and feeding problems. However it can occasionally present as paroxysmal muscle spasms, a condition termed Sandifer syndrome.

Case: A 4 month old baby girl presented with a 9 week history of intermittent episodes of muscle spasms with head turning in a torticollis like fashion and internal rotation of the arms accompanied by crying. She initially presented to the emergency room with head turning to the right and clenching of her right fist. Her neurological exam at this time was negative. Over the following 9 weeks her episodes continued and she received a neurologic workup including two EEGs, one occurring during an episode of muscle spasm, which were not consistent with epilepsy. A structural MRI was also performed, showing no abnormalities. In addition, she received a full physical therapy evaluation which revealed full ROM of the head and neck, the attainment of all developmental milestones, and no evidence of torticollis. Due to the intermittent nature of these episodes, inconsistent with torticollis, and a negative neurologic workup, a consultation was sought in our office. At the time of our meeting, medical history did not reveal any fevers, feeding difficulties or weight loss. There was no apparent provocation for these incidents. In between episodes the infant had no stiffness and appeared to be in normal health. Upon physical examination she was a healthy appearing child with no neurologic deficits or other significant findings. Based on her symptom history, a diagnosis of Sandifer syndrome was made. She was prescribed ranitidine and follow up was scheduled with her primary care physician as well as a pediatric gastroenterologist. After being on the ranitidine for several days the patient is no longer having full blown episodes. She does experience some intermittent stiffness and posturing which is being treated with physical therapy and stretching exercises.

Discussion: This case highlights the importance of understanding the variety of presentations of GERD. Awareness of the less prevalent way this illness presents could potentially avoid a costly workup for neurologic and structural causes, avoid initial misdiagnosis and expedite treatment. It is important for common diseases to remain on the differential diagnosis, even if typical features are not present.

A Case of Mycoplasma Pneumoniae Related Erythema Multiforme

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Introduction: *Mycoplasma pneumoniae* is a well-known cause of community-acquired respiratory illness. However, extra-pulmonary manifestations of the infection are becoming more apparent including neurologic, musculoskeletal, and dermatologic presentations. One such presentation is erythema multiforme/Steven Johnson Syndrome. Here we discuss a patient who experienced worsening skin lesions and mucosal ulcerations after a self-limiting episode of fever, fatigue, and non-productive cough approximately 2 weeks prior to presenting at our hospital.

Case: 20 year old Hispanic female, with no significant past medical history, presented with worsening skin lesions of one week duration. The lesions began on her right lower extremity and quickly spread symmetrically to her arms, trunk, palms, and soles, as well as her oral mucosa. Approximately one to two days after the onset of the rash she noticed the lesions on her vulva, which were associated with hematuria and dysuria . She described the lesions as raised and circular with a central area of "pus" and surrounding redness. She stated the lesions were intensely pruritic and painful and that she had never experienced lesions similar to those before. Two weeks prior to her presentation, the patient reported experiencing gradual onset of fever and fatigue along with a persistent, non-productive cough that resolved on its own. The patient stated she presented to a nearby hospital approximately one day after the lesions appeared and returned there twice more. During this time she was placed on Acyclovir, Cephalexin, and Azithromycin. She denied any animal/insect bites or sick contacts but stated she had traveled to the Dominican Republic six months prior and had been with a new sexual partner for the past month without any contraceptive use. Vitals on admission were T: 101.6°, BP: 101/74, HR: 121 RR: 18 O₂: 99% RA. Physical exam revealed an alert age-appropriate female with bilateral conjunctival erythema and ocular discharge as well as swollen ulcerated lips and diffuse raised red target-like lesions with central erosions over trunk and extremities including palms and soles. Pertinent laboratory data revealed CBC and CMP within normal limits, an elevated ESR and CRP, negative Hepatitis markers for HCV and HBV, negative rapid HIV screen, negative *Legionella* antigen, negative HSV-1 and HSV-2 DNA, negative HSV-1 IgG, positive HSV-2 IgG, and positive *Mycoplasma* IgG and IgM. A punch biopsy of a lesion on the patient's lower extremity revealed marked epidermal spongiosis with blister formation containing neutrophils and degenerated keratinocytes in a background of mild chronic superficial perivascular inflammation. The patient was continued on intravenous fluids and 100 mg of methylprednisolone with discontinuation of all other antibiotic and antiviral therapies. She began to show symptomatic and clinical improvement and on day 6 of admission was discharged.

Discussion: This case illustrates the potential for severe cutaneous presentations secondary to a *Mycoplasma pneumoniae* infection. While *Mycoplasma pneumoniae* more commonly causes a self-limiting respiratory infection, it is crucial that the clinician also recognize the various other disease processes associated with infection by this organism so that prompt and appropriate treatment can be initiated.

Case of a 49 Year Old with Newly Discovered Metastatic Lung Cancer

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Introduction: Although screening for lung cancer in high risk individuals using imaging studies has been discussed and studied for many years, there have been no randomized trials that have demonstrated a mortality benefit with the practice of screening. Recently in 2012, the National Lung Screening Trial was the first study to show a mortality benefit in asymptomatic smokers with at least a 30 pack year history using the screening method of low dose CT imaging. Additional studies using CT screening are also ongoing, yet inconclusive to date.

Case: A 49 year old male with a newly discovered lung mass and likely metastasis to his kidneys, liver, and bone presented to the emergency department at Central Maine Medical Center (CMMC) with symptoms of a cough with sputum, occasional hemoptysis, and dyspnea. Three weeks previous to presenting to the emergency department, he went to his primary care physician at a small rural hospital in Farmington, ME with what he thought was a chest cold and complained of pain on his left side. A chest x-ray was obtained and findings were consistent with a primary diagnosis of a right lung mass. Further imaging by CT with angiography at CMMC confirmed a large mass in the region of the right hilum with extensive involvement of the mediastinum, measuring at least 7 cm and causing severe compression of the right main pulmonary artery, right main stem bronchus and their branches, right lung atelectasis, and possible left lung pneumonia. Over 24 hours previous to admission, his breathing had become more labored and he had increased neck and back pain, as well as discomfort of his chest, flanks, and bilateral leg pain. His review of systems revealed worsening constitutional symptoms. Negative review of systems included bruising, headaches, hearing loss, change in smell, cyanosis, and constipation. Lung biopsy by bronchoscopy revealed invasive, poorly differentiated, non-small cell carcinoma. Prognosis for his diagnosis, per oncology, was 1-2 years.

Discussion: The risk of developing lung cancer for a current smoker of one pack per day for 40 years is approximately 20 times that of someone who has never smoked. Also, patients who are chronic smokers are also more likely to have chronic obstructive pulmonary disease, recurrent infections, pneumonia, multiple doctor visits and admissions. Lung cancer symptoms can mimic more benign conditions common to smokers and include: Cough (50-75%), hemoptysis (25-50%), dyspnea (25%), and chest pain (20%). Therefore, in a busy primary care office, it is easy to overlook and difficult to diagnosis lung cancer especially with multiple comorbid conditions.

Due to the high mortality rate of lung cancer and the high prevalence of cancer among smokers, it is important to remember to use modalities such as x-ray imaging in order to rule in or out common comorbid illnesses, as well as screening asymptomatic high risk individuals for lung cancer using low dose CT imaging with the potential for discovery of malignancy and overall reduction of mortality. This is particularly important for patients who are smokers who also have comorbid illnesses. In addition, for further workup for non-resolving symptoms of cough, hemoptysis, dyspnea, and/or chest pain, a low dose CT-scan should be considered. Potentially, with screening methods, this young 49 year old patient could have had a better prognosis.

Severe Hirsutism in a Patient with Dysmenorrhea: An Unusual Presentation of Polycystic Ovarian Syndrome

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Introduction: Menstrual irregularity and hirsutism, or unwanted hair growth, are concerns that frequently lead women to seek medical care. Physiologically, the presence of the two in tandem can suggest significant hormone imbalances and must be investigated for underlying pathology such as neoplasm or endocrinopathy. Polycystic ovarian syndrome (PCOS) is the cause of hirsutism in 75-80% of all cases, and normally presents with findings of obesity, insulin resistance, hyperlipidemia, and a lack of virilization in addition to hirsutism and multiple ovarian cysts. This case explores a hirsute patient diagnosed with PCOS despite absence of these symptoms, and demonstrates the complexity of expression of polycystic ovarian syndrome.

Case Discussion: The patient is a twenty-one year old woman who was referred to the gynecologist from her primary care physician after complaining of oligomenorrhea. She reported beginning her menses at sixteen years of age and experiencing somewhat regular menses from age eighteen to twenty. Over the past year, she became concerned by the increasing irregularity of her menstrual cycles and reported that she did not menstruate for two consecutive months with only "light spotting" in the month prior to her gynecological visit. During the interview the patient's significant facial hirsutism and somewhat masculine facial structure and body habitus were readily apparent. On physical exam, the patient was noted to have extensive male pattern hair growth of the face, chest, abdomen, genitalia, legs, and back for a modified Ferriman-Gallway hirsutism score between 23-30 out of a potential 36. Her breasts were consistent with Tanner stage II and cliteromegaly was present. A full work-up for hirsutism showed appropriate DHEA sulfate (171 ug/dL) and 17-OH progesterone (130 ug/dL) levels for a female of her age, with an elevated free serum testosterone of 94 ng/dL. A CT scan of her abdomen and pelvis was unremarkable except for one large cyst, a smaller potential cyst, and multiple ovarian follicles. Despite significant hirsutism and a complaint of oligomenorrhea, the patient's DHEA sulfate, 17-OH progesterone, and free testosterone levels were reassuring suggesting against neoplasm, Cushing's syndrome, 21-hydroxylase deficiency, or all other known hirsute conditions. She therefore met the criteria for polycystic ovary syndrome (PCOS) as established by the American Endocrine Society.

Discussion: The patient was started on an estrogen-progestin oral contraceptive. Many women with PCOS respond to an oral contraceptive in that it reduces hirsutism, normalizes their menses, and offers the added benefit of reduced endometrial hyperplasia and risk of neoplasm.

Tuberculosis Peritonitis: An Elusive Diagnosis in a Patient with Ascites and Spiking Fever

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Introduction: Tuberculosis (TB) peritonitis is an infection of the peritoneum caused by *Mycobacterium tuberculosis*. With an incidence of 2 persons per one million annually, TB peritonitis is one of the rarest extra-pulmonary presentations of TB. It most commonly develops when mycobacterium from a primary lung focus is hemotogenously spread to the peritoneal wall, resulting in granulomatous tubercle formation. HIV, immunocompromised, immigrant, and peritoneal dialysis patients are at higher risk. Unfortunately, tuberculin skin testing and peritoneal fluid analysis are often inconclusive. Culture is definitive but suboptimal due to its 4-8 week incubation period. Studies suggest that up to 50% of patients with untreated TB peritonitis die within 6 weeks of presentation, which means many patients die awaiting culture results. *Mycobacterium* culture is the gold standard test.

Case: A 62-year-old Honduran male with a past medical history of chronic kidney disease, diabetes and hypertension, presented with complaints of myalgias, anorexia, nausea, vomiting and abdominal pain for the preceding two weeks. He also noticed increasing abdominal distention and a ten pound weight gain despite his anorexia over this period. Vital signs on admission showed blood pressure 155/72, pulse 77, respirations 18, temperature 97, and O2 saturation 100% on room air. Physical exam revealed a distended abdomen with hypoactive bowel sounds and right upper-quadrant tenderness. Labs revealed WBC 8.6, hemoglobin 6.4, hematocrit 18.9, BUN 157 and creatinine 15.2. He was admitted for uremia in the setting of end-stage renal disease and was started on hemodialysis. After transfusion he was started on Procrit for anemia. On day two the patient developed a fever of 100.7 without obvious source of infection. Fever of unknown origin was worked-up with urinalysis and multiple blood, line and stool cultures, which were all negative. Autoimmune and infectious disease work-ups were also negative and PPDs failed to indurate after 72 hours. Computed Tomography (CT) was ordered to evaluate his increasing abdominal distention and revealed severe ascites in the mid-abdomen and pelvic inlet. Cirrhosis and heart failure were ruled out as causes with CT and Transesophageal echocardiogram. Ascitic fluid analysis showed a lymphocyte predominant WBC count of 470, ADA 30.4 U/L, albumin 2.2 g/dl, and LDH 182 U/L but preliminary culture and TB PCR returned negative. Procrit was discontinued for suspicion of drug fever but his temperature continued to spike up to 104 degrees F daily. Chest x-ray showed small bilateral pleural effusions but thoracentesis was negative for TB. CT of the chest revealed a 7mm calcified granuloma in the right middle-lobe but biopsy was subsequently negative. On day 23, the patient underwent exploratory laparoscopy that revealed numerous small white implants on the bowel, peritoneum and omentum, highly suspicious for peritoneal TB. Biopsies showed granulomatous inflammation also strongly suggestive of TB. He was treated with isoniazid, rifampicin, pyrazinamide, and ethambutol and within two days his fever resolved.

Discussion: Due to its lack of pathognomonic signs and symptoms TB peritonitis tends to be diagnosed late in its clinical course. Therefore, a presentation of ascites, fever, and abdominal pain in those at increased risk should raise strong suspicion. Despite a high level of suspicion and a 30 day hospital stay with an extensive TB workup, it was only after laparoscopy that the diagnosis of TB peritonitis was made and the patient was successfully treated. Laparoscopy is sensitive (93%), specific (98%) and rapid. Our case supports that it is a valuable and expeditious diagnostic tool for TB peritonitis.

Case Report: Wernicke-Korsakoff Syndrome

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Introduction: Wernicke-Korsakoff syndrome is a neurological manifestation of thiamine deficiency often seen in chronic alcoholics. Wernicke's encephalopathy (WE) is the first stage of the disease, presenting with the classic triad of encephalopathy, ophthalmoplegia, and ataxia. Korsakoff syndrome (KS) is a later stage of the same disease, characterized by anterograde and retrograde amnesia, confabulation, impairments in attention and concentration, and lack of insight or complete denial of illness. This case study highlights a situation where a patient failed to disclose the extent of their alcohol abuse history.

Case: Our patient was a 59-year-old Caucasian man who presented for a scheduled vascular surgery procedure; namely aortobifemoral bypass for aortic occlusive disease. There was some indication pre-operatively that the patient had issues with alcohol abuse; however, there was no documented history of alcohol dependence. Additionally, probably for a multitude of reasons unknown to this writer, the patient and his family minimized his alcohol use. On postoperative day two, the patient became confused, lethargic and underwent respiratory failure requiring intubation. His surgeon quickly identified delirium, and suspecting WE ordered IM and IV thiamine, along with initiating a Clinical Institute Withdrawal Assessment (CIWA) with Lorazepam. At that point the patient's wife disclosed to the treatment team that she believed her husband was an alcoholic, and that he was frequently abusing alcohol just prior to surgery. Neurologic and psychiatric consultations provided treatment recommendations for his WE, however by postoperative day twenty-two he remained ataxic, irritable, unable to follow simple instructions, disoriented to place and time, and appeared to be responding to visual hallucinations. At that point Risperidone, an atypical antipsychotic, was added as a standing dose to his medication regimen. Nursing staff was instructed to utilize atypical antipsychotics in the place of benzodiazepines for acute agitation due to concerns that the benzodiazepines were actually disinhibiting him rather than acting favorably towards behavioral control. Subsequently, with the addition of a second atypical antipsychotic, Quetiapine, his behavior improved, along with his sleep, appetite, and he was no longer ataxic. However, he remained inattentive, exhibited profound impairments in retrograde amnesia, and he began confabulating. At that point the suspected diagnosis of KS was made, and by postoperative day forty-four, against medical advice, the patient was discharged to the care of his wife despite recommendations for him to be placed in a rehab facility.

Discussion: Rapid assessment and treatment of thiamine deficiency is paramount in the prevention of Korsakoff syndrome. This case not only demonstrates the clinical manifestations of Wernicke-Korsakoff syndrome, but it also highlights several social and psychological factors that complicated this particular clinical course. Specifically, this case illustrates the social stigma related to substance abuse and mental health issues, as well as the pathologic psychological codependency between the patient and his wife (e.g. wife's enabling of the patient's alcoholism).

Postmenopausal Bleeding in a Woman with an IUD Retained for 42 Years

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Introduction: The intrauterine device (IUD) is a widely utilized method of contraception that was first popularized in the 1950s. The first modern IUD was available in the 1920s and by the early 1970s, a variety of devices were available to women in the US, including the Lippes Loop. The Lippes Loop was removed from the market in 1985 due to a decline in IUD use and a new FDA rule that would require further clinical studies to obtain premarketing approval. The clinical studies included an investigation of the safety of leaving the IUD in situ when contraception is no longer indicated.

Case: A 69 year old gravida six, para four, abortus two female with a past medical history of hypertension and morbid obesity presented to a family medicine clinic with of post-menopausal bleeding. She described a three month history of three episodes of vaginal bleeding, each lasting less than two days. The patient denied prior episodes, pain with bleeding, or abdominal pain. Physical examinations of the cardiac, respiratory, and abdominal systems were benign. The gynecologic speculum exam revealed strings emerging from the cervical os, but no evidence of bleeding. The bimanual exam demonstrated no palpable uterine masses or adnexal tenderness. When asked about an IUD, she recounted that she had one placed 42 years ago, following the birth of her fourth child. She reported that she had not had it removed because, although she no longer needed contraception, the device was not causing any discomfort. To assess for endometrial hyperplasia, an ultrasound was ordered which revealed a homogenous 5mm endometrial thickness. At that time, the patient was referred to the gynecologist for removal of the IUD (suspected of having become imbedded in the uterine wall) and an endometrial biopsy. At this visit, a Lippes Loop IUD was removed without complications and an endometrial biopsy was obtained. The biopsy revealed FIGO Grade 1 endometrial carcinoma and the patient was referred to a gynecologic oncologist for treatment.

Discussion: This case is amongst only two published cases of endometrial pathology discovered in the presence of a retained Lippes Loop and postmenopausal bleeding. It demonstrates that an IUD may be retained for decades before a patient manifests symptoms to alert a provider. The widespread use of IUDs for the past 50 years and unknown prevalence of prolonged retention merits increased screening by primary care physicians. If an examination reveals the presence of an IUD retained after menopause, it is best for the IUD to be removed. Although there are no studies clearly demonstrating risk of prolonged retention, the presence of an IUD may delay necessary diagnostic testing for endometrial pathology. Moreover, this serves as a reminder to all providers that even when a patient presents in the post-menopausal period, a thorough gynecologic history and exam is warranted.

A New Diagnosis of Adult Onset Still's Disease

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Introduction: Adult Onset Still's Disease (AOSD) is a systemic inflammatory disease of unknown etiology with an estimated prevalence rate less than 1/100,000. The characteristic symptom triad includes daily spiking fevers, evanescent erythematous rash, and arthritis. Diagnosis may be delayed as it requires exclusion of infections, neoplasms, and other autoimmune disorders.

Case: A 58 year old Caucasian woman with a history of polymyalgia rheumatica on tapering prednisone, hypothyroidism, and type 2 diabetes mellitus was admitted after 16 hours of fever, vomiting, and non-bloody diarrhea. On admission, review of systems was positive only for 4 days of left arm pain without recent trauma. Examination revealed vital signs within normal limits and decreased range of motion in the left upper extremity secondary to pain. Laboratory studies were significant for WBC 17,100/uL with 9% bands, hemoglobin 9.2g/dL, platelets 718,000/uL, ESR 128 mm/hour, C-reactive protein 19.908 mg/L. Peripheral smear showed toxic granulation and Dohle bodies. Records reviewed from three outside hospitalizations within the previous 6 months revealed similar musculoskeletal complaints, hematologic abnormalities, and elevated inflammatory markers including ferritin levels between 575- 72,000. A recent outpatient ferritin was 27,008 ng/mL.

While hospitalized, the patient developed recurring overnight fevers ranging from 101-103.5 degrees F. Rheumatology, infectious disease, hematology/oncology, and gastroenterology were consulted. On hospital day 4, a transient erythematous maculopapular rash was noted on her shoulders and back. The rash recurred daily with intermittent pruritus and variable distribution over her back, shoulders, neck, and face. Negative workup included shoulder and elbow imaging, shoulder aspirations, blood and urine cultures, EGD, colonoscopy, HIDA scan, and abdominal ultrasound. CT chest/abdomen/pelvis showed diffuse lymphadenopathy. Serology was negative for HIV, tick borne illnesses, ANA, RF, or CCP. Thyroid screen was unremarkable. Iron studies showed serum iron 38 mcg/dL, transferrin 123 mcg/dL, ferritin >1650 ng/mL, and soluble transferrin receptor 2.6 mg/L. PPD was negative. By hospital day 8, the negative infectious workup in combination with her persistent symptomatology and elevated ferritin were deemed sufficient to proceed with an AOSD diagnosis. Prednisone was increased to 45 mg daily and after remaining afebrile for 24 hours, she was discharged. She continues to improve in rheumatology follow up.

Discussion: This case demonstrates the extensive clinical evaluations that may be obtained before arriving at a diagnosis of AOSD given the broad and potentially devastating differential. Diagnosis can be complicated by the disease's rarity, variable presentation, and lack of a specific diagnostic test. This patient had multiple recent hospitalizations and interim outpatient monitoring involving symptoms and signs strongly suggestive of AOSD. Markedly elevated serum ferritin levels are a notorious, yet non-specific, feature of AOSD. This case emphasizes the importance of considering AOSD when a patient has a ferritin level greater than 5 x ULN.

Loperamide Overdose and Torsades de Pointes, a Case of Long QT Syndrome

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Introduction: Long QT syndrome (LQTS) is a condition characterized by a prolonged cardiac repolarization that predisposes a person to life threatening arrhythmias. The QT interval, normally 370ms - 440ms, is a common measurement found on electrocardiogram tracings. LQTS is an acquired syndrome caused by certain medications and/or electrolyte imbalances, however, several genetic mutations in specific cardiac channels have been found leading to Congenital LQTS (CLQTS). According to the literature, the prevalence of CLQTS is about 1:7000. The presentation and age of onset for CLQTS is quite variable and appears multi-factorial. While factors such as stress and QT prolonging medications are known to correlate with symptom onset, it is unclear whether presumed cardiac safe drugs in high amounts have any influence.

Case: A 24 year old homeless female, who no longer has custody of her 3 children, was brought to the emergency room at night for syncope. The patient described an episode of severe anxiety and minor chest pressure that caused her to experience a brief episode of syncope. The patient's history was significant for anxiety and consumption of 20-30 tablets of loperamide throughout the day in an attempt to control opiate withdrawal. In the emergency room the patient experienced a 15 second run of Torsades de Pointes. She was subsequently transferred to the cardiac care unit where she was noted to have a QT prolongation of 600ms and some inter ventricular conduction delays. Metoprolol 25 mg was initiated but ultimately withheld due to bradycardia. Ultimately, a dual chamber pacemaker and internal defibrillator were placed in an attempt to prevent future sudden cardiac death.

Discussion: It is often unclear whether or not previous medications or overdoses play any role in CLQTS symptom onset. According to the literature there have been cardiac related side effects to loperamide overdoses, but evidence of its link to a prolonged QT interval is lacking. This case presents a challenging treatment decision. If a washout period of literature confirmed QT prolonging drugs is unresponsive, the question becomes whether to continue conservative therapy like a beta blocker, or implant a defibrillator. It is a significant life changing decision to put an internal defibrillator in a young female pt prior to an actual confirmed genetic condition. Due to the patient's complicated social history and possible poor medication compliance, an axillary implantable defibrillator was placed to correct any life threatening arrhythmias. This case conveys the treatment and management dilemma a physician faces in the lengthy period of time before CLQTS can be confirmed with genetics.

Acute Brodifacoum Poisoning: A Case Report of Intentional Ingestion of Rat Poison Containing Brodifacoum

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Introduction: Current formulations of the commonly used rat poison, D-Con, contain a second generation of anticoagulants called brodifacoum, often referred to as a “superwarfarin.” This potent anticoagulant is long acting with effects lasting weeks to months after the ingestion. According to the CDC, intoxication of rat poison can “manifest as epistaxis, gingival bleeding, hematemesis, hematuria, hematochezia, menometrorrhagia, ecchymosis, petechial hemorrhages, intracranial hemorrhages, or bleeding.” Unfortunately, since there are currently no restrictions on the sale of these poisons they are readily available. This case shows some of the possible side effects that these poisons can cause when ingested intentionally.

Case: A 22 year old schizophrenic male presented worsening lethargy, weakness, epistaxis, and finally an episode of syncope. He denied any history of trauma. Physical exam was significant only for several large hematomas on his arms, legs, and back. Routine toxicology screening came back negative. Laboratory studies were significant for a hemoglobin of 6.1 and an INR too high to be detected. A detailed medical history revealed that he had recently attempted suicide by drinking ethylene glycol. This prompted further questions about other possible substances that he might have ingested. Patient admitted to ingesting 3 and ½ boxes of D-Con rat poison 7 to 10 days prior to his syncopal episode. After 4 units of fresh frozen plasma and 7 units of packed red blood cells his hemoglobin levels rose to above 7 and the patient was transferred to a larger medical facility. At transfer, his INR was down to 9.01. Poison Control was consulted and the half-life of this poison was determined to be multiple weeks to months. To prevent excessive bleeding during this time, the patient was started on 300mg of Vitamin K orally and would continue this for months while his INR remained high.

Discussion: In 2010, there were 38,364 suicides in the United States, according to the CDC. This case illustrates how important it is to expand our differential toxicology diagnosis when treating patients with known suicidal ideation. There are many legal substances that are readily available to someone who is willing to attempt suicide by ingestion. Given the ease of access, rat poison should be placed high on the list of differentials for possibly suicidal patients who come in with sudden coagulopathies.

Fournier's Gangrene in Women – A Rare Disease with High Morbidity and Mortality

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Introduction: Fournier's gangrene is a rare, life-threatening, necrotizing fasciitis of the urogenital and perineal region. The mortality rate can reach as high as 40% and in some studies, up to 88%. Treatment is emergent radical debridement with aggressive parental antibiotics. This infection has an incidence of 3.3/100,000 men 50-79 years old and is even more rare in women (one woman for every ten men). Affected women often have a predisposing factor such as diabetes or immunosuppression. In those presenting with septic shock and altered mental status, early identification of infection is necessary to decrease morbidity and mortality.

Case Description: A 57-year-old woman with multiple sclerosis and diabetes presented to the ER with an acute mental status change. She was unable to provide an accurate history but family reported complaints of fatigue and abdominal pain for one week. Vital signs were: BP-139/73, P-125, R-20, T-96.7. The patient appeared cachectic, uncomfortable, and delirious. Exam was benign except for a mildly tender, ecchymotic area around a suprapubic C-section scar. BMP revealed Na⁺ 129, Calcium 12.9, Glucose 428. Initial diagnosis was hyperglycemia and hypercalcemia possibly explaining her altered mental status. WBC was 13.8 with 68% bands, HgB 12.5 and platelets 197,000. Peripheral smear showed toxic granulation and vacuolization. CXR was normal. With leukocytosis, severe bandemia, and tachycardia, the patient met criteria for SIRS without an obvious infectious etiology. However, a careful gynecologic exam revealed an abscess of the posterior left vulva draining purulent fluid. Abdominal CT showed numerous gas-bubbles in the abdominal wall tracking to the vulva, perineum and left thigh, as well as around the uterus, cervix and rectum. Upon re-questioning the family, it was revealed there was a vague history of vaginal bleeding, but otherwise there were no genitourinary sign or symptoms. With sepsis and Fournier's gangrene as the new diagnosis, parenteral antibiotics were immediately started and the patient was stabilized for DKA before being sent to the OR for debridement. In the OR, an incision was made from the abdominal wall to the left labia and extending into the perineum and inner thigh. Copious purulent fluid and extensive necrotic subcutaneous tissue was found. Necrotic tissue was sharply dissected and the wound was irrigated with antibiotic solution. The subsequent hospital course included additional debridement of the abdominal wall, flanks and inner thighs, diverting colostomy, parenteral antibiotics and multiple wound vac changes. Wound cultures grew GBS, S. Aureus, E. Coli and Candida. Blood cultures grew GBS. On day-2, the patient went into DIC. She remained intubated and obtunded in the ICU from admission until transfer to Rhode Island Hospital wound care 15 days later. The patient has since been lost to follow up as her care was transferred to another hospital and care team.

Discussion: Fournier's gangrene must be considered as a cause for sepsis in women even though it is exceedingly rare. Risk factors including diabetes and immunosuppression require us to lower our threshold for suspicion, as they are often present in these patients. Our case illustrates the importance of diligent history-taking and physical exam to localize the source when not readily apparent. Small, external lesions in the genitourinary and perineal region are the tip of the iceberg for extensive necrotizing fasciitis. Prompt surgical and antibiotic management is necessary when Fournier's gangrene is suspected, however despite our best efforts, mortality and morbidity remains high.

Inguinal Hernia Containing Endometriosis

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Introduction: Endometriosis within the inguinal canal is exceedingly rare. Upon review of the literature, only 82 cases of inguinal endometriosis have been recorded since 1896. Of those 82, only 30% have included inguinal hernias. Approximately 5-10% of the population will experience a hernia throughout their lifetime. Inguinal hernias are the most frequent groin hernia variant and, although they occur more often in men, women have a 5% lifetime risk of developing one. Additionally, endometriosis is one of the most commonly encountered gynecologic pathologies. Endometriosis consists of ectopic endometrial implants that are usually discovered at extrauterine sites such as the ovaries, rectovaginal pouch, and pelvic peritoneum. While the exact prevalence of endometriosis in the general population is unknown, it is estimated to affect approximately 8-15% of premenopausal women. The following is a unique case demonstrating the co-occurrence of two common pathologies.

Case: A 45 year old nulliparous Caucasian female presented for a surgical consult regarding a right inguinal mass. The patient's extensive review of systems included back pain during the menstrual cycle.. The mass was first noticed by the patient 6 months prior to the consult. The patient had experienced a year of groin discomfort as well as an intentional 15 pound weight loss. The groin discomfort was best noticed when standing and was more difficult to appreciate when lying supine. The mass provided more discomfort than pain. PCP obtained an ultrasound revealing a 2.7 x 1.3 cm inhomogeneous echoic focus suggesting an attached fluid collection. Physical examination during the consult was not explicitly suggestive of a hernia and raised more concern for possible malignant lymphadenopathy. The patient was scheduled for lymphadenectomy the following week. During the procedure, dissection was carried into the external ring and a firm palpable lump was identified. This did not appear to be a lymph node, as it was covered with a smooth membrane and contained within a hernia sac. The sac was then traced up to the internal canal where a right incarcerated inguinal hernia was diagnosed. The hernia sac and contents were sent to pathology for evaluation and ultimately revealed a rubbery tan nodule measuring 2.5 cm x 1.2 cm x 2.0 cm that was covered by a smooth mesothelial-like lining and contained endometriosis.

Discussion: In the instance of a groin mass, it is important to obtain a detailed reproductive history from the patient, as symptoms such as cyclical pelvic pain and/or infertility may lead the provider to consider gynecologic involvement. This case illustrates that when a female of reproductive age presents with a groin mass, the provider should include a detailed gynecologic review of system with endometriosis included within a broad differential diagnosis.

Chronic Mesenteric Ischemia In Severe Atherosclerotic Disease

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Introduction: It is imperative to recognize that chronic mesenteric ischemia may be the manifestation of diffuse underlying vascular disease. Our patient presented only with post-prandial abdominal pain, nausea and an associated weight loss. After extensive work-up, she was found to have diffuse atherosclerotic disease with coronary, aortic and mesenteric involvement and an extensive collateral circulation.

Case: A 77-year old woman presented to our hospital with a two-month history of post-prandial abdominal pain associated with, nausea, loose stools and a 15 pound weight loss. This patient had been evaluated at multiple hospitals for the same symptoms with no definitive diagnosis. Vital signs on admission were temperature 97.9°F, heart rate 91 and regular, respiratory rate 18, blood pressure 96/54 mmHg, and oxygen saturation 98% on room air. Laboratory studies were significant only for an elevated Troponin I level of 1.39ug/L to 1.52ug/L and a mildly elevated CK-MB fraction of 3.8. Cardiology and Surgery consults were obtained. Serial 12-lead EKGs, an echocardiogram with color Doppler, and a nuclear medicine stress test confirmed the presence of an NSTEMI with severe coronary artery disease. A Doppler ultrasound of the lower extremities revealed significant bilateral arterial insufficiency. An MRA with IV contrast of the abdomen was performed and the results were impressive. The test revealed complete occlusion of the infra-renal aorta, superior mesenteric artery and inferior mesenteric artery with the entire small and large bowel being perfused by collaterals from the celiac axis which was itself narrowed. Due to these findings, the patient was a poor candidate for open surgery. The patient was kept nothing by mouth (NPO), kept on Acute Coronary Syndrome (ACS) protocol and was sent to the cardiac catheterization lab where angiography of the coronaries and other major vessels was done. At this time, percutaneous transluminal angioplasty (PTA) of the right subclavian artery was also performed. On day three, vascular surgery attempted angioplasty with stent placement of the celiac artery but was not successful due to severe stenosis of the aorta. During her stay, she continued to have periodic, resolving, supraventricular contractions with mild hypotensive episodes that the patient was unaware of. Upon stabilization, the patient was discharged to follow-up as an outpatient and to return for angioplasty. A repeat attempt to stent the celiac artery was successfully completed one month later. The patient is currently reported to be stable with improved symptoms. Future procedures to relieve extensive stenosis may be required but medical management is preferred at this point in time.

Discussion: Diffuse and severe atherosclerotic disease may present with few symptoms but poses a large risk of future vascular events including; myocardial infarction, mesenteric ischemia, cerebrovascular accidents, ischemic extremity and organ hypo-perfusion, necrosis and failure. Furthermore, Coronary artery disease with reduced cardiac function may decrease blood perfusion to already narrowed vessels, exacerbating tissue hypoxia. In patients like this, who present with post-prandial abdominal pain, extensive work-up must be done with a high index of suspicion for mesenteric ischemia. If stenosis is severe, revascularization procedures may be performed to avoid potential bowel infarction and death.

Simultaneous Rupture of the Anterior Cruciate Ligament, Medial Collateral Ligament and Patellar Tendon in a Collegiate Athlete

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Introduction: Patellar tendon rupture in combination with an anterior cruciate ligament (ACL) injury +/- a medial collateral ligament (MCL) injury is a rarely reported injury pattern.

Case: We report a case of a 20-year-old collegiate athlete who sustains a simultaneous rupture of his patellar tendon, ACL and MCL while playing football. He was treated in a staged manner with acute primary repair of the patellar tendon followed by a 3 month rehabilitation period. Reconstruction of the ACL with bone-patellar tendon-bone allograft was then performed. The MCL was treated conservatively given its stability with valgus load at 30° after ACL reconstruction. At 6 month follow up he had a Lysholm score of 70, an IKDC score of 80.46 and a 2mm side-to-side difference on KT-1000.

Discussion: There are 6 reported cases of simultaneous rupture of the patellar tendon and ipsilateral ACL. There are 8 reported cases of simultaneous rupture of the patellar tendon and ipsilateral ACL and MCL. There has been no consensus amongst these 14 cases on management of this complex knee injury. We review the literature on this complex injury pattern and propose a treatment algorithm for the management of these combined knee injuries.

Autologous Hematopoietic Cell Transplantation and Risk of Secondary Malignancy

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Introduction: Multiple myeloma accounts for 1% of all cancers in the US, about 10% of hematologic malignancies in the US. While the initial therapy for multiple myeloma is autologous hematopoietic cell transplantation (HCT), the treatment is not without its own risks. One of the most significant risks is the development of future malignancies. Our patient presented 7 years after stem cell transplant for multiple myeloma with 2 weeks of bleeding gums and pancytopenia, and was subsequently diagnosed with myelodysplastic syndrome.

Case: A 59 year-old Portuguese woman presents to our hospital with bleeding gums over the last two weeks. She had been diagnosed with multiple myeloma in 2001, and received autologous stem cell transplants in 2005 with two years of maintenance thalidomide after that with notable remission. Since then, she has had imaging studies to evaluate for remission, including PET scans and MRIs as well as blood work. The patient had been asymptomatic with no bruising or petechiae, and her labs from August 2012 showed a white blood cell count of 4.5, platelets of 85, and a hemoglobin of 12. A total body PET-CT done in January 2012 showed no FDG avid masses or adenopathy. But in the last two weeks, she has observed that she was having bleeding in her mouth and bruising on her back, arms, and legs, as well as tiny red spots on her lower legs over the last few days. Vital signs on admission were temperature 97.2°F, heart rate 74, respiratory rate 16, blood pressure 119/75 mmHg, and oxygen saturation 98% on room air. Laboratory studies were significant for pancytopenia: leukocytes 2400/uL, hemoglobin 7.8 g/dL, hematocrit 23.1%, and platelets 7000/uL. Peripheral blood smear showed no schistocytes, blasts 3-5%, lymphocytes, and nucleated erythrocytes. A bone marrow biopsy was performed to determine the etiology of the pancytopenia. The pathology report identified an increased number of atypical megakaryocytes, consistent with myelodysplastic syndrome.

Discussion: This patient had a past history of multiple myeloma, which was treated with three autologous HCTs, who presented with new pancytopenia, which was diagnosed as myelodysplastic syndrome. HCT carries the risk of developing future malignancies, such as acute leukemia, myelodysplastic syndrome, and solid tumors including non-melanoma skin cancer, squamous cell cancer of the oral cavity, and breast cancer. Cumulative incidences of myelodysplastic syndrome or acute leukemia were found in one study to be 3.1% at 5 years, 4.5% at 10 years, and 15% at 15 years. Studies have estimated a cumulative incidence rate of solid tumors secondary to autologous HCT at 4% at 10 years.

Idiopathic Pulmonary Fibrosis: A Case Study, Approach to Diagnosis, and Research.

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Introduction: IPF is a less common form of lung disease with an approximate prevalence of 14–42.7 per 100,000 in the US in 2006 or 26 per 100,000 in the European Union in 2012. Despite these numbers, the life expectancy from the time of diagnosis is 2–3 years. When a patient presents with worsening shortness of breath, it is worth doing a thorough work up, because often, this illness can be overlooked and misdiagnosed as COPD. Once the diagnosis is made, the patient needs to be directed to treatment, or research, because unfortunately, this disease has an ill-fated course.

Case: A 67-year-old male came to the pulmonary clinic for shortness of breath, which he had for a number of years but seemed worse over the past 6 months. He was a 1.5 pack per day smoker for 48 years until he discontinued 7 years ago. He had a CT scan in 2009 showing abnormal lymph nodes but had bronchoscopy at that time with a negative transbronchial needle aspiration. He has a history of squamous cell carcinoma of the tongue treated surgically in 2009. He also underwent evaluation for obstructive sleep apnea but was not currently being treated with CPAP, because he could not tolerate it. He notes a shortness of breath occurs with one flight of stairs, sometimes less. He has an albuterol inhaler, although he rarely uses it, because he does not think it helps much. He has no history of asthma or seasonal allergies. He denies any cough, sputum, wheezing, chest pain, or syncope. He denies any history of blood clots, hemoptysis, tuberculosis, or lung cancer. The patient was found on physical exam to have a few crackles at the lung bases. A recent chest x-ray showed increased interstitial markings, more so than in the film from 2010. His CT scan showed peripheral and basal interstitial lung disease with honeycombing and a question of emphysematous cysts. His most recent spirometry was normal. The question is whether his CT changes are due to emphysema with fibrosis or an idiopathic pulmonary fibrosis, given the worsening CT finding over a 3-year period. The next steps were to rule out connective tissue disease, so RF, ACE, and ANA were ordered. The patient planned to return in 6 weeks and then in 6 months for complete pulmonary function testing. For symptomatic relief he planned to lose weight. Should this be IPF, any respiratory illness superimposed on the fibrosis will be treated. Should he want more definitive treatment, a clinical study could be offered to him.

Discussion: Given this case, it is important to understand the stepwise diagnostic approach in lung disease and the consideration of differential diagnoses each step of the way. Over the past decade, the definition of IPF has grown more specific, differentiating itself from other ILD's. The definition of IPF: a chronic fibrosing interstitial pneumonia of unknown cause, with a histologic pattern of usual interstitial pneumonia (UIP) on surgical lung biopsy. Although a lung biopsy is not critical, an appropriate substitute would be high resolution CT image. Overall, four diagnostic criteria are required: 1. Exclusion of other causes of ILD. 2. Abnormal pulmonary function tests or impaired gas exchange. 3. Bibasilar reticular abnormalities with minimal ground glass opacities on HRCT. 4. Transbronchial lung biopsy or bronchoalveolar lavage specimens without features to support alternative disease. Despite a more specific diagnosis, the options for an effective treatment are still minimal. Historically, the approach had been to use corticosteroids and other immune modulators such as azathioprine or cyclophosphamide to reduce what was thought to be a reactive immune response in the lungs. However, as recent as 2008, these modalities have proven to be ineffective or even detrimental in the outcome of IPF. Since then, the recognition of increased fibroblasts in the lung tissue of IPF patients has refocused research, targeting the fibrosis cascade, angiogenesis, hormonal influences, and alternative inflammatory pathways. Although many trials have led to dead ends, the molecule pirfenidone, a pyridine with anti-inflammatory, antioxidant, and anti-fibrotic properties, has been approved for treatment of IPF in the European Union. This molecule alters the expression, synthesis and possibly the accumulation of collagen, and it inhibits the recruitment, proliferation, and expression of extra cellular matrix cells.

Adult Granulosa Cell and Thecoma/Fibrothecoma Tumor of the Ovary in Pregnancy

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Introduction: The occurrence of ovarian tumors diagnosed during pregnancy is rare, with an estimated incidence of 0.11 per 1000 pregnancies. About 10% of granulosa cell tumors (GCT), a type of sex cord-stromal tumor of the ovary, present in pregnancy. GCT is a very rare form of neoplasm that has the tendency to be malignant. It can present as a large mass with a mean diameter of 15 cm and it can be hormonally active. The adult granulosa cell tumors (AGCTs) account for 1-2% of all ovarian tumors and their occurrence is most frequently observed in peri- and postmenopausal women. This case describes an unusual type of ovarian tumor in a young pregnant woman. Our case is rare because of the patient's childbearing age, a rapidly enlarging mass which persisted into the third trimester of pregnancy and the simultaneous incidence of two types of sex cord-stromal tumors: adult granulosa cell tumor and thecoma/fibrothecoma.

Case: A 30-year-old Caucasian female, G1P2 presented at 30 weeks gestation. She had an unremarkable prenatal course until week 20 during which her routine ultrasound revealed the presence of a right ovarian mass measuring approximately 6 cm in diameter. The mass was asymptomatic, believed to most likely be a cyst and it was decided that the mass would be closely monitored throughout the pregnancy. At 28 weeks, patient began to experience mild and intermittent pelvic pain. By the 30th week, the pain began to intensify, becoming extremely sharp and constant. At 36 weeks, right pelvic pain suddenly worsened. At 36 weeks and 4 days, it was discovered that the mass was now measuring 17 cm in diameter, resulting in a growth of 11 cm in a period of 10 weeks. An amniocentesis was performed to assess for fetal lung maturity and to evaluate for the possibility of an immediate delivery. Following the amniocentesis, patient developed an acute and intolerable right lower quadrant pain. Fortunately, fetal heart rate remained adequate and reassuring. Despite amniocentesis results confirming immature fetal lungs, it was decided that an elective cesarean delivery would be performed, followed by a right oophorectomy. A viable 3,160 g female fetus was successfully delivered with APGAR scores of 9 and 9. Caesarian section proceeded without complications and without excessive blood loss.

Discussion: Few cases of adult granulosa cell tumors or thecoma/fibrothecoma in pregnancy have been described in the literature. There appears to be no recent cases of pregnant women with a combination of a granulosa cell tumor and of a thecoma/fibrothecoma as observed in our patient. Our case presents a gravid patient with an uncommon case of an adult type of granulosa cell tumor of the ovary and of a concurrent ovarian thecoma/fibrothecoma. Patient displayed no apparent risk factors for such tumors, there was no report of a family history of breast or ovarian cancer or a state of nulliparity as patient had previously delivered a viable female fetus. Another unusual feature is the presentation of these tumors at a child bearing age. Most sex-cord stromal tumors occur beyond our patient's young age of 30. In addition, most adnexal masses, as mentioned previously, do not persist beyond the first trimester and usually resolve spontaneously. In such cases, the only management is a close monitoring of the pregnancy. Our patient's mass persisted into the third trimester and grew rapidly. Therefore, there was a high risk of malignancy and ensuing complications.

Ovarian tumors, if hormonally active, can cause various clinical problems. They can produce any of the sex steroid hormones. The pathologic secretion of these estrogenic or androgenic hormones can lead to specific effects on hormone-sensitive organs. In addition to the endocrine effects, ovarian tumors can cause additional complications due to their mass effect. Adnexal masses that persist into the second trimester of pregnancy, as occurred in our patient, are at a greater risk for torsion, which is found to occur in 15-20 % of ovarian tumor cases. Ovarian torsions increase the incidence of spontaneous miscarriage or preterm delivery and can also lead to obstruction of labor. It is clear that routine use of ultrasound in early pregnancy has increased the incidence and detection rate of ovarian masses in pregnancy. Although most masses are found to be cysts of benign entities, it is important to monitor the pregnancy closely as the mass could progress and potentially be malignant. Earlier detection and suspicion of a tumor can aid the obstetric team in efficiently managing the pregnancy and monitoring for any signs of ovarian torsion, rupture or obstruction which could compromise the pregnancy.

Uterine Perforation in a 36 Year Old Female

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Introduction: The prevalence of uterine anomalies is higher among women with adverse reproductive outcomes such as recurrent pregnancy losses, infertility, malpresentation, preterm birth, and premature rupture of membranes. Our patient, with a known uterine didelphys, underwent dilation and curettage after suffering a second first trimester miscarriage. During the procedure both uteri were believed to have been perforated.

Case: A 36 year old female, gravida 2, para 0 with known history of previous early trimester loss, currently undergoing fertility treatment is referred for dilation and curettage following missed abortion. Ultrasound revealed a nonviable fetus, 7 week 5 day gestation in the left horn. Patient was brought to the operating room and received general anesthesia. On examination there was noted to be a mid vaginal septum extending to the apex of the vagina as well as a bilateral cervix and uterine didelphys with enlarged left uterus. The cervix was dilated and on initial suction curettage revealed no tissue. With further instrumentation there was noted to be no significant tissue or bleeding. The right side uterine cervix was dilated. With free passage of the dilator there was felt to be perforation. On re-inspection of the left uterus with ultrasound the cavity was unable to be cannulated with perforation extending medially and a thin myometrium of less than 0.5cm on the medial aspect. After suspected perforation pelviscopy evaluation was performed. Upon inspection there was noted to be 30-40 cc of blood in the cul-de-sac on both sides of the septum. The right uterus revealed a pinpoint perforation on the medial aspect which was cauterized. Evaluation of the left horn revealed a perforation on the medial aspect with thin myometrium. The margins of the myometrium were cauterized. The pelvis was irrigated. Due to the extent of laceration and hemostasis it was felt to be best to review further treatment options with the patient prior to proceeding with any further surgical treatment.

Discussion: Uterine perforation is a potential complication of several intrauterine procedures, as well as, the most immediate complication of dilation and curettage. The risk of perforation is increased by factors that limit access to the uterine cavity or decrease the strength of the myometrium. Such factors include cervical stenosis, scarring of the endocervical canal due to cone biopsy, uterine malposition, distortion of the uterine anatomy, menopause and pregnancy. Uterine perforation is associated with multiple complications. Short term risks include hemorrhage and injury to bowel or bladder. Long term risks include sepsis due to an unrecognized bowel perforation or a bladder perforation leading to either a rectal vaginal fistula or a bladder vaginal fistula due again to unrecognized injury at the time of perforation. In conclusion when a perforation is suspected a diagnostic laparoscopy is warranted in order to diagnose and treat an injury to the vasculature, bladder and or bowel, to prevent hemorrhage, sepsis and resultant fistulas.

An Unusual Presentation of Hepatocellular Carcinoma: Cryptococcal Meningitis in an HIV Seronegative Patient

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Introduction: Historically, cryptococcal meningitis is a rare diagnosis and most often associated with immune suppression in HIV seropositive patients. Other presentations of cryptococcal meningitis have been identified in a small population of patients with other forms of immune compromise such as liver disease, recent organ transplant, malignancy or corticosteroid use. This patient had a complicated hospital course due to the severe side effects of the key treating agent, liposomal amphotericin B, which ultimately revealed a solitary mass in his liver and subsequent work-up for hepatocellular carcinoma.

Case: A 55 year-old male with a history of alcohol abuse and no other medical problems presented to the emergency department for a third visit at our hospital after being contacted to return immediately for treatment for a fungal meningitis when laboratory results showed a growth of yeast in his cerebrospinal fluid culture. The patient had recently been discharged from the hospital. Initially, he presented with a history of severe headaches, nausea, vomiting, neck and back pain and associated gait instability for a few weeks in duration. At his first visit, the patient's only laboratory abnormality was an elevated erythrocyte sedimentation rate and a CT scan did not show any acute findings. At his second visit, he was diagnosed and treated for aseptic meningitis when his physical exam showed meningeal signs and the laboratory studies of the cerebrospinal fluid showed a WBC of 130, RBC of 12 with a repeat of 950, cell count was 4, neutrophils were 6, lymphocytes were 87, monocytes were 7, glucose was decreased at 23 and total protein was 90. A repeat lumbar puncture was performed and the cerebrospinal fluid of both samples was confirmed to be *cryptococcus neoformans*. Patient was admitted and began a planned 4-week course of liposomal amphotericin B. He was seronegative for HIV and showed no other signs of immune suppression. The patient recalled exposure to a bird-infested worksite. The patient experienced a challenging hospital course and developed acute renal failure, electrolyte abnormalities, superficial phlebitis and a lower gastrointestinal tract bleed. The GI bleed prompted a work-up with further imaging, endoscopy and colonoscopy, which led to discovery of a solitary liver mass in the setting of cirrhosis. The patient completed his course of anti-fungal treatment and was discharged with follow-up care with infectious disease, gastroenterology and hepatology consultants while preparing for a liver transplant in the near future.

Discussion: The pathogenesis and intermittent clinical presentation of cryptococcal meningitis in this patient made the initial diagnosis difficult. This case highlights the importance of a thorough evaluation of a seemingly healthy patient diagnosed with an opportunistic infection such as cryptococcal meningitis for further causes of immune suppression. This patient's hepatocellular carcinoma demonstrated one of the rare findings of the pathogenesis of cryptococcal meningitis and its association with immune suppression due to a hepatic malignancy and cirrhosis. The rigorous course of the amphotericin B treatment brought to light significant underlying features in this patient, and ultimately identified the cause of the immune suppression.

Co-infection with Lyme Disease and Babesiosis

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Introduction: The *Ixodes scapularis* tick is the common vector for both *Borrelia burgdorferi* and *Babesia microti* and it is important to recognize that both can be present simultaneously. Our patient presented with both symptoms of Lyme disease and babesiosis and included Bell's palsy and hemolytic anemia.

Case: A 58 year old man, with a past medical history of diabetes, presented to the hospital with facial droop and edema of the face and lower extremities. One week prior he presented to the emergency room with diffuse arthralgias and radicular pain down his neck. X-ray of the shoulder was done which was negative and a Lyme C6 peptide was sent. He was diagnosed with musculoskeletal pain and sent home. The patient returned to the emergency room one day later with worsening edema and new complaints of generalized weakness and lethargy. His workup revealed hyperglycemia and he was admitted to the hospital for insulin adjustment. There was concern for Lyme disease, however, his C6 peptide was negative. He was discharged home and re-presented three days later with new facial droop and anasarca. He is an avid hiker and had noticed numerous tick-bites but denied any history of rash. Initial vital signs were temperature 98° F, heart rate 84, respiratory rate 18 and blood pressure 161/79. On physical exam the patient was found to have facial swelling, left facial droop with left facial palsy, lower extremity edema to the groin. Laboratory studies were significant for an H/H of 9.9/28.4 yet during his admission three days prior his Hgb had been 12.2. Laboratory studies for hemolytic anemia found LDH of 467 IU/L, haptoglobin <8 mg/dl and bilirubin 0.6 mg/dl. LFTs were obtained and demonstrated elevated an AST of 163 IU/L and ALT of 99 IU/L. Even though initial titers were negative we were concerned for tick-borne illness. Infectious Disease was consulted who felt the patient's presentation was consistent with Neurological Lyme and babesiosis. A lumbar puncture was performed and IgM and IgG antibodies were discovered in the CSF. Western Blot also confirmed the presence of Lyme IgM and IgG antibodies. Babesia PCR was positive, although blood smear had been negative. The patient was started on Azithromycin 250 mg once a day and Atovaquone 750 mg twice a day orally for the Babesia and Ceftriaxone 2 g IV every 24 hours for 14 days for Neurological Lyme.

Discussion: Lyme disease is the most common tick-borne disease in the northeastern United States and is often associated with outdoor exposure. While not nearly as frequent, babesiosis can also occur concurrently due to its shared vector. Patients that have been exposed to either of these pathogens may not initially have positive titers or blood smears and therefore must continue to remain on the differential diagnosis. Hemolytic anemia is not associated with Lyme, therefore babesiosis cannot be excluded. In patients with Bell's palsy and

hemolytic anemia, it is important to have a high-index of suspicion for co-infection of *borrelia burgorferi* and *babesia microti*.

Axillary Pseudoaneurysm With Embolization Causing Arterial Occlusion And Brachial Plexopathy

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Introduction: Most pseudoaneurysms are the result of iatrogenic or penetrating injuries such as trauma resulting in an arterial puncture with subsequent formation of a hematoma. When treatment is delayed, hemorrhage, venous edema, erosion of the skin and neurologic compression due to mass effect are all emergent conditions that risk permanent loss of function or potential life threatening complications. Common presentation of this condition in an extremity includes pallor, decrease or loss of pulses, poikilothermia, paresthesias, pain and potential paralysis. While these findings were all present in our patient, an atypical precipitating event lead to an unforeseen diagnosis.

Case: A 62 year old male with a past medical history of hypertension presented to the emergency room with a painful and weak left upper extremity. Patient stated his arm had felt weak with a dull, non-radiating ache since an unwitnessed fall at his home one month ago. Although vitals were within normal limits, on physical exam he had poor capillary refill of the left distal upper extremity coupled with absent radial and ulnar pulses. Also noted on physical was absent sensation distally from the cubital fossa along with biceps strength 3/5, finger flexors 2/5, triceps and finger extensors and intrinsics 0/5. X-ray of the left shoulder revealed inferior and anterior humeral head subluxation, which when coupled with history of traumatic injury raised suspicion of possible fracture. Subsequent non-contrast CT revealed fracture of the superolateral portion of humeral head with adjacent multiple bony fragments as well as a 12.6 X 9.0 cm hematoma. This large hematoma not mentioned on the initial physical assessment, was palpable and the size of a baseball, further explaining subsequent diminished brachial plexus function. CT angiography discovered a large pseudoaneurysm of the left axillary-brachial junction with complete disruption and distal embolization to the brachial trifurcation and run off branches. On further work up, arteriography showed thrombosis of the pseudoaneurysm with distal constitution of the brachial artery. Interventional radiology then performed endovascular stent and grafting after which embolectomy and thrombectomy were done. Orthopedics attempted closed reduction of the anterior dislocation but were unsuccessful. Following these interventions, patient regained pulses in ulnar and radial arteries and experienced left upper extremity erythema and warmth. Median nerve function was retained as well as the ability to flex his digits but he was unable to perform digit or elbow extension or intrinsic motion. Despite the development of post perfusion edema without evidence of compartment syndrome and residual symptoms such as paresthesias in the distal extremity, the patient refused rehabilitation treatment but agreed to discharge with home care services.

Discussion: While recognition of a pseudoaneurysm typically occurs in the history of a penetrating injury, indicators such as pain, pallor, absent pulses, and paresthesias may hasten diagnosis and decrease the likelihood of emergent vascular or neurologic compromise. Despite the lack of penetrating injury or iatrogenic intervention, when considering these symptoms in any patient, especially one with increased vascular risk factors, it is essential to rule out pseudoaneurysm formation and perform a thorough physical examination as potential mass effect can lead to a surgical emergency.

Thrombocytopenia of Unclear Etiology: Immune-Mediated Thrombocytopenia in the Septic Patient

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Introduction: Thrombocytopenia is a common clinical issue and can be attributed to a wide range of etiologies. Our patient presented on day one with acute renal failure with obstructive uropathy and developed an isolated thrombocytopenia on day two. Consequentially, the patient was suspected to have immune mediated thrombocytopenia, and was started on gammaglobulin and steroids. Later on day two, urinalysis and urine culture results prompted diagnosis of urosepsis secondary to pyelonephritis due to gram-negative, extended spectrum beta lactamase producing rods.

Case: A.D., a 59-year-old-male with a past medical history only significant for prostate carcinoma status post radial robotic prostatectomy, presented at the PMD three days post ER visit with continued complaints of weakness, body aches, as well as nausea and vomiting. This in combination with the patient's acute rise in creatinine (1.6 from baseline of 0.89), discovered from ER lab workup, prompted PMD to direct admit the patient to SMMC for right flank pain and acute kidney injury workup. On direct floor admission, vital signs were temperature 97°F, BP 78/56, heart rate 78, respiratory rate 18, and pulse ox 96%. Laboratory workup was significant for: leukocytes 18.9 k/uL (90% segs, 2% lymphocytes), BUN 114 mg/dL, Cr 8 mg/dL, platelets of 24 k/uL. Acute renal failure prompted transfer to MICU, where obstructive uropathy was diagnosed status post renal ultrasound. Foley catheter was placed. The patient was given IV fluids, 1 Amp NaHCO₃, Zofran prn for nausea, and cefepime. Day two vitals were temperature of 98.6 °F, respiratory rate of 28, heart rate of 83, and BP of 92/58. Laboratory workup was significant for WBCs 2.3, hemoglobin 14.1, hematocrit 39.7, BUN 126, creatinine 6, and platelets 18. CT Abdomen/Pelvis without contrast confirmed mild to moderate right obstructive uropathy due to a 4 mm calculus proximal to the right ureter. Urinary stent placement as well as emergency hemodialysis for severely elevated BUN/Cr was completed. Urinalysis was significant for cloudy urine, with trace ketones, +3 blood, +2 protein, +3 leukocyte esterase, too numerous to count WBCs, and RBC's, moderate bacteria, as well as +2 sulfosalicylic acid. Urine culture confirmed growth of gram-negative, extended spectrum beta-lactamase organisms, confirming the diagnosis of urosepsis. Subsequent isolated thrombocytopenia work up revealed fibrinogen 611 mg/dL and D-Dimer 1 ng/mL, LDH 54, haptoglobin 190, bilirubin studies within normal limits, hepatitis panel negative, HIV negative, HCV negative, and platelet morphology was normal. As a result, the patient was treated for immune mediated thrombocytopenia with IV gammaglobulin and steroids as well as serial platelet transfusions. The patient's urosepsis was treated with meropenem.

Discussion: Based on the patient's history, physical exam, CBC, platelet morphology, and poor response to platelet transfusion, a presumptive diagnosis of immune-mediated thrombocytopenia secondary to severe sepsis was made for the patient's isolated thrombocytopenia. Due to the patient's severe septic state, the exact etiology of the isolated thrombocytopenia is highly questionable. Additionally, in the setting of acute kidney failure, we must question whether or not the use of IV gammaglobulin and steroids were appropriate in this patient. Furthermore, due to the lack of consensus on the diagnostic criteria and the indications for steroid therapy in "critical illness-related corticosteroid insufficiency (CIRCI)," such as in the septic patient, the role of severe, isolated thrombocytopenia may have some utility as a biologic marker for indications or contraindications for steroid therapy in CIRCI.

Assessing Variability of the American Society of Anesthesiologists Physical Status Classification

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Introduction: The American Society of Anesthesiologists Physical Status (ASA PS) classification was designed in 1941 by doctors Saklad, Rovenstein, and Taylor. The original design was meant to be a taxonomy to improve communication between anesthesiologists through providing a standard grading system for risk stratification and medical management. Revised in 1962, the ASA PS has evolved today to be used not only for risk stratification and medical management but also for billing and reimbursement purposes. Patients are assigned a score of 1-5, with E for emergent care. The scoring is based on the health and co-morbidities of the patient, which affect how much skill is required to safely anesthetize the patient. Previous studies have demonstrated variation in scoring among anesthesiologists. The purpose of this study was to identify variation in ASA PS classification among anesthesiologists and correlate differences with years of practice and level of training to identify major causes of variability in scoring.

Methods: Anesthesia residents, attending physicians, and certified registered nurse anesthetists (CRNAs) at Maine Medical Center were asked to score 10 hypothetical clinical cases using the ASA PS and answer questions regarding the participants age, gender, years of practice, and additional training. Data was collected via survey and analyzed using SPSS version 20.

Results: 114 anesthesia practitioners were contacted via email to complete the survey. 61% of anesthesia providers responded to the survey. Four out of the ten clinical vignettes had significant variance in scoring. With analysis controlling for the impact of position type and years of practice, years of practice was shown to be the significant variable in two out of ten questions, with fewer years of practice contributing to greater discrepancies in scoring. Position type was found to be a significant contributor to variance in scoring of two of the questions. Future studies are aimed at expanding the survey to larger, less homogenous populations.

Conclusions: There is greater variability in ASA-PS scoring among practitioners with less experience, while the position of the practitioner was also found to be a significant source of variability. Our data showed that residents had greater variability in scoring in vs. CRNAs and Attendings. Since residents are by definition less experienced than attending physicians, it seems plausible that the true source of variability may be inexperience. Further analysis among a larger population of anesthesia practitioners should be conducted to determine if variability can be attributed solely to years of practice.

Vitamin D₂ Is As Effective As Vitamin D₃ In Maintaining Circulating Concentrations Of 25-Hydroxyvitamin D

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Introduction: Recent studies have suggested that vitamin D₂ was 30-50% less effective than vitamin D₃ in maintaining serum 25(OH)D levels. Results from two studies showed that when vitamin D₂ and vitamin D₃ was given as a single 50,000 IU dose or when 4000 IU vitamin D₂ and vitamin D₃ was given for 2 weeks, vitamin D₂ was less effective in maintaining serum 25(OH)D levels compared with vitamin D₃. Our objective was to determine whether vitamin D₂ was less effective than vitamin D₃ in maintaining serum 25-hydroxyvitamin D levels or increased the catabolism of 25-hydroxyvitamin D₃. Give some grounding in this from the reports – what is the literature saying about this?

Methods: This was an IRB approved, randomized, placebo-controlled, double-blinded study of 80 healthy adults subjects, with unknown vitamin d levels, age 18–84 years old. Subjects were randomized using a computer-generated program into 1 of 4 groups: (1) placebo, (2) 1000 IU vitamin D₃, (3) 1000 IU vitamin D₂, or (4) 500 IU vitamin D₂ plus 500 IU vitamin D₃ daily for 11 wk at the end of the winter. All subjects had blood samples collected at baseline and every week for a total of 11 wk. The results are presented as means ± SD. Data were analyzed using mixed-effects regression to perform a repeated-measures analysis of 25(OH)D levels across time and groups. Pairwise comparisons were performed between all treatment groups as well as each treatment group vs. placebo. Interactions between treatment group and time compared the linear change in 25(OH)D over time between the groups. A repeated-measures mixed-effect model also compared the 25(OH)D₂ and 25(OH)D₃ across visits for each of the treatment groups. Statistical analysis was performed using SAS (SAS Institute, Inc., Cary, NC).

Results: Sixty-eight (68) adults completed the study resulting in an 85% retention rate. Of the 68 study participants, sixty percent were vitamin D deficient at the start of the study. The circulating levels of 25-hydroxyvitamin D (mean ± SD) increased to the same extent in the groups that received 1000 IU daily as vitamin D₂ (baseline 16.9 ± 10.5 ng/ml; 11 wk 26.8 ± 9.6 ng/ml), vitamin D₃ (baseline 19.6 ± 11.1 ng/ml; 11 wk 28.9 ± 11.0 ng/ml), or a combination of 500 IU vitamin D₂ and 500 IU vitamin D₃ (baseline 20.2 ± 10.4 ng/ml; 11 wk 28.4 ± 7.7 ng/ml). The 25-hydroxyvitamin D₃ levels did not change in the group that received 1000 IU vitamin D₂ daily. The 1000 IU dose of vitamin D₂ or vitamin D₃ did not raise 25-hydroxyvitamin D levels in vitamin D-deficient subjects above 30 ng/ml.

Conclusion: A 1000 IU dose of vitamin D₂ daily was as effective as 1000 IU vitamin D₃ in maintaining serum 25-hydroxyvitamin D levels and did not negatively influence serum 25-hydroxyvitamin D₃ levels. Therefore, in our study vitamin D₂ was found to be is equally as effective as vitamin D₃ in maintaining 25-hydroxyvitamin D status.

Delirium and the Family Caregiver: Best Practices for Optimal Care

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Introduction: Delirium is known as an acute confusional state that is experienced by many hospitalized patients, especially older adults. Delirium presents as disturbances of cognitive function that can affect orientation, attention, memory and planning (Meagher 2001). Currently there is substantial research on the risk factors, etiology and management of delirium. However, there is a deficit of information educating the delirious patient's family members and/or caregiver of this medical condition. In addition there is very little research exploring the impact of caring for a patient with delirium on family and caregivers. This research addressed two objectives relative to the medical literature on delirium for older adults: (1) to investigate published studies that address the impact on the family regarding caring for a loved one with delirium; and (2) determine if there are interventions that provide family caregivers with education and/or coping skills to manage delirium.

Methods: A date specific literature review was conducted in several major databases, including: Medline-PubMed, Medline EBSCO, Medline Proquest, CINAHL, and Cochrane Collection Plus. Documented interventions related to delirium, family, and impact on informal caregivers were examined. A process of systematic elimination revealed key articles that met the objectives. Findings were summarized reporting the type of education available for family caregivers to aid in the care of the delirious loved one.

Results: A total of 208 citations applied to the criteria for the initial data base searches, however after removing duplicate citations only 92 citations remained. After reading the abstracts of those 92 citations, only 30 journal articles were identified as addressing the objectives of this project. A complete read through of the 30 articles were conducted twice. Six articles were identified as focusing on education strategies for family/informal caregivers, specifically on how to care for a delirious loved one. These were analyzed and presented.

Conclusion: Since delirium is an acute medical condition that can linger post hospital and ultimately can lead to death, it is imperative to explore the impact of delirium on family caregivers and educate them about this life threatening health condition and how best to augment care. Currently there is a dearth of research explaining and exploring the impact of delirium on the family/informal caregiver, and how best to educate them to aid in caring for a loved one with delirium.

If They Build It They Will Come: A Bidirectional Approach to Continuing Medical Education in Haiti

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Introduction: Continuing Medical Education (CME) for Haitian physicians was limited before and subsequently weakened by the 2010 earthquake. Physicians for Haiti (P4H) is a Boston-based non-profit organization that works in conjunction with Haitian physicians to advance medical education in Haiti. P4H's provides Haitian-directed creation and provision of situation-relevant CME material with a goal of increased participation by Haitian healthcare providers in educational activities. This is an assessment of P4H's activities over a two-year period.

Methods: This is a retrospective analysis of P4H's activities and interventions from January 2011 through December 2012. A formal needs assessment was performed in 2011 including over sixty Haitian physicians. Program implementation was initiated in parallel to the needs assessment with preliminary data from our Haitian partner organizations guiding the development of educational modules, online educational case discussions, in-person conferences and workshops. P4H also created a Visiting Professor Program and travel grants to allow for Haitian physicians to participate in international conferences with the objective of beginning a means for the bilateral exchange of ideas. All projects were monitored including the number of educational modules created, the participation in online discussions, and attendance at in-person conferences. We also evaluated recipient response and feedback in terms of satisfaction and short term knowledge acquisition.

Results: During the two-year analysis period P4H produced nine educational modules on subjects such as diabetes mellitus and neonatal nutrition. The number of members in our online case discussion increased by 78% percent, from 20 to 91 members and these participants engaged in 63 discussions. There have been 19 conferences with approximately 30 attendees at each, and two country-wide CME conferences with 80 participants in 2011 and 145 participants in 2012, representing a 50% growth in participation. Five Visiting Professors teaching courses in subjects ranging from the social determinants of health to neurology were provided to P4H partners. Travel grants for four residents and three attending physicians were provided for attendance at international health conferences.

Conclusion: The attendance and participation in the CMEs provided by P4H has increased over the two-year analysis period, suggesting that there is the desire for formal medical education beyond the undergraduate and post-graduate level

in Haiti. Future research can focus on qualitative analysis of the post-CME surveys to better address the needs Haitian physicians identify in their practice.

Use of Urinary Catheters in U.S. EDs 1995-2009: A Potentially Modifiable Cause of Catheter-Associated Urinary Tract Infection?

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Background: Catheter-associated urinary tract infection (CAUTI) is the most prevalent hospital-acquired infection. In 2007, the Centers for Disease Control (CDC) published guidelines for reducing CAUTI, including appropriateness criteria for urinary catheters (UCs). The objective of this study was to calculate frequency and trends of UC placement and potentially avoidable UC (PAUC) placement in US EDs and identify predictors of ED UC placement in admitted patients.

Methods: We analyzed the National Hospital Ambulatory Medical Care Survey (NHAMCS), a weighted probability sample of US ED visits, from 1995-2009 for use of UCs in adults. UCs were classified as PAUC if the primary diagnosis did not meet CDC appropriateness criteria. Predictors of ED placement of UC for admitted patients were assessed with multivariate logistic regression, results shown as odds ratio (OR) and 95% CI. Statistics controlled for the survey sampling design.

Results: UC placement varied from 22 to 33 per 1000 adult ED visits, peaking in 2003. Overall, 1.6% (CI 1.5 - 1.7%) of discharged patients and 8.5% (CI 7.9 - 9.1%) of admitted patients received UCs. The most common reasons for visit among patients receiving UCs included stomach and abdominal pain, cramps and spasms, urinary dysfunctions, shortness of breath and chest pain and related symptoms. More than half of ED-placed UCs were for potentially avoidable diagnoses. The most common discharge diagnoses among patients receiving UCs included genitourinary symptoms, urinary tract infections, abdominal pain and congestive heart failure. Predictors of UCs in admitted patients included increasing age (≥ 80 y vs. 18-59y, OR 3.1, CI 2.7 - 3.6), female gender (OR 1.3, CI 1.2 - 1.4), race (Hispanic vs. white, 0.8, CI 0.6 - 0.9), arrival by ambulance (OR 2.5, CI 2.3 - 2.8), increasing urgency (≥ 2 h vs. immediate, OR 0.8, CI 0.6 - 1.1) and longer ED visits (≥ 4 h vs. < 2 h, OR 1.4, CI 1.2 - 1.7); facility characteristics included region (South vs. Northeast, OR 2.2, CI 1.9 - 2.5), teaching ED (OR 1.3, CI 1.2 - 1.5) and urban location (OR 1.3, CI 1.1 - 1.5).

Conclusions: The high rates of PAUC suggest a potential for reduction of UCs in admitted ED patients—a proven strategy to reduce CAUTI.

Lessons to Be Learned: Changing Perspectives in Acupuncture Research Methodology Translated to Osteopathic Manipulative Therapy Clinical Trials

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Introduction: Osteopathic Manipulative Therapy (OMT) research faces many methodological challenges, especially when placed into an atmosphere dominated by the Randomized Control Trial (RCT). Two central postulates of RCTs are randomization and control. Any intervention is thus thought to be divided into characteristic (specific) and incidental (placebo, non-specific) effects. But does it make sense to split complex interventions such as OMT into characteristic and incidental effects? Recent research has shown that elements categorized as “incidental” in drug trials are integral to interventions such as acupuncture. Since OMT also cannot separate its characteristic and incidental effects, we may learn something from recently suggested shifts in acupuncture methodology. The field of acupuncture is moving away from the explanatory design and shifting towards pragmatic trials to better study acupuncture as it is actually performed in practice. As a field, they have also developed research reporting guidelines (the STRICTA standards) to improve transparency of research design and results. In the same vein, OMT research would also benefit from standardization of research reporting.

Methods: This work is based on a PubMed literature search in the fields of acupuncture and OMT research methodology and is a translational work across these two fields.

Results: Three suggestions to improve research transparency are presented here. The first would be to implement a set of reporting guidelines, specifically tailored to OMT research that would be designed from acupuncture’s STRICTA guidelines. The second would be to use a questionnaire for research participants to determine the believability of the chosen control condition, similar to the questions proposed by Fulda et al. The third is implementing a graphing method designed by Thorpe et al. to consolidate aspects of OMT trial design. This tool will better determine where each study falls on the pragmatic-explanatory spectrum and would also demonstrate the external validity of each study.

Conclusion: The goal of these proposed measures is not to dictate research methodology but to increase transparency with clinical trial study design and findings. These tools should improve the quality of manuscript reporting and allow OMT researchers to look objectively at the appropriateness of research paradigms currently employed for OMT research.

Assessment of Rotator Cuff Tendon Integrity with Single Detector Polarization Sensitive Optical Coherent Tomography

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Grants: National Institute of Health Grants R01 AR44812, R01 HL55686, R01 EB02638/HL63953, R01 AR6996, and R01 EB000419.

Introduction: Rotator cuff repair (RCR) is the most common tendon repair procedure used in the US and of the more than 40,000 RCR procedures performed, 25 to 60 percent fail in the first two years. While strong evidence exists that migration of undifferentiated cells into the tendon is critical in recovery, evidence also supports the fact that characteristics of the detach tendon also influence success. A feasible hypothesis is the presence of organized collagen in the tendon is also required for procedure success, even if the network is reorganized at a later time point. As direct visualization does not reliably correlate with collagen content, and no technology is available to the surgeon for intra-operative assessment of collagen, a clinical need exists for a technology to assess the relative importance of tendon organized collagen both experimentally and clinically.

Methods: In this study Optical Coherence Tomography (OCT) in its polarization sensitive embodiment (PS-OCT), a new method of micron scale imaging FDA approved in several other fields, is used to assess collagen concentration in ruptured supraspinatus tendons. Patients with full thickness supraspinatus ruptures were selected. During a routine arthroscopic rotator cuff repair surgery, resected sections of supraspinatus tendons that were considered normal by the surgeon were collected. Using PS-OCT, collagen in the various sections of the resected tendon were evaluated and compared to histopathology. The intensity of birefringence by PS-OCT was determined by measuring the maximum and minimum back-reflection through different polarization states. The samples then went through histopathology to measure organized collagen type I and III with polarization microscopy of picosirius stained regions. These areas were registered with PS-OCT images for correlation. Bivariate plots were generated, and simple regression analysis was performed to determine the linearity of the two groups. Correlation coefficients were calculated using the Spearman correlation.

Results: This study found that approximately 50% percentage of the tendons deemed acceptable by visual inspection for reattachment were collagen depleted by histopathology. A strong correlation existed between results correlated with polarization sensitive OCT (PS-OCT) imaging that demonstrated depleted concentrations of collagen.

Conclusion: This study demonstrates the potential of PS-OCT for both research and clinically use to assess collagen organization with the objective of improving outcomes in RCR.

Protective Characteristics of Critically Ill Patients Against the Development of Delirium

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Introduction: Delirium is characterized by acute changes in mental status with signs of inattentiveness and either disorganized thought or changes in level of consciousness. Delirium in critical illness is linked to increased rates of infection, prolonged mechanical ventilation, and protracted length of stay. Most of the focus of delirium research has involved identifying drugs that transition patients to delirium. This retrospective pilot study sought to identify protective characteristics, focusing on hemodynamics and lab values, of critically ill patients that are protective against transitioning to delirium.

Methods: Delirium was assessed with the Confusion Assessment Method for the ICU (CAM-ICU) on all patients admitted to the surgical intensive care unit. The CAM-ICU is a validated, brief series of questions administered bedside on mechanically ventilated patients with a high level of interrater reliability. Exclusion criteria was coma (level of sedation assessed the Richmond Agitation Sedation Scale) or language barrier. Assessments were performed twice daily for seven weeks by three medical students, for a total of 575 assessments on a total of 124 patients. All other data were obtained from the electronic medical record retrospectively and variables were analyzed by an independent t-test.

Results: Eighteen patients were delirious, for an incidence of 14.51%, with most patients exhibiting hypoactive delirium. The average age of all patients was 56.98 years. 83 patients were male and 41 were female. The average age of delirious patients was 61.47 years. Thirteen were male and five were female. There was no statistically significant difference in the intraoperative variables that we compared between delirious and non-delirious patients (systolic, diastolic and mean arterial blood pressure, heart rate, temperature, oxygen saturation, and duration of surgery). There was a statistically significant difference in the post operative mean hemoglobin, mean creatinine, and mean BUN between the delirious and non delirious patients. The mean hemoglobin of non-delirious patients was 10.45, compared to 9.28 in delirious patients ($p=0.001$). The mean creatinine in non-delirious patients was 1.15, versus 2.13 in delirious patients ($p=0.006$). The mean BUN in non-delirious patients was 18.34, compared to a mean BUN of 35.58 in delirious patients ($p=0.004$).

Conclusion: Exposure to benzodiazepines and to anticholinergic medications can contribute to delirium. The postoperative differences that we found in delirious and non delirious patients in creatinine and BUN may reflect impaired drug metabolism in critically ill patients. This impaired metabolism may contribute to accumulation of neurotoxic metabolites causing delirium.

AMPK Activator + PDK Inhibitor Combinations in Prostate Cancer

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Background: This project was focused on the regulation of metabolism in prostate cancer. Cancer cells display a phenomenon known as the Warburg effect whereby they generate energy through aerobic glycolysis, even in the presence of oxygen. This is an inefficient means of energy production, but confers the cancer cell with many advantages, such as increased blood supply and substrates (such as lipids, nucleotides and proteins) for cell growth, protection from apoptosis and an environment more conducive to evasion of the immune system and invasion of surrounding tissue.

Methods: The goal of this project was to counteract this metabolic reprogramming in order to inhibit tumor cell proliferation. To this end, I combined two drugs: A769662, an AMP-activated protein kinase (AMPK) activator, and Sodium Dichloroacetate (DCA), a Pyruvate Dehydrogenase Kinase (PDK) inhibitor. AMPK is a major regulator of cellular metabolism that stimulates lipid breakdown and inhibits lipid synthesis. Lower levels of AMPK activation have been seen in prostate cancer with decreasing AMPK activation corresponding to higher-grade cancers. Pyruvate Dehydrogenase (PDH) is the enzyme that converts pyruvate (from glycolysis) to acetyl CoA for entrance into the TCA cycle and oxidative phosphorylation, as occurs in normal cellular metabolism. PDK, which is elevated in many tumors, inhibits PDH, preventing pyruvate from being converted to acetyl CoA. DCA inhibits PDK, thereby relieving the inhibition of PDH.

These experiments were performed using prostate cancer cells, LNCaP (androgen-dependent) and PC3 (androgen-independent). A769662 and DCA were used both as single agents and in combination. Cells were treated for 48 hours with either a single agent or combination at various concentrations. Cells were then collected and cell viability was accessed using trypan blue (Vi-Cell, Beckman Coulter). Target inhibition or activation was accessed by Western Blot. Both drugs significantly decreased cell growth and a synergistic effect with the combination was observed.

Acknowledgements

Funding for this project was provided by the American Cancer Society, New England Division through the Betty Lea Stone Fellowship program.

The Patient Simulator for Training of Anesthesia Residents in the Management of Local Anesthetic Systemic Toxicity

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Introduction: Patient simulation is a training technique that allows medical learners to become familiar with complex and rare procedures, diagnoses, and treatment plans. The benefits of using simulation training include increased understanding of less-common complications, decreased reaction times, and improved patient safety. Local anesthetic systemic toxicity (LAST) has an incidence of only 2.2 per 10,000 regional blocks, making training in recognition and management of this high-mortality complication ideally suited to simulation. The use of the patient simulator (PS) to enhance the training of anesthesia providers in the management of LAST is assessed in this study. A knowledge deficit is anticipated in the learners' ability to recognize symptoms and initiate proper therapy. By using a PS scenario, better understanding and retention of key concepts are expected when compared to using standardized lecture.

Methods: Anesthesia residents at the University of Kentucky are randomized into two groups. The first group participates in a pilot PS scenario based on LAST complicating an interscalene block. In the scenario the patient experiences anxiety that progresses to seizure and cardiovascular collapse. The resident is expected to manage the patient, recognizing signs of LAST. The simulation performance is assessed using a checklist based on ideal LAST treatment. Following the first simulation encounter, knowledge of LAST is evaluated through a computerized, 15-question multiple-choice examination (pre-test). An attending anesthesiologist then explains proper management of LAST during a 10-minute discussion and debriefing period in which deficiencies or weaknesses are addressed. Afterwards, the resident completes a second simulation to reinforce the concepts and foster retention. Finally, a post-test exam is administered followed by a brief survey, which provides self-assessment of the learning activity. The second group of residents does not experience simulation, but proceeds directly to the pre-test. Next, a 15-minute recorded lecture on LAST management is shown to the resident. The resident then is asked to take the post-test and survey. In approximately 2-3 months, each resident who participated in the study will be asked to return for evaluation of LAST management concept retention using a new PS scenario with a checklist, post-test, and brief self-evaluation survey.

Results: Objective data collected from our pilot study show that the PS experience results in better understanding of LAST recognition and management. Subjective self-assessment also shows increased resident confidence in ability to manage LAST after simulation.

Conclusions: PS provides residents with an opportunity to respond to high-stress situations and rare events without placing a patient at risk. This instrument has helped to facilitate significant improvement in clinical knowledge associated with recognition and management of rare or complex anesthesia. At the conclusion of this study, we expect results will show PS training is superior to standard lecture based teaching in LAST management.

Hospital Length of Stay, Patient Reported Outcomes and 30-day Readmission Rates in Heart Failure Patients Receiving Osteopathic Manipulation.

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Introduction: There are nearly 5 million people living with heart failure in the United States, accounting for over 1 million hospitalizations per year. There are also 550,000 new cases of HF diagnosed each year. Heart failure is the most common cause of hospital admissions in the United States and unsurprisingly, this clinical syndrome is extremely costly and places an increasingly enormous strain on our healthcare system and can severely lower a patient's quality of life. Heart failure as a diagnosis carries a 50% 5 year survival rate. Heart failure is one of the leading causes for readmission 30 days post-discharge among Medicare Beneficiaries. Along with COPD and psychosis, HF readmissions accounted for \$17.4 billion in 2004. It is in the best interest of hospital administrators, health care providers, and patients to maximize patient quality of life, minimize hospital length of stay and readmission for people with this chronic condition. The purpose of this study is to improve the standard of care for hospitalized heart failure patients. Our hypothesis is that Osteopathic Manipulation as an adjunct to the standard of care will improve patient outcomes as measured by Length of Stay, Readmission Rate, and Quality of Life compared to patient outcomes in those who receive the standard of care only.

Methods: Patients admitted to MMH with a primary diagnosis of HF or HF exacerbation who meet clinical criteria (both inclusion and exclusion) and provide consent will be randomly placed in 1 of 3 treatment groups: a treatment, a control, or a sham group. All groups will receive standard of care treatment. In addition to this, one group will receive no additional treatment, one group will receive an OMM protocol, and one group will receive a sham (placebo) protocol. All participants will complete a satisfaction survey upon discharge. Patient satisfaction, length of stay, and fluid balance and weight change will be recorded and compared among the 3 groups. Once sufficient participants have been recruited, a power analysis will be performed. A two-sample t-test will be used to examine if there is a significant difference in terms of the length of stay between the study groups. A two-sample proportion test will be used to examine if there is a significant difference in 30-day readmission rates among the study groups.

Results: Since IRC approval, the study has 15 patients, and statistical analysis has been done on 13 participants. Following the removal of 4 patients due to prolonged hospital stay and failure to complete the discharge questionnaire adjusted analysis was completed on 9 patients. The Adjusted Average Length of Stay: Sham Group 10.75 days (4 patients), Treatment Group 3.5 days (2 patients), and Control Group 6.33 days (3 patients). Average Total Weight Change at End of Stay: Sham -4.08 kg, Treatment -4.73 kg, Control -4.82 kg. Average Fluid Balance at End of Stay: Sham -13.5 L, Treatment -3.0 L, Control -4.0 L. Change in average survey score: Sham +11, Treatment +3.75, Control -1.5. 30 Day Readmissions: Sham 0, Treatment 1, Control 1.

Conclusion: This remains an ongoing research study. It received IRC reapproval in January of 2013. Preliminary data has been analyzed, but remains inconclusive since the sample size has not met expectations. At the time of this submission, the strongest correlation has been increased patient satisfaction in the Treatment and Sham groups. Patient recruitment is actively underway, however the rate of new patient inclusion has fallen short of expectations due to difficulty obtaining a primary diagnosis of heart failure. Should this study demonstrate improved patient outcomes with the adjunct of Osteopathic Manipulation, the initiation of larger scale, longer term studies to further analyze this relationship would be warranted.

In Vivo Micron Scale Arthroscopic Imaging of Human Knee Osteoarthritis with Optical Coherence Tomography: Comparison with MRI and Arthroscopy

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Introduction: Osteoarthritis is currently treated with total joint replacement or pain-relief. A clinical need exists for early osteoarthritis diagnostic methods for potential preventative interventions. Currently MRI, X-ray, and arthroscopy are limited in their resolution for the assessment of early disease. Optical Coherence Tomography's, OCT, high resolution, small fiber-optic probes, and realtime imaging makes it ideal for assessing articular cartilage. This research describes in-vivo human arthroscopic OCT imaging with qualitative baseline comparisons made with MRI and arthroscopic inspection.

Methods: Patients were selected based on the following criteria: already identified for routine arthroscopic partial meniscectomies, not appropriate for meniscal repair, male or female between 30-60 years of age, a preserved joint space on radiographs, a meniscal tear confirmed by MRI, symptomatic for less than six months duration, and medically cleared for routine arthroscopy/meniscectomy/MRI. Patients, selected for routine arthroscopic partial meniscectomies, were also assessed OCT imaging engine through an imaging arthroscopic endocatheter intraoperatively. The endocatheter was introduced into the joint space through an anteromedial utility portal. This engine used a wideband light source of 12mW. The imaging was captured at a rate of 10 frames per second at a resolution of 800 x 304 pixels. The OCT imaging engine has an axial resolution of 12 μ m and a lateral resolution of 25 μ m. The imaging engine utilizes a sterile OCT imaging endocatheter, with the cross sectional diameter of 0.017 inch and has a focal length of 1.2mm. The endocatheter has an internal pullback rate of 0.5mm/sec, which allows the data to be formatted into a video stream. The registered images were then compared against the patients arthroscopic and MR images.

Two year MRI follow-ups are underway to quantitatively compare OCT with MRI in addition to assessing the long-term outcomes of changes noted in the OCT images. This study is the first to demonstrate in vivo human arthroscopic imaging with OCT. The data generated was compared with conventional arthroscopic and MR imaging. While it cannot be understated, these other modalities play critical roles in joint management, the extremely high resolution of OCT along with its ability of measure collagen breakdown, make it a powerful technology for the potential evaluation and sequential monitoring of therapeutics. This preliminary data, showing OCT's arthroscopic capabilities, demonstrates a feasibility to diagnose pathology earlier than MRI and arthroscopy. OCT's high resolution, real-time data stream and small fiber optic endocatheters makes it ideal for assessing articular and meniscal cartilage. Ongoing clinical trials are underway assessing the long-term outcomes of changes noted in OCT images.

Grants: National Institute of Health Grants R01 AR44812, R01 HL55686, R01 EB02638/HL63953, R01 AR6996, and R01 EB000419.

MEK and RAF Inhibitors for BRAF-mutated Cancers

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The mitogen-activated protein kinase (MAPK) pathway has been implicated in the pathophysiology of many cancers. Under normal physiologic conditions, the RAS-RAF-mitogen-activated protein kinase kinase (MEK)-mitogen-activated protein kinase (ERK) signaling cascade interaction is initiated by ligation of a receptor-linked tyrosine kinase by its cognate growth factor. It has been demonstrated in many systems that aberrant autocrine or paracrine stimulation of growth factor receptors is pathogenic in large part because of MAPK activation. As one of the key downstream effector pathways of mutated RAS (KRAS, NRAS and HRAS), pharmacologic inhibition of components of the MAPK pathway has been pursued as a means to indirectly inhibit RAS, which remains a technical challenge for direct pharmacologic inhibition. RAF and MEK are the two non-membrane-bound, serine-threonine and tyrosine-threonine kinases, within the pathway that have been most extensively explored as drug targets. The discovery of activating BRAF mutations in cancer clarified which cancer types and subsets of certain cancers are most dependent on activation of the MAPK pathway for growth and survival. Now, with the successful translation of selective BRAF and MEK inhibitors into validated therapies for BRAF mutant melanoma, the field seeks to resolve the role for these agents in cancers harbouring RAS mutations or those driven by aberrant growth factor receptor activation.

Breast Cancer-Induced Bone Remodeling, Skeletal Pain and Sprouting Of Sensory Nerve Fibers

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Breast cancer metastasis to bone is frequently accompanied by pain. What remains unclear is why this pain tends to become more severe and difficult to control with disease progression. Here we test the hypothesis that with disease progression sensory nerve fibers that innervate the breast cancer bearing bone undergo a pathological sprouting and reorganization, which in other non-malignant pathologies has been shown to generate and maintain chronic pain. Injection of human breast cancer cells (MDA-MB-231-BO) into the femoral intramedullary space of female athymic nude mice induces sprouting of calcitonin gene related peptide (CGRP⁺) sensory nerve fibers. Nearly all CGRP⁺ nerve fibers that undergo sprouting also co-express tropomyosin receptor kinase A (TrkA⁺) and growth associated protein-43 (GAP43⁺). This ectopic sprouting occurs in periosteal sensory nerve fibers that are in close proximity to breast cancer cells, tumor-associated stromal cells and remodeled cortical bone. Therapeutic treatment with an antibody that sequesters nerve growth factor (NGF), administered when the pain and bone remodeling were first observed, blocks this ectopic sprouting and attenuates cancer pain. The present data suggest that the breast cancer cells and tumor-associated stromal cells express and release NGF, which drives bone pain and the pathological reorganization of nearby CGRP⁺ / TrkA⁺ / GAP43⁺ sensory nerve fibers.

Review of Eccrine Sweat Gland and Nephron Function with Implications for Targeted Treatment of Uraemia

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The purpose of this literature review was to highlight similarities between the nephron and eccrine sweat gland (ESG). The nephron has been very well characterized in recent years. Individual mechanisms of solute movement for K^+ , Na^+ , NH_4^+ , urea, inorganic phosphate (Pi) and creatinine have been elucidated. Many of the same solutes excreted in urine are also excreted in sweat. The ESG has been shown to excrete Na^+ and K^+ , but we were unable to find research involving molecular mediators of nitrogenous compound excretion. Despite this, nitrogenous compound concentration in sweat has been reported. First, we will present a brief overview of nephron solute transport. Normal and diseased states will be considered. Next, a detailed review of the ESG will be presented. Finally, we will look into past attempts at thermally induced diaphoretic therapy. The discussion will focus on next steps in research that would implicate the ESG as a target for therapeutic use in patients with chronic uraemia.