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## **DEAN'S RECOGNITION**

Once again, I would like to congratulate the *DrexelMed Journal* on a successful 2018 publication. Each year, we look forward to seeing the academic efforts of our residents and fellows throughout the Drexel University College of Medicine community. The work of these trainees and their faculty mentors is critical to the educational mission of the College, as well as their own career development. The breadth of medicine showcased in this publication highlights the diverse clinical learning and research experiences our graduate medical trainees enjoy.

My sincere congratulations and gratitude to all the authors and editors for another outstanding volume of work.

Daniel V. Schidlow, MD  
Annenberg Dean and Senior Vice President, Medical Affairs  
Drexel University College of Medicine

## **EDITOR'S COMMENTS**

It is a pleasure to present the 2018 edition of the *DrexelMed Journal*. Each edition is unique, and the representation from so many departments and subspecialty divisions is something I personally enjoy reviewing with each volume. I hope each author and their mentors are very proud of the work that is showcased in this journal. It represents clinical medicine and research excellence and an investment of time and energy from all involved. Every year the submissions vary in their content and number, but the commitment to academic and scholarly work is never in doubt.

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## **Abstracts - Clinical Case**

### **1.A case report of confined placental mesenchymal dysplasia**

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**Introduction:** Placental mesenchymal dysplasia (PMD) is a distinct placental phenotype that often gives rise to placentomegaly<sup>1</sup> and can clinically mimic molar pregnancy. The condition is known to be associated with fetal abnormalities including intrauterine growth restriction, Beckwith-Wiedemann Syndrome, and fetal death<sup>1, 2</sup>. We report a case of a molar-biparental chimeric placenta with two distinct histopathological morphologies and cytogenetic profiles.

**Case:** Ultrasound examination of a 20 year-old gravida two para one at eight weeks of gestation revealed an abnormal placenta. Genetic studies were undertaken, and chorionic villus sampling revealed normal fetal karyotype, but mosaic diploid homozygous and diparental cell line on microarray. Follow-up amniocentesis showed normal female fetal karyotype and normal fetal microarray.

The patient was closely followed during her pregnancy, and growth lag of the fetus as well as umbilical artery doppler abnormalities were noted

beginning at 24 weeks of gestation. Decision was made for delivery at 27 weeks and 6 days of gestation due to non-reassuring fetal status. Upon cesarean delivery, the placenta was noted to be significantly enlarged and globular in overall appearance. The neonate had APGAR scores of 6 and 7 at 1 and 5 minutes respectively, and weighed 713 grams.

**Discussion:** Histopathological examination revealed placental mesenchymal dysplasia (PMD) with cytogenetic studies confirming a chimeric placenta composed of a diploid homozygous cell line and a biparental cell line. The chimerism was noted to be restricted to the placenta with the neonate unaffected in growth and development at 2 months of life.  
Ref.

1. Parveen Z, Tongson-Ignacio JE, Fraser CR, Killeen JL, Thompson KS. Placental mesenchymal dysplasia. *Pathol Lab Med* 2007; 131:131-137

2. Vaiabuch E, Romero R, Kusanovic JP, Erez O, Mazaki-Tovi S, Gotsch F, et al. Three dimensional sonography of placental mesenchymal dysplasia and its differential diagnosis. *J Ultrasound Med.* 2009;28:359–68

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### **2.Hematuria: A Rare Complication of Short Bowel Syndrome**

Brian Lin, DO\*, Andrew Quinn, MD\*, Michelle Gorbos-Spina, DO\*\*

\*Drexel University College of Medicine: Internal Medicine

\*\*Abington Memorial Hospital: Department of Medicine, Division of Internal Medicine

**Introduction:** The most frequent areas of involvement of Crohn's disease overlap with where vitamin K is primarily absorbed - in the ileum, distal jejunum, and cecum [4,5]. More than half of patients with Crohn's disease still undergo an intestinal resection within 10 years after diagnosis, with another one-third requiring a repeat resection within 5 years [1]. Short bowel syndrome is a malabsorption syndrome that can occur as a complication of Crohn's disease and bowel resections.

**Case:** An 84 year old male with a history of Crohn's disease, multiple bowel resections, and short bowel syndrome presented with painless hematuria. The patient was not on any anticoagulation treatment and was taking oral vitamin K supplementation. Patient was a hemodynamically stable and frail. Labs were significant for a markedly elevated INR >10.0. Urinalysis showed gross hematuria. Chemistry reflected severe electrolyte abnormalities secondary to malabsorption syndrome,

dehydration and metabolic acidosis secondary to chronic bicarbonate loss due to diarrhea. The coagulopathy was corrected with IV vitamin K and the hematuria resolved. Electrolytes and fluids were parenterally repleted.

**Discussion:** Previous case reports have described rare bleeding diathesis in short bowel syndrome, but painless hematuria secondary to severe vitamin K malabsorption is a unique complication [6,7]. Further research should focus on prevention of short bowel syndrome by minimizing surgical resection and improving medical management of Crohn's disease. With new immunosuppressants and monoclonal antibodies, future research should evaluate the effect of these new treatments on incidence of surgical resections and short bowel syndrome in Crohn's disease [1,2].

Ref.

1. Limketkai BN, Parian AM, Shah ND, Colombel J. Short bowel syndrome and intestinal failure in Crohn's disease. *Inflammatory Bowel Diseases*. 2016 May; 22(5): 1209-1218.
2. Thompson, JS, Iyer KR, DiBaise JK, Young RL, Brown CR, Langnas, AN. Short bowel syndrome and Crohn's disease. *Journal of Gastrointestinal Surgery*. 2003 Dec; 7(8): 1069–1072.
3. Britton E, McLaughlin JT. Ageing and the gut. *Proceedings of the Nutrition Society*. 2013; 72: 173-177.
4. Abraham C, Cho JH. Inflammatory bowel disease. *The New England journal of medicine*. 2009; 361(21): 2066-2078.
5. Goncalves A, Roi S, Nowicki M, Dhaussy A, Huertas A, Amiot M, Reboul E. Fat-soluble vitamin intestinal absorption: absorption sites in the intestine and interactions for absorption. *Food Chemistry*. 2015; 172: 155-160.
6. Eisenman A, Enat R. Superficial skin necrosis--an uncommon manifestation of short bowel syndrome. *Harefuah*. 1999 Jun 1; 136(11): 855-7, 915.
7. Grabosch S, Pennycook J, Pakravan A, Mostello D. Short bowel syndrome causing bleeding diathesis and profound vitamin deficiency in pregnancy. *Obstetrics & Gynecology*. 2013 Feb; 121(2 Pt 2 Suppl 1): 434-6.

### 3.A Severe Case of Rapidly Progressing Infective Endocarditis

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**Introduction:** Infective endocarditis is an infection that involves the endocardium of the heart and primarily affects one or more heart valves. The clinical presentation is extremely variable and depends on multiple risk factors. If left untreated, local complications of the heart can occur such as congestive heart failure, conduction abnormalities, or severe valvular insufficiency.

**Case:** This is a 45-year-old male with an unknown medical history who was admitted for altered mental status. Initial imaging with MRI brain revealed several acute infarcts. Transthoracic echocardiogram on admission was unremarkable. The presumptive diagnosis was endocarditis given the embolic nature of the infarcts and positive blood cultures for methicillin-sensitive *Staphylococcus aureus*. The following morning the patient developed a new holosystolic murmur and Janeway lesions. Within a few days of admission, the patient developed PR prolongation on electrocardiogram and a new diastolic decrescendo murmur. Transesophageal echocardiogram (TEE) was performed and

showed multiple aortic vegetations causing significant valvular insufficiency without evidence of heart failure. Cardiothoracic surgery subsequently took the patient to the operating room. Repeat TEE during surgery revealed an aortic root abscess. While undergoing aortic valve and root replacement, the patient went into complete heart block requiring implantation of a pacemaker.

**Discussion:** This case highlights the clinical challenge of diagnosing and treating endocarditis early before significant complications arise. Early utilization of TEE is warranted for patients at high risk for endocarditis and its complications. This prompts the question whether TEE should be performed directly without delay in select individuals whose initial presentation appears unfavorable.

Ref.

1. *Cardiol Clin*. 2000 Nov;18(4):773-87.
2. Molnar A, Sacui D, Manole S, Radulescu A, Beyer R. *Med Ultrason*. 2016 Jun; 18(2):253-6
3. Eudailey K, Lewey J, Hahn RT, George I. *J Thorac Cardiovasc Surg*. 2014 Mar; 147(3):e26-8. Epub 2013 Nov 27



#### 4.Multivessel Spontaneous Coronary Artery Dissection: A Unique Approach Successful To Intervention

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\*\*\*Abington Memorial Hospital: Department of Medicine, Division of Cardiology

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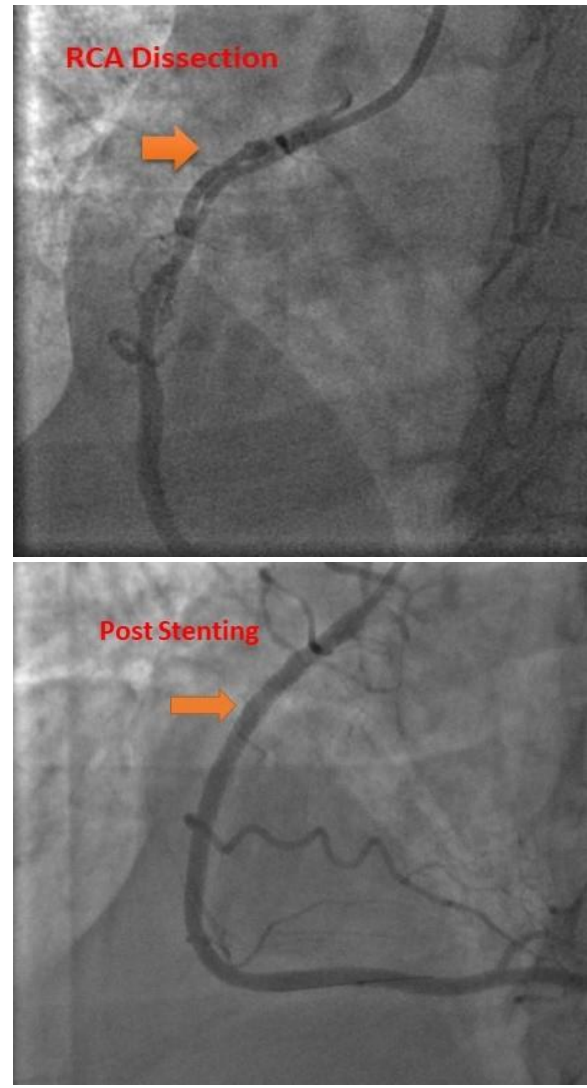
**Case:** 51year old Male with PMH of Pre diabetes with unstable angina, found to have spontaneous non atherosclerotic RCA(Fig1) and LAD dissection Type 1. Patient was medically managed with Aspirin, Plavix and metoprolol as per guidelines. After four months of optimal medical therapy, he continued to have angina. Exercise nuclear stress showed large area of ischemia in RCA territory. PCI of RCA was performed using Intravascular ultrasound (IVUS)through radial access(Fig2).

**Discussion:** Patients with non-atherosclerotic spontaneous coronary artery dissection (NA-SCAD) usually present with symptoms and signs characteristic of acute myocardial infarction (MI), chest or shoulder pain, syncope, dyspnea, diaphoresis, and nausea are the most common symptoms. In most spontaneous coronary artery dissection (SCAD) patients, conservative therapy is the preferred strategy, but PCI is one of option if optimal medical therapy fails (as in our patient). PCI with SCAD is often technically challenging in part due to fragility of the vessel wall and difficulty finding the true lumen. (1) In our Patient PCI was successful as we used IVUS to identify the true lumen. He was discharged home and is angina free.

Ref.

1. Saw, Karin Humphries, Eve Aymong, Tara Sedlak, RoshanPrakash, An, Jacquelinedrew Starovoytov, G.B. John Mancini.

Journal of the American College of Cardiology Aug 2017, 70 (9) 1148-1158





## 5.A common presentation, reveals an unexpected diagnosis.

Zain Ali, MD\*, Rafiq Ali, MD\*, Daniel Ringold, MD\*\*

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**Case:** A 63-year old Caucasian female presented with watery, non-bloody diarrhea, worsening over one week, associated with nausea, vomiting, crampy abdominal pain and subjective fever. Recent medical history was significant for a UTI treated with Trimethoprim-sulfamethoxazole 2 weeks before the onset of diarrhea. On presentation, she was afebrile, normotensive, tachycardic (100 beats/min), and normal respiratory rate. Physical exam showed mild abdominal tenderness. Laboratory findings demonstrated leukocytosis (WBC 12000), with normal LFTs, amylase, lipase, and lactic acid. CT Abdomen/Pelvis was unremarkable. Given the recent use of antibiotics, she was provisionally started on metronidazole for Clostridium Difficile (C.Diff) infection, soon transitioned to oral Vancomycin given worsening symptoms. Stool studies including a C.Diff assay ruled-out infectious etiology. A sigmoidoscopy, revealed patchy granularity in the colon. Biopsy demonstrated Collagenous Colitis. Pantoprazole, fluvastatin were stopped and budesonide initiated, which was tapered with remission.

**Discussion:** The initial presentation was convincing for C.Diff infection, however further investigation negated this, histopathology revealed Collagenous Colitis. Risk factors described for MC include females, advanced age, autoimmune disease, malignancy and prior organ transplantation(1), familial factors may have association(2). Medications implicated include aspirin, NSAIDs, statins and PPIs. Histopathology establishes diagnosis. Budesonide is deemed the most effective treatment(3). Our case highlights the importance of considering microscopic colitis as a differential for non-infectious acute onset diarrhea. Ref.

1. ANA Paula Hamer, Sousa Clara, Flvia DM, Juliana NF, Thais GG. Microscopic colitis: A literature review. Revista da Associao Mdica Brasileira. 62(9):895-900.
2. Wickbom M, A., Nyhlin M, N., Montgomery M, S., Bohr M, J., Tysk M, C. Family history, comorbidity, smoking and other risk factors in microscopic colitis: a casecontrol study. Eur J Gastroenterol Hepatol. 2017; 29(5):587-94.
3. Cotter T, Pardi D. Current Approach to the Evaluation and Management of Microscopic Colitis. Curr Gastroenterol Rep. 2017; 19(2):1-6.

## 6.Hernia Mimicker

Abdul Shakoor Badr, MD\*, Victor Dy, MD\*\*

\*Easton Hospital: Surgery

\*\*Easton Hospital: Department of Surgery

62 year old otherwise healthy auto-mechanic referred to the general surgeon with non reducing lump in his left groin noticed few months ago causing discomfort and occasional pain. Morbid obesity precluded definitive hernia examination, necessitating imaging. CT scan performed was negative for lymphadenopathy but significant for being reported as an inguinal hernia. He electively underwent a left groin exploration with the intent of hernia repair. Interestingly, no hernia was found but a firm, well circumscribed, lobulated soft tissue growth was found arising from the external oblique aponeurosis. This was

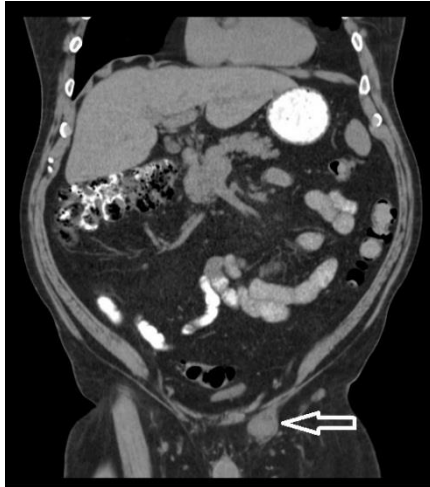
dissected free from cord structures and divided off of the aponeurosis. After securing hemostasis, closure was performed in a standard fashion. Final pathology was angiofibroma.

Soft tissue masses should always be a differential in the scenario of a groin lump. Surgeons should be aware of the masses arising not only in the subcutaneous layers but also deeper. The mass in discussion is classified as an angiofibroma like lesion. The tumor is composed of spindle and stellate shaped cells within a fibrous and myxoid stroma. There are many small vessels, most of which contain a cuff of hyalinized stroma. The

spindle and stellate cells show some variability in size and shape. The vimentin positivity supports a mesenchymal tumor. The negative results for actin, desmin, and calponin mitigate against a smooth muscle tumor and aggressive angiomyxoma. The negative result for S-100 and

CD117 mitigate against a neural tumor and gastrointestinal stromal tumor respectively. These lesions are benign with minimum tendency for local recurrence.

Ref.  
Histopathology. 2016 Sep;69(3):459-69. doi: 10.1111/his.12943. Epub 2016 Apr 1 .



## **Abstracts -- Research**

### **1.Outcomes of TAVR in COPD patients at Abington Jefferson Health**

Ali Ghani, MD, Usman Sarwar, MD, Mohsin Hamid, MD, Wajahat Humayun, MD, Bilal Lashari, MD, Mary Naglak, Bruce Klugherz, MD

Abington Memorial Hospital: Internal Medicine

**Background:** Aortic stenosis (AS) is very common in elderly patients. A significant proportion of these people have the concomitant chronic obstructive pulmonary disease (COPD) too. The aim of this study was to assess mortality in transcatheter aortic valve replacement (TAVR) patients with moderate to severe COPD.

**Methods:** This was a retrospective chart review of 23 patients with COPD and Society of Thoracic Surgery risk score (STS score) > 8 who underwent TAVR evaluation. **RESULTS:** 47.8% of patients who came to our center for TAVR evaluation were male and 52.2% had hypertension. Of the 23 patients with COPD, 12 underwent TAVR, 1 patient underwent balloon aortic valvuloplasty (BAV), 1 had surgical aortic valve replacement (SAVR) and 9 had no intervention. Postoperative complications occurred in 3 of the 12 TAVR patients; one had a stroke, one required a pacemaker and one had a major bleeding episode. Two of the twelve

patients (16.7%) who had TAVR died within 6 months. 55.6% (5 of 9) patients who did not have any intervention died within 6 months, 4 survived at least 6 months. The SAVR patient died, the BAV patient did not. Statistical analyses were limited by small sample size.

**Conclusion:** In our small sample of patients with COPD, high STS score and moderate to severe AS, who underwent TAVR, 6 months post-op 83.3% were alive in comparison to 44.4% of those who did not undergo TAVR. While additional research needs to be conducted, COPD patients appear to be viable candidates for TAVR.

Ref.

1.Leon MB, Smith CR, Mack M, et al. Transcatheter aortic-valve implantation of aortic stenosis in patients who cannot undergo surgery. *New England Journal of Medicine* 2010;363:1597-607.

2.Brady ST1, Davis CA, Kussmaul WG, Laskey WK, Hirshfeld JW Jr, Herrmann HC et al. Percutaneous aortic balloon valvuloplasty in octogenarians: morbidity and mortality. *Annals of Internal Medicine*, May 1989

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### **2.Outcomes of Septic Patients Requiring New Onset Renal Replacement Therapy – A Retrospective Analysis**

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**Objectives:** About 13% of patients with acute kidney injury (AKI) in the intensive care unit receive renal replacement therapy (RRT). Several studies have demonstrated that AKI in non-selected critically ill patients are associated with high mortality rates (up to 80%) as well as other complications including development of end stage renal disease. We sought to explore outcomes specifically of septic patients requiring new onset renal replacement therapy.

**Methods:** A retrospective analysis was performed of patients with a diagnosis of sepsis and/or septic shock who received RRT during the time period of 6/2016 – 5/2017 at Hahnemann University Hospital. We included all adults (18+) who required new onset RRT. Exclusion criteria included anyone who had received RRT previously and those with AKI not due to sepsis. A total of 25 subjects were included in the study. Multiple data points were examined and outcomes we observed for included length of

RRT, length of hospital stay, renal recovery and 5, 30, 60 and 90-day mortality rates.

**Results:** 84% (21/25) of patients received continuous RRT only, while 16% (4/25) received both continuous and intermittent dialysis. Total 90-day survival rate was 16%. Of the surviving patients, 75% had renal recovery with only 1 patient requiring long term dialysis.

**Discussion:** Sepsis and septic shock with AKI requiring new RRT is associated with significant mortality rates. Our results coincide with the current paradigm that AKI requiring RRT in critically ill patients is a poor prognostic indicator associated with dismal outcomes. Renal recovery is possible in surviving patients.

Ref.

Al Enezi F, Alhazzani W, Ma J, Alanazi S, Salib M, Attia M, Thabane L, Fox-Robichaud A. Continuous venovenous hemofiltration versus venovenous hemodiafiltration in critically ill patients: A retrospective cohort study from a Canadian tertiary centre. *Can Respir J* 2014; 21:3

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De Corte W, Dhondt A, Vanholder R, De Waele J, Decruyenaere J, Sergoyne V, Vanhalst J, Claus S, Hoste EAJ. Long-term outcome in ICU patients with acute kidney

injury treated with renal replacement therapy: a prospective cohort study. *Critical Care* 2016; 20:256.  
Deepta C, Muralidhar K. Renal replacement therapy in ICU. *Journal of Anaesthesiology and Clinical Pharmacology* 2012; 28(3): 386-396

Lohse R, Damholt MB, Wiis J, Perner A, Lange T, Ibsen M. Long term end-stage renal disease and death following acute renal replacement therapy in the ICU. *Acta Anaesthesiologica Scandinavica* 2016; 60. 1092-1101

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### 3. Association of MTHFR gene polymorphism with metabolic syndrome

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**Background:** Evidences about the relationship between *MTHFR* gene polymorphism and metabolic syndrome are controversial. So the present study aimed to investigate if *MTHFR* gene polymorphisms *MTHFR C677T* and *MTHFR A1298C* are related with metabolic syndrome.

**Methods:** 318 patients were enrolled and single nucleotide polymorphisms for *MTHFR C667T* and *A1298C* were genotyped. BMI, fasting blood glucose level (FBG), total cholesterol(TC), low density lipoprotein(LDL), High density lipoprotein (HDL) and triglycerides(TG) were measured.

Table 1 Binary logistic regression model for *MTHFR 1298* variants

	OR	95%CI	P
Gender (men), n(%)	0.760	0.433-1.335	0.340
BMI	1.010	0.969-1.053	0.645
FBG, mg/dL	0.993	0.983-1.002	0.118
TG, mg/dL	0.997	0.990-1.004	0.395
TC, mg/dL	1.014	0.988-1.041	0.303
HDL, mg/dL	0.963	0.932-0.992	0.027*
LDL, mg/dL	0.994	0.968-1.020	0.645
HTN(%)	0.803	0.471-1.367	0.419
DM(%)	0.904	0.483-1.690	0.751

BMI, body mass index; FBG, Fasting glucose; TG, total glycerin; TC, total cholesterol; HDL, HDL-cholesterol; LDL, LDL-cholesterol; HTN, hypertension; DM, diabetes mellitus.

**Results:** In our study population, there was no significant differences for BMI, FBG, TC, LDL, TG or any component disease of MS between *MTHFR C667T*, *MTHFR A1298C* wild type and variants. *MTHFR A1298C* wild type had

significant higher HDL level than *MTHFR A1298C* variants (50.9±1.6 VS. 47.1±1.0, P=0.036). Binary logistic regression analysis also showed that *MTHFR A1298C* variants was significantly associated with lower HDL level (OR=0.963, 95%CI 0.93-0.99, P=0.027). General linear model showed that there was no statistical significant interaction between *MTHFR C667T* and *A1298C* gene polymorphism on HDL level.

**Conclusions:** Our study suggested that *MTHFR C667T* gene polymorphism is not related with any components of metabolic syndrome. *MTHFR 1298* variants significantly associate with lower HDL level compared to *MTHFR 1298* wild type.

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## 4. Vasodilator Stress Testing with Nuclear Perfusion Imaging: A Poor Modality for Ruling Out Coronary Artery Disease in Patients with Left Bundle Branch Block

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**Objectives:** Patients who present with left bundle branch block (LBBB) require further cardiac evaluation to rule out coronary artery disease (CAD). In these patients, the ventricular septum is difficult to assess for perfusion mismatch because of the inherent wall motion abnormality created by the intraventricular conduction defect. We believe that vasodilator stress testing in the setting of LBBB produces a high false positive rate during the evaluation for CAD. **Methods:** We obtained outpatient data from January 2010-2016. Patients that were included in our study were adults 18 years of age and older who presented with LBBB and received a Lexiscan stress test.

**Results:** We obtained a cohort of 60 patients that presented for outpatient evaluation for LBBB. 23.3% had a normal Lexiscan stress test. 43.3% had an abnormal Lexiscan, but medical management was preferred. 80% who received a cardiac catheterization for an abnormal Lexiscan were found to have normal coronary arteries or non-obstructive CAD. Using Analysis of variance (ANOVA) we found that patients with obstructive CAD had the highest number of risk factors. Moreover, patients with a false positive Lexiscan had a lower number risk factors than patients who had a normal Lexiscan (p=0.041).

**Discussion:** We found that vasodilator stress testing had a low sensitivity and high false

positive rate when used to evaluate for CAD in patients with LBBB. This brings to question the utility of stress testing in this subset of patients and perhaps pursuing cardiac catheterization directly in patients with 4 or more risk factors.

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**5.An Intervention on Hepatitis C screening at an inner city tertiary care center: A Quality Improvement initiative**

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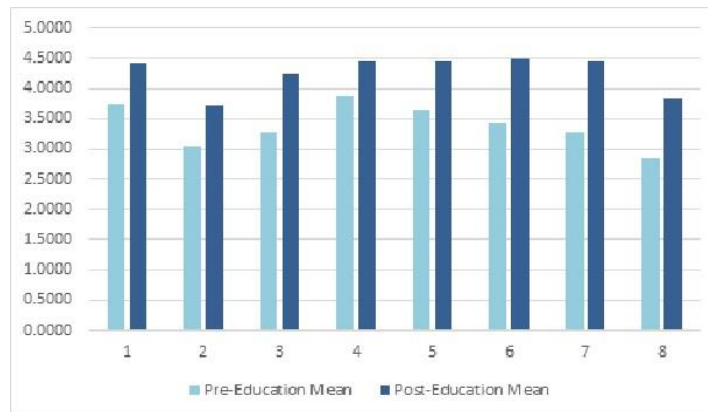
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**Background:** The prevalence of hepatitis C continues to grow exponentially, with inadequate screening being an obstinate issue. Current guidelines recommend one-time testing patients born between 1945 and 1965 given that 70% of those infected are 'baby boomers'. Our aim was to increase the inpatient rate of hepatitis C screening among baby boomers.

**Methods:** Interventions to increase screening at our inner-city tertiary care center included incorporation of a statement into the EMR history and physical document template highlighting a state mandate for hepatitis C screening as well as a lecture given to house staff to increase awareness of HCV. Surveys to assess changes

in resident opinions on hepatitis C were conducted. A collaborative program with specialists was created to provide inpatient management and linkage to outpatient care for those testing positive. 421 total charts were retrospectively studied prior to and after interventions.

**Results:** Results showed a considerable rise in screening after interventions (16.9% vs 33.3%,  $p=0.031$ ). Survey results amongst house staff after the educational session showed an increase in knowledge regarding the appropriate screening testing (41.5% vs 88.2%,  $p<0.001$ ) as well as insight regarding hepatitis C ( $p<0.001$ ) based on the Likert scale (Figure 1).





**Conclusions:** By increasing awareness and incorporating testing into daily practice we nearly doubled inpatient screening of hepatitis C among baby boomers. Previous survey data has shown insufficient knowledge amongst physicians regarding hepatitis C; our study addressed this as education contributed to a boost in our screening numbers. The inpatient setting is an essential avenue for HCV screening.

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## 6.Changes in surgical management with hysterectomy surrounding the AAGL guidelines for prevention of post-hysterectomy prolapse: a tertiary care experience

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**Objective:** To compare the use of post-hysterectomy prolapse prevention procedures at time of hysterectomy before and after the release of the AAGL guidelines.

**Methods:** This retrospective chart review evaluated women who underwent hysterectomy for benign reasons between 2012 and 2016 at a single, tertiary care center. The patients were

divided into two groups, the first from 2012 to April 2014, and the second from May 2014 to 2016, as the AAGL guidelines were published in April 2014. Electronic medical records was reviewed for demographics. Dictated operative reports were used. Primary outcome was use of apical prolapse prevention (APP) technique.

Characteristic	Pre Publication	Post Publication	P value*
N	330	313	
Age (mean)	45.9 ±6.8	44.6 ±7.2	0.015
BMI (mean)	31.8 ±8.1	31.3 ±7.4	0.8
<b>Diagnoses</b>			
Fibroids	195 (59.0%)	146 (46.6%)	<0.001
Menorrhagia or AUB	193 (58.4%)	147 (46.9%)	0.89
Pelvic Pain	55 (16.6%)	53 (16.9%)	0.97
Endometriosis	20 (6.0%)	15 (6.3%)	0.46
PMB	19 (5.7%)	18 (5.7%)	0.89
Dysmenorrhea	18 (5.4%)	19 (6.0%)	0.76
Other*	63 (19.0%)	52 (16.6%)	0.50

**Table 1**

**Results:** A total of 643 women were included in this analysis. There were 7 common indications for hysterectomy (Table 1). There were higher concomitant post-hysterectomy prolapse prevention repairs in the post-guidelines group than in the pre-guidelines group (70, 22.3% v 41 12.4%). Pre-publication, 50 (82%) uterosacral

ligament suspensions (USLS), 7 (11%) McCall's culdoplasty, and 4 (6%) Richardson angle techniques were performed. Post-publication, 83 (90%) USLS, 9 (10%) McCall's culdoplasty, and 0 Richardson angles were performed. There was no difference regarding type of procedure used between both groups (Table 2).



**Table 2**

AAGL Guideline	Pre Publication	Post Publication
McCalls + Vaginal Hysterectomy	3 (11%)	6 (22%)
USLS +Abdominal or Laparoscopic Hysterectomy	38 (12%)	64 (22%)
Total	41 (12.4%)	70 (22.3%)

**Discussion:** By comparing the number of APP techniques used before the AAGL Practice Bulletin publication and afterwards we saw an increase in the rate of APP techniques integrated into benign hysterectomies of 10.9%. This was not statistically significant. Although use of APP techniques increased after the publication of the AAGL recommendation, when controlling for surgeon there was no significant change in their use.

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## 6. Food deserts and gestational weight gain: an urban problem?

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**Introduction:** Over 48% of women in the United States gain more than the recommended amount of weight in pregnancy, and poor access to healthy foods has been proposed to contribute to this. Philadelphia has many food deserts, neighborhoods with poor access to affordable healthy food. These areas have been studied before; however, no studies have focused on pregnant women. The purpose of this study was to identify whether food access impacts gestational weight gain.

**Methods:** A survey detailing food access was administered to 197 postpartum women. Electronic medical record data was collected regarding gestational weight gain and basic demographic data. Primary analysis looked at

gestational weight gain as influenced by the frequency of produce shopping. We also analyzed gestational weight gain based on distance to the nearest grocery store. Data was analyzed using chi-square tests, Spearman's correlations, and logistic regression. **Results:** Mean BMI of participants was 27.86, with 32.5% having a BMI of 30 or greater, and 59.3% gaining appropriate gestational weight. Produce shopping frequency did not significantly impact gestational weight gain,  $P=0.08$ . Participants who shopped for produce less frequently were least likely to gain excess weight; however, this trend is not a significant,  $\rho=-0.09$ . There was no significant correlation of appropriate weight gain and distance to the

nearest grocery store, ( $p=0.97$ ).

**Conclusions:** The majority of women who participated in this study gained the

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## 7. Gestational Weight Gain As It Relates to Placental Efficiency

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**Objective:** Obesity is rapidly increasing in the USA and has become a major determinant of health. Pre-pregnancy BMI has correlations with adverse pregnancy outcomes. In 2009, the Institute of medicine updated guidelines for weight gain in pregnancy in accordance with the WHO BMI categories. They recognized a significant influence of gestational weight gain on maternal and fetal well-being (1). Gestational weight gain (GWG) when monitored decreased risk of maternal comorbidities, fetal weight concerns and cesarean section. Furthermore, fetal growth and development is a reflection of placental function (2). Multiple studies have established the ratio of fetal weight to placental weight (F:P) to be an indirect measure of placental efficiency with abnormal ranges associated with adverse maternal and neonatal outcomes (3,4, 5).

**Methods:** We performed a retrospective chart review of the deliveries at Hahnemann University Hospital in January 2016 to evaluate fetal weight, placental weight and fetal: placental weight ratio throughout late preterm and term gestation according to gestational weight gain in patients stratified by maternal BMI.

**Results:** We discovered that fetal and placental weight increased with increasing BMI through underweight, normal, overweight, obese and morbidly obese categories. In contrast, the ratio of fetal to placental weight was lower in underweight women but did not vary across the remaining BMI categories. Furthermore, no correlation was evident between fetal weight, placental weight and the F:P ratio relative to gestational weight gain.

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## 8. Long term outcomes of women with recurrent vulvovaginal candidiasis after a course of maintenance fluconazole

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**Objectives:** Data about long-term clinical outcome after a course of maintenance fluconazole in those with recurrent vulvovaginal candidiasis (RVVC) is lacking. We aimed to determine the rate of recurrence after maintenance therapy.

**Methods:** A retrospective analysis of women with *C. albicans* RVVC from 1/2008 to 1/2017 was performed using chart review to obtain information about recurrence after maintenance therapy. Patients were considered resolved if they had no further episodes of candidiasis, sporadic with <3 episodes yearly, and ongoing with > 3 episodes yearly.

**Results:** 1672 patients with *C. albicans* vaginal isolates were identified. Of these, 201 met the criteria for RVVC. The mean age was 40.4 years; 151 (77.4%) were White; 133 (66.2%) had comorbid vulvar conditions; 76 (37.8%) had

a risk factor for vulvovaginal candidiasis. 120 complete charts were further analyzed. The mean length of follow-up after discontinuing maintenance therapy was 39.9 months. After the initial course, 23 (19.2%), 21 (17.5%), and 76 (63.3%) were resolved, sporadic and ongoing, respectively. Risk factors, comorbid vulvar conditions, obesity, menopause status and length of therapy were not associated with relapse. Age 40 or greater was associated with relapse, ( $p=0.018$ ). Out of the 201 total patients with RVVC, 22 (10.9%) of patients self-reported at least one adverse event. The most common was gastrointestinal symptoms (8, 4%).

**Conclusions:** Although RVVC can be controlled, relapse is common after an initial course of maintenance fluconazole. Ongoing maintenance remains the most effective treatment option.

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## 9. Improving Trainee Competency with Ureteral Catheterization During Cystoscopy Simulation

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**Introduction:** Ureteral catheterization is a procedure that is conducted during a cystoscopic exam. Educational simulations for medical trainees have been shown to be beneficial in clinical scenarios although there is little literature on ureteral catheterization simulations.

**Methods:** OBGYN and Urology residents and medical students voluntarily participated in a 2-hour simulation and didactic session including a pre and post-didactic survey. Two simulations were done on a model using cystoscopy and included placement of a unilateral ureteral catheter with oversight of the urogynecology fellows. The primary outcome was to assess the

confidence and knowledge. McNemar's test and Wilcoxon signed ranks test were used to analyze data.

**Results:** In total, 25 trainees participated in the didactic simulation. Sixteen subjects were OBGYN residents, 2 subjects were urology residents, 4 were urology students and 3 were OBGYN students. Eighty eight percent of trainees had a strong interest in learning ureteral catheterization defined as 3 or greater on the nominal scale of 1 to 5. For the combined group (all trainees), knowledge increased ( $p=0.033$ ), confidence increased ( $p<0.001$ ), and time improved ( $p<0.001$ ) from pre-didactic simulation

to post-didactic simulation. Ninety two percent of trainees found the simulation and didactic session helpful in improving their ability to performing ureteral catheterization. **Conclusion:** Simulation with didactics does improve trainee knowledge and confidence.

Improving residency programs with the addition of simulations in ureteral catheterization can help increase comfort and improve time when performing procedures in clinical practice. Encouraging participation to simulation teaching will further improve medical training.

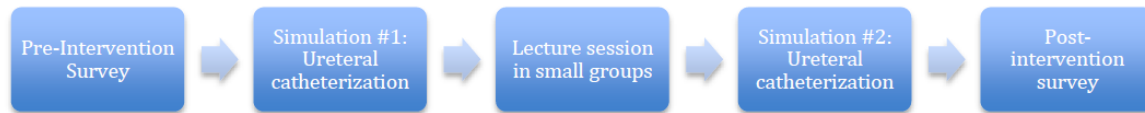


Figure 1. Flow of Simulations and Lecture During a 2-hour Session

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## 10. Attitudes and Perceptions of Family Planning Among Patients and Skilled Medical Providers in the Rural Community of Axim Government Hospital to Help Reduce Termination Rates

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Lack of access and knowledge about comprehensive reproductive health resources is a major problem among rural communities of Ghana. At Axim Government Hospital, there were over 250 women experiencing termination of pregnancy between the years of 2013-2014. Increased termination rates are mainly due to lack of knowledge about family planning alternatives within the community. Many women experience an increased morbidity associated with medical and psychological factors associated with termination of pregnancy, without seeking medical assistant. Using a qualitative research methodology, this research inquiry will specifically identify risk factors for termination of pregnancy and investigate the reasons for limited implementation of reproductive. Semi-structured interviews were conducted among patients and health care providers, using a self-administered questionnaire. This study used a total sample of

20 individuals, ten patients and ten health care providers between the ages of 15-54 who were interviewed between March 24, 2014 to April 11, 2014. All data was collected from the Maternity Ward Admission & Discharge Book. Surveys were conducted by a self-administered questionnaire with both closed and opened ended questions. Most health care providers believe that emergency TOPs were needed however, many of them personally did not feel comfortable doing elective TOPs if they were offered. Nurses were also observed spending little time counseling patients prior to any TOP procedure, which have been a result of shortage of skilled staff and the multitasking of most midwives. Majority of the health care providers also indicated commitment and readiness to provide counseling services for women both pre/post TOPs.

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## 11. Evaluation of the Urinary Microbiome of Interstitial Cystitis/BPS Patients: is there a correlation with the urine culture colony count?

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**Introduction:** Interstitial Cystitis/ Bladder Pain Syndrome (IC/BPS) is incompletely understood. Recent work suggests that the urinary microbiome plays an important role. We propose that there is a correlation between low level bacterial counts in IC/BPS in the absence of a clinical urinary tract infection.

**Objective:** The objective of this study is to examine the relationship between the findings of low colony-count cultures and patients with IC/BPS.

**Methods:** Patient charts were reviewed from February 2017 through July 2017. Patients with a diagnosis of IC/BPS, over the age of 18 were included in our analysis. Urine samples were sent for culture at each visit. These cultures were assessed for growth, CFU, and type of bacteria.

**Results:** Our cohort was comprised of 428 patients, and 826 urine cultures. Twenty-one of the patients were male (5%), providing 38 (5%) of the urine culture results. The most common culture result was no growth, 561 (67.9%), followed by 10,000-50,000 CFU, (112, 13.6%),

and then >100,000 CFU (66, 8.0%). The most common types of bacteria found were Enterococcus 26%, E. Coli 15%, Group B Strep (GBS) 13.6%, and Klebsiella 10.6%. Males were more likely than females to have no growth and lower colony forming units. When bacteria did grow, excluding contaminated cultures, there was no difference between males and females for type of bacteria.

**Conclusions:** Our data show that in patients with IC/BPS, urine cultures were significantly more likely to grow bacteria with a lower CFU, most commonly 10-50,000 CFU. Enterococcus was the most common bacteria.

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## **Articles**

### **1.How to narrow the contraception knowledge gap according to inner-city young women**

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#### **Introduction**

As of 2010, the U.S. adolescent pregnancy rate was 57 per 1,000. This was the highest adolescent pregnancy rate in developed countries worldwide outside the former Soviet bloc.<sup>1</sup> In 2006, 83% of pregnancies among women aged 15-19 and 64% among women aged 20-24 were unintended.<sup>2</sup> Research has consistently demonstrated a lack of contraception use and contraception knowledge in the United States, and adolescents and young adults are disproportionately affected.<sup>2</sup>

Among young adults who have had sex education in school, only 25% had received this education before the age of 15.<sup>3</sup> Through childhood into adulthood, adolescents evolve into individuals, build social circles, develop friendships, and explore sexuality. Age brings an increased curiosity for sexual practices and one's sexuality.<sup>3</sup> According to the National Campaign to Prevent Teen and Unplanned Pregnancy, 1 in 4 adults receive sexual education before the age of 15.<sup>3</sup> It is difficult for adolescents to make decisions on contraceptive methods if they lack sufficient knowledge of all of their options, including each form's effectiveness, side effect profile, and typical use versus perfect use rates. More specifically, unintended pregnancy disproportionately affects minority populations.<sup>4</sup> In 1995, African American and Hispanic women's use of reversible contraceptive methods, such as an oral contraceptive pill or a long-acting reversible contraceptive method, did not differ from that of Caucasian women. However, by the late 2000s, African American women were significantly less likely than Caucasian women to use effective reversible contraceptive methods than no method.<sup>5</sup>

A reason for the racial disparities in pregnancy and contraception use could be the lack of

knowledge of contraceptive methods and reliance on less effective methods of contraception amongst low-income, urban adolescents. According to findings from the CHOICE Project, the most common mistake of study participants was to overestimate the effectiveness/underestimate the risk of failure of short-acting contraception, condoms, or natural family planning.<sup>6</sup> Misinformation can be due to receipt of information from informal resources, such as friends and family. Women may reject a certain method based on a family member's myth or experience. Rumors, invalid inferences, and vicarious experiences supplied by the social network have a direct effect on contraceptive decisions for many women. Media sources, such as the Internet or television, provide information that can either spark or supplement information received verbally from one's social circle.<sup>7, 8</sup> It may be worthwhile to direct contraceptive education not just toward the adolescent, but also towards those who participate in the individual's decision making. Exploring the role of educating family members of adolescents, providing schoolteachers with specialized training on contraception, as well as utilizing electronic and social media may enhance contraception awareness amongst teens and young adults. Ritter, Dore, and McGeechan believe "the use of electronic and social media is an increasingly important tool to engage young people while age appropriate discussions before young people are sexually active, both in and out of schools, reduce stigma and initiate important dialogue"... "To further reduce barriers to delivery of contraceptive knowledge and sexuality information in schools, teachers would benefit from better support with specialized training and resources."<sup>9</sup> It is imperative that we narrow this contraception knowledge gap.

This study is designed to first gather an understanding of what an inner-city young female population may be aware of in terms of their contraception knowledge base, and then see if this relates to age, race, and education level. This survey study will then assess how they would

prefer to learn about various forms of contraception. In turn, this will hopefully provide answers on how to enhance contraception education, particularly in a lower-income urban population, and ultimately promote safer, more efficient family planning.

#### Tables

Table 1: Ethnicity of Responders

Ethnicity	Frequency (total = 86)	Percent (%)
African American	69	80.23
Latina	6	6.98
Caucasian	4	4.65
Asian	1	1.16
Other	6	6.98

Most of our survey participants represented minority populations.

Table 2: Education Levels of Responders

Education	Frequency (total = 86)	Percent (%)
Did not complete high school	20	23.26
Completed all four years of high school	36	41.86
Completed or enrolled in college or trade school	30	34.88

About 2/3, 65.12%, of responders did not have more than a high school level of education.

#### Methods

This was an IRB-approved cross-sectional study, protocol #1510003993, using a survey as its primary research tool. This study was conducted at an academic inner-city women's health clinic. Researchers personally designed the survey, which consisted of 14 multiple choice questions addressing the study's objectives. Participants only disclosed their age on the top of the survey, and then circled with which ethnicity they identified and their education level (less than high school, completed all four years of high school, or enrolled in college/ trade school). Due to the maximum age of participants, graduate school was not an option in this survey. To assess contraceptive knowledge, participants were able to choose short-acting forms, such as condoms, pills, and patches, or long-acting reversible contraception (LARC) methods, such as an implant or intrauterine device (IUD). Participants were able to circle as many contraceptive options as they knew. Subsequent multiple-choice questions assessed how

participants learned about contraception, what affected their attitudes on contraception, and how participants felt they could enhance their contraception education, including learning about contraceptive options, benefits, and side effects. Participants were able to circle more than answer choice for these questions. Surveys were distributed to all registered female patients of Drexel University's Women's Care Center between the ages of 15 to 24 where English was their primary language. Exclusion criteria included women younger than 15 years of age or older than 24 years of age, women with a documented diagnosis of a learning disability, and women where English was not their first language. Researchers collected the surveys from those meeting inclusion criteria, and answers were documented in an encrypted Excel spreadsheet. Answers to each survey question were tallied. Multivariable regression analyses were performed to detect statistically significant associations between participants' responses and demographics, as well as to determine if



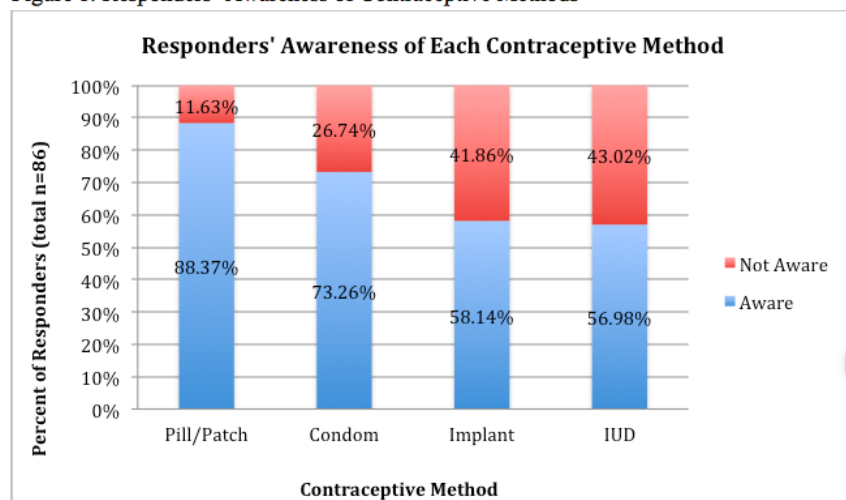
participants' knowledge on contraceptive methods correlated with a particular learning resource.

**Results**

A total of 101 surveys were distributed, of which 86 (85.15%) were answered completely. Ages ranged from 16 to 24, with an average of 21 +/- 2.49 years. Most women in this study were African American (n=69, 80.23%); Caucasians only represented 4.65% (n=4).

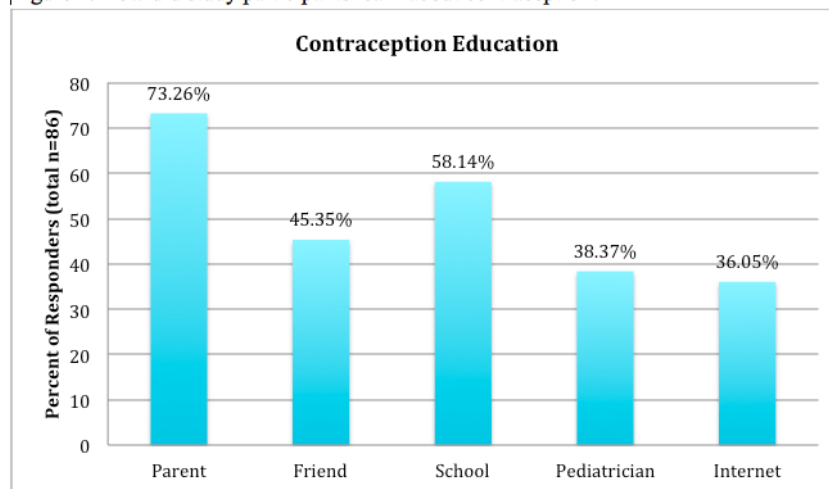
Please see Table 1 for more details. Two-thirds of our participants did not complete school beyond the 12th grade, and about 1/3 of this group (n=20, 35.71%) did not complete all four years of high school (Table 2). Neither ethnicity nor one's educational level was related to her knowledge of a particular contraceptive method (p >0.05). Over 90% (n=79) of our survey participants did not want to become pregnant within the next year.

Figure 1: Responders' Awareness of Contraceptive Methods



A total of 86 women answered this question. Only about half of responders were aware of long-acting reversible contraception methods. (IUD= intrauterine device)

Figure 2: How did study participants learn about contraception?

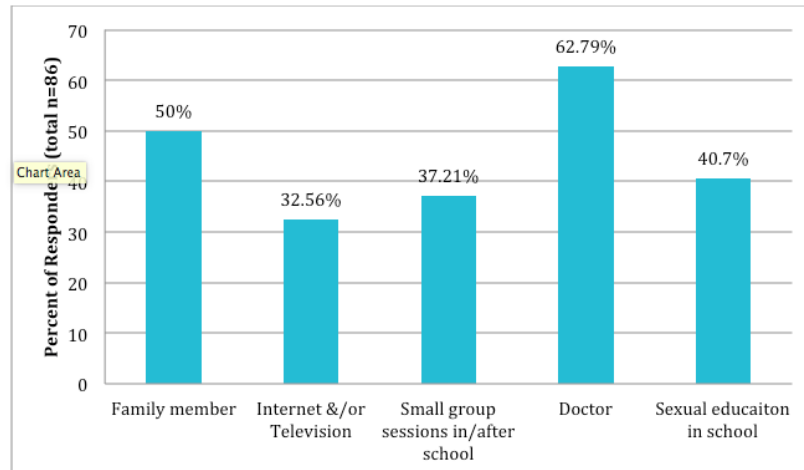


Participants were allowed to pick more than one answer choice to this question.

This said, about 42-43% had not heard of LARC methods, and about a quarter (n=23, 26.74%) of women had not heard of a condom (Figure 1). Most participants (n= 63, 73.26%) learned about birth control from a parent. Only about half of participants received contraception education in school (n=50, 58.14%), and only about a third (n=33, 38.37%) received contraception education

from their pediatrician (Figure 2). Despite the knowledge deficit regarding contraception, 95.35% of survey participants believed their resources were trust-worthy and valid. Since most participants learned about contraception from parents, we conducted a logistic regression analysis to determine if this was related to knowledge of a particular contraceptive method.

Figure 3: How could we better learn about birth control options, their risks, and their benefits?



Choice a= having more open conversation with family members, choice b= knowing about reliable resources on the Internet and/or television, choice c= having small group learning sessions with peers, either at school or as an extracurricular activity, choice d= having more open conversations with your doctor at an earlier age, before becoming sexually active, and choice e= encourage more effective sexual education in school. Participants were allowed to pick more than one answer choice to this question.

Learning from parents did not correlate with knowledge of condoms, pills/patch, or LARC ( $p>0.05$ ). In fact, if a participant received contraception education from a resource other than her parent, she was more likely to have heard of an IUD ( $p<0.05$ ). Participants were more likely to have heard of IUDs and condoms if they had learned about contraception from friends ( $p= 0.037$  and  $0.008$ , respectively). Participants were more likely to be aware of condoms if they had learned about contraception in school ( $p=0.002$ ) or from a friend ( $p=0.008$ ). Knowledge of implants was more likely if the responder had learned about birth control in school or from their pediatrician ( $p=0.009$ ). When asking participants what affects

their attitudes on birth control, most people chose their doctor (60.47%). Only 36.05% of participants felt media resources would influence their attitudes on contraception. When asked what could have previously enhanced their education, over 3/4 of women did not think either receiving lessons at a younger age or having after school programs would have improved their contraception education, and most women were satisfied with their prior contraception teaching (n=52, 60.47%).

While more than half of our study's participants (n=53, 61.63%) felt their pediatricians' education was sufficient, only 38.37% (n=33) of all participants actually learned about birth control from their pediatrician. Lastly, when participants

were asked how they could better learn about birth control going forward, they were least likely to choose media resources, such as Internet and/or television (n=28, 32.56%). About 2/3 of participants (n=54) thought having more open conversations with their doctor at an earlier age, before becoming sexually active, could potentially enhance contraception knowledge in the future (Figure 3).

### **Discussion**

Our survey study confirms the presence of a contraception knowledge deficit amongst female adolescents and young adults in an inner-city environment. Survey participants were almost four times more likely to not be aware of a LARC versus a condom (Figure 1). These findings coincide with data collected by the National Center for Health Statistics (NCHS), as part of the National Survey of Family Growth (NSFG).<sup>10</sup> In 2011-2013, 97% of female teenagers who had sexual intercourse had used a condom at least once, whereas only 2-3% of female teens had ever used an IUD or implant.<sup>10</sup> Despite not having the knowledge of long-acting, reversible, “top-tier” contraception, 91.86% (79 out of 86) of our study’s participants did not want to get pregnant within the next year.<sup>11</sup> Interestingly, our study showed that a participant with less than four years of high school education was aware of the same methods of contraception as a participant who was enrolled in a higher level of education. The fact that education level did not correlate with one’s knowledge of contraceptive methods coincided with participants’ belief that enhancing sexual education in school would not be as beneficial as would having more open conversations with their doctors at an earlier age. Additionally, while only about half of the study’s participants learned about birth control in a school setting, the majority (73.26%) learned about birth control from their parents. This finding is in concordance with Yee and Simon’s article in the *Journal of Adolescent Health*, which stated that young, urban, minority women may consider one’s social network a more reliable and convincing resource than one’s physician.<sup>8</sup> Unfortunately, parents were the only resource that did not correlate with knowledge of

IUDs. This may be due to parents not being aware of recently developed contraceptive method. It may be beneficial if healthcare providers of parents educate on the latest contraceptive method. This will hopefully then translate to educating the daughters of these parents, thereby enhancing adolescent and young adults’ knowledge on contraception. Despite most participants learning about contraception from their parents, participants were more likely to be aware of implants and IUDs if they had learned about birth control from their pediatrician or in school. Unfortunately, only 38.37% (n=33) of the study’s participants received contraception education from their pediatrician, and 58.14% (n=50) received contraception education in school.

One could imagine that if all pediatricians and schools provided comprehensive contraception education, the awareness of efficacious, long-acting reversible contraception might become universal knowledge. These findings coincided with our study’s participants’ opinion on how to enhance future education on birth control. Fifty-four (62.79%) of participants believed that having more open conversations with their pediatricians at an earlier age, before becoming sexually active, would improve their contraception education. While our study did not show a strong favoritism of media resources as being popular modes of contraception education, Ritter, Dore, and McGeechan believe these may be important tools to engage young people in learning about birth control.<sup>9</sup> A reason for the discrepancy in our study could be that many of our survey participants lack access to the Internet and/or value family’s opinions with more weight. While our survey study did not specifically address one’s access to the Internet, lack of access could be a potential reason for why a lower income teen may not opt for this educational resource.

The findings in this study add to the current literature on contraception and young adults. While this study’s sample size does not compare to the volume of participants as included in Frost et al’s study (623 female and 618 male participants)<sup>12</sup>, we similarly found a deficiency in contraception knowledge, and took this one step

further. We attempted to investigate how a particular disadvantaged group of young women would prefer to learn about contraception, with the goal of narrowing the contraception knowledge gap and improving safety of sexual practices.

A disadvantage of this study was that it did not investigate sexual activity. Findings have varied regarding the association between contraceptive knowledge, its use, and sexual behavior.<sup>12</sup> However, Frost et al demonstrated an inverse relationship between contraceptive knowledge and expectation to have unprotected sex in the next three months in their survey study.<sup>12</sup> It would have been interesting to see if sexual activity of our particular study's population of participants correlated with contraception knowledge and its use. Women who are not sexually active may not inquire about contraception from their family, peers, media resources, or school, and therefore not know about contraceptive options.

### **Conclusion**

Adolescents and young adults are disproportionately affected by our country's unintended pregnancy rate.<sup>1-3</sup> There is a lack of knowledge with respect to contraception, and we need to narrow this knowledge gap. According to the American College of Obstetricians and Gynecologists (ACOG), "highly effective LARC methods are underutilized, and promoting

affordable access to LARC methods for current low-use populations, including adolescents and nulliparous women, may help reduce unintended pregnancy."<sup>13</sup> It is difficult for any individual, let alone an adolescent, to make decisions on contraceptive methods if she lacks sufficient knowledge of all of their options, including each form's effectiveness, side effect profile, typical use rate, etc...

Based on our survey's results, most responders learned about contraceptive methods from family. Unfortunately, this resource was the least likely to bring awareness of LARCs. Adult healthcare providers should spend time discussing contraception with their patients, while emphasizing open communication between their patients and their patients' children. Our study also demonstrated that pediatricians could be a potential resource for enhancing contraception knowledge amongst inner-city adolescents and young adults. Pediatricians should stress the importance of sexual health and the usage of birth control with their patients at young ages, hopefully before their patients become sexually active. If adult healthcare providers and pediatricians emphasize reproductive health and contraception in their preventative care visits, the contraception knowledge gap amongst adolescents and young adults will hopefully narrow.

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## 2.Contact Precautions- does it affect patients perception of health care provided?

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### **INTRODUCTION:**

The increased prevalence of infections caused by antibiotic-resistant strains of bacteria is a grim reality facing healthcare providers today. These organisms include methicillin-resistant *Staphylococcus aureus* (MRSA), carbapenemase-producing Enterobacteriaceae and vancomycin-resistant Enterococcus – all of which are implicated increasingly in causing healthcare-associated infections<sup>1</sup>.

This has led to a high emphasis on implementing preventive strategies to curb the spread of these organisms. Furthermore, the fact that the development of novel antibiotics against multi-drug resistant organisms (MDROs) currently lags behind the spread of these organisms is a significant cause of concern<sup>2</sup>. As a consequence of this, the Centers for Disease Control and Prevention (CDC) guidelines recommend the use of contact isolation as a means of preventing the spread of resistant organisms within healthcare institutions.

Contact isolation entails performing adequate hand hygiene; and the use of gloves and protective gowns when caring for patients that are suspected or proven to be colonized/ infected with resistant organisms<sup>3</sup>. *Clostridium difficile* is one of the most common infectious causes of diarrhea associated with the healthcare setting<sup>4</sup>. In the United States, this organism has been linked to the development of antibiotic-associated colitis which is a significant cause of morbidity and mortality in the hospitalized population<sup>5-6</sup>. A peculiar fact about *Clostridium difficile* is that it forms resilient spores which persist on environmental surfaces for months.

Furthermore, alcohol-based hand rubs (which are frequently used in hospitals for hand hygiene) are ineffective against these spores<sup>7</sup>. As a consequence, it has been recommended that patients with suspected or proven infection with *Clostridium difficile* be placed on contact precautions in these cases wearing gowns, gloves in addition to washing of hands with soap and water after each patient encounter are recommended<sup>8</sup>.

A beneficial framework for assessing the quality of healthcare is the six domains of health care quality as put forth by the Institute of Medicine (IOM)<sup>9</sup> which states that quality health care should be guided by the framework of being STEEP: Safe, Timely, Efficient, Equitable and Patient-centered<sup>9</sup>. It is alarming that some research exists that suggests that patients under contact precautions are more prone to developing some adverse outcomes such as pressure ulcers, falls, delirium or symptoms of depression and longer hospitalizations<sup>10-12</sup>. Furthermore, previous studies carried out on patients under contact isolations revealed that the patients expressed a higher degree of dissatisfaction with the care provided and also reported a lack of understanding of contact precautions<sup>12,13</sup>. A previous study done showed that an overwhelming number of patients under contact precautions were of the opinion that receiving education about MDROS would probably be beneficial in helping them make better decisions about their health care<sup>14</sup>.

Healthcare institutes are bound to provide quality-Patient-centered health care for all patients including those placed under contact



precautions. This includes a commitment to providing adequate patient education/counseling to patients under contact precautions. This study was performed to ascertain the quality of patient education provided before contact precautions were implemented in a Tertiary healthcare hospital. Also, this study was tailored to determine how the quality of the education provided impacted patient's perception of the quality of care provided.

### **MATERIALS AND METHODS**

Approval for this study was gotten from the Institutional Review Board (IRB) before commencing the study. The study was questionnaire-based, and the sample sized consists of 64 randomly selected hospitalized patients who were placed under contact precautions for MDROs and Clostridium difficile from April through to May 2017. All recruited subjects were able to communicate verbally and read English. Exclusion criteria included: age <18 years, a history of dementia, diagnosed delirium / other medical conditions leading to altered mental status and patients requiring mechanical ventilation. The sample population received a questionnaire that was structured to determine both their satisfaction with the quality of education provided before contact precautions were placed and also their satisfaction with the quality of health care provided by our hospital. Responses were assessed for overall positivity or negativity. Subsequently, results were analyzed using the Statistical Package for the Social Sciences (SPSS) software. Data were summarized using descriptive statistics such as means, standard

deviations, medians, and frequencies. Inferential statistics such as t-tests and chi-square analyses were performed where appropriate. All p-values were two-tailed, and a level of < 0.05 was considered significant.

### **RESULTS:**

There were a total of 64 patients included in this study. Forty-three percent of the respondents were males, and 57% were females. Most of the surveyed population was 40 years old or older (77.9%). Of the surveyed population, 18% indicated that their highest level of education was primary school (grades 1-6), 39.3% reported high school (grades 7-12), 31.1% reported undergraduate study (Bachelor's degree) and 11.5% reported post-graduate (Master's, Doctorate, MD, DMD) as their highest level of education. Only 32.8% indicated that they received notification before being placed on contact precautions. Furthermore, only 39.1% of the participants reported satisfaction with the quality of education provided by members of the healthcare delivery team about contact precautions. Ten patients (15.6%) reported that they felt alarmed when they first saw hospital staff enter their rooms wearing gloves and gown. Also, only 53.1% of respondents indicated that they were willing to remind staff to wear gowns/gloves if they forgot to do so before entering the room. Of note, twenty-seven patients (42.9%) reported that they were unable to answer questions from their family/friends about why contact precautions were implemented. Also, 10.9% of the respondents indicated that being under contact precautions made them feel less human.

**Figure 1.**

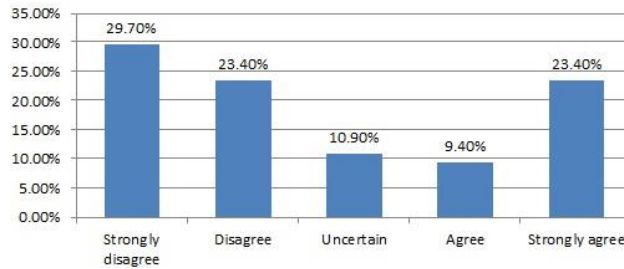


Fig 1 Patients response to: "I received notification before contact precautions were started."

**Figure 2.**

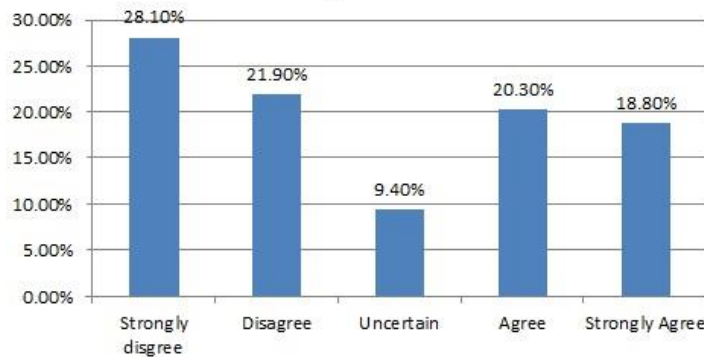


Fig 2 Patients response to: "I am satisfied with the quality of education provided before being placed on contact precautions."

With regards to perception of care provided by the hospital, fifty-three patients (85.5%) of the sampled population expressed satisfaction with the quality of care provided. Also, 82.5% percent of respondents did not agree with the statement "I would have received better care if I was never placed on contact precautions." This study also

revealed that 82.8% of respondents did not have the perception that members of the staff spent less time caring for them since as a result of being under contact precautions. There was no statistically significant association observed when the results were stratified for age, gender and highest level of education.



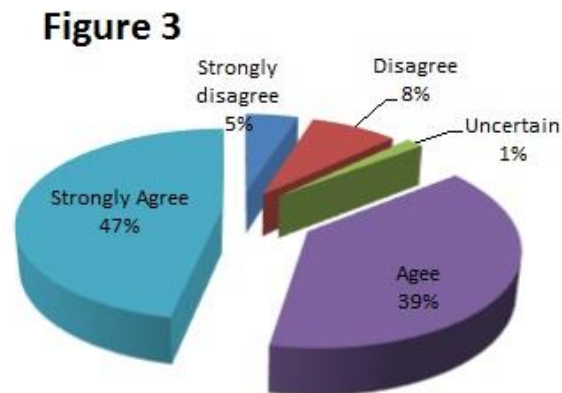


Fig 3 Distribution of responses to: "I am satisfied with the care provided by the hospital so far."

### **DISCUSSION:**

Results from this study revealed that vast patients under contact precautions indicated that they were satisfied with the quality of healthcare provided by the hospital. This finding was suggestive of the fact that patients did not view contact precautions as an impediment to delivery of quality health care. However, a study performed in a different hospital suggested that isolated patients were found to be more likely to make complaints to the hospital about their care<sup>15</sup>. It is noteworthy that in the same study, other factors indicative of lapses in patient care such as a higher rate of the adverse event, unrecorded vital sign and days without physician progress notes were noted amongst patient under contact precautions<sup>15</sup>.

A vast majority of patients in this study did not have the perception that less time was spent on their caring for them while under contact precautions. Also, a high percentage of respondents did not feel that their health care would have been better if they were never started on contact precautions. This is in resonance with the results from another study where no significant difference was discovered in both the average time spent with isolated patients compared with nonisolated patients and the number of organ systems examined in both groups during clinical encounters<sup>16</sup>. Also, that study showed that isolated and nonisolated groups gave high ratings to all of the items about the facility and health care providers<sup>16</sup>. However,

a different study yielded a different result as it suggested that attending physicians were less likely to examine patients under contact precautions when compared with patients not on contact precautions<sup>17</sup>. When comparing the results gotten from our study with results obtained from the other reviews cited earlier, it is not unreasonable to conclude that the implementation of contact precaution does not independently have an overwhelming impact on patient's perception of care. Instead, other factors such as an Institution-wide commitment to consistently providing safe, timely, efficient, equitable and patient-centered care play most likely plays a more crucial in affecting patient's perception of the quality of healthcare offered while on contact isolation. On a final note, results of this study indicated that despite a sizeable percentage of respondents reporting that they were not notified or adequately educated before the commencement of contact precautions, this did not correlate with patients perceiving that the overall quality of care was inadequate. A possible explanation for this is that patients may have instinctively assumed that wearing gowns and gloves was a standardized method of infection control performed on every patient admitted to the hospital. By extension, this may well explain the observation that over 80% the respondents did not feel alarmed when they first saw the member of staff wearing gowns and gloves.

**LIMITATION:**

A limitation of this study was the fact that the sample size was only 64 patients all of whom were surveyed in a single facility hospital. For future studies, statistical power could be increased by increasing the sample size and also including multiple healthcare centers.

**CONCLUSION:**

Implementation of contact precautions may not independently cause an adverse perception on the quality of care health provided among patients under contact precautions.

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## Case Reports

### 1. Elevated Osmolar Gap Secondary to Propylene Glycol in an Asymptomatic Patient

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**Background:** Propylene Glycol (PG) is widely used as a solvent in food products, medications and multivitamins. PG toxicity has been reported in the intensive care unit setting in patients receiving an infusion of medications (1-4) containing PG as a solvent.

**Case report:** A 2-year-old previously healthy female was brought to the Emergency Department (ED) with a possible ingestion of a liquid that contained isopropyl alcohol and methyl salicylate. In the ED, the patient had normal vital signs and examination. Blood work revealed an osmolar gap (OG) of 114 mOsm/kg and lactate of 2.9 mmol/L with a normal anion gap. Repeated laboratory values showed an OG of 62mOSm/kg and a lactate of 1.1 mmol/L. The patient was observed in the ED for eight hours and was later transferred to a pediatric hospital for further observation. On further questioning, the mother stated that she had been using "Africa's Best Super Gro Hair & Scalp Conditioner" on the patient that contained propylene glycol. The patient was admitted for next 24 hours and remained asymptomatic throughout the hospital course.

**Conclusion:** Although PG is classified as a "Generally Recognized As Safe" by the Food and Drug Administration (FDA) (5), dermal absorption of PG may occur with continued application. To our knowledge, this is the first reported case discussing an asymptomatic patient with an OG of 114 mOsm/kg after dermal absorption of a product containing PG. It is important to consider accumulation and the potential for PG toxicity in patients with an elevated OG and hyperlactatemia.

Ref:

1. Arroliga AC, Shehab N, McCarthy K, Gonzales JP. Relationship of continuous infusion lorazepam to serum propylene glycol concentration in critically ill adults. *Crit Care Med.* 2004;32(8):1709-1714.
2. Pillai U, Hothi JC, Bhat ZY. Severe propylene glycol toxicity secondary to use of anti-epileptics. *Am J Ther.* 2014;21(4):e106-109.
3. Barnes BJ, Gerst C, Smith JR, Terrell AR, Mullins ME. Osmol gap as a surrogate marker for serum propylene glycol concentrations in patients receiving lorazepam for sedation. *Pharmacotherapy.* 2006;26(1):23-33.
4. Mullins ME, Barnes BJ. Hyperosmolar metabolic acidosis and intravenous Lorazepam. *N Engl J Med.* 2002;347(11):857-858; author reply 857-858.
5. "Database of Select Committee on GRAS Substances (SCOGS) Reviews". FDA. Accessed January 23, 2017

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### 2. Cocaine-Induced Hepatotoxicity

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**Background:** Cocaine use may adversely affect many organ systems including the cardiovascular, central nervous, and pulmonary systems. Hepatic injury in the setting of cocaine toxicity is an uncommon manifestation and most case reports describe a mild elevation

in transaminases.

**Case:** 28-year-old male was found on the street agitated. In the emergency department he was tachypneic (RR 40), tachycardic (HR 173), and hyperthermic (103.6oF) with confusion. After administration of 4mg of lorazepam and 5mg of

haloperidol he required endotracheal intubation. Laboratory analysis revealed acute kidney injury (BUN 20 mg/dL, Cr 2.22 mg/dL), lactic acidosis (4.7 mmol/L), and rhabdomyolysis (CPK 15,064 IU/L). Urine drug immunoassay was positive for benzodiazepines, cocaine, and tetrahydrocannabinol. Serum acetaminophen level was negative and initial transaminase levels were normal (ALT 35 IU/L, AST 59 IU/L). The patient was extubated on day two of hospitalization, and he admitted to a two-day binge of intravenous cocaine. The patient developed acute hepatotoxicity on hospital day two. INR peaked at 10.6, and AST and ALT peaked at 4283 IU/L and 4219 IU/L. The patient was started on n-acetylcysteine (NAC). Comprehensive testing for liver disease was performed and was negative. Liver function improved and the patient was discharged after 11 days.

**Conclusion:** Fulminant hepatotoxicity is a rare potential side-effect of cocaine use. Hepatotoxicity is hypothesized to result from glutathione depletion and subsequent oxidative injury and lipid peroxidation from cocaine metabolites. Treatment primarily includes glutathione repletion (NAC) and supportive care.

Ref,

1) Kanel GC, Cassidy W, Shuster L, Reynolds TB. Cocaine-induced liver cell injury: comparison of morphological features in man and in experimental models. *Hepatology* (Baltimore, Md). 1990;11(4):646-651

2) Roth L, Harbison RD, James RC, Tobin T, Roberts SM. Cocaine hepatotoxicity: influence of hepatic enzyme inducing and inhibiting agents on the site of necrosis. *Hepatology* (Baltimore, Md). 1992;15(5):934-940

3) Powell CJ, Charles SJ, Mullervy J. Cocaine hepatotoxicity: a study on the pathogenesis of periportal necrosis. *International journal of experimental pathology*. 1994;75(6):415-424.

### 3. Retained Bullets and the Perils of Plumbism

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**Objective:** Plumbism may occur in cases where bullets or bullet fragments are retained in the body. (1) It is more often, but not exclusively, seen in cases where the bullets or fragments are lodged in bone, near or in joint or serosal surfaces, found within fluid-filled cysts, associated with bone fractures, or during times of rapid bone turnover. (2)(3) We present a case of elevated lead levels in a patient with retained bullets and bullet fragments and aim to highlight the importance of follow-up in such patients in order to limit morbidity and mortality due to prolonged lead poisoning.

**Case Report:** A 30 year-old-male presents to Emergency Department with chest tightness. His past medical history was significant for quadriplegia, tracheostomy, and ventilator dependency after sustaining multiple gunshot wounds 57 days prior to presentation. A computed tomography scan of the chest showed bullets and/or fragments in the lower neck, right upper humeral shaft, chest wall,

abdominal wall, and right anterior thigh. The patient had no symptoms or signs of lead toxicity but whole blood lead levels were 24 mcg/dL (reference 0-19 mcg/dL).

**Conclusion:** No level of lead exposure is deemed completely safe, alluding to the fact that lead levels released by retained ballistic material anywhere in the body is not entirely harmless. There are a multitude of variables affecting the rise in lead levels in such patients, rendering clear guidelines on monitoring levels difficult to establish. However, it is imperative that physicians be mindful of plumbism in patients presenting with retained bullets.

Ref

1. Weiss D, Tomasallo CD, Meiman JG, et al. Elevated Blood Lead Levels Associated with Retained Bullet Fragments — United States, 2003–2012. *MMWR Morb Mortal Wkly Rep* 2017;66:130–133. DOI: <http://dx.doi.org/10.15585/mmwr.mm6605a2>

2. Nguyen, Ann, Jeffrey J. Schaidler, Mariah Manzanares, Roy Hanaki, Robert J. Rydman, and Faran Bokhari. "Elevation of Blood Lead Levels in Emergency Department Patients with Extra-articular Retained Missiles." *The Journal of Trauma: Injury, Infection, and Critical Care* 58, no. 2 (2005): 289-99.

doi:10.1097/01.ta.0000119205.24520.1d

3. Farrel SE, Vandevander P, Schoffstall JM, et al. Blood lead levels in emergency department patients with retained lead

bullets and shrapnel. Academic Emergency Medicine. 1999 Vol 6(3) p. 208-12

#### 4. Cardiotoxicity Resulting from Yew Plant Ingestion

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**Introduction:** The American yew, *Taxus canadensis*, is a slow-growing plant used in landscaping. It is a conifer native to Europe, Africa, Iran, and Asia. The toxic components of the plant are taxine alkaloids that affect myocardial sodium and calcium channels and can result in life-threatening dysrhythmias (1,2).

**Case:** A 48-year-old female presented to the emergency department (ED) after ingesting fragments of a yew plant in a suicide attempt. Upon arrival to the ED, blood pressure was 75/57 mmHg, temperature 95.5 oF, and heart rate 30 bpm. Her vital signs improved with intravenous (IV) fluids and 0.5 mg IV atropine, but she subsequently developed ventricular tachycardia. She was given a 150 mg bolus of IV amiodarone and converted to normal sinus rhythm. After two hours, the patient exhibited ventricular fibrillation. She underwent successful electrical cardioversion and was administered IV calcium gluconate and magnesium sulfate. She was placed on norepinephrine, amiodarone, and bicarbonate infusions, with admission to the

intensive care unit. Initial laboratory analysis was only significant for a serum lactate of 4.7 mmol/L (reference 0.5-1.0 mmol/L). After three days of hospitalization, the above medications were discontinued and repeat electrocardiogram normalized. She was discharged in stable condition to psychiatric care.

**Discussion:** Regional poison centers in the United States receive numerous calls regarding yew plant ingestions every year, with the majority of exposures occurring as exploratory ingestions in children (1,3). We present a rare case of *Taxus canadensis* toxicity in a suicide attempt. With supportive care, the patient recovered without further sequelae.

Ref.

1. Goldfrank LR, editor. Goldfrank's manual of toxicologic emergencies. 10th ed. New York: McGraw-Hill; 2015.
2. *Taxus Canadensis* [Internet]. Natural Resources Conservation Service: Plants Database. [cited 2017 Aug 31]. Available from: <https://plants.usda.gov/core/profile>.
3. Olson K, editor. Poisoning and Drug Overdose. 6th ed. New York: McGraw-Hill; 2011.

#### 5. Lymphangioliomyomatosis: A Common ED Presentation of a Rare Disease

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**Case Summary:** A 25-year-old female with history significant only for tobacco abuse presents to ED with two weeks of progressively worsening dyspnea and chest pain. Vitals show an oxygen saturation of 75%, tachypnea, and tachycardia. Physical examination demonstrated a female with marfanoid appearance in acute respiratory distress. Heart was regular, tachycardic, and without murmur. Lungs were clear to auscultation. Digital clubbing was

present. EKG was without acute ST or T-wave changes. Labs revealed a troponin of 0.1. Bedside echocardiogram demonstrated a dilated right atrium and ventricle. CT chest performed to assess for pulmonary embolism showed lymphangioliomyomatosis (LAM) complicated by bilateral infiltrates and evidence of pulmonary hypertension. Antibiotics were initiated to cover for complicating pneumonia. Her hypoxia resolved with a



nonrebreather mask and she was hospitalized in the medical transition unit. Following her admission, she was subsequently transferred to another facility for evaluation for heart and lung transplant.

**Significance:** LAM is a progressive, rare disease that occurs in women of reproductive age. The presentation of LAM is respiratory distress, which mimics many common presentations to the ED. Advanced disease can present with hypoxia and signs of pulmonary hypertension (1). Differential diagnoses include other cardiopulmonary disorders including COPD and sarcoidosis (1). Biopsy is the gold standard for diagnosis, however if the presentation and CT findings are classic it is not necessary. Eventual treatment is lung and possible heart transplant

(3,4). While there is no cure, early diagnosis is important so that patient counseling and early interventions such as smoking cessation occur (2).

Ref

1. Kalassian KG, Doyle R, Kao P, et al. Lymphangiomyomatosis: new insights. *Am J Respir Crit Care Med* 1997; 155:1183
2. Johnson SR, Cordier JF, Lazor R, et al. European Respiratory Society guidelines for the diagnosis and management of lymphangiomyomatosis. *Eur Respir J* 2010; 35:14
3. Oprescu N, McCormack FX, Byrnes S, Kinder BW: Clinical Predictors of Mortality and Cause of Death in Lymphangiomyomatosis: A Population-based registry. *Lung* (2013) 191:35-42
4. Belkin A, Albright K, Fier K, Desserich J, Swigris JJ: "Getting stuck with LAM": Patients perspectives on living with Lymphangiomyomatosis. *Health and Quality of Life Outcomes* 2014, 12:79.

## 6.Recurrent Cerebrovascular Accidents In A Patient With Cardiac Calcified Amorphous Tumor: An Urgent Need For Timely Diagnosis

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**INTRODUCTION:** Cardiac Calcified Amorphous Tumor (CAT) is an uncommon primary cardiac tumor. Despite its benign pathologic features, cardiac CAT can cause life-threatening conditions including embolic cerebrovascular accident (CVA).

**CASE:** A 63 year-old Caucasian male presented with worsening dysarthria and right hemiparesis. He had previous CVAs, especially 5 new ones in 3 months from March to May 2017 and 14 episodes of syncope prior to March 2017. His symptoms were thought to be related to his long-standing history of cocaine abuse and uncontrolled hypertension. On admission, MRI/MRA demonstrated acute small vessel infarction in the left parietal periventricular white matter and prior microhemorrhages. TTE demonstrated no valvular lesions. However,

given his multiple CVAs and high pre-test probability of cardiac embolic source, TEE was performed, illustrating a focal echodense mobile mass on left coronary cusp. Subsequently, he underwent surgery for tumor removal. Pathological report of the resected mass demonstrated a fragment of degenerated hyalinized tissue with calcifications, consistent with cardiac CAT. Cultures from blood and tumor were negative, ruling out infective endocarditis.

**DISCUSSION:** Recurrent embolic CVA within the short time period caused by CAT is a rare entity. Could our patient's CAT have been diagnosed earlier as the cause of recurrent CVA if his cocaine use or uncontrolled hypertension did not obscure the picture of possible cardiac embolism?

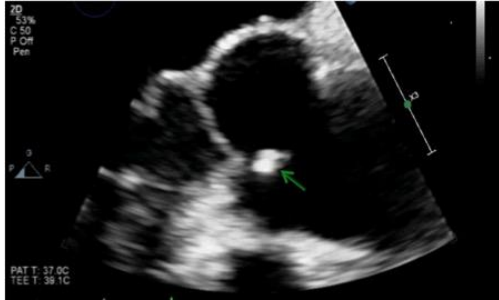


Figure 1: A focal echodense mobile mass, 5x0.6mm, on left coronary cusp (arrow) on TEE 06/01/2017

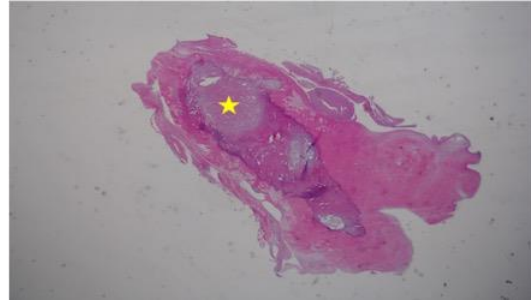


Figure 2: 2x view of tissue fragment: Pink fragment with hyalinized change, Central area of calcification (star) - tissue has been "decalcified"

This case demonstrated the need for essential, timely diagnosis of CAT in particular and heart tumor in general so that early surgical intervention can be performed to prevent further serious sequelae of cardiac embolism.

#### Ref

1. Reynolds C, Tazelaar HD, Edwards WD. Calcified amorphous tumor of the heart (cardiac CAT). *Hum Pathol.* 1997;28:601-606.
2. DeRook FA, Comess KA, Albers GW, Popp RL. Transesophageal echocardiography in the evaluation of

stroke. *Ann Intern Med.* 1992;117:922.

3. Engberding R et al. Diagnosis of heart tumours by transoesophageal echocardiography: a multicentre study in 154 patients. *Eur Heart J.* 1993;14(9):1223.
4. Hussain N et al. Calcified amorphous tumors (CATs) of the heart. *Cardiovasc Pathol.* 2014;23(6):369–371

## 7. Right sided hypothalamic stroke presenting with Horner's syndrome - An unusual presentation of disseminated Coccidioidomycosis

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A 46 year old man with no significant medical history presented with 3 months of intermittent high grade fevers and 1 week of severe bi-temporal headaches. Also, 1 day prior he developed weakness in his right eye lid. Review of systems was significant for drenching night sweats and unintentional weight loss of 20lbs in about 3months. There was a recent travel to Arizona with no travels outside of the U.S.A. Physical exam was significant only for right sided Horner's syndrome. MRI (Magnetic resonance Imaging) of the cervical spine was unremarkable about brain MRI demonstrated a small acute right hypothalamic stroke. Chest X-ray showed a small lateral left upper opacity with associated hilar prominence. An echocardiogram was done and this ruled out a cardiac source of a thrombo-embolism. A lumbar puncture was performed that returned significant for CSF

(cerebrospinal fluid) protein of 100mg/dl, CSF glucose of 25mg/dl and an elevated WBC of 387 (90% lymphocytes). Serum anti-nuclear antibody, antineutrophil cytoplasmic antibody and other rheumatologic tests were negative. However, CSF coccidioidal antigen was positive with coccidioidal antibody titer of 1:32. Biopsy of the left upper lobe lung lesion was performed. Histology revealed classic spherules of coccidioidomycosis. A diagnosis of disseminated Coccidioidomycosis with coccidioidal meningitis complicated by arteritis and subsequent hypothalamic infarction was made. Horner's syndrome noted on presentation was thought to have been as a consequence of the hypothalamic infarct. Patient was discharged on long term high dose fluconazole (800mg daily). Headaches and fevers improved remarkably with therapy.



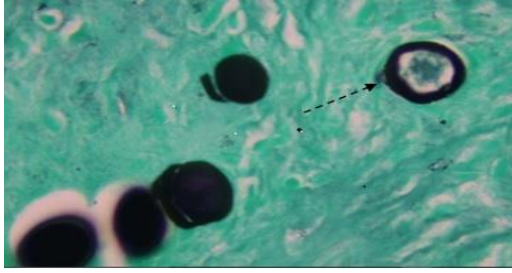


Figure 1. Silver stain of lung biopsy showing classical spherule of *Coccidioides* (marked with the arrow).

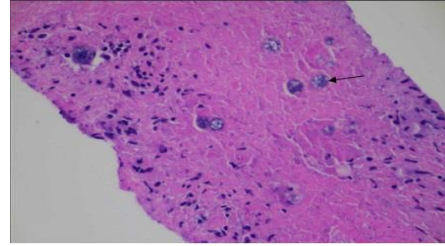


Figure 2. Haematoxylin and Eosin stain of lung biopsy showing multiple spherules of *Coccidioides* (one is marked by the arrow)

Ref.

Williams PL, Johnson R, Pappagianis D, et al. Vasculitic and encephalitic complications associated with *Coccidioides immitis* infection of the central nervous system in humans: report of 10 cases and review. *Clin Infect Dis* 1992; 14:673. Saubolle MA, McKellar PP, Sussland D. Epidemiologic,

clinical, and diagnostic aspects of coccidioidomycosis. *J Clin Microbiol* 2007; 45:26.

Galgiani JN, Ampel NM, Blair JE, et al. 2016 Infectious Diseases Society of America (IDSA) Clinical Practice Guideline for the Treatment of Coccidioidomycosis. *Clin Infect Dis* 2016; 63:e112

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## 8.A Deadly Prescription: Combination of Methotrexate and Trimethoprim-sulfamethoxazole

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**Case:** A 68-year-old female with a history of RA on 10 mg MTX weekly, presented to ED with lethargy and decreased oral intake. One month ago, her PCP prescribed a two weeks course of TS for a presumed bacterial skin infection and she developed painful oral sores and flu-like symptoms one week into therapy. In ER her vitals were stable. The physical exam included severe oral mucositis, lip ulceration and an erythematous rash under her left breast. Laboratory evaluation showed: creatinine: 2.39 mg/dL (baseline normal), potassium: 5.3meq/L, leukocyte count: 3.2K/uL, ANC: 1.8K/uL and hemoglobin of 8.7mg/dL (baseline: 11mg/dL). TS was stopped as the symptoms were attributed to its side effect profile and supportive care with IV fluids, and oral care was given. The clinical course continued to worsen over the next few days including worsening of neutropenia and mucositis. A careful review of her medication list and possible drug interactions was done, and her symptoms were in fact attributed to MTX-TS interaction

leading to MTX toxicity rather than toxicity of TS itself. MTX levels came back high at 0.5 micromole/L. Leucovorin rescue along with Filgrastim was given which resulted in resolution of her symptoms.

**Conclusion:** The combination of the MTX and TS should be avoided as it can lead to significant toxicity and possibly death. Primary care doctors need to be educated about this potentially deadly combination as it usually bypasses the pharmacy based safety checkpoints on the outpatient basis.

Ref

1. Thomas MH, Gutterman LA. Methotrexate toxicity in a patient receiving trimethoprim-sulfamethoxazole. *The Journal of rheumatology*. 1986;13(2):440-441.

2. GROENENDAL H, RAMPEN FHJ. Methotrexate and trimethoprim-sulphamethoxazole-a potentially hazardous combination. *Clinical and Experimental Dermatology*. 1990;15(5):358-360.

3. 10. Katchamart W, Bourré-Tessier J, Donka T, et al. Canadian recommendations for use of methotrexate in patients with rheumatoid arthritis. *The Journal of rheumatology*. 2010;37(7):1422-1430. <http://www.ncbi.nlm.nih.gov/pubmed/20516029>.

## 9. Capnocytophaga Canimorsus- An unusual cause of severe thrombocytopenia in an immunocompetent host

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**Case:** Our patient was a 44-year-old with a medical history of asthma and heavy alcohol use presented with 4 days of diffuse lower abdominal pain, fever and diarrhea. Lab testing was consistent with severe sepsis with White Blood Count of 9000/UL with 14 % bands, critically lowered platelet count of  $3 \times 10^9/L$ , lactic acid of 3.5MEQ/L and creatinine of 4.5mg/dl. Repeat platelet count 7 hours after presentation was less than  $2 \times 10^9/L$ . Furthermore, examination of the peripheral blood smear showed the presence of neutrophils, with several neutrophils having toxic granulations and heavy vacuolation. Also, diplobacilli were clearly seen in several neutrophils but no schistocytes were present. Empiric intravenous broad spectrum antibiotic therapy was started.

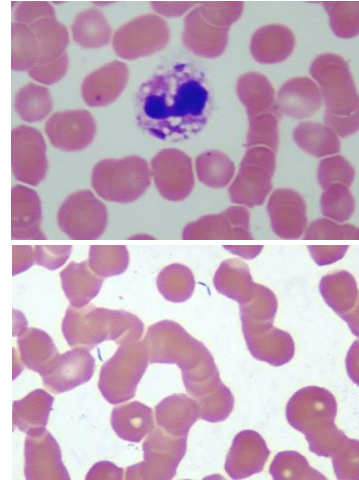


Figure 1(left). Peripheral blood smear showing a neutrophil with diplobacilli and heavy vacuolation indicating severe sepsis

Figure 2(right). Peripheral blood smear showing the presence of extracellular diplobacilli

Blood cultures after 24hrs returned negative. On day 2 of incubation gram negative rods were isolated from blood cultures. Patient showed clinical improvement and by day 5 platelet count was of  $115 \times 10^9/L$  with renal function returning to normal. Antibiotics were narrowed to ceftriaxone while identification of the isolates was pending. Two weeks later this was identified as *Capnocytophaga Canimorsus* from exposure to saliva of his dog.

**Discussion:** *Capnocytophaga canimorsus* is a facultative Gram-negative bacillus that is typically a constituent of the oral flora of dogs and cats. Transmission is through licks or bites especially from dogs. This bacteria is a rare cause of sepsis with profound thrombocytopenia. Alcoholics and immunocompromised host are mostly affected. Treatment is with a beta-lactam-beta-lactamase combination or a cephalosporin.

Ref.

Popiel KY, Vinh DC. 'Bobo-Newton syndrome': An unwanted gift from man's best friend. *Can J Infect Dis Med*

*Microbiol* 2013; 24:209.

Morgan M. *Capnocytophaga canimorsus* in peripheral blood smears. *J Clin Pathol.* 1994;47: 681-682

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## 10.A Case of ST Elevations in a Patient with Polymyositis

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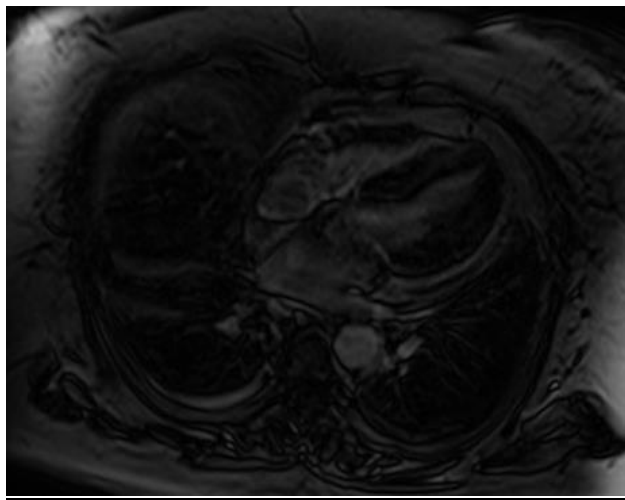
\*\*\*Drexel University College of Medicine: Department of Medicine, Division of Cardiology

\*\*\*\*Drexel University College of Medicine: Department of Medicine, Division of Rheumatology

**Introduction:** Cardiac disease in polymyositis is common but underdiagnosed. It is a leading

cause of morbidity and mortality in patients with polymyositis (3).

**Methods:** We describe a case of ST elevations in a 57 year old female with relapse of biopsy proven polymyositis admitted with worsening proximal muscle weakness. She was treated with prednisone, azathioprine, and IVIG. Initial creatinine kinase was 1032 U/L. On day three, she became dyspneic and developed chest pain. Electrocardiogram (ECG) showed ST elevations in leads I and aVL with reciprocal ST depressions in the inferior leads. Troponin I was elevated and peaked at 0.78 ng/mL.



Cardiac MRI showing delayed enhancement involving the septum and lateral wall of the left ventricle Ref.

1. Diederichsen LP, Simonsen JA, Diederichsen AC. Cardiac abnormalities assessed by non-invasive techniques in patients with newly diagnosed idiopathic inflammatory myopathies. *Clinical Experimental Rheumatology*. 2015; 33(5):706-14.
2. Lundberg IE, The heart in dermatomyositis and

**Results:** Cardiac catheterization showed mild nonobstructive coronary artery disease. ECG on day four showed persistent ST elevations and T wave inversions in leads I and aVL. Echocardiogram revealed a left ventricular ejection fraction of 55% with mild concentric left ventricular hypertrophy. Cardiac MRI revealed delayed myocardial enhancement in the septum and lateral wall of the left ventricle without endocardial involvement consistent with myocarditis.

**Conclusion:** There is an increased risk of myocardial infarction, heart failure, arrhythmias, and sudden cardiac death in patients with polymyositis (2). This case illustrates the importance of carefully evaluating for acute coronary syndrome (ACS) in patients with polymyositis and chest pain. Increased vigilance in cardiovascular prevention, surveillance and risk modification is needed in these type of patients. Cardiac MRI can help diagnose myocarditis when an echocardiogram is inconclusive (1). Moreover, myocarditis can present with persistent ST elevations as well as elevations of cardiac enzymes mimicking ACS (4).

- polymyositis. *Rheumatology*. 2006; 45:4-21.
3. Lu Z, Guo-chun W, Li M, Ning Z. Cardiac Involvement in Adult Polymyositis or Dermatomyositis: A Systematic Review. *Clinical Cardiology*. 2012; 35:685–691.
  4. Stogiannos PN, MytasEmail DZ, Katsaros AA. Chest pain and ST-segment elevation in a patient with polymyositis: a case report. *BioMed Central*. 2009; 2:84

## 12. Severe Pancytopenia In A Patient With Glioblastoma: Is Temozolomide the Sole Culprit?

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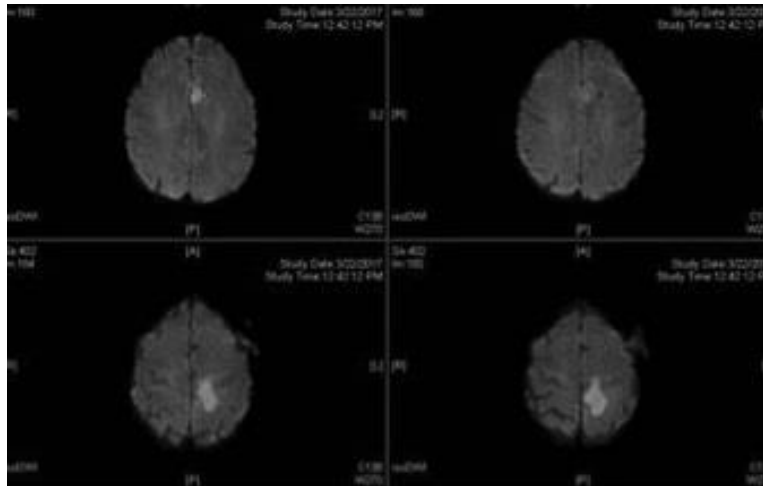
**INTRODUCTION:** Temozolomide (TMZ) is the standard chemotherapy used in conjunction with post-surgical radiation for patients of Glioblastoma. Severe pancytopenia in the setting of concurrent exposure with Temozolomide and Sulfamethoxazole/Trimethoprim (Bactrim) has

not been widely reported.

**CASE:** A 69 year-old Caucasian female initially presented in 3/2017 for evaluation of right-sided weakness was found to have a left frontoparietal brain mass with biopsy consistent with Glioblastoma. She was started on concurrent

chemotherapy with daily Temozolamide (day 30 as of 5/23/2017) and daily radiation (last session on 5/22/2017). She was also on Bactrim for Pneumocystis Pneumonia (PCP) prophylaxis. On 5/23/2017, she presented with sepsis and severe pancytopenia. Temozolamide, Bactrim and radiation were discontinued. Given no adequate recovery of her counts regardless of transfusions

and growth factors, bone marrow biopsy was performed, demonstrating total marrow aplasia with rare immature mononuclear cell and scattered lymphocytes and plasma cells (1% cellularity). With her persistently suppressed count, ongoing infection with worsening mood, she and her family decided on hospice care.



	3/27/2017	4/26/2017	5/23/2017 (ADMISSION)	6/6/2017
WBC	13.4	12.1	0.7	0.2
Hgb	13.2	13.7	9.2	6.6
Platelets	412	420	3	9 => 67 (post-transfusion)

Figure 1 (top): MRI showed a 2.6 x 3.0 x 2.3 cm left parasagittal frontoparietal mass and a 0.9 x 1.2 x 0.7 cm left frontal parasagittal mass. Figure 2 (bottom): Patient's CBC Trend

**DISCUSSION:** Normally, Temozolamide-induced myelosuppression is reversible in 2 weeks; unfortunately, that was not observed in our patient's case. In Doyle et al.'s study, 2 of 3 patients who developed severe myelosuppression after Temozolamide were concurrently on Bactrim (1). This prompted the question for the true underlying etiology of severe pancytopenia observed in these patients – effect of Temozolamide alone or combined effect of Temozolamide and Bactrim. Further research to identify the etiologies, risk factors and

interventions to decrease morbidity and mortality in these patients is necessary.

Ref.

1. Doyle TJ et al. Fatal hematologic toxicity with prolonged continuous administration of temozolamide (TMZ) during radiation therapy (RT) in the treatment of newly-diagnosed glioblastoma multiforme (GBM): report of a Phase II trial. *Journal of Clinical Oncology*. 2005;23:Article 1546.
2. Comez G et al. An Unusual Case of Aplastic Anemia Caused by Temozolamide. *Case Reports in Medicine*. 2010;2010:Article ID 975039.
3. Gerber DE et al. The impact of thrombocytopenia from temozolamide and radiation in newly diagnosed adults with high-grade gliomas. *Neuro Oncol*. 2007;9:44-52

## 11. Cardiac Metastasis from Cervical Cancer a Rare Occurrence Requiring the Use of Multimodal Imaging Studies for Diagnosis

Ralph Cipriano, MD\*, Dexter Jacob, MD\*\*, S. Farhan Hasni, MD\*\*\*

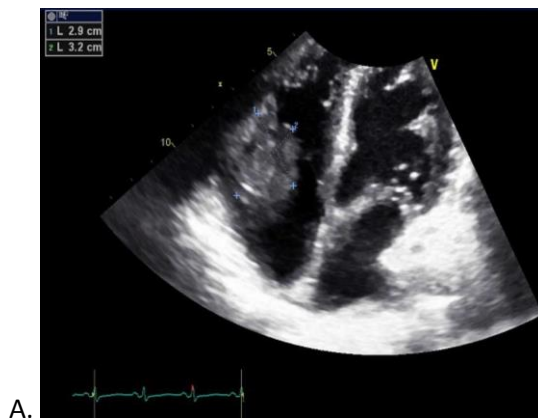
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**Case Description:** 54-year-old female with a past medical history significant for cervical cancer stage IIIB presented to an outside hospital with four days of pleuritic chest pain. Transthoracic echocardiogram (TTE) revealed a large circumferential pericardial effusion. Given tamponade physiology, she underwent a pericardial window with evacuation of 800 cc of fluid. Cytology revealed squamous cells consistent with metastatic cervical squamous cell carcinoma. Immunostains of the tumor cells were strongly positive for P16, P63 and CK7 supporting the diagnosis of metastatic cervical cancer. Approximately, one month later she developed a recurrence of pleuritic chest pain and was admitted to our hospital. **A)** TTE described a large irregular mass measuring 5cm

in diameter, starting in the pericardial space and encroaching through the RV and RA causing moderate functional tricuspid stenosis. A cardiac MRI was obtained to further characterize the lesion: **B)** 4.1 x 4.0 cm heterogeneous enhancing soft tissue mass within the right atrioventricular groove which appears to be intracardiac with mass effect towards the right atrium and right ventricle. The findings are consistent with neoplastic process, likely reflecting metastases given history of cervical cancer. **Discussion:** The heart is rarely involved in extrapelvic metastasis from recurrent cervical cancer (1). A multimodal, non-invasive imaging approach plays a crucial role in the early discovery of cardiac masses and establishing a diagnosis.



Ref.

1. Ferraz JG, Martins AL, de Souza JF, et al. . Metastatic tumor of squamous cell carcinoma from uterine cervix to heart: ante-mortem diagnosis. Arq Bras Cardiol 2006; 87: 104–107

## 12. Refractory TTP during pregnancy in Sickle-Beta (0) Thalassemia: a case report

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A 38-year-old G5P2113 African-American female with sickle-beta (0) thalassemia (S0) presented at 24w4d of gestation with severe, bilateral lower

extremity pain. Prior pregnancy was significant for an emergent C-section due to pre-eclampsia at 28 weeks of gestation. At the time of



admission, the patient was thought to be in sickle cell crisis. By the fifth day of hospital admission, the patient had marked hypertension, transaminitis, and a platelet count of 57,000. Due to concern of HELLP syndrome, the patient was taken to the OR for expectant delivery. Laboratory findings included: LDH-1040, reticulocyte count- 279 (baseline 264) at 12.9% (baseline 8.8%), and hemoglobin-5.9 (baseline 8-9). Five days after delivery, the patient's symptom worsened and thrombocytopenia dropped to < 20,000. Peripheral blood smear illustrated 3-5 schistocytes per hpf with microangiopathic changes. An ADAMTS13 level returned at < 10% with the presence of an inhibitor. Plasma exchange and high-dose intravenous steroids were started emergently, and she was treated with Rituximab throughout her hospital stay. The patient suffered a prolonged hospital course, and microvascular complications of acute and chronic hemolysis most likely led to dialysis dependence. During an attempt to wean plasma exchange, the patient suffered a TTP relapse marked by profound confusion and a platelet drop <50,000.

This rare, complex case implies the utmost importance of prompt initiation of therapy in a presumed diagnosis of TTP, particularly in the setting of pregnancy and underlying hemolytic anemia. We also suggest a possible correlation with baseline hemolytic anemia and TTP during pregnancy.

Ref.

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### 13. Renal Vein Thrombosis as initial presentation of SLE

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A 43-year-old female presented with right-sided flank pain, fevers, and chills. She was recently treated for pyelonephritis and discharged on oral antibiotics although with incomplete response. Initial vitals included blood pressure 133/61mmHg, heart rate 105 beats/min, respiratory rate 18, Temp 102. Physical exam was unremarkable except mildly distended abdomen with generalized abdominal tenderness. Initial labs showed normal complete metabolic profile with elevated WBC count of 22.2 K/uL, hemoglobin 8.9 mg/dL, platelets 466 K/uL. Urinalysis was positive for nephrotic range proteinuria. A CT abdomen/pelvis revealed an opacity in left renal vein consistent with left renal vein thrombosis followed by MRI abdomen which showed left-sided pyelonephritis in addition to renal vein thrombosis. A CT chest was consistent with right upper lobe consolidation which was

treated with broad-spectrum antibiotics. She was started on intravenous heparin. IR guided lysis catheter and tPA was used for renal vein thrombosis. Later patient developed acute kidney insufficiency requiring hemodialysis for worsening creatinine. Further workup came back positive for anti-smith, anti dsDNA, anti-RNP antibodies, and ANA with speckled appearance. Other workup was negative for anti-MPO, PR-3, cANCA and pANCA. In addition to anticoagulation, the patient was treated with intravenous steroids and improved clinically. Renal biopsy was delayed because of the risk of anticoagulation. Renal vein thrombosis as an initial presentation for systemic lupus erythematosus is very challenging. No clear-cut data is available so far to guide management. Nephrotic range proteinuria should be investigated aggressively and SLE should always



be one of the differentials.

Ref.

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renal vein thrombosis. *Z Rheumatol* 2003;62:246–50.  
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## 14.Spontaneous Left Main Coronary Artery Thrombus: A Rare Cause of Acute STEMI in A Young Male and Unique Interventional Approach to Successful Perfusion

Shahzad Ahmed, MD\*, Sahil Banka, MD\*\*, Aswin Mathew, MD\*, Idean Amirjazil, MD\*, Gary Ledley, MD\*\*

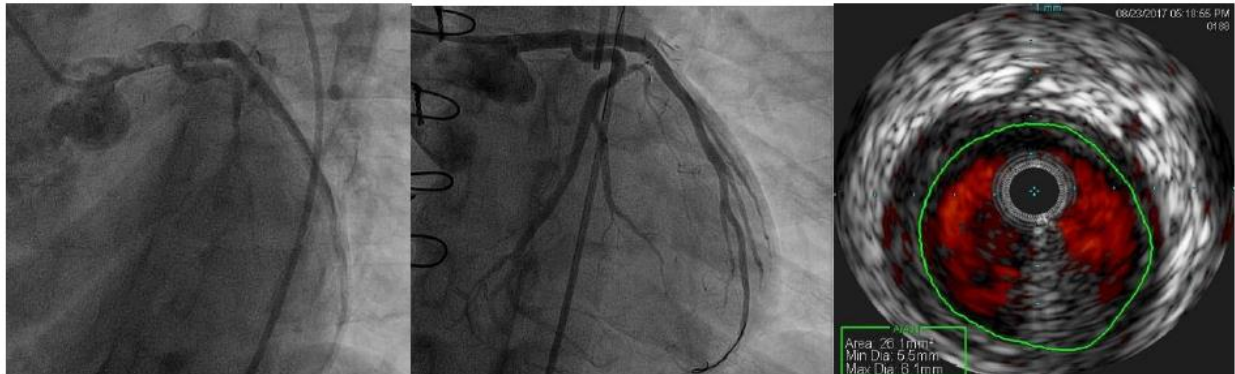
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**Introduction:** Left main coronary arterial thrombus is a rare diagnosis during coronary angiography and is estimated to be 0.8-1.7% among patients with STEMI. Left main thrombus presents both a diagnostic and therapeutic challenge.(1)

**Case:** 32 yo male with substernal chest pain associated with shortness of breath, lightheadedness and diaphoresis. Past medical hx include recurrent nstemi and LAD thrombosis requiring drug eluting stents to LAD and D1. He also had chronic RCA dissection. Exam: Normal vitals and exams. Labs were normal except mildly

elevated troponin at 0.18. ECG: Inferior and Inferolateral STEMI. Coronary Angiogram demonstrated an opacity in the left main artery (Fig 1) that need to be differentiated between thrombus vs. arterial dissection especially given this patients hx of previous right coronary arterial dissection. IVUS allowed us to confirm that the opacification in the left main artery was actually a thrombus (Fig 2). The left main was stented (Fig 3) and patient was discharged home on dual antiplatelet therapy for one year. Hypercoagulable work up was negative.



Left to right: Fig 1,2,3

**Discussion:** Spontaneous Left main thrombus in young patients is a rare cause of STEMI (1). A thorough evaluation should include family and social history including drug abuse and risks for hypercoagulable state. The options for complete revascularization include CABG, percutaneous intervention, mechanical aspiration, thrombectomy or thrombolytics with intracoronary

thrombolysis with G2b/3a inhibitors or anticoagulation parenterally(2). These treatment options can be combined together and can be useful in patients with focal or extensive thrombosis. Our patient underwent aspiration followed by PCI and post procedure anticoagulation.

Ref.

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2. De Luca G, Suryapranata H, Thomas K, et al. Outcome in patients treated with primary angioplasty for acute myocardial infarction due to left main coronary artery occlusion. Am J Cardiol. 2003;91:235–8

## 15. Cytomegalovirus as a cause of severe pancytopenia in an immunocompetent patient

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**INTRODUCTION:** The prevalence of CMV in developed countries is 30-70%<sup>1</sup>. Acute CMV infection in immunocompetent individuals is rarely serious. It presents as a self-limiting condition similar to a mononucleosis like syndrome or may be completely asymptomatic<sup>2</sup>. **CASE:** 70 year old female who recently underwent percutaneous cholecystostomy for emphysematous cholecystitis was noted to have pancytopenia. Physical examination revealed pallor and multiple ecchymosis scattered over the chest. Patient was afebrile. The hematologic parameters are shown in Table 1. Computed

tomography scanning was negative for hepatosplenomegaly / lymph node enlargement. All blood cultures were negative. A bone marrow biopsy revealed a low cellularity at 30 % with no myelodysplasia, plasma cell dyscrasia or lymphoma cells. A cytomegalovirus IgM antibody titer was found to be positive. The patient received platelets, packed red cells transfusions and supportive therapies as necessary. The pancytopenia resolved spontaneously after 2 weeks following which the patient was discharged from the hospital.

Hematologic Parameter	At admission	Nadir (after 10 days)
Hemoglobin (gm/dL)	14.5	7.7
Total Leukocyte Count (K/ $\mu$ L)	9.2	3.1
Platelets (K/ $\mu$ L)	228	17

**DISCUSSION:** Cytomegalovirus infection may cause a mononucleosis like syndrome similar to Epstein Barr virus in immunocompetent patients<sup>2</sup>. In a small subset of hosts, primary CMV infection may lead to a transient disruption of hematopoiesis. IgM assays provide a good sensitivity and specificity for diagnosing primary CMV infection<sup>3</sup>. Unexplained pancytopenia in immunocompetent patients should prompt testing for CMV IgM antibodies. These hematologic abnormalities are usually self-limiting with

marrow function normalizing within 10 – 14 days of primary infection<sup>2</sup>.

Ref.

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 3. Gandhi MK, Khanna R. Human cytomegalovirus: Clinical aspects, immune regulation, and emerging treatments. Lancet Infect Dis. 2004;4(12):725-738

## 16. Use of Edward Sapien 3 Aortic Valve to Replace Failing Bio Prosthetic Mitral Valve in High Risk Surgical Patient

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\*\*\*Drexel University College of Medicine: Cardiovascular Disease

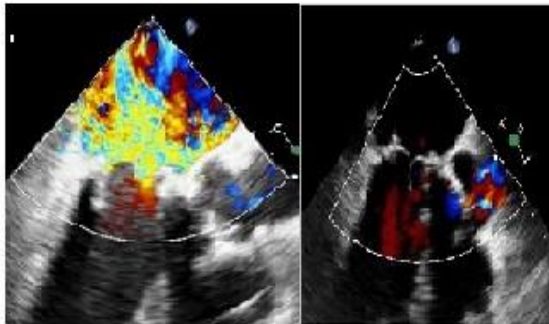
\*\*\*\*Abington Memorial Hospital: Department of Medicine, Division of Cardiology

**Introduction:** Mitral regurgitation is the second most common valvular abnormality [1]. Re-do cardiac surgery is not always possible in failing bioprosthetic valves in high-risk surgical patients. We are presenting a case of trans-catheter mitral valve replacement in a patient with a failing bioprosthetic mitral valve.

**Case:** The patient is 84 Yr. old Female with Past medical history of bioprosthetic MVR in 2007, presented with dyspnea on exertion from last 6 months. Echo was significant for Severe MR with a mean gradient of 9, EF was 60-65 %, RVSP was 70-75. Cardiac Catheterization showed RA 13 RV 59 PA 56/22(29), PCWP 26 PA sat 55% severe MR. Coronaries: LAD 10% prox. On CT surgery evaluation Her STS mortality risk for redo surgical MVR found to be 11%. Based on her STS score, she was considered high risk for surgical

replacement. Because of recent successful cases of a transcatheter mitral valve in valve implantation, the patient was selected for that procedure. The procedure was performed via femoral venous access and a valve was delivered via valve delivery system through a puncture of the interatrial septum. Post-procedure TEE showed minimal MR and patient dyspnea resolved.

**Conclusion:** Bio Prosthetic valve use has been increased significantly but because of their limited durability, there will be a constant clinical need for their replacement or repair. Currently available options include Re do open surgery, but it is associated with high morbidity and mortality and recent advancement in trans catheter approach provide an alternative approach in high-risk surgical patient.[2]



Ref.

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## 17.Enlarging right leg nodule in a 77 year old male

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**Case Description:** A 77 year old male patient presented for evaluation of a lesion on the right ankle. The lesion arose 3 weeks prior to presentation with simultaneous cellulitis on the right leg. He initially received oral antibiotic treatment (clindamycin, then cephalexin) without improvement. At that time, he was hospitalized and received intravenous antibiotics (Piperacillin/tazobactam). Subsequently, he was transitioned to oral antibiotics (clindamycin and gatifloxacin) which he completed at home. The cellulitis improved, however, the lesion persisted and enlarged. He was otherwise asymptomatic. Examination revealed a 7-cm erythematous to violaceous, round, firm, non-tender non-fluctuant nodule with surrounding hyperpigmentation and superficial hyperkeratosis on the right anterolateral ankle (Figure 1), and significant edema, mild erythema, and hyperpigmentation on the right leg (Figure 2). Shave skin biopsy was performed. Histopathology revealed diffuse large B cell lymphoma with plasmacytic differentiation; immunoperoxidase stain exhibited lymphoma cells positive for CD20, negative for CD3 and AE1/3, CD3 stain showed mature T-cells interspersed amongst lymphoma cells. Large B cell lymphoma was diagnosed.

**Discussion:** Primary cutaneous large B cell lymphomas, leg type are important to recognize due to their poor prognosis, aggressive behavior, rapid progression, and extra-cutaneous spread. NF-kB activating mutations have been identified as a common culprit and provide an opportunity for targeted therapy. A multidisciplinary approach to treatment with R-CHOP and radiotherapy is recommended (1). Our patient received Rituximab which led to subsequent remission.



Ref.

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## 18.Against “Severe” Odds: Spontaneous Vaginal Delivery Without Major Complications in a Patient With Undiagnosed Severe Mitral Stenosis

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**Introduction:** This case describes the presentation of a pregnant patient found to have mitral stenosis secondary to rheumatic fever during labor.

**Case:** A 37 year old G1P0, who immigrated from Laos 8 months prior, presented at 37 weeks of gestation in labor. Cardiology was consulted for asymptomatic atrial fibrillation with rapid ventricular response. Physical exam was

remarkable for loud S1 and diastolic rumbling murmur in midclavicular 4th intercostal space with radiation to the apex. Bedside echocardiogram showed stenotic mitral valve. During 2nd stage of labor, her oxygen saturation decreased and bilateral rales were noted with improvement after 10mg intravenous furosemide. After delivery, the patient received a transthoracic echocardiogram showing ejection

fraction of 40-45%, severe enlargement of left atrium, severe mitral stenosis with mean gradient of 35 mmHg, mitral valve area of 0.69cm<sup>2</sup> and pathognomonic “hockey stick” appearance of the mitral valve consistent with rheumatic heart disease (Figure 1,2). Transesophageal echocardiogram ruled out clots and patient was cardioverted into normal sinus rhythm. She wasn't a candidate for balloon annuloplasty and was discharged home with flecainide, warfarin, and diltiazem.

**Discussion:** An American Heart Association

study showed severe mitral stenosis to be correlated with 67% increased chance for maternal cardiac events and 6% chance of maternal mortality. This patient and her child were high risk for complications, but fortunately both had good outcomes. We hypothesize variables such as left atrial compliance, pregnancy weight, baby weight, and lack of comorbidities such as obesity, hypertension, diabetes, and tobacco use history contributed to a favorable prognosis.

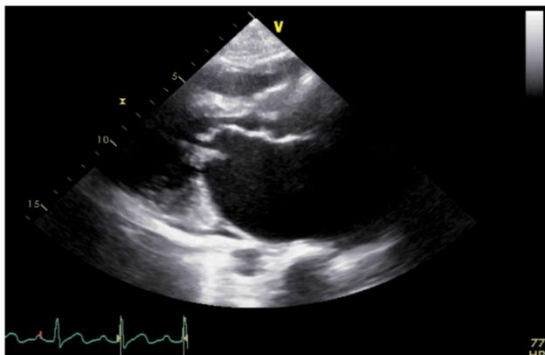


Figure 1 parasternal long axis showing “hockey stick” appearing anterior mitral valve leaflet and thickened mitral valve leaflets

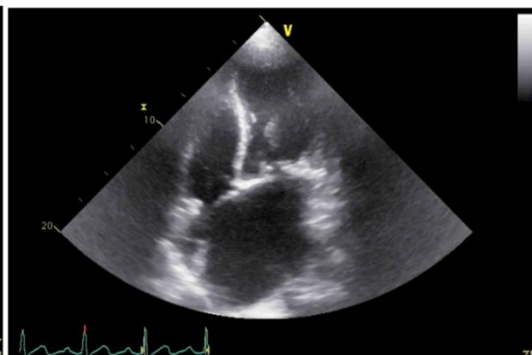


Figure 2 apical four chamber showing severely dilated left atrium and thickened mitral valve

Ref.

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## 19.A Rare Case of Clozapine induce Myocarditis presenting as Chest Pain

Ali Ghani, MD, Usman Sarwar, MD, Wajahat Humayun, MD, Arslan Cheema, MD, Mohsin Hamid, MD, Ganesh Gajanan, MD  
Abington Memorial Hospital: Internal Medicine

**Introduction:** Myocarditis is an inflammatory disease of the myocardium. Most common cause of myocarditis is infectious in etiology (mostly viral), among non-infectious causes, cardiotoxic drugs is one of an important cause. We are presenting a rare case of clozapine induce myocarditis in newly diagnosed schizophrenia patient.

**Case:** Pt. is a 40 yr Old M with PMH significant for schizophrenia and DM2, that presented initially to the hospital requesting psychiatric services with depressed mood and suicidal ideation. He was recently started on clozapine (atypical

antipsychotic) as an outpatient. On admission, he complain of chest pain and shortness of shortness of breath. The initial evaluation was significant for troponin elevation (peak of 5.0), EKG show sinus tachycardia. CT PE was negative for pulmonary embolism. Echo show reduced EF (35-40%) with left ventricular global hypokinesia. Stress test was also negative for ischemia. In light of clinical feature and evaluation drug induce (clozapine) myocarditis was suspected, ESR and eosinophil count was checked that also supported the diagnosis.

**Discussion:** Drug induce myocarditis is common



cause among non-infectious causes of myocarditis. Recently there is an increased number of clozapine induce myocarditis.[1] Clozapine cause focal eosinophilic myocarditis. Most patients present within 1-4 weeks after the start of the drug with nonspecific chest pain, troponin leak and elevated ESR and eosinophil count. Like other drug induce hypersensitivity myocarditis treatment is supportive after

discontinuation of drug. Role of corticosteroid is questionable.[2]

Ref.

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## 20. Coronary Artery Dissection: Little bit more short of breath

Usman Sarwar, MD\*, Mohsin Hamid\*, Shahzad Ahmad\*\*, Klugherz Bruce, MD\*\*\*, Wajahat Humayun, MD\*\*\*\*

\*Abington Memorial Hospital: Internal Medicine

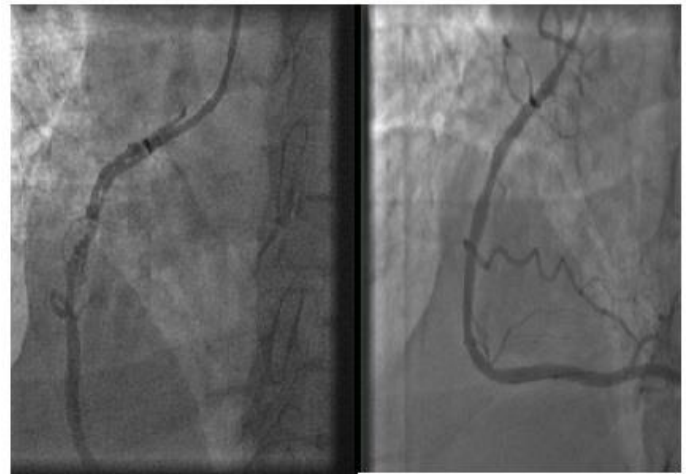
\*\*Drexel University College of Medicine: Cardiovascular Disease

\*\*\*Abington Memorial Hospital: Department of Medicine, Division of Cardiology

\*\*\*\*Abington Memorial Hospital: Department of Medicine, Division of Internal Medicine

**INTRODUCTION:** Spontaneous coronary artery dissection (SCAD) is a non-traumatic and non-iatrogenic separation of the coronary arterial wall and is a rare cause of acute myocardial infarction or dyspnea on exertion[1].

**Case:** Patient is 51 year old male with PMH of DM and obesity initially presented with chest pain on exertion and dyspnea from last 4 months. Initial workup including left heart catheterization was done that showed double coronary artery dissection (LAD + RCA) without critical luminal obstruction, at that time according to guidelines [2] it was decided to treat patient conservatively so, he was started on aspirin and Plavix along with metoprolol.



He continued to have chest pain on optimal medical therapy so stress test was done that showed inferior wall ischemia, repeat LHC was done that showed 0 % stenosis in LMCA, OM1, Proximal and distal LAD. 10 % stenosis in left circumflex. Dissection was present in mid-long segment of LAD and from proximal to mid-RCA. Because patient continues to have symptoms with conservative therapy this time PCI was done and 2 DES was placed with a resolution of patient's chest pain on follow up.

**Discussion:** In most spontaneous coronary artery dissection (SCAD) patients, conservative therapy is the preferred strategy especially in absence of critical luminal obstruction and hemodynamic compromise. But PCI is one of option if optimal medical therapy fails (as in our patient). In our Patient PCI was successful and he was discharged home after 2 days with complete resolution of chest pain.

Ref

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## 21.A Rare case of Cardiac Interatrial Septal Papillary Fibroelastoma

Selamawit Woldemariam, MD\*, Koroush Khalighi, MD\*\*, Munish Sharma, MD\*

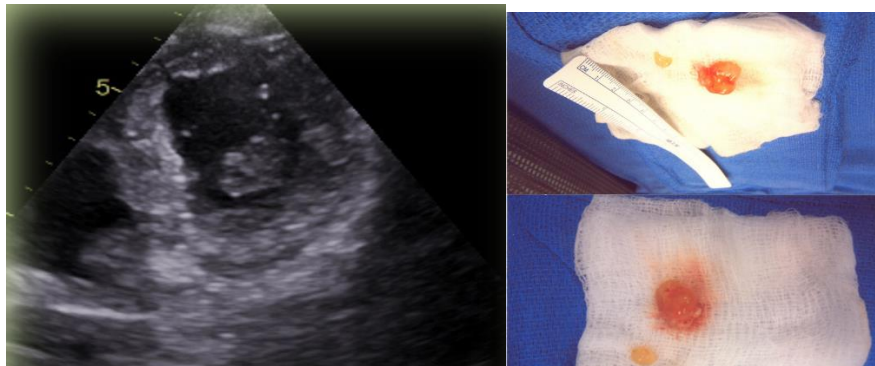
\*Easton Hospital: Medicine

\*\*Easton Hospital: Department of Medicine

**Introduction:** Cardiac papillary fibroelastomas, as reported in recent publications, are the most common benign primary heart tumors outnumbering myxomas (1). Cardiac papillary fibroelastomas tend to arise from cardiac valve surfaces, and are known for their thromboembolic potential (2).

**Case Discussion:** We present the case of a 68-year-old male who had undergone a routine echocardiogram for atypical chest pain and was found to have an echo dense structure attached to the interatrial septum. CT of the chest showed a pedunculated ovoid mass 1.3x1.0cm. Further work up with Cardiac MRI revealed a lesion

along the tricuspid valve measuring approximately 1.4x0.9 cm. After an informed consent, the patient opted for elective excision. Through a median sternotomy approach, tumorectomy was done of the mass which appeared to have small pedicle based on the interatrial septum just at the junction of the posterior and septal leaflets of the tricuspid. Competence of the tricuspid valve appeared to be uncompromised. Histology results were shortly reported as papillary fibroelastoma. Patient had an uneventful perioperative period and on follow up.



**Conclusion:** Papillary fibroelastomas develop predominantly on valves, but may arise elsewhere in the heart as is the case in our patient where the stalk originated from the interatrial septum. More cases of papillary fibroelastomas are being identified on histology as opposed to prior reports of myxomas being the most common

benign tumors. Surgical resection is curative and timely management of these tumors prevents complications, mainly thromboembolic ones.

Ref.

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## 22. Amphetamine Induced Dilated Cardiomyopathy

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\*\*Abington Memorial Hospital: Internal Medicine

**Introduction:** Amphetamines are FDA approved for treatment of Attention Deficiency Hyperactive Disorder (ADHD). Cardiomyopathy related to

amphetamine use is a rare phenomenon. Our patient presented with hemoptysis and shortness of breath, and was subsequently found to have

severe heart failure secondary to prolonged use of amphetamines.

**Case:** 24-year-old female with past medical history of morbid obesity, and ADHD presented with hemoptysis of 2 days duration associated with a progressive decline in her functional status, dyspnea on exertion, and lower extremity discomfort. She denied any chest pain, palpitations, syncope, or history of Coronary Artery Disease. Patient had 18-year history of using prescribed amphetamines for ADHD treatment. She was a former smoker, and denied illicit drug or alcohol use. Physical exam showed trace bilateral lower extremity edema without JVD. She appeared euvolemic with a normal cardiovascular exam. Echocardiogram demonstrated dilated left ventricle, dilated right ventricle with severely reduced ejection fraction (5-10%). CT chest was remarkable for cardiomegaly. Patient subsequently developed decompensated heart failure and diagnosis of amphetamine related cardiomyopathy was made. Inotropic therapy with milrinone along with valsartan-sacubitril and metoprolol succinate was initiated with clinical improvement in symptoms.

**Description:** Amphetamine related

cardiomyopathy is a rare, but potentially lethal condition. Most reported cases occur after the use of large amounts of illegal stimulants, but acute cardiomyopathy after taking prescription amphetamines is also possible. While the mechanism of amphetamine related dilated cardiomyopathy remains unclear, hypertensive crises via adrenergic drive play a role. We emphasize importance of monitoring of cardiovascular health in patients using amphetamines.

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## 23.A Benign Surgery, Yet A Fatal Outcome

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\*Abington Memorial Hospital: Internal Medicine

\*\*Abington Memorial Hospital: Department of Medicine, Division of Pulmonology

**Introduction:** Venous thromboembolism (VTE) prophylaxis guidelines are clear for major orthopedics surgery but data regarding foot and ankle surgery is insufficient. Death from pulmonary embolism (PE) after an ankle surgery is extremely rare.

**Case:** A 34 year-old-healthy female with recent surgery for a left ankle fracture twenty days prior to presentation came into the emergency room for evaluation of sudden onset palpitations and dyspnea on exertion which started one day ago. She was ambulatory since the surgery with an ankle boot but not on VTE prophylaxis. She was taking OCP's. On examination, pulse: 132/min, BP: 144/103 mmHg, respiratory rate: 38, oxygen saturation 97 on room air and BMI of 38. She was

in mild respiratory distress. Extremity examination revealed a well-healed scar on the left ankle. CT angiography revealed bilateral extensive PE, and intravenous heparin was initiated. The patient remained stable until she collapsed while ambulating to the bathroom. CPR for initiated for PEA arrest. Intravenous thrombolytics were administered during CPR. The eventual return of spontaneous circulation was achieved, however, she had multiple PEA arrests over the course of next few hours. Extracorporeal membrane oxygenation (ECMO) was initiated for eventual surgical embolectomy, however, she developed disseminated intravascular coagulation (DIC) and despite

aggressive therapy expired within twelve hours of admission.

**Discussion:** Risk of non-fatal VTE after foot and ankle surgery is low, 1-4% without prophylaxis.

Ref.

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Although routine VTE prophylaxis is not recommended after foot and ankle surgery, those with multiple risk factors should be considered for VTE prophylaxis.

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## 24.A rare cause of urinary retention: a case of idiopathic transverse myelitis

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**Introduction:** Acute transverse myelitis (ATM) is a rare neurological disorder with the reported incidence of 1 to 4 new cases per 1 million people per year. (1) It is more common in young individuals. All 5 criteria should be met in order to diagnose ATM. (2).

**Case:** A 23-year-old male without past medical history comes to the ER with complaints of urinary retention, constipation, and bilateral thigh pain over the last 3 days. No history of trauma. No medications. No family history of neurologic or autoimmune conditions. Vital signs and physical exam were unremarkable. The Foley catheter was placed, 850 ml of urine was drained. CT of abdomen and pelvis showed moderate amount of stool in the colon and decompressed urinary bladder. MRI of the brain and spine with contrast showed hyperintense T2 signal of distal thoracic spinal cord starting at approximately T10 and extending to the conus (Figure). EEG was normal. NMO IgG, MMA, ANA, anti-SS-A,B,

Syphilis screening, HSV1,2 IgG were all negative. B12 was normal. The patient completed a 5-day course of high dose of IV steroids followed by outpatient prednisone taper. His symptoms completely resolved when he was seen one month later in the clinic.



Ref.

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**Discussion:** Idiopathic transverse myelitis (ITM) is a diagnosis of exclusion and should be considered only when other causes of ATM (nervous – multiple sclerosis, neuromyelitis optica; infectious – viral, bacterial, fungal; systemic autoimmune) are ruled out. (3) Prompt initiation of steroid therapy is associated with better outcome. (4)

## 25.A Unique Case of Autoimmune Hepatitis

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**Introduction:** Autoimmune hepatitis (AIH) is a rare and progressive inflammatory condition of the liver. The clinical presentation of AIH varies widely and is associated with a high mortality rate if left untreated.

**Case:** A 30 year old man with past medical history of asthma presented with two weeks of progressively worsening jaundice. Initial diagnostic studies revealed an AST of 1548, ALT of 1527, and a total bilirubin of 27.

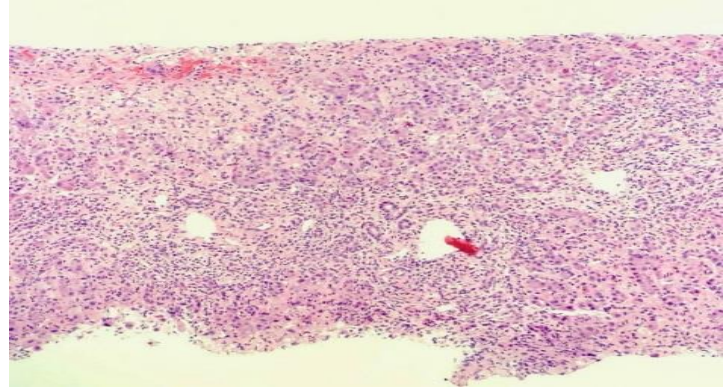


Figure 1. Necrosis with significant acute and chronic inflammatory infiltration surrounding the portal tract

Infectious workup and acute hepatitis panel were negative. Diagnostic imaging with abdominal ultrasound was negative for gallstones or biliary ductal dilatation and showed normal liver size and echogenicity. Transjugular liver biopsy was obtained and revealed findings consistent with acute liver injury pattern with confluent pericentral necrosis, single cell necrosis, and inflammation. Autoimmune serologies were mildly positive for anti-nuclear antibodies, anti-smooth muscle antibodies, and an elevation in total IgG, which were suggestive of type 1 AIH (1). Our patient was started on high dose oral prednisone. He responded to

treatment and showed marked improvement in his liver function tests shortly after initiation of therapy.

**Discussion:** Early diagnosis of AIH is challenging because it can present with a heterogeneous clinical picture and must be considered in the differential of acute liver injury and liver failure. Prompt diagnosis and treatment is crucial to prevent progression of AIH. Standard therapy includes prednisone and azathioprine (2). The addition of azathioprine allows for lower doses of corticosteroids and less associated side effects. Treatment failure occurs in 9% of patients and liver transplant is required.

Ref.

1. M.P. Manns, A.J. Czaja, J.D. Gorham, E.L. Krawitt, G. Mieli-Vergani, D. Vergani, et al. American Association for the Study of Liver Diseases: diagnosis and management of autoimmune hepatitis. *Hepatology*; 2010, pp. 2193-2213

.Czaja AJ, Manns MP. Advances in the diagnosis, pathogenesis, and management of autoimmune hepatitis. *Gastroenterology*; 2010; 139:58-72



## 26. Cryptosporidium: A Deadly Cause of Diarrhea in a Heart Transplant Recipient

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\*\*Drexel University College of Medicine: Department of Medicine, Division of Infectious Diseases and HIV Medicine

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**Introduction:** Cryptosporidium is a chlorine-resistant parasite found in water or soil contaminated with animal or human feces (1). Presentations range from asymptomatic to profuse, watery diarrhea. Most patients overcome the infection within two weeks, even without treatment. However, in immunocompromised hosts, Cryptosporidium can be deadly (2).

**Case:** Seventy-nine year old male with an orthotopic heart transplant, on Tacrolimus & Mycophenolate, presented with altered mental status and a few days of profuse, watery diarrhea. He denied any travel, swimming, drinking unpurified water, or recent illness. His temperature was 91.6°F and systolic blood pressure in the 50's. He was placed on broad spectrum antibiotics and required Norepinephrine during his intensive care unit stay to sustain perfusion. Blood and urine cultures, as well as different stool bacterial & viral panels resulted as

negative, except his Cryptosporidium antigen. Treatment with Nitazoxanide was initiated, which resulted in a vast improvement in diarrhea and a weaning off of the vasopressor.

**Discussion:** Cryptosporidium can cause severe hypovolemia in immunocompromised hosts. Oral and intravenous hydration is required, and sometimes even vasopressors must be used to prevent death. Nitazoxanide, paromomycin, azithromycin or a combination can be used for treatment (3)

Ref.

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(3) Abubakar, I., Aliyu, S. H., Arumugam, C., Usman, N. K., & Hunter, P. R. (2007). Treatment of cryptosporidiosis in immunocompromised individuals: systematic review and meta-analysis. British Journal of Clinical Pharmacology. 2007; 63(4),387–393.

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## 27. Injection Drug Use and a Bicuspid Aortic Valve: an uncommon cause of back pain

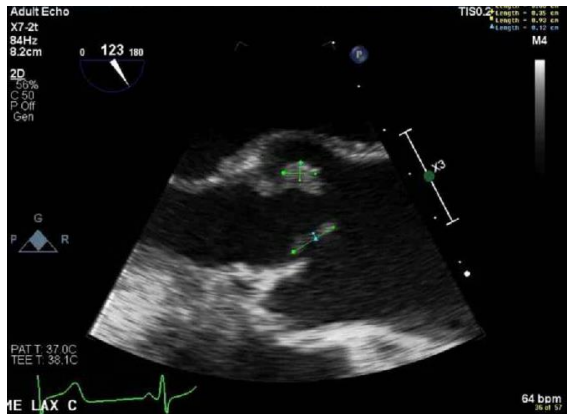
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\*\*Drexel University College of Medicine: Cardiovascular Disease

**Introduction:** Infective endocarditis (IE) is caused by microbial infection of the endothelial lining of the heart, most commonly affecting the heart valves. Left untreated IE is uniformly fatal. Although IE in the setting of injection drug use (IDU) usually involves the right heart it is estimated that 20% of cases involve the aortic valve. Additionally, IE of a bicuspid aortic valve increases the risk of abscess formation and often requires early surgery. We present a case of IE of a bicuspid aortic valve due to IDU.

**Case:** 49-year-old man with a past medical history of recent IDU presented with two weeks of worsening back pain, right leg weakness, and fever and chills. MRI revealed 6.2cm epidural abscess at L5-S2. Blood cultures were positive for MSSA. TEE revealed PFO, bicuspid aortic valve, and a mobile 0.6cm x 0.3cm echodensity on the left coronary cusp and another mobile 0.6cm x 0.1cm echodensity on the right coronary cusp, with severe aortic insufficiency. Patient underwent laminectomy and improved with IV antibiotics.



**Discussion:** Bicuspid aortic valve (BAV) is present in 2-3% of the general population<sup>3</sup>. Although BAV is not independently predictive of in-hospital mortality or 5-year survival, IE of a BAV increases the risk of abscess formation that often requires early surgical intervention<sup>4</sup>. Most clinicians are aware of the most common long-term complications of BAV including aortic valve replacement and aortic dissection<sup>5</sup>. However, clinicians must also be cognizant of the increased risk of abscess formation in patients with BAV in the setting of IE.

Ref.

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## 28. My Heart Hurts: A rare case of purulent pericarditis

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**Introduction:** Acute pericarditis is the most common disorder of the pericardium and is seen in 5 percent of patients admitted to the ER for non-ischemic chest pain.<sup>[1,2]</sup> Although most common causes of pericarditis are viral in aetiology, purulent pericarditis is the very rare cause of pericarditis in the post antibiotic era with an incidence of less than 1%.

**Case:** Patient is 73 Yr old Male with PMH of HTN presented to ER with flu like symptoms and dull chest pain from last 6 days. On initial evaluation



he found to be in acute renal failure with Cr. of 4.93 and BUN of 96, other labs significant for mild troponin leak of 0.21, WBC count of 17.8 with



79% neutrophil. EKG show diffuse ST elevation consistent with acute pericarditis. Echo show large pericardial effusion without cardiac tamponade effect. The initial diagnosis was uremic pericarditis in the setting of acute renal failure, but nephrologist differed and recommend pericardiocentesis, according to nephrology expert view uremic pericarditis is a manifestation of chronic renal failure rather than of acute renal failure. Pericardiocentesis was done and pericardial fluid culture grew MSSA. The patient was started on Ancef and was discharged after recovery. Even after extensive evaluation TEE, CT scan of chest abdomen pelvis we were unable

to locate the source.

**Discussion:** Purulent pericarditis is very rare entity in post-antibiotic era.[3].The most common source is hematogenous spread or extension of pneumonia. But diagnosis is can be challenging like in our cases especially in absence of an obvious source of infection.

Ref.

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## 29. Ureteral Adenocarcinoma

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Primary epithelial tumor of the kidney and ureter is rare, and adenocarcinomas account for less than 1% of the malignancies arising from the urothelium. We describe the case of a 77-year-old male patient who presented with gross hematuria. Cystoscopy was negative for any intravesical tumors but left ureteral cannulation was not possible. CT urogram revealed

prominent left hydronephrosis secondary to 3 cm spiculated retroperitoneal mass on top of the distal ureter. Patient uneventfully underwent left nephroureterectomy. Grossly the tumor was found to be 2.5x3.4 cm arising in the wall of distal ureter approximately 15 cm from the renal pelvis, and was found to be extending beyond the wall of the ureter into the periureteral tissue.



Left, No evidence of any fixed filling defects on the right side. Complete obstruction of the left distal ureter. Right, The distal ureter modestly dilated (green arrow) due to an approximately 3 x 2 cm bladder trigone mass that obstructs the ureteral orifice

Sectioning the kidney revealed thin renal cortex with dilated pelvis and renal calyces with no obvious parenchymal tumors or calculi. Histologic examination revealed moderately differentiated invasive mucinous adenocarcinoma with CK 7 and CK 20 positivity suggestive of a primary ureteral adenocarcinoma.

Ref.

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papillary adenoma in the kidney pelvis. *Yokohama Med Bull* 1960 Dec;11:491–500

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### 30. Jejunal Perforation Secondary to T-cell Lymphoma: An Uncommon Cause of Pneumoperitoneum

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\*Easton Hospital: Surgery

\*\*Easton Hospital: Department of Surgery

**Introduction:** T-cell lymphomas comprises only 10% of small bowel Non-Hodgkin Lymphomas (NHL), but carry a worse prognosis. These tumors are more likely to perforate than adenocarcinoma (up to 25% of patients), but the most common presentation is nonspecific abdominal pain or obstruction (1).

**Case:** A 70 year-old male with hypertension presented to the emergency department with a 1 day history of progressively worsening epigastric pain associated with nausea. He reported no previous abdominal issues or surgeries. On exam the patient had generalized abdominal tenderness with guarding, rebound, and rigidity. CT scan demonstrated pneumoperitoneum

predominately in the upper abdomen and he was taken urgently for surgery. Laparotomy revealed the presence of a copious amount of non-odorous greenish-yellow fluid in the peritoneum, suggesting peptic ulcer perforation. However, upon further inspection a perforation was discovered in the proximal jejunum with an underlying mass. Segmental small bowel resection was performed with side-to-side anastomosis between jejunal loops. Pathology of the specimen later confirmed T-cell lymphoma of the jejunum. Postoperatively the patient was in stable condition to be discharged home on postoperative day six.



Figure 1: CT abdomen pelvis demonstrating free intraperitoneal air and free fluid surrounding the liver.

**Discussion:** The small bowel constitutes approximately 90% of the mucosal surface area of the GI tract, but it accounts for only 1-3% of gastrointestinal malignancies. NHL are one-fourth of these malignant tumors, most commonly Ref.

1. Cheson BD, Fisher RI, Barrington SF, et al.

Recommendations for initial evaluation, staging, and response assessment of Hodgkin and Non Hodgkin lymphoma: The Lugano classification. *J Clin Oncol* 2014; 32(27): 3059-67.

2. Harris JW, Evers M. Small Intestine- Lymphoma. In:

in the ileum (1). Treatment usually involves chemotherapy, surgery is reserved for instances of localized disease, obstruction or perforation (2,3).

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### 31. Limb-Body-Wall Complex: a rare presentation in a discordant twin pregnancy

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\*Monmouth Medical Center: Obstetrics and Gynecology

Limb-body wall complex (LBWC) is a rare defect in development that results in the absence of the ventral abdominal wall(1, 2). Prenatal ultrasound diagnostic findings include a major abdominal wall defect, a short umbilical cord, and severe kyphoscoliosis(3). There are many variations in the phenotype that have led to debate surrounding its etiology(4). We present a case of a discordant dichorionic-diamniotic (di-di) twin pregnancy affected by LBWC. The patient is a 25 year-old G1P0 who presented in preterm labor at 30.1 weeks of gestational age (wga) with a di-di twin IVF pregnancy known to be discordant for LBWC. Twin A was diagnosed at 18wga with

ultrasound findings of a large ventral wall defect, severe kyphoscoliosis, a shortened umbilical cord, and bilateral club feet. The extraabdominal peritoneum was filled with ascites and adhered to the placenta.

The patient underwent delivery by uncomplicated Cesarean section. Twin A was noted to have a large abdominal wall defect, severe kyphoscoliosis, absent external genitalia, and bilateral club feet (Figures 1 and 2). The anomalies of Twin A were not compatible with life. Autopsy was declined. Twin B delivered as a vigorous preterm female with no visible anomalies.

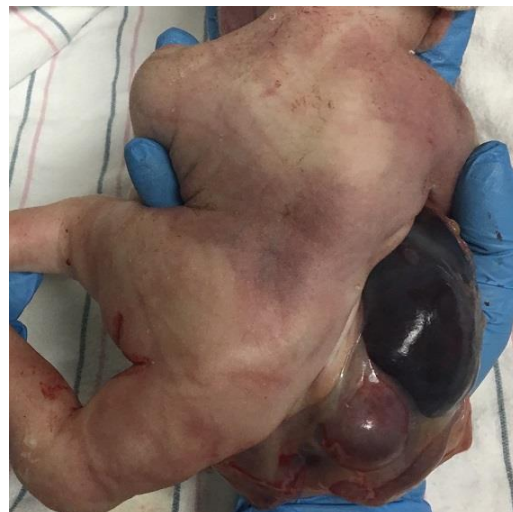


Figure 1: Abdominal wall defect with herniation of organs. Figure 2: Severe kyphoscoliosis

There are several documented cases, like this one, of discordant twin pregnancies managed expectantly for the survival of the morphologically normal twin(5). Delivery route is another important management consideration. Most Ref.

1 – Luehr B, Lipsett J, Winlivan JA. Limb-body wall complex: a case series. *J Matern Fetal Neonatal Med.* 2002;12:132-7.  
 2 – Forrester MB, Merz RD. Epidemiology of abdominal wall defects, Hawaii, 1986-1997. *Teratology.* 1999;60:117-123.  
 3 – Daskalakis G, Sebire N, Snijders R, Jurkovic D, Nicolaides KH. Sonographic diagnosis of body stalk anomaly at 10-14 weeks of pregnancy. *Ultrasound Obstet Gynecol*

documented cases in twins were delivered by Cesarean section(5). This patient opted for Cesarean section, which provided her the opportunity to bond with Twin A prior to demise.

1997; 10:416-8.

4 – Van Allen MI, Curry C, Gallagher L. Limb-body wall complex.I.Pathogenesis. *Am J Med Genet.* 1987;28:529-548.

5 – Bergamelli S, Prefumo F, Fratelli N, Valcamonico A, Zanardini C, Fichera A. Management of discordant body stalk anomaly in monozygotic twin pregnancies.

*Ultrasound Obstet Gynecol,* 2017; doi:10.1002/uog.17559

### 32.A case of urethral prolapse in a postmenopausal female

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\*Drexel University College of Medicine: Female Pelvic Medicine and Reconstructive Surgery

\*\*Drexel University College of Medicine: Department of Obstetrics and Gynecology

**Introduction:** Urethral prolapse is a circumferential eversion of urethral mucosa through the distal urethra and is distinguished from a urethral caruncle which is an eversion of the posterior edge.[1][2][3] Urethral prolapse has a bimodal distribution in prepubertal girls and postmenopausal women.[4] It may result in strangulation if left untreated. [5]

**Case:** Patient is a 58-year-old female with a urethral caruncle over the past 8 years conservatively managed with topical estrogen cream. She had denied any urinary urgency, dysuria, hematuria, vaginal bleeding during this time period. She also reported vaginal bulge symptoms with a stage 3 cystocele and tried a pessary. She noted intermittent spotting and tenderness at the urethra. Examination was significant for a urethral prolapse which was tender yet reducible. She was recommended to continue vaginal topical estrogen cream and start sitz baths. She underwent prolapse repair with graft for the cystocele. Cystourethroscopy was performed revealing excess urethral mucosa with edema of the urethra.



The bladder was otherwise unremarkable with bilateral efflux identified. The urethra was notable for a large urethral prolapse. A fine tip bovie cautery was used to make a circumferential incision and interrupted stitches incorporating the vaginal epithelium were placed to prevent retraction of the urethral mucosa as the excess tissue was excised and allow for adequate reapproximation. A catheter was maintained for two weeks postoperatively. The patient was instructed to apply vaginal estrogen cream. At her follow-up, 4 weeks postoperatively, the patient is healing well, voiding without difficulty and no evidence of urinary incontinence.



Ref.

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- [3] J. Green, A. Brodie, and T. Tassadaq, "A rare case of urethral prolapse in a postmenopausal woman.," *BMJ Case*

- Rep.*, vol. 2017, p. bcr-2017-222182, Oct. 2017.
- [4] J. K. Y. Ko, M. T. Y. Seto, S. F. Ngu, and V. Y. T. Cheung, "Urethral Prolapse in a Postmenopausal Woman," *J. Obstet. Gynaecol. Canada*, vol. 36, no. 2, p. 105, 2014.
- [5] M. L. Jessop, S. Zaslau, and O. Al-omar, "Case Report A Case of Strangulated Urethral Prolapse in a Premenopausal Adult Female," *Case Rep. Urol.*, vol. 2016, pp. 1–3, Jun. 2016

### 33.Branch Retinal Artery Occlusion Secondary to a Congenital Heart Condition

Krishni Peddada, MD\*, Kristen Kelly\*, Weiye Li, MD\*\*

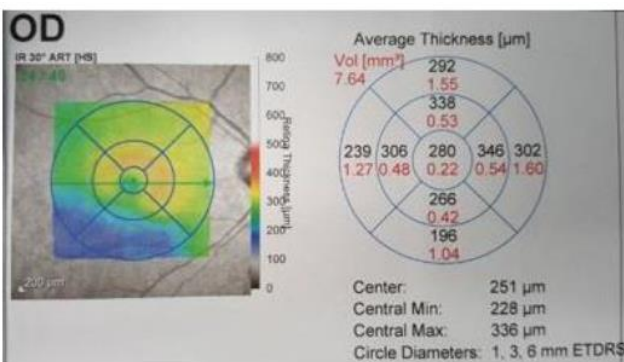
\*Drexel University College of Medicine: Ophthalmology

\*\*Drexel University College of Medicine: Department of Ophthalmology

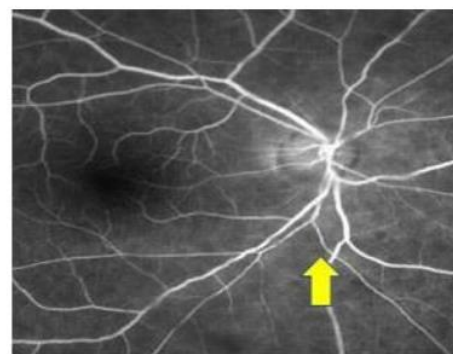
**Introduction:** Branch retinal artery occlusions (BRAO) lead to retinal ischemia and subsequent vision loss (1). This condition is usually observed in older patients with significant comorbid vascular disease (2). We discuss the case of a patient that presented with BRAO secondary to a congenital heart condition.

**Case:** A 42 year old healthy female presented for ophthalmological examination with a new episode of transient visual loss in her right eye and a longstanding "black spot" in her superior vision. Visual acuity was 20/20 in both eyes, intraocular pressures were normal, and there was no afferent pupillary defect. Anterior segment

examination was white and quiet. Visual field of the right eye showed a dense superonasal deficit. Spectral-domain optical coherence tomography showed corresponding atrophy of retinal layers inferotemporal to the fovea (Figure 1). A fluorescein angiogram highlighted arteriolar narrowing beyond the second bifurcation of the inferotemporal branch of the central retinal artery (Figure 2). She was diagnosed with an old BRAO and amaurosis fugax. Workup for vascular risk factors showed a normal blood pressure, normal lipid profile, and no diabetic disease. Echocardiogram revealed a congenital aortic bicuspid valve and a patent foramen ovale (PFO).



**Figure 1:** OCT macula, right eye. Dense atrophy of inferotemporal macula which correlated with visual field testing showing deficit in supranasal region



**Figure 2:** Fluorescein angiogram, right eye. Significant kinking and damage to the blood vessel after the second bifurcation at the inferior temporal vascular arcade.

**Discussion:** Retinal occlusive vascular disease is usually a manifestation of systemic vascular disease. However, some patients may have congenital heart conditions that predispose them

to develop BRAO. The association between PFO and BRAO has been reported in rare cases, but an association between PFO combined with



congenital aortic bicuspid valve and BRVO has not yet been described (3,4).

Ref.

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### 34. Pediatric Non-Involuting Congenital Hemangioma in the Maxillary Sinus: Atypical Location of a Typical Mass

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\*\*\*St. Christopher's Hospital for Children: Department of Plastic Surgery

\*\*\*\*Drexel University College of Medicine: Department of Radiologic Sciences

**Introduction:** Hemangiomas are benign proliferations of blood vessels that are found in the head and neck region. Hemangiomas arising within paranasal sinuses are uncommon with few

cases reported in existing literature. This case demonstrates the atypical presentation of a common vascular tumor and discusses important radiologic findings, as well as treatment options.

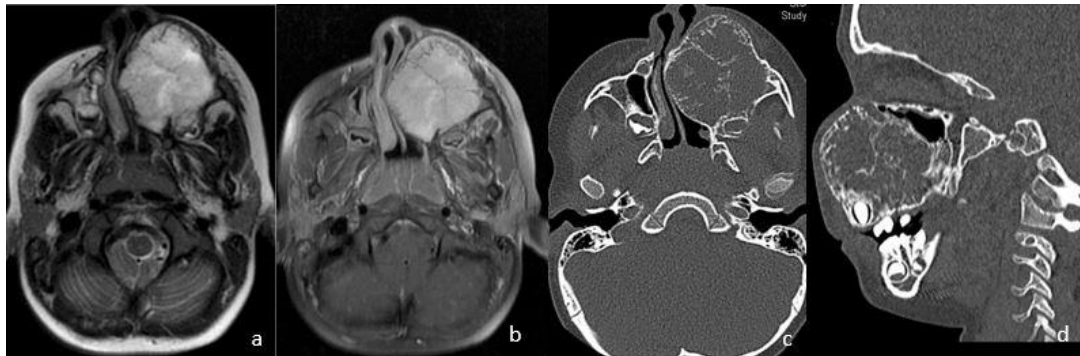


Figure 1. a-b; MRI Axial T2 and contrast-enhanced T1-weighted image show a large avidly enhancing, heterogeneous lesion within the left maxillary sinus. This is the usual appearance of a congenital hemangioma. c-d; Axial and sagittal CT in bone tissue windows demonstrate significant involvement of the facial and maxillary bones.

**Case Report:** We explore the case of a 4 year old male who presented with a large left maxillofacial non-involuting congenital hemangioma (NICH). The mass was present since birth and had exhibited slow and gradual growth. MRI demonstrated an avidly enhancing, heterogeneous lesion in the left maxillary sinus (Figure 1a-b). CT demonstrated bony involvement with impingement on midline facial structures (Figure 1c-d). Catheter angiogram revealed a vascular mass with enlargement of the

supplying left internal maxillary artery. Treatment involved endovascular embolization of bilateral internal maxillary arteries utilizing particles and coils with reduction of blood flow to the mass (Figures 2). The lesion was successfully resected the following day with minimal intraoperative hemorrhage.

**Discussion:** NICH are characterized by a round shape lesion overlying skin telangiectasia. The vascular lesions exhibit persistent fast-flow and do not regress. [1, 3]. The differential diagnosis

include pyogenic granuloma, angiosarcoma, squamous cell carcinoma and Sturge Weber syndrome. Complications arising from these vascular lesions involve bleeding, ulceration, congestive heart failure, infection, airway obstruction and visual complications [2]. The diagnosis relies on clinical history, physical, radiographic, laboratory and histological exams. The treatment options include surgery, laser surgery, local and systemic corticosteroids, Interferon alpha, Imiquimod and Propranolol [1].

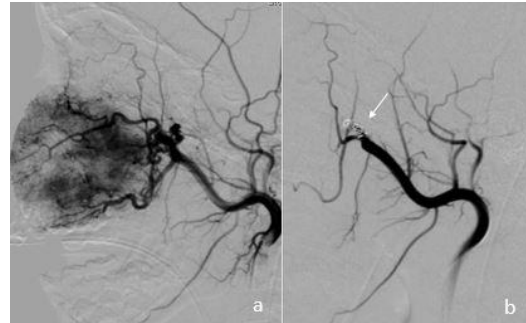


Figure 2. a; Catheter angiography of the NICH performed prior to embolization shows significant vascular proliferation within the maxillary sinus. b; After coiling the left internal maxillary artery, angiography reveals vascular flow to the lesion is successfully minimized. Arrow points to coil in the left maxillary artery.

Ref.

1. Faris Foco and Amila Brkic (2013). Vascular Anomalies of the Maxillofacial Region: Diagnosis and Management, A Textbook of Advanced Oral and Maxillofacial Surgery, Prof. Mohammad Hosein Kalantar Motamedi (Ed.), ISBN: 978-953-51-1146-7, InTech, DOI: 10.5772/53853. Available from: <http://www.intechopen.com/books/a-textbook-of-advanced-oral-and-maxillofacial-surgery/vascular-anomalies-of-the-maxillofacial-region-diagnosis-and-management>

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### 35. An Unexpected Cause of Respiratory Compromise in Adulthood

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**Introduction:** Respiratory obstruction and compromise may arise from causes such as mediastinal tumors, hemangiomas, bronchogenic cysts, as well as a variety of aortic arch anomalies (1). Compression of the trachea by the brachiocephalic trunk, known as innominate artery compression syndrome, occurs from anomalous position where the artery crosses anterior to the trachea (2).

**Case:** A 28-year-old female presents with malaise, fatigue and respiratory difficulty. Patient

is referred for an MRI study with a suspicion of vocal cord lesion or thymoma. Multi sequence multi planar MRI of the soft tissues of neck demonstrate a discrete anterior tracheal compression that results approximately 50% tracheal narrowing in the AP dimension. This was secondary to innominate artery crossing anterior to trachea (Figure 1), compatible with innominate artery compression syndrome. Note, no additional lesions were found.

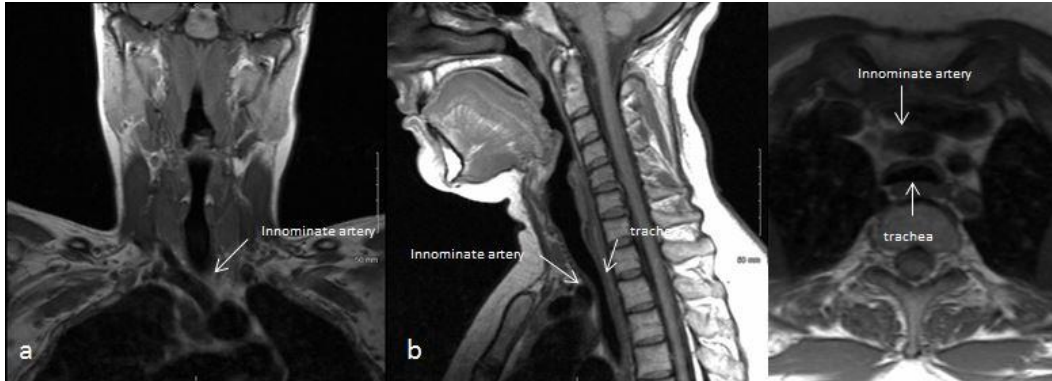


Figure 1: Sagittal (a), coronal(b) and axial (c)T1 weighted images demonstrate compression of the trachea by innominate artery.

**Discussion:** Tracheal compression may occur from either congenital or acquired conditions. Congenital causes of tracheal compression tend to manifest early in life. Nevertheless, there are cases where these conditions are asymptomatic, but manifest symptoms later in life. Respiratory obstruction may arise from a variety of conditions including aortic arch anomalies (1). Compression of the trachea by the brachicephalic trunk, known as innominate artery compression syndrome occurs from anomalous position where the artery crosses anterior to the trachea (2). MRI is an appropriate study that is able to confirm the anomaly and determine if surgical intervention is required (1). Surgery has been found to provide

symptomatic improvement by suspending the innominate artery to the sternum (3).

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### 36. Pediatric Mandibular Osteosarcoma: Diagnosis, Treatment, Complications and Recurrence

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**Introduction:** Osteosarcoma (OS) is an aggressive malignant bone tumor that can produce immature bone (osteoid). It often occurs in long bones, and rarely in the jaw. The average age of mandibular OS occurrence is 35 years, with a M:F ratio of 2:1. Most mandibular OS involves the ramus and body, and rarely the condyle.

**Case:** 12 year old female presented with jaw pain and asymmetric facial swelling, thought to be of

dental or TMJ origin. Maxillofacial bone CT demonstrated spiculated periosteal reaction centered in the left mandibular ramus, involving the condyle. The lesion invaded the surrounding soft tissues causing mass effect, effacing the fat planes of the masticator space and abutting the left parapharyngeal fat. (imageA) . Patient underwent wide surgical resection and fibular implant placement. Post-surgical CT and MRI imaging demonstrated myositis involving the

muscles of mastication and submandibular abscess, treated with intravenous antibiotics.(imageB) 6 month post-op facial MRI demonstrated small focus of abnormal enhancement in left temporalis muscle, suggesting persistent infection in the surgical bed

vs tumor recurrence.(imageC) 2 month follow-up CT of the maxillofacial bones demonstrated spiculated ossification within the enhancing soft tissue mass in the left temporalis muscle that doubled in size. Findings are consistent with osteosarcoma recurrence. (image D).

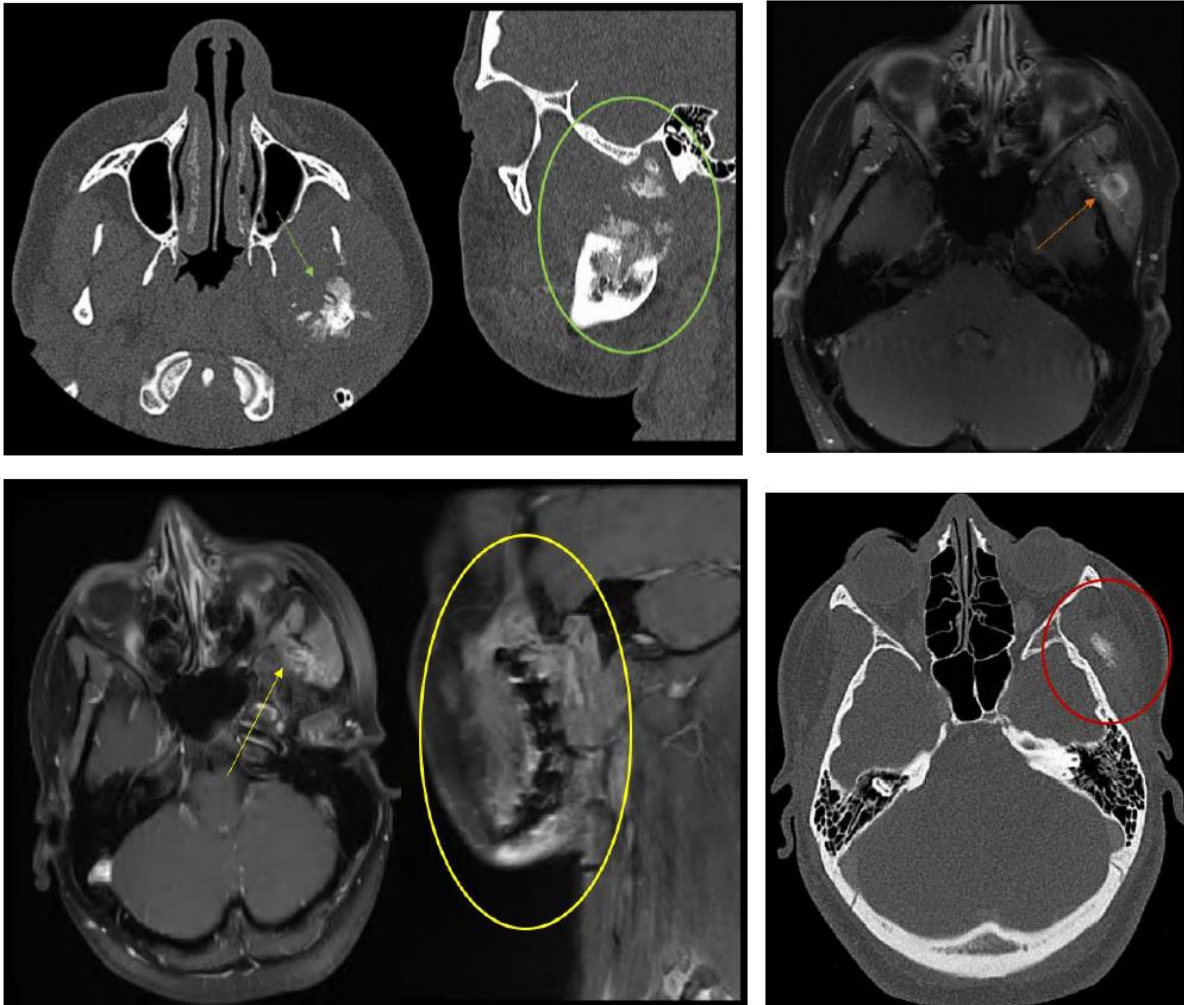


Image A, upper left; Image B, lower left; Image C upper right; Image D lower right

**Discussion:** The case demonstrates atypical age, location, complications, and duration for recurrence. Close CT and MRI surveillance is essential for timely diagnosis of OS recurrence. While initial treatment is wide surgical resection, as our patient underwent, recurrence usually demonstrates remission with radiation, and sometimes chemotherapy.

Ref.

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### 37.Arteriotomy closure with Angio-Seal device following inadvertent placement of central line into the right subclavian artery

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Arterial puncture is a complication that occurs in 4.2-9.3% of central line placements<sup>1</sup>. An 80-year old woman was admitted to the MICU with severe hypotension, secondary to sepsis and bacteremia. She required an emergent central line for pressors. Insertion of a right internal jugular venous line was performed and yielded arterial blood gas values. CTA of the neck demonstrated the line entering the proximal right subclavian artery (SCA) and terminating in the descending aorta (Figure 1.) Intervention was planned to remove the arterial line and repair the right subclavian arteriotomy with an Angio-Seal (St. Jude Medical) vascular closure device (VCD) or covered stent placement. Femoral access was achieved and contrast angiography demonstrated the cervical catheter terminating in the descending aorta (Figure 2). There was no significant atherosclerotic stenosis or calcification of the right SCA, which are contraindications for the use of VCDs.<sup>2</sup> Femoral

access was maintained and a wire was ready on the table in the event that Angio-Seal closure was not successful and endovascular repair via a stent became emergently necessary. The arterial line was removed over an Amplatz wire. The tip of a vascular sheath was positioned over the wire in the aortic arch. An aortic run was performed to confirm the intravascular position of the sheath (Figure 3.) The Angio-Seal device was advanced into the sheath and deployed. Hemostasis of the right subclavian arteriotomy was achieved. Post-procedure arteriography identified absence of contrast extravasation and no filling defect in the region of the arteriotomy closure (Figure 4).

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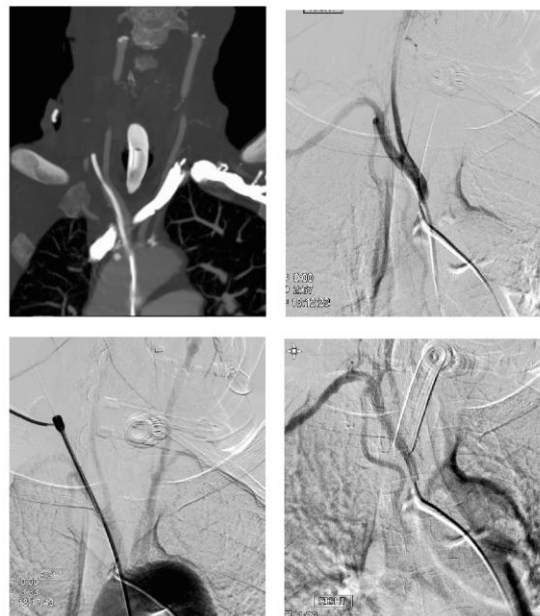


Fig 1 upper left; Fig 2 upper right; Fig 3, lower left; Fig 4 lower left



### 38. Abnormal <sup>99m</sup>Tc-MDP Colonic Uptake

David Kopylov, MD\*, Daniel Hirsch, MD\*, Andrew Kim, MD\*\*

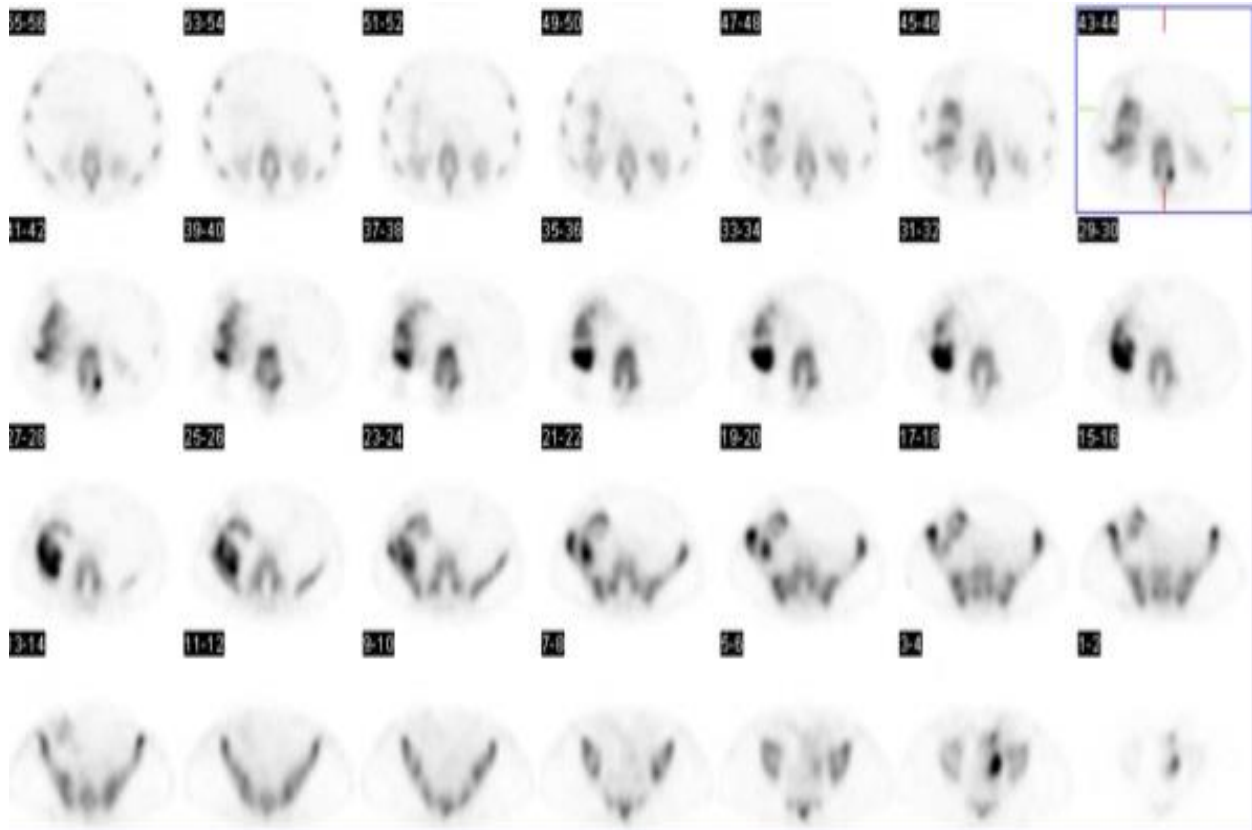
\*Drexel University College of Medicine: Radiology-Diagnostic

\*\*Drexel University College of Medicine: Department of Radiologic Sciences

A 58-year-old male with a history of hepatocellular carcinoma presented for pre-transplant evaluation, where he underwent a nuclear medicine bone scan to exclude metastatic disease. The study demonstrated symmetric uptake in the bilateral shoulder, hips, and lower lumbar spine compatible with degenerative changes. Additionally, there was unusual focal uptake in the right colon (Figures 1 and 2). To date, the reported incidence of colonic uptake on bone scan is exceedingly rare. Ergün et al. reviewed 2144 bone scans and found that only roughly 1% (22) demonstrated intestinal uptake of <sup>99m</sup>Tc-MDP [1]. Erhamamci et al. specifically reviewed bone scans of 50 transplant liver candidates with end stage liver disease, and while 4 patients demonstrated nonosseous findings, none of them showed colonic uptake [2]. While this can be a nonspecific finding, increased <sup>99m</sup>Tc-MDP uptake within the colon has been described in the setting of prior sestamibi scan, colovesicle fistula, and gastrointestinal stromal tumor [3]. When evaluating bone scans, one must exclude the possibility of artifact when observing a nonosseous finding. Wilson et al. demonstrated that if not properly stored, <sup>99m</sup>Tc-MDP may become oxidized and form pertechnetate. Because pertechnetate is excreted through the gastrointestinal tract, a compromised bone scan may demonstrate gastric activity as pertechnetate is being degraded [4]. A wide variety of increased <sup>99m</sup>Tc-MDP uptake in nonosseous structures has been described in the literature, affecting nearly every anatomic region. Nonosseous findings may be broadly categorized into four distinct etiologies: a) neoplastic b) metabolic c)

post-traumatic and d) genitourinary causes [5].





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## Review Articles

### **1. Neurosarcoidosis: The Great Imitator of the Millennial Age**

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A 38-year-old male was evaluated for a one day history of left facial numbness and episodic slurred speech. Patient awoke 3 a.m. day of admission with difficulty speaking and facial numbness and tingling, lasting 10-15 seconds. He denied any related pain, visual or auditory changes, recent illness, recent travel, headaches, focal weakness, dizziness, or lightheadedness. There were no exacerbating or alleviating factors. Over the course of the day the episodes repeated eight times. The patient had a 15-pack year history however denied illicit drug and alcohol use. Family history was negative for autoimmune conditions or cancer, but positive for coronary artery disease, hypertension, and stroke. Past medical history was significant for lung biopsy proven sarcoidosis, diabetes mellitus type 2, and herpes labialis on acyclovir.

On physical examination, temperature was 100.3F, heart rate 102bpm, blood pressure 162/104 mmHg, and oxygen saturation 96% on room air. Patient was in no acute distress, with normal cardiopulmonary exam. Physical exam was negative for erythema nodosum, cervical or axillary lymphadenopathy, joint effusions, ulcerations, or rashes. Neurological exam was negative for Kernig's and Brudzinski's sign. Patient was alert and oriented to person, place, and time with no memory loss. Motor function was preserved in all extremities with 2+ reflexes and negative Babinski's sign. 12-lead electrocardiogram revealed sinus rhythm with no ischemic ST changes. Labs were relevant for ESR 35mm/hr, CRP 20mg/dl, ACE 110 µl, Hgb 13mg/dl, WBC 11.0x10<sup>9</sup>/L.

#### Questions for consideration:

1. Which CNS manifestation should initially be considered?

#### 2. Which CNS etiologies present similarly?

A middle-aged smoker with diabetes mellitus and a family history of coronary artery disease who presents with facial numbness and aphasia should be ruled out for an acute cerebrovascular event. Given that his symptoms resolved after several seconds but recurred spontaneously without trigger, one should be suspicious for a transient ischemic attack.

Transient ischemic attacks (TIA), often labeled as "mini strokes", usually manifest as neurologic deficits such as weakness, amaurosis fugax, aphasia, or confusion. Correct workup is necessary to distinguish between true vascular events and mimickers. The challenge of diagnosing true transient ischemic events is that symptoms resolve by time of assessment and there is no test to definitively diagnose a TIA. However once verified by clinical history, it is important to assess the risk of developing ischemic stroke in the future. The ABCD2 criteria is utilized for such purpose. This incorporates age, blood pressure, clinical features of unilateral weakness and/or speech impairment, duration of symptoms, and the presence of diabetes. Patients with a score of 6-7 have an ~8% two-day stroke risk while those with 0-3 have a 1% risk and may not require hospitalization<sup>10</sup>. Symptoms can be characterized as positive or negative symptoms; positive includes "excess" of CNS neuronal activity such as seizures or changes in sensation while negative include loss of functioning such as numbness or aphasia<sup>2</sup>. Common mimickers of TIA events include seizures, migraines with aura, syncope, vestibular disturbances, functional/anxiety related, peripheral nerve dysfunction, transient global amnesia, structural disease, autoimmune disease, electrolytes changes, or toxin related.

Neurosarcoidosis is a diagnosis of exclusion in which there is usually no focal origination of the neurologic deficit.

It is important to perform a thorough history and physical to determine the risk factors and the likelihood of one diagnosis over the other. In this patient, the transient speech disturbance was a challenging symptom to assess. Aphasia is the inability to understand or produce verbal language. Dysarthria describes motor dysfunction. Was this the action of Broca's expressive aphasia, Wernicke's receptive aphasia, cranial nerve, or peripheral nerve pathology? The duration of symptoms and risk factors produced a wide differential that would require extensive diagnostic workup.

*3. Which studies should be performed next?*

*4. Which treatment would be beneficial to this patient given the likely diagnosis?*

The standard lab workup for patients with altered mentation, neurological deficits, or syncope should include TSH, free T4, lipid panel, HbA1C, B12, folate, RPR, glucose, and/or calcium. However, all these may not be necessary as they should be ordered specific to the patient's presentation, risk factors, and comorbidities. The initial concerns include seizures, stroke, TIA, meningitis, and encephalitis. Alternate diagnoses could include drug/toxin ingestion, electrolyte or endocrine abnormalities, trauma, and malignancy including meningeal carcinomatosis and lymphoma.

In a patient with intermittent but recurring symptoms, seizures and stroke like activity needs to be ruled out. CT of the head was performed and revealed no acute intracranial abnormality with normal CT angiographic exam of the head and neck. The role of standard imaging such as computerized tomography scans (CT) in seizures or TIA has not been shown to be beneficial however it is beneficial in assessing for prior stroke, new hemorrhagic lesion, or space occupying mass. Given transient symptoms and history of loss of consciousness, patient was started on levetiracetam for seizure prophylaxis

while awaiting the results of an EEG to assess for underlying epileptic forms. Spot-EEG on this patient was normal. However, given high risk for seizure like activity, patient was continued on levetiracetam maintenance dose of 500 mg BID. Diffusion weight imaging such as magnetic resonance imaging (MRI) can help detect earlier changes in brain tissues. MRI is the imaging modality of choice not only for stroke assessment but also for the diagnosis of neurosarcoidosis.

In this patient, MRI of brain revealed leptomeningeal enhancement along the right frontal and temporal lobe. The most typical finding in neurosarcoidosis is leptomeningeal involvement seen as thickening and enhancement of the leptomeninges on T1-weighted images. Other abnormalities commonly seen on MRI include white matter lesions, hydrocephalus, mass lesions, meningeal enhancement, and parenchymal enhancements<sup>5</sup>. Meningeal enhancement has both diagnostic and therapeutic implications as its presence in neurosarcoidosis suggest high likelihood of response to corticosteroids<sup>7</sup>. In the era of modern MRI imaging, the incidence of neurosarcoidosis is 15-28%<sup>3</sup>.

The role of lumbar puncture (LP) in altered mental status is only thought to be helpful in the case of meningitis or encephalitis. However, the indications for diagnostic LP are broad: evaluation for subarachnoid hemorrhage, meningitis (bacterial, viral, tuberculous, cryptococcal, chemical, carcinomatosis), neurological disorders (not limited to but including multiple sclerosis, sarcoidosis, guillain barre, chronic inflammatory demyelinating polyneuropathy, mitochondrial disorders, leukoencephalopathies, paraneoplastic syndrome, neurosarcoid), and to assess for elevated intracranial pressure<sup>1</sup>. 95% of patients with meningitis have the triad of altered mental status, fever, and neck stiffness<sup>2</sup>. However, immunocompromised patients may not be able to mount a fever.

It is important to obtain a CT head to rule out increased cerebral pressures prior to LP secondary to risk of herniation. CSF findings supporting a diagnosis of neurosarcoidosis are

related to markers of inflammation and systemic sarcoidosis with predominantly lymphocytic pleocytosis, elevated protein level with or without oligoclonal bands, low glucose level, elevated IgG level, and elevated ACE levels among others<sup>8</sup>. LP performed in our patient revealed elevated protein 56, glucose 111, 2 white blood cells, negative xanthochromia, elevated ACE, negative HSV, negative VDRL, ESR 14, CRP 3, elevated IgG 8.5, CSF IgG: Protein 15.2%, and negative cryptococcus. CSF cytology was negative for malignant cells. Although the CSF IgG index is used to evaluate patients with multiple sclerosis, it can be found in a wide variety of other conditions including infections, Guillain-Barré Syndrome, other demyelinating or inflammatory conditions<sup>4</sup>. In study by Zajicek<sup>5</sup>, 81% of neurosarcoid patients demonstrated either CSF protein elevation or pleocytosis and 55% demonstrated CSF oligoclonal band elevation. CSF ACE levels can be elevated in 24-55% of cases therefore insensitive but highly specific for neurosarcoidosis<sup>3</sup>. Serum ACE levels are elevated in 65% of sarcoid patients however they are relatively insensitive<sup>3</sup>.

The diagnosis of neurosarcoidosis became a stronger consideration given patient's comorbidities, presentation, and imaging results. In the assessment of neurosarcoidosis, other methodologies include whole body gallium scanning, bronchoalveolar lavage (BAL), and the Kveim-Siltzback antigen skin test. A gallium scan is a useful indicator of systemic disease although can be relatively non-specific. Ga-67 citrate is a marker than be uptaken by tissues involved in active sarcoid, malignancy, tuberculosis<sup>5</sup>. BAL can be performed but is relatively insensitive and nonspecific, showing lymphocytosis with elevated CD4:CD8 ratio. The Kveim-Siltzback antigen skin test is utilized as an assessment for systemic sarcoidosis. It has a sensitivity of 78% that compares favorably with rates of positivity in patients with systemic sarcoidosis<sup>5</sup>. Kveim tests are difficult to perform given the 4-6 week time interval required before biopsy and was not performed in our patient.

As concern for neurosarcoidosis grew, it was important to assess for the accuracy of the

patient's previous diagnosis. Records from a bronchoscopy guided biopsy at a prior hospital revealed non-necrotizing granulomas comprised of epithelioid cells and multi-nucleated giant cells in the right middle lobe lateral segment (B4). The granulomas were located in the peribronchial and interstitial locations and had a pleomorphic lymphoid population. Focal non-necrotizing granulomatous vasculitis was also identified. Cytology, bacterial and fungal culture, viral panel, acid fast smear, and anti-neutrophil cytoplasmic antibody were negative for malignancy, infection, or pauci-immune vasculitis. Patient was diagnosed with stage II pulmonary sarcoidosis consisting of lymphadenopathy and lung parenchymal disease. At that time, patient was treated with a brief course of corticosteroids. After careful consideration, the likelihood of a neurosarcoidosis diagnosis in a setting of positive systemic symptoms, positive histology, lack of risk factors for other etiologies, and imaging modalities, a diagnosis of probable neurosarcoidosis was made. Patient was placed on IV solumedrol 1 gram for 5 days and had significant improvement in signs and symptoms.

#### Discussion:

Sarcoidosis is an inflammatory disorder with systemic manifestations characterized by the presence of noncaseating granulomas. Typically, sarcoidosis manifests prior to age of 40 and commonly in African American populations with the mean age of onset of neurosarcoidosis between 33-41 years of age<sup>3</sup>. Evidence supports the involvement of CD4+ T helper cells, IL-12, IL-2, interferon gamma, and lymphotoxin in response to an unknown antigen<sup>7</sup>. Neurologic manifestations commonly occur within the first 2 years of illness. Neurosarcoidosis can involve all aspects of the brain including the parenchyma, meninges, spinal cord, and peripheral nerve with a tendency to involve the hypothalamic region. The diagnosis needs to be supported by histologic evidence of noncaseating granulomas. 60% of patients with neurosarcoidosis experience spontaneous improvements or remission<sup>3</sup>. Due to the high likelihood of basal leptomeningeal involvement, cranial neuropathy can occur in 75% of patients with facial nerve



predominance<sup>7</sup>. Lower cranial nerve involvement would explain the symptoms of dysarthria in our patient with subsequent loss of facial sensory modalities manifesting as numbness or tingling. Other manifestations include hypothalamic and pituitary dysfunction, encephalopathy, intracranial mass mimicry, spontaneous hemorrhage, mononeuritis multiplex, myopathy, small fiber neuropathies, granulomatous arteritis, and seizures. Seizures occur in 7-22% of patients with neurosarcoidosis<sup>3</sup>, commonly well controlled with anti-epileptics. Seizures can be focal or generalized and may be related to cortical irritation, parenchymal masses, or small vessel vasculitis associated with granulomatous angiitis<sup>3</sup>. Transient expressive aphasia is not a common feature of neurosarcoid as indicated above. Given the rarity of neurosarcoidosis, there was also concern for meningeal carcinoma and lymphoma especially when acute causes such as vascular event, seizures, and meningitis are excluded. Autoimmune mimickers include granulomatosis with polyangiitis, behcet's syndrome, lupus, and multiple sclerosis. Lumbar puncture, although a very good diagnostic and often therapeutic approach, is only about 30% sensitive for detecting malignancy. Leptomeningeal biopsy would provide more information however is a highly invasive technique that may produce low yield. Our patient refused leptomeningeal biopsy however repeat MRI brain revealed unchanged leptomeningeal enhancement.

Attempts have been made to classify diagnoses of neurosarcoidosis based on probability. A 'possible' diagnosis can be made with a patient has the clinical presentation suggestive of neurosarcoidosis with exclusion of alternate diagnoses. 'Probable' diagnoses are those that have a clinical syndrome suggestive of neurosarcoidosis with laboratory support for CNS inflammation (elevated CSF protein, oligoclonal bands) and MRI evidence suggestive of

neurosarcoidosis, exclusion of other diagnoses, and evidence of systemic sarcoidosis (histology, Kveim test, gallium scan, chest imaging, and/or ACE levels)<sup>5</sup>. A 'definite' diagnosis of neurosarcoidosis include the above as mentioned as well as a positive nervous system biopsy with histology positive for noncaseating granulomas.

Treatment of patients with neurosarcoidosis is recommended in 3 patient populations: symptomatic patients with biopsy proven neurosarcoidosis, symptomatic patients with neurosarcoidosis suggested by MRI findings and documented evidence of systemic sarcoidosis but without neurosarcoid biopsy, and asymptomatic patient with neurosarcoidosis with proven by biopsy. Corticosteroids are the most effective and first line agents for acute and chronic neurosarcoidosis. Immunosuppressive agents have been used in patients with limited or ineffective response to steroids<sup>9</sup>. Second line agents include azathioprine, methotrexate, cyclosporine, cyclophosphamide, mycophenolate, TNFalpha inhibitors (pentoxifylline, thalidomide, infliximab), and radiation<sup>3</sup>. Systemic corticosteroids, as mentioned, seem beneficial however, prospective studies need to be performed to truly assess benefits. In study by Zajicek et al, doses of prednisolone less than 20-25 mg/day had symptom recurrence. It was also noted that concomitant anti-epileptic drugs could reduce prednisolone concentrations and efficacy via induction of hepatic enzymes.

Prognosis of patients with neurosarcoidosis is generally associated with worse outcome than patients without neural involvement in systemic sarcoidosis. Patient with acute and subacute course have better prognosis compared to patients with chronic course. Neurosarcoidosis just be worked up with meticulous detail considering there is a high degree of mimicry without disorders and as high as 32% of patient may suffer relapse (9).

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## 2. Imaging Appearance of High Intestinal Obstruction in Neonates: A Review

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### Introduction:

High intestinal obstructions are common in newborns and the radiologist plays a key role in the workup of these infants. The clinical presentation is often vomiting which may be bilious if the obstruction is below the level of the ampulla of Vater. The primary diagnostic concern in an infant with bilious vomiting is an intestinal malrotation with associated midgut volvulus. If not surgically corrected in a timely fashion, midgut volvulus can result in diffuse bowel necrosis (1). It is therefore a potentially fatal entity, requiring the emergent input of the radiologist. Bilious vomiting is, however, not synonymous with intestinal malrotation with midgut volvulus, and in very limited scenarios further workup with the often required upper GI series following the initial abdominal radiographs may not be indicated (2, 3).

### Imaging Findings

The initial imaging modality in a neonate with suspected high intestinal obstruction is the abdominal radiograph (2). If the clinical presentation includes bilious vomiting, an upper GI series usually follows, as a normal bowel gas pattern does not exclude intestinal malrotation with midgut volvulus. If the patient is unstable, the radiograph may not be obtained at all and a fluoroscopic scout radiograph will suffice.

Malrotation with Midgut Volvulus (Figure 1) is the only high intestinal obstruction which requires emergent surgery. Bowel malrotation occurs when the bowel does not undergo normal embryonic 270 degree counterclockwise rotation. Normal rotation results in a long length fixation of the mesenteric base with the duodenojejunal junction (DJJ) fixed in the left upper quadrant, and the cecum fixed in the right lower quadrant. When the bowel does not undergo normal rotation, the result is a short mesenteric base which may serve as a pedicle for the bowel to twist leading to bowel obstruction, bowel ischemia and/or necrosis. Obstruction may also occur in the setting of malrotation without a volvulus when abnormal fibrous peritoneal bands, called Ladd bands, are present, constricting small bowel.

When a neonate presents with bilious vomiting, the ensuing abdominal radiograph may demonstrate a normal bowel gas pattern (3). However, the most suggestive radiographic finding is a moderately distended stomach and proximal duodenum with a small amount of distal bowel gas. In the setting of bowel necrosis pneumatosis and portal venous gas may be seen, or if there is frank perforation pneumoperitoneum. The goal of the upper GI series is to demonstrate the site of the DJJ. A neonate with bilious vomiting and evidence of malrotation without

volvulus on a fluoroscopic study must be treated emergently as a volvulus may be intermittent (1). If a volvulus is present at the time of the upper GI, the level of obstruction is expected at the second/third portion of the duodenum. Normally, the DJJ should be located to the left of the left vertebral pedicle and as superior as the level as the duodenal bulb (Figure 1a) (1-3). If the stomach is distended with contrast or gas, or other bowel loops are distended, the DJJ may be displaced inferiorly (Figure 1b). If there is any question regarding the location of the DJJ, the

contrast may be followed to the cecum to determine bowel rotation. Alternatively, a contrast enema may be performed. The classic imaging finding of midgut volvulus is a dilated proximal duodenum with tapered narrowing which may terminate with a corkscrew appearance (Figure 1c). The DJJ will notably be in an abnormal location (1d). Other appearances of volvulus include to-and-fro motion of contrast in the 2nd or 3rd portion of the duodenum and a tapered appearance of the duodenum at the site of obstruction (3).

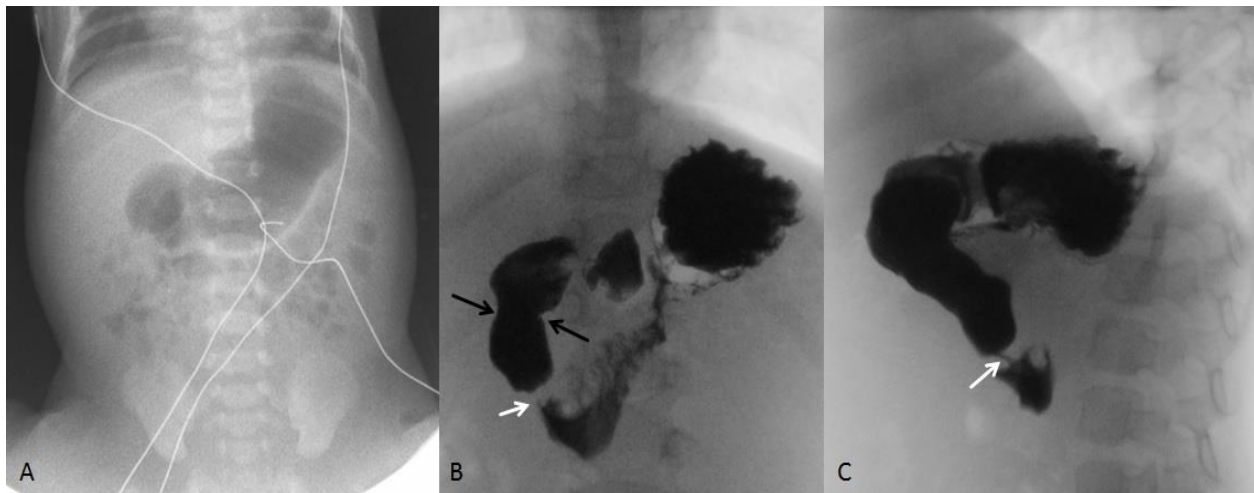


Figure 1: **NORMAL BOWEL ROTATION AND SMALL BOWEL MALROTATION WITH MIDGUT VOLVULUS** A. Fluoroscopic AP image of the upper abdomen during an upper GI series demonstrates the normal location of the DJJ (white arrow), to the left of the left pedicles and at the same craniocaudal level as the duodenal bulb (white star). B. Fluoroscopic AP image of the abdomen in a different patient with Hirschprung's disease and resulting gaseous distention of multiple loops of bowel demonstrates a low lying DJJ, attributable to mass effect from adjacent distended loops. C. Fluoroscopic lateral image of the abdomen in an infant with bilious emesis demonstrates the characteristic corkscrew appearance of midgut volvulus (black squiggly arrow arrowhead). D. AP projection during the same study demonstrates the DJJ in an abnormal location (white squiggly arrow).

Duodenal Atresia (Figure 2) is the most common upper intestinal obstruction in the neonate (3). Prenatal diagnosis is becoming more common with prenatal ultrasound and MRI. It results from embryologic failure of duodenal recanalization which normally takes place at 12 weeks gestation. It is associated with trisomy 21 and can be seen in association with malrotation, annular pancreas among other anomalies. An anteroposterior abdominal radiograph will classically demonstrate a "double bubble" (Figure 1a). The larger bubble which is centered in the left upper abdomen corresponds to a gas distended stomach. The smaller bubble corresponds to the gas distended duodenum. No distal bowel gas

should be seen. If distal bowel gas is seen in the setting of a "double bubble", duodenal stenosis is a consideration, however, a malrotation with midgut volvulus can have this appearance as well and therefore an emergent upper GI series is indicated (1-3). If the stomach is decompressed due to placement of an endogastric sump tube, the classic "double bubble" may not be visualized (Figure 1b) and imaging findings may simulate a gastric outlet obstruction. In this situation, clamping the sump tube or even instilling air through the sump tube and repeating the radiograph may be helpful.

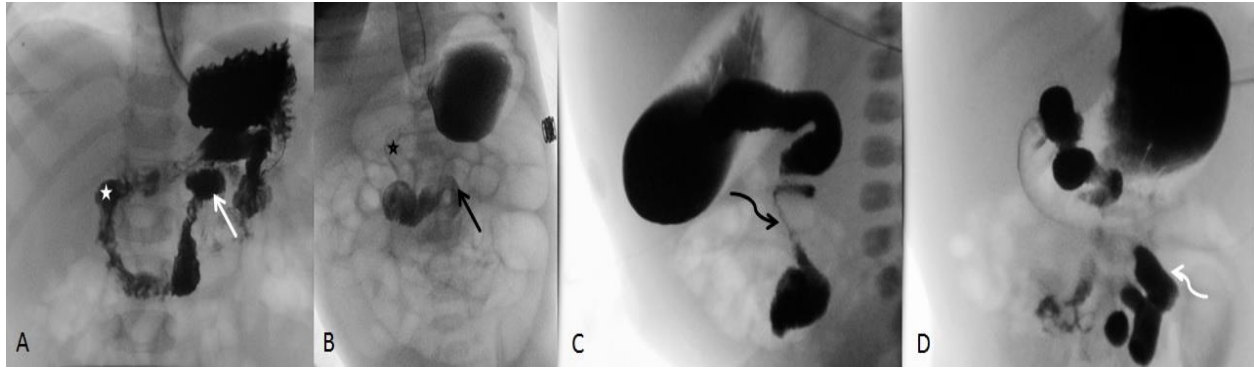
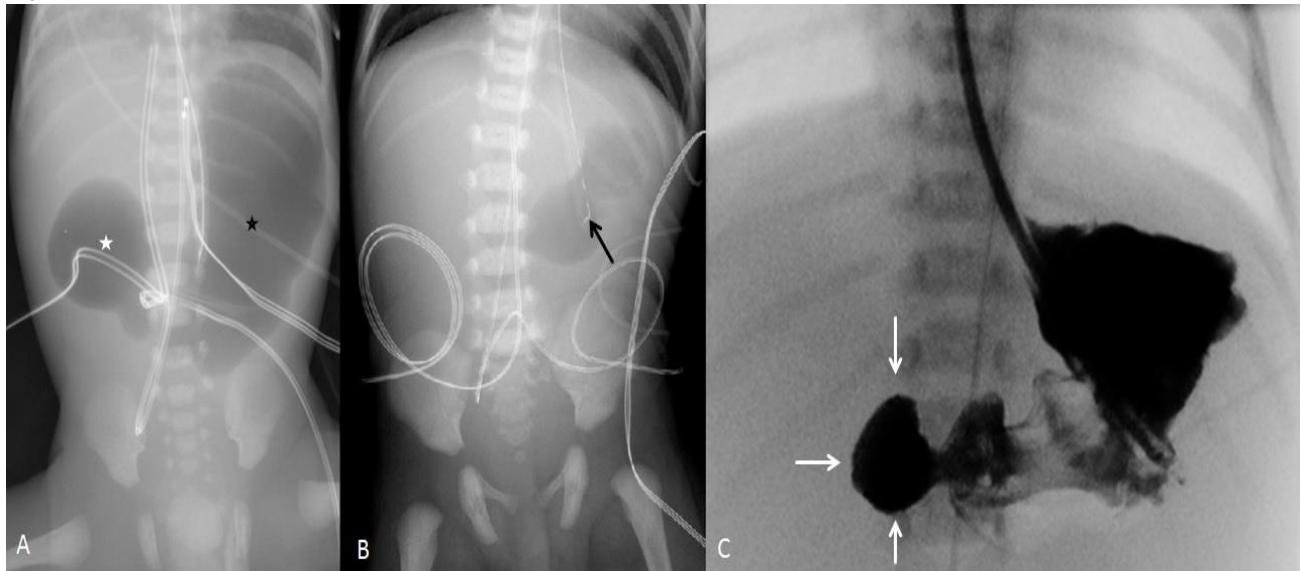


Figure 2. **2 CASES OF DUODENAL ATRESIA** A. AP abdominal radiograph in a neonate with bilious emesis demonstrates a classic double bubble without distal bowel gas. Endogastric tube, umbilical venous and umbilical arterial catheters are in place. Duodenal atresia and annular pancreas was found at surgery. (black star-gastric bubble; white star- duodenal bubble) B. AP abdominal radiograph in a neonate with bilious emesis demonstrates a sump tube with its tip in a relatively decompressed stomach (black arrow). No gas is seen in the duodenum or remainder of the bowel. Umbilical arterial and venous catheters are in place. The umbilical venous catheter is low. C. Fluoroscopic AP image obtained during an upper GI series demonstrates barium in the stomach and first portion of the duodenum (white arrows). Barium did not pass into more distal bowel. Duodenal atresia was confirmed at surgery.

Alternatively, an upper GI series may be performed which will show the level of the obstruction (Figure 1c). While a malrotation with midgut volvulus can occur in the setting of duodenal atresia, an upper GI series will not be diagnostic, as contrast material will not be able to reach the level of the volvulus. Therefore, in the setting of duodenal atresia with high clinical suspicion for concurrent volvulus, surgical exploration would be necessary (1).

Duodenal Stenosis and Duodenal Web are alternative diagnoses considered when malrotation is excluded in the neonate with a radiographic “double bubble” with distal bowel gas (Figure 3a). Duodenal stenosis may be intrinsic or may result from extrinsic compression in the setting of an annular pancreas. Obstruction from Ladd's bands (discussed above) are another alternative, but this would be in the setting of malrotation. The degree of proximal bowel distention visualized on radiographs, will be determined by the degree of stenosis or the aperture size in the case of a web. In lesser

degrees of obstruction, the clinical presentation may occur later, i.e. in an older child or even in an adult. In the neonatal period, symptoms will include feeding intolerance and bilious emesis. Those who present later will report nausea, vomiting, gastroesophageal reflux and abdominal pain. The diagnosis is made by fluoroscopy. In duodenal stenosis, fixed circumferential narrowing of a variable length of duodenum will be noted. When the neonate with bilious emesis is being evaluated with an upper GI, it is important to patiently wait for the contrast to pass through the stenosis in order to confirm bowel rotation, or else a midgut volvulus may be missed. A duodenal web will classically demonstrate a “windsock” contour of the second/third portion of the duodenum (Figure 3b). Other imaging features which may be seen include an orifice at the site of the web's aperture (Figure 3c) or dimpling of the outer contour of the duodenum proximal to the site of obstruction when the web is stretched distally, corresponding to pulling of the web's insertion site (Figure 3b) (3).

Figure 3. **DUODENAL STENOSIS AND DUODENAL WEB** A. AP fluoroscopic scout v

View of the abdomen obtained in neonate with a prenatal diagnosis of trisomy 21 and duodenal atresia (but did not present with bilious emesis). Gaseous distention of the stomach and duodenum is demonstrated with distal bowel gas. Duodenal stenosis was confirmed at surgery. B,C. AP (B.) and lateral (C.) fluoroscopic images obtained during an upper GI series in an 11 month old with multiple episodes of vomiting several hours following feeds demonstrate marked focal narrowing of the distal 2nd portion of the duodenum (white arrows) with relative distention of the more proximal duodenum. Puckering of the duodenal walls proximal to the stenosis raises the possibility of a duodenal web corresponding to the site of insertion of the web. Duodenal web was confirmed at surgery.

Jejunal Atresia will typically present in the first few days of life with bilious emesis. Radiographic findings may demonstrate diagnostic features of gaseous distention of the stomach and 2 or 3 additional loops of small bowel without any distal gas. If the radiologist is confident that absolutely no distal gas is present (and that the distended loops are contiguous and correspond to the duodenum and proximal jejunum), an upper GI may not be necessary prior to non-emergent surgery. If there is any doubt (i.e. not all of the loops are distended) an upper GI series should

be performed (1). Fluoroscopic imaging will demonstrate barium in a distended stomach, duodenum and proximal jejunum without passage into the more distal jejunum. Gaseous distention of a single distal loop without additional loops may also be seen. If additional gas filled loops are seen, findings suggest an incomplete obstruction as can be seen in jejunal stenosis or a web. Of note, distended loops of bowel, whether stomach or small bowel, may displace the DJJ inferiorly (3).





Figure 4: **2 CASES OF JEJUNAL ATRESIA** A. AP abdominal radiograph in a neonate with bilious emesis demonstrates 3 gas bubbles (numbered 1-3), presumably the stomach, duodenum and jejunum. B. AP fluoroscopic image from an upper GI series confirms the bowel loops visualized on the radiograph correspond to the stomach, duodenum and jejunum. The distal portion of jejunal loop is air filled. No distal gas is visualized and barium did not progress any further. Jejunal atresia was confirmed at surgery. C. AP abdominal radiograph in a neonate with bilious emesis demonstrates 4 gas bubbles (numbered 1-4), presumably the stomach, duodenum and 2 jejunal loops. D. AP fluoroscopic image from an upper GI series confirms the bowel loops visualized on the radiograph correspond to the stomach, duodenum and jejunum (numbered 1-4). No distal gas is visualized and barium did not progress any further. Jejunal atresia was confirmed at surgery.

### **Discussion and Conclusions:**

There are several etiologies of upper intestinal obstruction in the neonate. In the setting of bilious emesis, the key pressing task is to determine if the DJJ is in the normal location. It is important to discuss the findings immediately with the caring

clinician when a malrotation is suspected even when volvulus is not demonstrated at the time of the exam. When the imaging findings of an upper GI series are not clear, following the contrast material to the cecum, or alternatively performing a contrast enema, may help guide management

based on the location of the cecum. It should be noted that a normal position of the cecum does not ensure normal bowel rotation and certainly does not exclude midgut volvulus (2). Up to 30% of patients with malrotation have a normal location of the cecum (2). Additionally, a high riding cecum (i.e. the right mid or upper abdomen) is a normal variant seen in neonates without a malrotation (2). If there is a long distance between the location of the cecum and the location of the DJJ, the risk of volvulus is decreased (3). Once a malrotation is excluded, the other etiologies may be considered and the differential diagnosis will be narrowed by the course of the contrast and appearance of the bowel. It is not necessarily important to distinguish the different atresias/stenoses, but it is helpful to the surgeon to determine the approximate site of involvement. Often, the surgeon will request a contrast enema to exclude additional atresias in the colon which can be seen most commonly in association with jejunal (or

ileal) atresias. In the setting of multiple atresias, fluoroscopic evaluation utilizing upper GI series and a contrast enema will only demonstrate the most proximal and most distal obstruction. Additional atresias may be suspected if intraabdominal calcifications are noted as can be seen in the setting of sporadic or hereditary multiple intestinal atresia syndromes with or without immunodeficiency (3). Radiography and fluoroscopy play an important role in the workup of a neonate with a high intestinal obstruction. The radiologist is an integral part of the diagnostic team in the neonate with bilious emesis.

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