The following abstracts will be presented at the Southern Medical Association Medical Summit-Annual Scientific Assembly, November 2-4, 2017, in St. Petersburg, Florida.

So as not to unintentionally alter the material’s intended meaning, abstracts are presented/published as received.

### Correlation Between Toe Brachial Index (TBI) and Leg Angiogram Findings

**Saturday, November 4 7:32 – 7:42 am**

<table>
<thead>
<tr>
<th>Presenting Author</th>
<th>Zulfiqar Qutrio Baloch, MD, Resident, Brandon Regional Hospital, Brandon, FL</th>
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<tr>
<td>Co-authors</td>
<td>Shabber Agha Abbas, MD, R-Endocrinology, Departement of Medicine, Hamilton, NJ</td>
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<td>Abbas Ali, MD, Department of Cardiology, West Virginia University, Morgantown, WV</td>
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<tr>
<td>Category</td>
<td>Medicine &amp; Medical Subspecialties</td>
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<tr>
<td>Abstract</td>
<td><strong>BACKGROUND / OBJECTIVES:</strong> The potential of falsely elevated ABI readings due to medial thickening in patients with advanced PAD can be mitigated by using TBI in such patients. Objective of our study was to describe a correlation between TBI and leg angiogram findings in patients with established PAD or signs and symptoms of PAD who partook in a 6 minute walk test study named STRIDES.</td>
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<td><strong>METHODS:</strong> Among 532 patients who had some available data from the STRIDES study, 280 had an angiogram conducted either before or after the 6-minute walk test. We restricted our analysis to 188 patients who either had a leg angiogram less than 13 months prior to STRIDES or had a leg angiogram at anytime after STRIDES. As is supported by the literature, we considered a TBI &lt;0.5 as a relevant surrogate for diagnosing PAD.</td>
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<td><strong>RESULTS:</strong> The mean TBI in patients with angiogram-identified lesions were (above knee 0.372, above and below knee 0.467, below knee 0.451, iliac 0.511, iliac and above knee 0.378, iliac and below knee 0.544, all locations 0.450). Below knee lesions were the most frequent lesion in 46 patients who had a TBI &lt;0.3 and in 127 patients who had TBI between 0.3 and 0.8. In patients with below the knee lesions 23 had a TBI &lt;0.3, 60 had a TBI between 0.3 and 0.8, and 2 had a TBI above 0.8. In those with below knee lesions roughly one fourth had above knee lesions as well.</td>
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<td><strong>CONCLUSION:</strong> In our retrospective analysis, the majority of patients with angiographic confirmation of PAD had a TBI &lt;0.5. Amongst these the majority had below the knee lesions. Only patients with iliac and above knee lesions had a TBI &lt;0.5, the rest of patients with iliac lesions had a TBI &gt;0.5. Limitations to consider with regards to our analysis include timing of angiographic assessment versus timing of TBI measurement. Patients who underwent leg angiogram up to a year prior to TBI were included of whom some had percutaneous transluminal angioplasty (PTA) done but had residual lesions that were not amenable to PTA. Additionally, some patients had several months pass before TBI was done and their lesions could have re-stenosed. We further propose that amongst patients with suspected iliac disease a low threshold for intravascular ultrasound would help identify those with ‘missed’ iliac disease.</td>
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The Successful Management of a Case of Prosthetic Valve Endocarditis Due to Propionibacterium Acnes Superimposed with Abscess Formation Without Surgical Intervention

Saturday, November 4
7:42 – 7:52 am

Presenting Author
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Category
Medicine & Medical Subspecialties

Abstract
INTRODUCTION
Propionibacterium acnes is an anaerobic, gram-positive bacillus bacteria, and is considered commensal bacteria on the skin [1]. Propionibacterium species is slow-growing require at least 6 days for growth in culture, and it can be difficult to determine whether positive culture reflect contamination vs true infection [3]. They have the ability to form biofilm robust behavior with high resistant to most antibiotics [4]. Clinical observations and experimental studies indicated antibiotic treatment in most cases is insufficient to eradicate biofilm infections. Therefore, to effectively treat biofilm infections with currently available antibiotics and evaluate the outcomes is important [5]. Abscess formation will further complicate the disease, and will require a redo surgery, combined with antimicrobial therapy consisting of penicillin with or without rifampicin [6].

CASE PRESENTATION
Patient is a 27 y/o F with history of hypertension and congenital aortic stenosis s/p aortic valve replacement in 2010 with a 21mm bio-prosthetic valve. In Jan 2016 she noticed increasing shortness of breath and chest pain, echo showed aortic valve stenosis. The recurrent stenosis was possibly from a combination of valve failure and size mismatch, latter underwent redo aortic valve replacement with a Konno aortoventricular patch, and right ventricle outflow tract augmentation. In August 2016 reported chest pain and a syncopal episode. In September 2016 reported dyspnea, orthopnea, PND, lower leg swelling, weight gain, generalized weakness. She was started in furosemide in October 2016, transthoracic echocardiogram showed severe leak between the mechanical aortic valve and the Konno patch. Cardiac CT revealed dehisced valve, concern for infectious endocarditis but there were no obvious vegetation, blood culture was negative, low ESR, CRP is elevated with mild leukocytosis. In November 2016 she underwent redo sternotomy with repair of aortic valve dehiscence. In the operating room, blood culture and biopsy were positive for Propionibacterium acnes.

MANAGEMENT
She was started on Intravenous (IV) ceftriaxone 2 grams q24 hours and rifampin 300 mg PO Q12 hours for 6 weeks. Repeat cardiac CT revealed vegetation in the right ventricular outflow tract (RVOT) attached to the Konno patch and there may be a fluid collection which could represent abscess between the valve and the patch.

Extended antibiotic therapy (6 more weeks) was recommended in an effort to postpone redo operation due to hostile chest from recent heart surgery and to allow chest inflammation to resolve several months after her last operation. 12-week therapy of IV Ceftriaxone and Rifampin, she was switched to oral Augmentin and Rifampin. In February 2017, follow up echocardiogram showed no features of aortic valve dehiscence and complete resolution of the large vegetation and peri-valvular abscess.

DISCUSSION
This is second case report of successful conservative management of P. acnes prosthetic valve endocarditis with peri-valvular abscess. Due to low suspicion, absence of IE symptoms, and culture
negative to grow P. acnes, the correct diagnosis and treatment of this condition was delayed. These species are not being included in the list of typical bacteria causing endocarditis. Usually surgical treatment plus antibiotics is the mainstay of care, but due to a recent surgery, a redo poses significant risk and slower recovery [6]. The treatment choice for our patient was based on susceptibility test and review of literature (table 1). Rifampin was added to the regimen to avoid the development of rapid resistance to Ceftriaxone monotherapy. This was a special circumstance in a patient with prohibitive operative risk. It is not clear whether this can be generalized without clinical trial data, though may be difficult to obtain due to rarity of this situation.

This is second case report of successful conservative management of P. acnes prosthetic valve endocarditis with peri-valvular abscess. Due to low suspicion, absence of IE symptoms, and culture negative to grow P. acnes, the correct diagnosis and treatment of this condition was delayed. These species are not being included in the list of typical bacteria causing endocarditis. Usually surgical treatment plus antibiotics is the mainstay of care, but due to a recent surgery, a redo poses significant risk and slower recovery [6]. The treatment choice for our patient was based on susceptibility test and review of literature (table 1). Rifampin was added to the regimen to avoid the development of rapid resistance to Ceftriaxone monotherapy. This was a special circumstance in a patient with prohibitive operative risk. It is not clear whether this can be generalized without clinical trial data, though may be difficult to obtain due to rarity of this situation.
Methemoglobinemia is extremely rare but potentially fatal disease. The most common cause of acquired methemoglobinemia are topical lidocaine and benzocaine. The most severe cases have been seen after usage of 20 % benzocaine spray. We report a case of methemoglobinemia after usage of benzocaine spray for discomfort from nasogastric (NG) tube.

A 74 year old woman with atrial fibrillation, CAD and history of colonic resection for colono-vaginal fistula was admitted with abdominal pain. She was found to have peritonitis due to perforated jejunal diverticulitis and underwent a small bowel resection. On the third postoperative day, patient experienced significant discomfort due to presence of NG tube. Surgery advised to keep the NG tube in place, owing to important secretions while patient is not defecating or passing gas. Patient was prescribed benzocaine lozenges and benzocaine spray for oropharyngeal discomfort. Later that day, rapid response was called due to complaints of chest pain and shortness of breath. Patient appeared cyanotic, in severe distress, alert and oriented. BP 174/88, HR 193, temperature 36.3 C, RR 25, O2 saturation low 80’s. Bibasal crackles present. EKG revealed atrial fibrillation with rapid ventricular response. Chest X-ray showed new bilateral airspace disease and pleural effusions. Patient was started on IV betablocker, followed by IV diltiazem, and furosemide. Her symptoms improved, however, heart rate remained elevated and O2 saturation low. Patient was put on ventimask 50% and simultaneously, ABG was drawn: pH 7.41, pCO2 27, pO2 70, O2 saturation 94%. Methemoglobinemia was noted at 31.6%.

Subsequently, patient was given 100 mg of methylene blue. ABG 1 hour later showed normalized methemoglobin (0.7%). Patient’s symptoms completely resolved. Patient converted back to sinus rhythm later that day.

A topical benzocaine is widely used and commonly considered as safe. The overall prevalence of methemoglobinemia is low (0.035%). However, our case demonstrates that even application of topical anesthetic at regular dose can carry a risk of causing a life-threatening illness, particularly in individuals with comorbidities leading to compromised oxygenation, such as anemia, heart or lung disease. Methemoglobinemia is treatable if addressed early. Therefore, prompt identification and treatment are crucial. Our case report is to raise awareness about this rare but potentially deadly complication of topical anesthetics and advise to use them with caution. Additionally, methemoglobinemia is generally low (if at all) on differential diagnoses list for chest pain and shortness of breath, however, we need to have low threshold of suspicion for methemoglobinemia in patients who recently underwent any procedure where topical anesthetics were used (NG tube placement, bronchoscopy, ERCP, TEE etc.) and are presenting symptoms of cyanosis, tachycardia, dyspnea, lethargy.
Shake It Off: A Curious Case of Rigors

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Category
Medicine & Medical Subspecialties

Abstract
Introduction: Heparin-induced anaphylactoid reactions are life-threatening reactions that have been described for more than 50 years. Affected patients usually have exposure to heparin in the previous ten days. This syndrome heralds the beginning of heparin-induced thrombocytopenia (HIT) with rigors and evidence of hemodynamic compromise. Symptoms usually improve with cessation of heparin infusion and supportive care if negative evaluation for HIT.

Case Presentation: An 82-year-old African-American male with no past medical history presented to the ER with sudden onset dyspnea and palpitations. Patient denied recent fever, chills, sweats, chest pain, paroxysmal nocturnal dyspnea, orthopnea, nausea, vomiting, or dysuria. On initial evaluation, the patient was found to have heart rate of 170 beats per minute. ECG showed atrioventricular nodal re-entrant tachycardia (AVNRT). Patient was given 6 mg of adenosine with spontaneous resolution of his AVNRT, dyspnea, and palpitations. Laboratory studies were within normal limits. Computed tomography of the chest showed an acute sub-massive pulmonary embolism. The patient was started on parenteral heparin infusion. Within ten minutes of IV heparin infusion, the patient developed chills and rigors. Initial differential diagnosis included HIT vs. acute respiratory distress syndrome vs. sepsis from superimposed bacterial pneumonia vs. infective endocarditis with septic emboli.

Final/Working Diagnosis: Heparin-induced anaphylactoid reaction

Management/Outcome: Parenteral heparin infusion was discontinued and switched to argatroban. Anti-platelet factor 4 antibody levels and serotonin release assay were obtained and both results came back negative. Patient had blood and urine cultures obtained with no growth observed. Transthoracic echocardiogram showed no stigmata concerning for infective endocarditis. After discontinuing unfractionated heparin, the patient stopped having chills and rigors. Given his negative evaluation for acute respiratory distress syndrome, HIT, sepsis, and infective endocarditis, patient was diagnosed with heparin-induced anaphylactoid reaction given the temporal relationship between receiving heparin and the onset of his rigors. Patient received education on his body’s response to heparin, and heparin was listed as a medication allergy.

Learning Objectives
Upon completion of this lecture, learners should be better prepared to:
1. Recognize rigors after heparin infusion as a sign of possible heparin-induced thrombocytopenia
2. Describe the pathophysiology, diagnosis, and treatment of heparin-induced anaphylactoid reactions
3. Describe the clinical implications of heparin-induce
Two Cases of Disseminated Infection Following Live Organism Anti-Cancer Vaccine Administration in Cancer Patients

Saturday, November 4
8:12 – 8:22 am

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Category
Medicine & Medical Subspecialties

Abstract

Introduction:
Increasingly, there is recognition that the immune system may be our greatest asset in the development of novel anti-cancer therapeutics. Many current chemotherapeutic agents and regimens are known to be immunosuppressive due to their toxicity to the bone marrow. For this reason, many cancer patients experience prolonged immunosuppression that can lead to co-morbidities such as severe infection and even additional cancers. Many emerging immunotherapies seek to modulate the immune system to destroy malignant cells while leaving the host in an immunocompetent state. Currently, live attenuated viral and bacterial vaccines are being studied as therapy for both locally advanced and metastatic cancers. However, use of these live attenuated vaccines in an immunocompromised host raises the theoretical risk of disseminated infection as the attenuated pathogen has the potential to replicate inside the host. We present two cases in which cancer patients, receiving experimental therapy with live attenuated vaccines, experience disseminated infection with the inoculated organism. To our knowledge, no other such cases have been reported in the literature.

Background:
CRS-207 is a vaccine that contains a live, experimentally modified strain of Listeria monocytogenes. This L. monocytogenes strain has been designed to exert anti-cancer activity by infecting antigen presenting cells (APCs) and elaborating large amounts of mesothelin (a peptide) which is subsequently processed and expressed on the major histocompatibility complexes (MHCs) of the APC. Mesothelin is a tumor-specific antigen commonly over-expressed in pancreatic ductal adenocarcinomas (PDAs) and is thus a potential target for an anti-PDA immune response. Currently, CRS-207 is used in an experimental protocol in conjunction with low dose cyclophosphamide and another cancer vaccine, GVAX, in the treatment of locally advanced or metastatic PDA.

Listeria monocytogenes is a facultatively intracellular, Gram-positive rod that can cause life threatening illness in individuals with weakened cell-mediated immunity. Although cases of listeriosis are rare, these cases often arise as outbreak clusters from a contaminated food source. The clinical manifestations of listeriosis in the immunocompromised host vary greatly, but often begin as a febrile gastroenteritis that rapidly evolves into bacteremia and sepsis with subsequent seeding of the meninges, leading to meningitis with or without cranial abscess formation. Additional clinical manifestations include but are not limited to endocarditis, cellulitis, hepatitis and hepatic abscesses, endophthalmitis, and pneumonia.

Cancer-lysing viruses are also being explored as an option in cancer therapy. In particular, oncolytic viruses (OVs) are being explored as a therapy for World Health Organization (WHO) grade IV astrocytoma (formerly glioblastoma multiforme or GBM). GBM is the most common primary intracranial tumor and is associated with a poor prognosis. Pioneering work using OVs against GBM
began in 1991 when a thymidine kinase-deficient strain of Herpes Simplex Virus (HSV) was found to have selective tropism for dividing cells of glial differentiation, e.g. GBM. Viruses currently being investigated as anti-glioma therapeutics include HSV, Adenovirus serotype 5, Reovirus, Measles, Poliovirus, human Parvovirus, and rat Parvovirus H-1. However, despite the proliferative development of dozens of anti-glioma OVs since 1991, none of these OVs have made it to phase III trials.

Adenovirus is a double-stranded DNA, non-enveloped, icosahedral viral pathogen that is a common cause of respiratory tract and conjunctival infections in humans. Adenoviruses were first isolated from the human adenoids in 1953 and have since been classified into 6 species (A-F) and over 50 serotypes. In the immunocompetent host, Adenovirus can cause mild infections with a relatively benign course. These infections often resolve spontaneously without the use of antivirals. In the immunocompromised host, however, infections can be life threatening. Hematopoietic stem cell transplant (HSCT) recipients are the classic patient population associated with disseminated adenovirus infection, but solid organ transplant recipients, human immunodeficiency virus (HIV) positive patients, and congenital immunodeficiency patients have experienced severe Adenoviral infection as well. In cases of severe infection, some clinicians have turned to off-label uses of the antiviral drugs cidofovir and ribavirin. Studies into the efficacy of these two agents in adenoviral infection has been inconclusive and conflicting; neither agent has been evaluated using randomized, prospective trials.

Case Presentation:

CASE 1

Our first patient was a 67-year old Caucasian female with a history of advanced PDA who presented to our facility with complaints of nausea, diarrhea, abdominal pain, fever, and progressive headache. She did not have a history of migraine headaches, but on presentation she complained of a progressively severe headache associated with photophobia. Her temperature was noted to be 100.4 °F (30 °C). She denied any recent sick contacts. Physical examination revealed a soft, non-distended abdomen that was tender to palpation in the lower quadrants. Kernig’s and Brudzinski’s signs were absent. The rest of the physical exam revealed no abnormalities.

Because the patient was enrolled in an experimental protocol with GVAX/low-dose cyclophosphamide and CRS-207, the patient was admitted to the hospital and had blood cultures drawn (from a central port) on admission. Her last experimental therapy dose was 12 days prior to admission. On admission, she was started on ceftriaxone. One out of two blood cultures drawn on admission grew L. monocytogenes and the ceftriaxone was changed to ampicillin and gentamicin. Cultures drawn on hospital day 2 also grew L. monocytogenes. A magnetic resonance image (MRI) on hospital day 2 revealed no intracranial abscesses or metastases. A lumbar puncture(LP) performed on the same day also revealed no abnormalities. The patient experienced steady improvement with resolution of fever, abdominal pain, and headache. On the day of discharge, she was noted to have a temperature of 98.2 °F (36.8 °C) and a completely benign physical exam. Following consultation with both infectious diseases and oncology, the patient was discharged to home on IV penicillin. A blood culture drawn 12 days later from the patient’s port demonstrated no growth, and the penicillin was discontinued.

CASE 2

Our second patient was a 58-year-old male with a history of recurrent right temporal GBM. Seven days prior to his admission, the patient (as a part of an experimental trial) received an intratumoral injection of an experimental oncolytic adenovirus. He had an uncomplicated surgical course. On admission, he complained of having several days of progressively worsening fever, somnolence, headaches, nausea, and dehydration. These general, non-specific signs and symptoms were initially ascribed to an immunologic response to the injected Adenovirus, but due to deteriorating mental status, the patient was admitted to the hospital.

A computed tomography (CT) scan showed no acute intracranial bleeds or other acute pathology. A subsequent MRI revealed increased tumor signal (over baseline) and central necrosis-findings consistent with a positive response of the tumor to the trial Adenovirus therapy. Infectious disease was also consulted due to the possibility of viral encephalopathy. A work-up of the fever
revealed Adenovirus DNA from the blood and from the cerebrospinal fluid (CSF), but initially there was confusion about the significance of this finding in the context of the patient’s clinical history. The patient’s team considered adding antiviral therapy such as cidofovir or ribavirin, but due to the toxicity of these drug, conservative treatment was initiated with corticosteroids to manage the patient’s cerebral edema. The patient’s leukocytosis and fever resolved, and his mental status returned to baseline. On discharge, the patient had no fever and his homonymous hemianopsia, present since his initial diagnosis of GBM, remained unchanged. Following discharge, the patient was continued on a normal follow-up schedule as part of the clinical trial.

Final Diagnosis:
Both patients who were participating in experimental protocols for their advanced cancers presented with signs of infection typical of the organisms present in their respective live vaccines. In both cases, the history of vaccination with the live attenuated organisms and their clinical presentation lead to successful diagnosis and treatment. While our first patient with L. monocytogenes infection did receive ampicillin-gentamicin therapy, the second patient with Adenovirus infection was treated conservatively without antiviral therapy.

Outcome/Follow-up and Discussion:
The use of live attenuated organisms in vaccines always poses the theoretical risk that these organisms can cause vaccine-induced disease. This theoretical risk has manifested into real possibility in certain patient populations such as pregnant women and Acquired Immunodeficiency Syndrome (AIDS) patients. In our first case, the patient experienced a febrile gastroenteritis with bacteremia 12 days following inoculation with an experimental, anti-PDA strain of L. monocytogenes. If the organism was “attenuated” before being administered to the patient, the question remains as to how, mechanistically, this organism reverted to a “wild-type,” disease-causing phenotype. The possibility also remains that the patient acquired this infection from contaminated food which is the usual way of acquiring L. monocytogenes infections in adults, or via the fecal-oral route from a sick contact. However, the patient denied any sick contacts. The ampicillin-gentamicin combination therapy proved successful and the patient was ultimately discharged home.

Our second patient presented a more challenging case. It was questionable at the time if this patient experienced a “real” disseminated Adenovirus infection or whether viral shedding was a normal part of the experimental therapy. The patient did experience a clinical syndrome of fever, headache, and altered mentation that would be consistent with a frank viral encephalopathy. Further, Adenoviral DNA was isolated from the patient’s blood and CSF. This patient did recover to his baseline mental status and was successfully discharged from the hospital after receiving conservative management with corticosteroids. Since the Adenovirus inoculated into this patient was an oncolytic virus (OV) it is possible that withholding antiviral therapy may have been indicated to allow the virus to infect and lyse the GBM cells. If the infection became life-threatening, it is difficult to know if antiviral therapy would have efficacy against such a modified virus.

Future work in this domain may include next-generation sequencing to determine whether the organisms isolated from clinical specimens are the progeny of the vaccine organisms. If the genome sequence of the clinical isolate varies from the original organism, it would be of scientific interest to know in which way it varies. The number of infections of this type can be expected to increase in the coming years as it becomes clear that the future of anti-cancer therapy lies in harnessing the immune system and immune system-modulating agents, such as vaccines, to destroy malignant cells.

Learning Objectives
Upon completion of this lecture, learners should be better prepared to:
1. Use a clinical history of trial enrollment to diagnose/manage a cancer patient who presents with apparent infection following live organism vaccine administration
2. Recognize the risks inherent to the use of live attenuated organisms in patients with a compromised immune system
3. Discuss, briefly, the use of experimentally modified organisms as anti-cancer therapy.
Combating Stroke Using the Nose to Brain Highway: Treatment with Intranasal Trans-Olfactory Angiotensin Type 2 Receptor Agonist After Ischemic Stroke is Neuroprotective

Saturday, November 4
8:22 – 8:32 am

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Category
Medicine & Medical Subspecialties

Abstract

Background: Options for treating patients with acute ischemic stroke are limited, and none are available to specifically counteract the post-ischemia inflammation and neuronal loss that occurs in the first hours and days after stroke. Recent preclinical studies of a protective pathway within the renin angiotensin system have highlighted the neuroprotective potential of post-stroke activation of the angiotensin type 2 receptor (AT2R). Compound 21 (C21), a selective small-molecule AT2R agonist, has been proven in multiple preclinical studies to reduce infarct size and ameliorate neurological deficits, when administered after ischemic stroke via intracerebroventricular or intraperitoneal routes. However, C21 only poorly penetrates the blood brain barrier (BBB). In the present study, we used the novel and non-invasive approach of intranasal trans-olfactory, or nose to brain (N2B) application, in order to bypass the BBB and deliver C21 directly into the brain.

Methods: The therapeutic efficacy of N2B application of C21 was assessed in a model of transient middle cerebral artery occlusion (MCAO) in male SD rats (12 weeks old) in three experiments. (i) Rats underwent ischemic stroke by endothelin-1-induced MCAO. They were randomly divided into two treatment groups, either receiving 0.9% saline or C21 (1.5 ug/kg) at 1.5, 4, 24 and 48 h post-stroke, using a rat intranasal catheter device (Impel Neuropharma, Seattle, WA) for N2B application. All rats underwent blinded neurological assessments at 4, 24 and 72 h after stroke, and immediately after the 72 h tests, were euthanized and cerebral infarct volumes were assessed by TTC staining. (ii) Rats (n=8) underwent implantation of a telemetry transducer (DSI, St. Paul, MN) into the abdominal aorta for measurement of blood pressure, heart rate and locomotor activity after N2B C21 (1.5 ug/kg) vs. 0.9% saline at baseline and post-ischemic stroke. (iii) Rats received saline or C21 via N2B application at baseline (n=8) or 4 hours post-stroke (n=8) followed 30 minutes later by euthanasia and assessment of C21 levels in target brain regions (e.g. olfactory bulb, cortex, striatum), and plasma. For comparison, C21 levels were also assessed in rats that received intraperitoneal injection of C21 at baseline or 4 hours post-stroke.

Results: (i) Post-stroke N2B delivery of C21 (1.5 ug/kg) elicited a nearly 50% reduction of cerebral infarct size (25.4 ± 4.7%; n=9) compared with saline-treated rats (48.4 ± 4.4%; n=21) [p<0.05; two-way Mann-Whitney test]. The C21 (1.5 ug/kg)-treated rats also displayed highly significant improvements in neurological Garcia and Bederson scores [p<0.01; two-way Mann-Whitney test]. (ii) N2B delivery of C21 (1.5 ug/kg) either in naïve rats, or in rats post-stroke, did not significantly alter baseline blood pressure, heart rate and locomotor activity. (iii) C21 was detected in the target brain tissue in both naïve (0.82 nM) and stroke (0.82 nM) animals after N2B administration, whereas intraperitoneal injections at a 20x higher dose resulted in high brain C21 levels only after stroke (2.14 nM), with much lower brain levels among naïve animals (0.33 nM).

Conclusions: Our results demonstrate, that N2B delivery of a low-dose of C21, an AT2R agonist, exerts protective effects after ischemic stroke without affecting blood pressure or heart rate. N2B administration delivers C21 to both plasma and to target brain regions under conditions of baseline and during stroke, whereas peripheral C21 delivery apparently requires disruption of the blood brain barrier by stroke to achieve significant brain levels despite being given at much higher total doses. These studies suggest N2B administration as potential future route of application of C21 to stroke.
patients that could minimize potential dose-related systemic side effects and more specifically target at-risk brain tissue.

**Learning Objectives**

Upon completion of this lecture, learners should be better prepared to:

1. Discuss the neuroprotective effects of activation of angiotensin II type 2 receptors (AT2Rs) by nose to brain administration of a novel agonist, Compound 21 (c21)
2. Consider the clinical implications of targeting at-risk brain tissue by nose to brain administration of this novel stroke therapeutic at low-doses
When Taste Buds Lands You Into ICU

Saturday, November 4
8:32 – 8:42 am

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Category
Medicine & Medical Subspecialties

Abstract
Introduction: Foodborne illness accounts for significant morbidity/mortality; 9 million illnesses occur annually with approximately 1300 deaths. It is important for clinicians to recognize the potential pathogenic organisms and the risk factors associated with significant morbidity and mortality.

Case presentation: A 69-year-old male with diabetes-mellitus, presented with nausea, vomiting and diarrhea for 2 days. He rapidly deteriorated to shock requiring vasopressors, dialysis and intubation. Significant examination findings included fever of 39.6 C, intubated and sedated, slightly distended abdomen with no skin lesions.

Laboratory investigations revealed WBC of 21,000/ml, Creatinine of 4.8mg/dl, procalcitonin of 65ng/ml and lactic acid 6 mg/dl.

Initial CT chest ruled out pulmonary embolus but revealed fluid filled loops of bowel. He attended a party two days prior to presentation where he ate a large basket of raw oysters along with Cole slaw and potato salad. The differential included foodborne illness due to Vibrio species, Listeria, Salmonella, E coli with Hemolytic uremic syndrome.

Stool PCR panel positive for Vibrio species. Stool cultures eventually revealed Vibrio fluvialis while blood cultures remained negative.

Final diagnosis: Gastroenteritis with multi-organ dysfunction(shock, AKI, encephalopathy) related to Vibrio fluvialis.

Management/Outcome: Initially, he was started on broad spectrum antibiotics but de-escalated to Doxycycline and ceftriaxone, with rapid improvement & subsequent extubation on day 3. After 14 days of Ceftriaxone and Doxycycline, he had full recovery. This combination of antibiotics was used based on the reported resistance panel of V. fluvialis in the literature.

An outbreak investigation done by Department of Health revealed 17% of 200 people who attended the party were affected, only one requiring ICU admission.

Vibrio species outbreaks are rare in USA, usually causing acute gastroenteritis. A higher inoculum V. fluvialis in an immunocompromised host or those with liver disease or diabetes-mellitus can result in aggressive clinical deterioration.

Learning Objectives
Upon completion of this lecture, learners should be better prepared to:
1. To improve awareness of and to recognize foodborne illness related to raw seafood
2. To identify non-V. vulnificus as a potential pathogenic organism transmitted by raw oysters
Inappropriate Testing for Clostridium Difficile (C-Diff) Infection for Hospitalized Patients, a Closer Look

Saturday, November 4
8:42 – 8:52 am

Presenting Author
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Category
Quality Health Care, Patient Safety, & Best Practices

Abstract
Background:
Clostridium Difficile (C-Diff) infection is a known cause of mortality and morbidity in hospitals, adding nearly 4.8 billion dollars a year to the health care burden. Testing for this organism is governed by guidelines highlighted in the Infectious Diseases Society of America (IDSA). Only patients with clinically significant diarrhea benefit from testing as a positive test can represent colonization or active disease. Our objective is to minimize unnecessary testing for C-Diff by providing health care clinicians with the latest evidence based guidelines in managing patients’ diarrhea. We also aim to outline the financial benefits that result from minimizing inappropriate testing.

Methods:
Prospective study performed at a university tertiary medical center. A clinically significant diarrhea was defined by the IDSA guideline for C-diff testing “as passage of 3 or more unformed stools in 24 or fewer consecutive hours”. Unless this was clearly documented in the patient’s file, a bedside patient interview was held for verification. Complete patient profile review was performed for all patients who were hospitalized for greater than or equal to seven days and tested for C-diff. Our aim was to detect any potential medications or interventions that could lead to developing diarrhea; Including antibiotics and proton pump inhibitor (PPI) use within 7 days prior to development of diarrhea, a bowel regimen for constipation or tube feeding within 48 hours of onset of diarrhea.

Results:
Results from data collected over one month period. A total of 53 C-Diff DNA amplified tests were performed, of those 53 cases, only 16 cases (30%) met the guidelines for collection while 37 cases (70%) did not meet these guidelines. Of the 16 cases that met the guidelines, only 5 (31%) cases came back positive for C-Diff, which is equal to 9.4% of the total sample. Of the 37 cases that didn’t meet the guidelines, 13 cases didn’t undergo any testing as patients were unable to provide a stool sample, the other 24 cases were tested for C-diff and all were found to be negative. The financial burden of the negative tests that did not meet the guidelines was around $7534 ($314 per test). Projected over one year, the price would be $90408. Taking into account, that this number doesn’t include the cost
of sample containers, transport, testing kits, prophylactic antibiotics, and isolation rooms/equipment’s. The data also showed 50% of the patients tested were on laxatives.

Conclusion:
Testing for C-Diff infection in patients with no clinically significant diarrhea has an extremely low yield. Additionally, testing those patients has a significant negative financial impact, as well as a negative psychological impact that results from being placed in isolation rooms. In addition, there is risk of side effects with the unnecessary use of prophylactic antibiotics.

Learning Objectives
Upon completion of this lecture, learners should be better prepared to:
Identify patients that meet the guidelines to be tested for C-Diff.
Reflect on the financial benefits that can be made when minimizing inappropriate testing for C-diff as well as consider other test were inappropriate testing is taking place.
Myxoid Liposarcoma of the Hand - Presentation of a Rare Pathology Mimicking as a Hand Abscess

Presenting Author
David A. Mateo de Acosta Andino MD, Plastic Surgery Resident, University of Alabama at Birmingham, Birmingham, AL

Co-authors
Ali Kilic, University of Alabama at Birmingham, Division of Plastic Surgery, Assistant Professor

Category
Surgery & Surgical Subspecialties

Abstract

Introduction
Soft tissue sarcomas represent 0.1–0.2% of adult neoplasms with liposarcomas (LS) accounting for 20% and an estimated incidence of 2.5 case/million/year. Malignant hand tumors represent 2–5% of all hand tumors. Only another two cases have been reported of myxoid liposarcoma (MLS) of the hand in the worldwide literature. The etiology of most tumors of the hand is unclear with factors such as genetic predisposition metabolic imbalances, and trauma reported as possible causative factors. In the current case, as well as in one of the other two reported cases, workplace may have contributed to the occurrence of MLS.

Open biopsy of extremity soft tissue lesions carries high morbidity. In the reported case, due to its confounding presentation, an incision and drainage was attempted finding a secondarily infected soft tissue mass.

Limb-sparing surgery with or without adjuvant RT is an effective treatment option for extremity STS. (6) MLS are relatively more radiosensitive than other types of STS, with high rates of regression after adjuvant radiotherapy. (7)

The current National Comprehensive Cancer Network (NCCN) guidelines recommend surgical resection with adjuvant radiotherapy for stage II–III MLS, unless the tumor is unresectable, in which case neoadjuvant radiation or chemoradiation are recommended obtaining higher rates of post neoadjuvant therapy resectability. (8, 9)

Case Presentation

We report a 41 year old right hand dominant African American male who presented to the emergency department with complaints of 14 days of intermittent fever, erythema edema and tenderness to the volar aspect of the left index metacarpophalangeal joint (MCP). He had a distant history of penetrating work related trauma to the area. Physical examination revealed a volar tender non mobile tense mass on the volar index finger MCP measuring approximately 3 cm x 2 cm limiting the flexion / extension range of motion (ROM) of the joint. Plain radiographs of the left hand showed a soft tissue density with no bony involvement. (Fig. 1A, Fig 1B)

Incision and drainage of the mass was performed revealing scant purulence and copious mucinous caseous material. Cultures of the obtained fluid revealed staphylococcus epidermidis. The patient was submitted to a formal MCP exploration finding a multiloculated mass extending to the dorsum of the index finger MCP and the proximal phalanx not involving the joint or tendons. (Fig. 2) This was resected completely. Histology confirmed the diagnosis of a 7x5.5x2.1 cm MLS. No round cell component was seen. The margins of excision were tumor-free on the macroscopic and microscopic examination. No adjuvant treatment was done. The tumor was classified as a Stage Iib (T2, N0, M0, G2 ) according to the Joint Committee on Cancer (AJCC) staging system of STS. (10)

Outcome and Follow up
The patient has been seen on multiple occasions within the 6 months following his initial resection there have been no signs of recurrence. He has regained full function of his hand motor and nervous function.
Upon completion of this lecture, learners should be better prepared to:

1. Include MLS of the hand as a differential diagnosis on patients presenting with unclear hand soft tissue tumors or abscess.
2. Initial differential diagnosis and work up of MLS of the hand.
3. Identify and refer patients with Hand MLS for further management to the hand surgery service.
**Surgical Stabilization of an Intramuscular Pectoralis Major Tear Utilizing Tendon Allograft**

**Presenting Author**
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**Co-authors**
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**Category**
Surgery & Surgical Subspecialties

**Abstract**

Introduction:
Pectoralis major tears remain a relatively uncommon clinical entity. Within the last ten years, however, the incidence has been steadily increasing. This may be, in part, due to the increased interest in weight lifting and utilization of anabolic steroids. Accurate diagnosis is critical as early surgical intervention yields superior results, particularly in an athletic population. Optimal treatment depends upon the location of the tear and extent of damage to the surrounding structures. The most common type of tear occurs at the tendinous insertion point as an avulsion type injury. Solitary intramuscular tears are exceedingly uncommon and can often be managed conservatively. However, musculotendinous and complex tears involving multiple injury subtypes may benefit from surgical intervention. The most common mechanism of injury is a rapid, eccentric loading of the muscle, as occurs during a bench press. This motion places the shoulder in an abducted, externally rotated position with maximal muscle tension occurring at the nadir of a repetition. The forces applied at this angle place the sternal head at an extreme mechanical disadvantage. This may overwhelm the pectoralis’ ability to adequately stabilize the deltopectoral region which can lead to significant muscular injury. Tearing of the muscle usually begins along the inferior fibers of the sternal head which are at maximal stretch during the final 30 degrees of humeral extension. This mechanism of action explains why the vast majority of injuries occur in active male patients engaging in strenuous physical activity such as bench pressing.

Case Presentation:
History: The patient is a 33-year-old right hand dominant male with no previous history of tendinous ruptures, nor steroid use who presented to our clinic with recent onset of severe right axillary and anterior shoulder pain. He reported that he was bench-pressing when he felt a tearing sensation in his right upper arm and chest at the nadir of his repetition. The patient noted immediate pain and swelling in this region and was unable to continue his workout.

Physical Examination: Upon initial examination, the patient was noted to have significant asymmetry of the anterior axillary region with tenderness to palpation in this area. There was also pain and weakness with resisted adduction and internal rotation of the right shoulder. He was neurovascularly intact and denied any paresthesias.

Differential Diagnosis:
1. Pectoralis Major Tear
2. Rotator cuff tear  
3. Pectoralis minor tear

Test and Results: Plain radiographs (AP, Y lateral, axillary) of the shoulder were normal. A pectoralis major tear was suspected so an MRI was obtained which clearly demonstrated muscular edema and a retracted tear of the pectoralis located at the musculotendinous junction. Treatment options and risks, both operative and non-operative, were discussed at length and the patient elected to proceed with surgical exploration and possible repair.

Final Working Diagnosis: Intramuscular pectoralis major tendon tear

Management/Outcome/and or Follow-up:

Operative Technique: Following proper identification of patient, surgical site and procedure the patient’s right upper extremity was prepped and draped in the usual sterile fashion. An incision was made from the tip of the coracoid to the anterior axillary fold and carried down sharply through skin and subcutaneous tissue. Dissection was carried to the level of the clavipectoral fascia and full thickness skin flaps were developed. The inferior border of the pectoralis was identified. The fascia along the inferior aspect was incised and blunt dissection was carried deep to the inferior border. With finger palpation beneath the inferior border, an intramuscular rupture of the sternal head was palpated though it remained within close proximity to the musculotendinous junction. Attention was then drawn to the deltopectoral interval. The cephalic vein was identified and retractors placed, revealing a torn sternal head. A retracted tear of the sternal head was easily visualized adjacent to the musculotendinous junction. This was reconstructed using a semitendinosus allograft weave. The graft was woven through the distal muscle along the inferior edge from lateral to medial and then vertically within the muscle and medial to lateral through the superior portion in a modified Pulver‐taft fashion. Krackow sutures were then placed through the tendon- graft construct at the reconstructed sternal head of the pectoralis in standard fashion.

The native footprint of the pectoralis was then identified on the humerus. This was carefully exposed and a light Judet decortication was performed with a small, narrow osteotome to create a bleeding surface for reattachment. Four staggered drill holes (two in the medial and two in the lateral footprints) were placed approximately 1.5 cm apart. A dual loaded all-suture suture anchor was placed in the central hole. The superior and inferior Krackow sutures were passed through separate pec buttons. These were then placed in the corresponding proximal and distal unicortical drill holes in standard fashion and flipped within the medullary canal. These sutures were then alternately tensioned, effectively bringing the augmented semitendinosis pectoralis muscle complex back to its attachment site. The sutures from the central hole were passed through the middle of the construct in Mason-Allen fashion for additional fixation. All sutures were tied, creating a stable anatomic repair of the intramuscular rupture, securely reinforced by the semitendinosus augmented reconstruction of the tendon. The incision was then irrigated and closed in the usual manner, and the patient placed in a shoulder immobilizer.

Results/Follow-up: The Patient was immobilized for 6 weeks with gentle Codman exercises, passive forward elevation and submaximal isometric sets. At his 6 week follow-up he was advanced to active ROM, followed by progressive isometrics and concentric strengthening. The patient was additionally evaluated at both 6 and 14 months. At his 6 month follow-up the patient reported that he had returned to his previous level of activity and had been working out without any significant functional limitations. He had noted some diminished strength initially but had been steadily improving since that time. At his 14 month follow-up he reported that he was exercising at his pre-injury level of strength and did not have any significant disability due to his previous injury. Aesthetically, he demonstrated some minor asymmetry along the anterior shoulder around the incision site but no functional defects were noted on physical exam.
Upon completion of this lecture, learners should be better prepared to:

- Describe the incidence and mechanism of injury of pectoralis tears
- Demonstrate a novel and effective means of surgical stabilization for this type of injury
- Recognize that early detection and surgical management of this condition is crucial to maximize outcomes in an active population.
Compliance with New Treatment Guidelines for Vulvovaginal Candidiasis

Saturday, November 4
9:12 – 9:22 am

Presenting Author
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Co-authors
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Category
Women's & Children's Health

Abstract

BACKGROUND

Vulvovaginal candidiasis remains one of the most common infections today.

Despite access to effective OTC antifungals, oral prescription products (fluconazole) are frequently prescribed, often by phone.

Recent investigations have reported a higher incidence of miscarriage and congenital abnormalities if fluconazole is used during pregnancy, especially in multiple doses. This prompted the FDA and CDC to issue warnings in 2016 to avoid all use in pregnancy. Current guidelines also suggest avoiding fluconazole for treatment of non-albicans species of yeast and to avoid use in resistant infections.

This investigation sought to assess compliance with new guidelines and establish a baseline to evaluate future interventions into suboptimal prescribing habits.

METHODS

300 Ob-Gyn, NP/CNM/PAs were contacted to complete a 15 minute online survey regarding prescribing habits. The survey spanned June through July 2016.

The first question asked for the number of fluconazole tablets prescribed at the initial diagnosis. The second question asked how often did patients call back for more tablets.

RESULTS:

284 Ob-Gyn and NP/CNM/PAs responded with 52% (58% Ob/Gyn, 46% NP/CNM/PA) stating they initially prescribe only one tablet, 37% (33% Ob/Gyn, 41% NP/CNM/PA) prescribed 2 tablets initially and 11% prescribed 3 or more.

Of those who prescribed a single tablet initially, 20% of providers stated that they received a call back requesting additional tablets due to partial/ no response. In total, over 58% of women receive more than one dose of fluconazole.

CONCLUSION:

Despite CDC and medical society recommendations to limit multiple doses of fluconazole, 48% of patients received more than one dose initially, and 20% of those prescribed one tablet/dose, requested more tablets later. Increased efforts appear necessary to educate providers of the changes in fluconazole dosing that are occurring because of resistance issues and safety concerns in reproductive age women.
Upon completion of this lecture, learners should be better prepared to:

1. Know the new CDC guidelines regarding treatment of vulvovaginal candida infections,
2. Be able to select the proper medication and dosing of antifungal treatment in pregnancy.
### Pyometra in Gynecologic Malignancy and as a Gynecologic Malignancy Mimic: Two Cases and Review of Literature

**Presenting Author**  
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**Co-authors**  
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**Category**  
Women's & Children's Health

### Abstract

**Introduction**  
Infections of the uterus are rare and occur most frequently following parturition, cervical canal obstruction (e.g. cervical carcinoma), or post-surgical abortion. The etiologic organisms vary greatly based on a variety of factors, including the patient’s age, gravidity, and menstrual cycle phase. Pyometra is defined as the accumulation of pus within the uterine cavity and is most frequently caused by mixed anaerobic organisms. Due to the tissue-destroying nature of these anaerobic organisms, necrotic tissue and purulent fluid accumulate within the uterine cavity. On ultrasound and perhaps in other imaging modalities, such debris may mimic malignancy. Thus, pyometra is clinically relevant as both a complication of true gynecologic malignancy and as a mimic of gynecologic malignancy. We report two cases; one in which a patient with cervical adenocarcinoma develops pyometra and one in which long-standing pyometra clinically mimics endometrial carcinoma. We also perform a literature review of pyometra in patients with gynecologic malignancy.

**Case Presentation**

**Case 1**

Our first case is a 59 year old female who presented with the recent onset of chills. Four months prior to her presentation, she was diagnosed with stage II cervical adenocarcinoma. She subsequently received chemotherapy with cisplatin with radiation. Her last treatment was around 17 days prior to the onset of chills. The patient was a social smoker, but discontinued smoking 2 months following her cancer diagnosis; the history is otherwise non-contributory. On review of systems, the patient endorses fever and chills but denies abdominal pain, dysuria, and odynochezia. On physical exam, the patient has a fever of 100.5°F (38.1°C). The abdomen is soft, non-tender, and non-distended. There is no costovertebral angle tenderness. Of note, a pelvic exam was not performed during initial evaluation. Because recent bloodwork revealed lymphopenia and the patient was presenting with an apparent infection, the patient was admitted to the hospital where a computed tomography (CT) scan (with contrast) of the thorax, abdomen, and pelvis was performed (Fig. 1). The CT scan revealed a distended, fluid-filled uterus with myometrial enhancement and a diagnosis of pyometra was made. Urine cultures and blood cultures drawn at the time of admission would demonstrate no growth, but fluid from the uterus was not cultured. On hospital day 2, the fluid distending the uterus was successfully drained and the patient’s ceftriaxone and doxycycline were discontinued and the patient was started on ampicillin-sulbactam. By hospital day 4, the patient reported feeling better and had been afebrile for over 24 hours. She was deemed stable for discharge and was discharged to home with a 2 week course of oral amoxicillin-clavulanic acid with instructions to follow up for further management of her cervical adenocarcinoma.

**Case 2**

Our second case describes the prolonged experience of a 71 year old female who presented with 3 months of green, foul smelling vaginal discharge which saturates 3 or 4 panty liners per day. Of note, the patient’s daughter was diagnosed with an unspecified gynecological cancer in her 20s. The patient received initial evaluation by her gynecologist who performed a pap smear and a work-up for vulvovaginal infection. The pap smear demonstrated no abnormalities, and reverse transcriptase
polymerase chain reaction (RT-PCR) assay results did not favor a diagnosis of bacterial vaginosis or vaginal candidiasis. Despite this, the patient was prescribed metronidazole but was forced to discontinue the drug following shortness of breath. A second, unknown antibiotic was prescribed but, again, the patient was forced to discontinue the drug following shortness of breath. Finally, 1 month before the patient’s presentation to Moffitt Cancer Center for further evaluation, the patient’s gynecologist took an endometrial biopsy which demonstrated “atypical endothelium” but insufficient tissue for definitive diagnosis. This increased the clinical suspicion for endometrial carcinoma and the patient was referred to Moffitt Cancer Center.

At presentation to Moffitt’s outpatient clinic, the patient appears healthy and afebrile. The review of systems is completely negative. The physical exam reveals no abnormal findings apart from the persistent green, foul smelling vaginal discharge. An ultrasound is performed and reveals a uterus that is retroverted and retroflexed. Additionally, there is a moderate amount of fluid in the uterine fundus with associated hypoechoic soft tissue debris. There is abnormal appearing soft tissue in the uterine body proximal to the cervix, and based on this finding, a second uterine biopsy is performed and samples are sent for microbiological and pathological analysis. Initial microbiological evaluation yielded mixed anaerobic flora and Gram stain demonstrated an abundance of white blood cells (WBCs) and Gram variable rods. An isolate from this sample was processed and sent for further microbiological evaluation via Matrix Assisted Laser Desorption Ionization Time-of-Flight (MALDI-TOF), and Actinomyces turicensis was identified. Pathologic evaluation of the patient’s endometrial tissue revealed benign epithelium with reactive change, scant squamous metaplasia, and abundant acute inflammation. Based on these findings, a diagnosis of pyometra was made. The patient is prescribed amoxicillin-clavulanic acid to take for 6 months. Less than 2 months after her second endometrial biopsy, the patient reported a marked decrease in the quantity of vaginal discharge.

Final Diagnosis/Results of literature Review
Our first case presented with pyometra secondary to her previously diagnosed cervical adenocarcinoma. Fortunately, this patient experienced none of the noted complications of pyometra such as perforation/peritonitis or sepsis. The patient responded favorably to therapy with ampicillin-sulbactam. Our second case provided a more challenging clinical scenario in which pyometra clinically mimicked genuine cervicouterine cancer. Ultimately, endometrial biopsy demonstrated no cellular changes consistent with malignancy, but did demonstrate acute-on-chronic inflammation with abundant bacteria.

The 10 publications reviewed for this report are summarized in Table 1.

Outcome/Review of Literature Discussion
Pyometra is an infrequent but serious complication in cervicouterine cancers in elderly women. The cornerstone of treatment relies in the rapid initiation of antibiotic therapy followed promptly by drainage of any fluid from the uterus. The principal complications of pyometra, when left untreated, are severe and include uterine rupture/perforation (leading to peritonitis), abscess formation (intrauterine or intraabdominal), and septic shock. Additionally, many patients had their cancer treatments disrupted because of the treatment of pyometra and its complications. Taken together, these observations seem to suggest that pyometra may lead to poorer outcomes in the treatment of cervicouterine cancers.

The variety of microorganisms reported in cases of pyometra can severely complicate antibiotic selection. Anaerobes, Gram positive cocci, and even acid fast bacilli (AFB) may be isolated in cases of pyometra (Table 1). Actinomyces turicensis, the organism isolated from our second patient, is an uncommon cause of genitourinary infections such as ulcers, perianal abscesses, balanitis, urethritis, endometritis, and vulvovaginitis[28]. A. turicensis is also a rare cause of bacteremia[29]. Pyometra as a mimic of cervicouterine cancer presents a dilemma to clinicians who frequently diagnose/treat these cancers. It should be noted that on clinical exam (as well as on uterine ultrasound) that pyometra can closely resemble malignancy. Tissue biopsy is therefore necessary to distinguish between malignancy and pyometra. Pyometra should be included in the differential diagnosis of presumptive (i.e. not yet confirmed) gynecological malignancy. Elevations in CA-125, an antigen sometimes associated with gynecological malignancy, are also seen in some cases of non-
cancer related pyometra[24, 25]. Therefore, measurements of serum CA-125 should be considered an ineffective method to distinguish between pyometra and gynecological malignancy. Again, tissue biopsy is necessary to distinguish between malignancy and pyometra.

Learning Objectives

Upon completion of this lecture, learners should be better prepared to:
1. Describe how pyometra fits into the differential diagnosis of gynecologic malignancies
2. Discuss the complications of pyometra

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Table 1 Summary of Literature Review Findings:

Ref no = Reference number; CX = microbial culture; ABX = antibiotics; SCC = squamous cell carcinoma; Cervical adeno = cervical adenocarcinoma; NR = not reported, IUD = intrauterine device; AFB = acid-fast bacilli; Uterine div = uterine discharge; CA-125 = cancer antigen-125. Note that in Arora et al (Reference 25), acid-fast bacilli were discovered via uterine tissue biopsy, NOT culture.