Vignette Session B

Cyst-tick swelling of the knee. Papia Kar¹; Subhashis Mitra². ¹Marshfield Clinic, Marshfield, Wisconsin; ²Detroit Medical Center/ Wayne State University, Detroit, Michigan. (Tracking ID # 9152)

LEARNING OBJECTIVES: 1. Recognize that musculoskeletal manifestation of Lyme, presenting as ruptured popliteal cyst, though rare should be considered in an endemic region. 2. Diagnose and treat soft tissue abscesses associated with Lyme disease.

CASE INFORMATION: A 51 year-old Caucasian male, with no significant past medical history presented with 7-day history of progressively increasing swelling over his right calf. He also reported redness in the region and pain on ambulation. The patient recalled pain and swelling of the right calf after trying to kick start a motorcycle 7-months ago which subsided with rest and elevation. The patient, a resident of central Wisconsin, has had tick bites in the past but denied any skin rash, fatigue or fever. He was afebrile with pulse of 90 beats per minute and blood pressure 143/84 mm of Hg. Physical examination revealed erythematous right calf with tenderness and a positive Homan’s sign with mild effusion of right knee joint. Laboratory studies revealed elevated inflammatory markers with CRP of 24.4mg/dl. Right lower extremity Doppler ultrasound showed no evidence of deep venous thrombosis, however did reveal a popliteal cyst with fluid leaking into the proximal calf. A magnetic resonance scan revealed a large Baker’s cyst with multiple septae with fluid dissecting into the gastrocnemius muscle causing significant compression. An ultrasound guided aspirate was cloudy, with total white blood cell count of 52,800 with 90% neutrophils. Gram stain and cultures from the fluid were negative. With concerns for a calf abscess and the risk of developing compartment syndrome, an open incision and drainage with debridement of the abscess was performed after 24 hours. The fluid from the Baker’s cyst was sent for Lyme polymerase chain reaction (PCR), which was positive. Lyme enzyme linked immunosorbent assay was reactive. Further confirmation was obtained by positive Western Blot analysis. Tissue obtained at surgery from the right medial calf was also positive for Lyme PCR. The patient was started on intravenous Ceftriaxone, which was switched to oral doxycycline upon discharge to complete a course of 3 months. The patient was closely followed-up in clinic and continues to do well.

IMPLICATIONS/DISCUSSION: Lyme disease caused by the spirochete, Borrelia burgdorferi, was first described in 1977 among patients with arthritis, living near Lyme, Connecticut. Ixodes scapularis (deer ticks) are responsible for transmission to humans. A popliteal or Baker’s cyst is a synovial fluid-filled mass, commonly located in the postomedial aspect of the knee and considered to be due to accumulation of fluid in the gastrocnemius-semimembranosus bursa. Prevalence of popliteal cyst increases with age and commonly caused by noninfectious knee effusions. Various microorganisms have been reported to cause infected popliteal cyst, including Staphylococcus aureus, Aspergillus fumigatus, Mycobacterium tuberculosis, Candida albicans among others. However Lyme disease presenting as a popliteal cyst in adults has rarely been reported. The diagnosis of popliteal cysts can be established with an ultrasound of popliteal fossa, and is useful in distinguishing ruptured popliteal cyst from thrombus. However MRI allows better evaluation of cyst rupture, hemorrhagic transformation or accompanying pyomyositis. Aspirate from the cyst should be sent for gram stain and bacterial culture along with acid-fast and fungal staining and culture. In endemic areas testing for Lyme PCR should be considered in appropriate clinic setting. Tissue obtained at surgery could also be sent for Lyme PCR as in our patient. Lyme popliteal cyst indicates disseminated infection and requires initial treatment with intravenous ceftriaxone. Surgical treatment may be necessary in some cases of ruptured cysts. In conclusion, we present a case of Lyme arthritis presenting with dissection of popliteal cyst and calf abscess, requiring surgical treatment. Lyme PCR was positive both from the synovial fluid and calf muscle. Arthritis is a common presentation of Lyme disease in the United States and should be considered as a possible cause of popliteal cyst especially in patients living in endemic areas.
Disseminated infection with vancomycin-intermediate staphylococcus aureus (VISA) in a 37-year-old
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LEARNING OBJECTIVES: 1. Diagnose VISA and identify its risk factors and treatment options 2. Recognize the insufficiency of maximal standard infection control practices for reliable control of VISA outbreaks

CASE INFORMATION: A 37-year-old female with history of intravenous drug use and hepatitis C was admitted after one day of nausea, vomiting, abdominal pain and left flank/back pain. She was undergoing treatment with daptomycin for MRSA endocarditis complicated by septic pulmonary emboli and tricuspid valve vegetation at a subacute facility, after having failed a six-week course of vancomycin. Evaluation of symptoms included an abdominal CT showing a possible tubo-ovarian abscess and possible osteomyelitis of the left sacroiliac joint, confirmed by lumbar spine CT. Echocardiogram showed vegetations of the tricuspid, aortic, and mitral valves. Blood cultures grew methicillin-resistant staphylococcus aureus (MRSA) that was also of intermediate resistance to vancomycin (i.e. VISA). The patient was begun on quinopristin-dalfopristin and trimethoprim-sulfamethoxazole. On the third hospital day, the patient developed new word-finding difficulties. Neuroimaging demonstrated a small MCA-territory infarction with hemorrhage, likely from a septic embolus. The tubo-ovarian abscess and osteomyelitis seen on prior imaging were also felt to be due to disseminated VISA infection. The patient underwent aortic valve replacement and tricuspid and mitral valve repair without complication, and was discharged on a six-week course of dalfopristin and trimethoprim-sulfamethoxazole.

IMPLICATIONS/DISCUSSION: MRSA is an increasing public health threat, but is usually susceptible to vancomycin and other glycopeptides. Vancomycin-resistant staphylococcus aureus (VRSA), defined by a minimal inhibitory concentration (MIC) greater than 16, is very rare. Within the United States, only seven cases have been confirmed. More common is MRSA with a vancomycin MIC of 4-8 mcg/mL, which is known as vancomycin-intermediate staphylococcus aureus (VISA). VISA is usually caused by the synthesis of an abnormally thickened staphylococcal cell wall that impairs the ability of the drug to reach targets within the cell. The first case of VISA was reported in Japan in 1997. Risk factors include indwelling central lines, dialysis, and prolonged courses of vancomycin. No single treatment has been reliably validated, but most reports suggest using an agent to which the VISA strain is known to be susceptible, such as daptomycin, linezolid, or quinopristin-dalfopristin. Our patient had persistent bacteremia despite a prolonged course of vancomycin, a risk factor for VISA. She then failed to clear her cultures with daptomycin. Her VISA strain demonstrated sensitivity to trimethoprim-sulfamethoxazole, so this agent was used with quinopristin-dalfopristin. Linezolid and quinopristin-dalfopristin sensitivities were not available. Guidelines for prevention and control of VISA are also unclear; an outbreak in an ICU in France in 2006, in which 8 of 22 infected patients died, demonstrated that maximum contact precautions were insufficient to control spread of infection, requiring twice-daily environmental cleaning and admission restrictions. VISA is a concerning threat to public health, especially in hospital settings, whose definitive prevention and treatment is poorly understood.
Meningococcemia Without Meningitis Coral Parikh, Danit Arad. Montefiore Medical Center, Bronx, New York. (Tracking ID # 12141)

LEARNING OBJECTIVES: 1. To review the spectrum of clinical manifestations of Neisseria meningitidis. 2. To recognize an unusual presenting feature of meningococcemia.

CASE INFORMATION: A 26 year-old man presented with one-day of fever and sore throat. He had no prior medical conditions and a review of systems was unremarkable. The patient was monogamous with his wife and he reported no history of sexually transmitted diseases. He was in college but did not live in a dormitory. The patient was febrile to 101.6 degrees Fahrenheit but appeared well and had an otherwise normal exam. He was admitted 2 days later due to blood cultures positive for Gram-negative diplococci.

Three days after the onset of symptoms, he noted swelling of multiple joints but no headache, nuchal rigidity, vomiting or photophobia. He remained febrile, coherent and had no focal neurological deficits. The neck was supple. The left shoulder and right elbow joints were warm and tender; range of motion was limited by pain and joint effusions were present. A similar finding was noted on the right third proximal interphalangeal joint. No skin lesions or urethral discharge was present.

The white blood cell count was 20 K/uL. No organisms were found on urethral culture. Treatment with ceftriaxone was initiated. The organism was subsequently identified as Neisseria meningitidis. The patient was asymptomatic by the 6th day of his illness and was discharged to complete a course of antibiotics.

IMPLICATIONS/DISCUSSION: Neisseria meningitidis is most commonly known as the second leading cause of bacterial meningitis in adults. However, the clinical manifestations of meningococcemia can be quite varied. Although meningococcal bacteremia may occasionally be transient and asymptomatic, in most individuals it is associated with fever, chills, nausea, vomiting, and myalgias. Adult patients with N. meningitidis bacteremia often have respiratory tract disease including pneumonia, sinusitis, tracheobronchitis and conjunctivitis. Approximately 10-30% of patients with meningococcal disease have meningococcemia without clinically apparent meningitis. The above patient had a favorable outcome, however, it is important to recognize that the absence of meningitis has been associated with increased mortality risk, possibly due to a delay in seeking medical treatment or a delay in the time of diagnosis. The clinical features of meningococcemia most strongly associated with a fatal outcome are shock, a purpuric or ecchymotic rash, a low or normal blood leukocyte count, an age of 60 years and older, and coma.

Arthritis, as the presenting sign, was shown to occur in only 2% of patients though 10% of patients eventually developed arthritis. Initially, a monoarthritis may raise concern for a primary purulent arthritis while a late presenting polyarthritis is thought to be due to immune complex deposition. Other uncommon manifestations include pericarditis, endocarditis and urethritis (reported in individuals who practice oral sex).

Finally, chronic meningococcemia can present as a rare syndrome of episodic fever, rash, and arthralgias that can last for weeks to months. If untreated or if treated with glucocorticoids, chronic meningococcemia may evolve into meningitis, fulminant meningococcemia, or endocarditis.

Recognizing the broad clinical spectrum of N. meningitidis is imperative especially because fatal disease is not always associated with the well-known meningitis.
LEARNING OBJECTIVES: 1. Identify neurocysticercosis as a possible cause of central nervous system infections in patients coming from endemic areas. 2. Recognize the various clinical presentations of neurocysticercosis and the way it can mimic other neurological conditions.

CASE INFORMATION: A forty year-old male worker from Mexico presented with episodic and progressively worsening lower back pain and headaches. Five months prior to admission, the patient injured his back and received a number of steroid injections to the lumbar region. The back pain worsened over the last two weeks prior to admission to involve associated symptoms of radiation down his lower extremities, severe band-like headaches, nausea, vomiting, fevers, chills, and photophobia. The day prior to admission, he became confused and could not recognize his family. On admission, the patient was alert and oriented only to name, appeared extremely tremulous, had nuchal rigidity, positive Kerning and Brudzinki sign, tenderness to palpation along the lumbar spinal processes, and lower extremity weakness with motor strength of 4/5 bilaterally.

Laboratory data were only significant for a leukocytosis of 17 k/uL. Computed tomography-guided lumbar puncture was attempted twice, however, cerebrospinal fluid was unattainable. Magnetic resonance imaging of the lumbar spine revealed multiple cystic lesions with peripheral enhancement that appeared intradural. The patient was empirically treated for bacterial and viral meningitis and bacterial abscesses with broad-spectrum antibiotics; however, on the two subsequent days of hospitalization, the patient became delirious with urinary retention, worsening neurological function with a broad-based gait. MRI of the brain and entire spine attained on day two revealed cysts too numerous to quantify extending from the thoracic to lumbar regions and communicating hydrocephalus; the brain was unremarkable. A cisterna magna puncture was performed to attain cerebrospinal fluid that revealed pleocytosis with a white blood cell count of 168, 0% polymorphonuclear cells, 95% lymphocytes, and 5% monocytes; slightly elevated protein of 63mg/dL, and a Western blot positive for Cysticercosis. Treatment with Albendazole and high-dose steroids was initiated.

IMPLICATIONS/DISCUSSION: Back pain and headaches are problems commonly encountered in the inpatient and outpatient settings. At first presentation, analgesics and physical therapy are often tried and imaging only attained when risk factors or alarm symptoms are involved; such as trauma, persistent or progressive symptoms, signs of underlying malignancy or infection, or an abnormal neurological exam. In this case, the patient was refractory to analgesics and had associated neurological abnormalities, suggesting an underlying neurological process. Imaging revealed cystic lesions throughout the spinal canal and included a differential diagnosis of microabscesses, tuberculous meningitis, toxoplasmosis, mycosis, neurocysticercosis, and drop metastasis.

Neurocysticercosis is the most common and serious parasitic infection of the central nervous system. It occurs during an infection by the larval stage of Taenia solium when ova are ingested. Ova develop into larvae, penetrate the intestinal wall and disseminate through the body via the hematological spread to encyst in tissue. T. solium preferentially invade the brain, appearing as parenchymal cysts on CT or MRI, and rarely as isolated spinal neurocysticercosis. Seizures are the presenting finding in over 70% of cases; in fact, neurocysticercosis is the most common cause of acquired epilepsy worldwide. Hydrocephalus and increased intracranial pressure, which develop in approximately 25% of cases, may manifest as nausea, vomiting and papilledema. However, the infection can manifest as any cognitive or neurological abnormality ranging from psychosis to stroke. In rare occasions, like in this case, it can present with meningeal signs. Clinical suspicion should be based upon travel history, history of contact with an individual who might carry the tapeworm, or history of residence in an endemic area of Latin America, Southeast Asia, and India. It is in these areas that the incidence of neurocysticercosis is up to 4% of the population.
A Case of Misdiagnosis: Strongyloides Infection Anjali Dhurandhar 1; Richard Miranda1. 1University of Colorado Denver, Denver, Colorado. (Tracking ID # 10744)

LEARNING OBJECTIVES: 1. Assess a patient with eosinophilia and recognize what is an appropriate evaluation. 2. Recognize the importance of identifying Strongyloides infection as a cause of eosinophilia.

CASE INFORMATION: This is a 42 year-old female who presented with non-bloody diarrhea and abdominal cramping. Vital signs were stable, but stool was positive for occult blood. The patient was prescribed ciprofloxacin 500mg twice daily to cover for pathogenic bacteria. Diarrhea resolved. Six weeks later, she presented with a two week history of loose stools, bloating and weight loss. WBC was 13.9 with eosinophil count of 2.73. Clostridium difficile toxin A by EIA was positive. The patient was treated with metronidazole 500mg three times daily for 14 days. The patient’s symptoms persisted and repeat Clostridium difficile toxin was negative. WBC remained elevated and eosinophil count continued to rise. Stool studies were repeated three times including culture, ova & parasites and Clostridium difficile toxin which were all negative. Stool was positive for fecal WBC and repeatedly positive for blood. The patient continued to lose weight (> 10% of original body weight). WBC peaked at 17.5, with marked eosinophilia 5.75 (32.9%). The patient was referred for EGD and colonoscopy, but biopsies from the duodenum and colon did not demonstrate any eosinophils, larvae or worms. However, the patient was started on budesonide for possible eosinophilic enteritis and had resolution of diarrhea. Absolute eosinophil count also declined, but was still elevated at 2.17. Therefore, the patient was referred to an infectious disease specialist who found a positive Strongyloides antibody at 1.74 (<1.0 normal). The patient was prescribed ivermectin for two days and then two weeks later, was prescribed additional course of ivermectin for two days due to persistent symptoms. The patient responded well to this second treatment and her eosinophil count declined and has remained at zero.

IMPLICATIONS/DISCUSSION: Eosinophilia almost always indicates underlying pathology and requires a thorough evaluation. Studies have shown that U.S. providers often overlook Strongyloides in the work up of asymptomatic eosinophilia and may have inadequate knowledge of helminth infections. Though not a common infection in the U.S., Strongyloides is endemic in Southeastern U.S. and has a high prevalence rate amongst those who have resided in endemic areas such as veterans and certain immigrant populations. Patients may be infected for decades and may be asymptomatic or have nonspecific symptoms. Untreated chronic infections may lead to significant morbidity and mortality as the patient ages and receives treatments for other illnesses, particularly corticosteroids. These patients may develop the hyperinfection syndrome that can result in bacterial sepsis and death. Strongyloides is the leading cause of helminth deaths in the U.S. Therefore, considering Strongyloides in the differential diagnosis of a patient with eosinophilia, nonspecific abdominal complaints, new-onset wheezing and/or skin lesions is of critical importance. Diagnosing Strongyloides with routine stool studies has poor sensitivity due to irregular larval excretion. Serological testing has higher sensitivity than direct methods and is an appropriate screening tool for individuals from endemic areas and in the workup of eosinophilia. Even if the pathogen cannot be directly visualized, a positive serologic test warrants treatment. Though this infection is completely curable in its chronic state, mortality is exceedingly high for the hyperinfection syndrome. Failure to consider this pathogen can lead to unnecessary morbidity and mortality. Our failure to recognize this pathogen did lead to the inappropriate prescribing of corticosteroids. Fortunately this patient had a good outcome and her infection was completely eradicated.