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Editorial Policy

The *DrexelMed Journal (DMJ)* features the scholarly activities of our graduate medical education trainees. This journal was created to highlight the many interesting and diverse scholarly activities and research ongoing at Drexel University College of Medicine and its participating affiliates (listed above). Recognizing that scholarly activity takes many forms, the *Journal* aims to publish all such efforts, and thus welcomes original research, reviews, case reports, and technical reports alike.

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The lead author must be in a current, Drexel-affiliated, graduate medical education program either as a resident or fellow, (i.e. PGY-1, etc.) and must be in good standing with the program. It is the responsibility of the lead author to review the submission(s) with all listed authors prior to the final electronic submission to *DMJ*. *DMJ* does not assume any responsibility for the addition or omission of authors. It is the responsibility of the lead author to verify all conflicts of interest for every author listed on the paper.

If residents from another institution would like to participate, they should request their designated institution official (DIO) to communicate directly with the Associate Dean of GME at DUCOM: Dr. Mark Woodland (215) 762-3500.

Please refer to the *DrexelMed Journal* website for further detailed instructions regarding submission guidelines:

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Please refer to the *DMJ* website for further instructions on how to submit your work for next year's edition.

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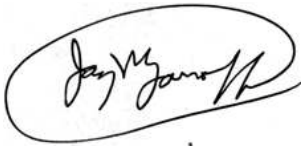
DREXEL UNIVERSITY
COLLEGE OF MEDICINE

EDITORIAL COMMENTS

We are happy to present the fifth issue of the *DrexelMed Journal*, featuring the scholarly activities of the graduate medical education trainees of Drexel University College of Medicine, Hahnemann University Hospital, Abington Memorial Hospital, Allegheny General Hospital, Easton Hospital, Mercy Health System, Monmouth Medical Center, St. Christopher's Hospital for Children, St. Peter's University Hospital, and Virtua Health.

This edition of the *DMJ* includes again almost twice as many submissions as our previous version. The scope and range of types of projects, subject matter, and depth of research are impressive. Residents and fellows working with faculty in over twenty specialties from all nine institutions have taken the time to present their scholarly activity to us.

We are very proud to bring you this edition of the *DrexelMed Journal*. We hope you take the time to peruse and appreciate the diverse richness of this year's edition and encourage you to submit your work for next year's edition!



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DEAN'S RECOGNITION

My congratulations to Dr.'s Berkson, Hamilton, Woodland, and Yanoff for the 5th Edition of the DrexelMed Journal. Five years ago when Drs. Yanoff and Woodland came to me with this idea, I whole heartedly supported the concept of emphasizing the scholarly activities of our residents. In line with the Strategic Plan of the College of Medicine to emphasize scholarly activity at the level of Graduate Medical Education, I also challenged them to expand beyond the halls of our primary GME affiliate and am pleased to see the participation of our affiliates continue to expand in this edition.

Finally, my personal appreciation to the many residents represented in this journal and to those of you in training who have ongoing scholarly activities. At Drexel, academic inquiry through research and innovation is part of our basic mission. We hope through out your training programs and your professional careers that you continue your endeavors to move medicine forward.

Richard V. Homan, MD
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Abstract: A Cross Sectional Study to Assess Patient Satisfaction in an Academic Health Center

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OBJECTIVE
To obtain a baseline level of patient satisfaction with the care provided by internal medicine residents at their ambulatory health care center.

METHODS
Patients completed a one-page questionnaire (in English or Spanish). Some questions covered three of Accreditation Council for Graduate Medical Education (ACGME) general competencies: interpersonal and communication skills (measured by introduction, explanation, and politeness), professionalism, and patient's perception of the provider's knowledge. Other questions assessed the staff: courtesy, ease of setting appointment, and privacy as well as the facility's location, comfort and cleanliness. Patient satisfaction was measured on a 5 point scale (1 = lowest satisfaction, 5 = greatest). Patients completed the survey while waiting for discharge instructions. After filling it out they deposited the anonymous forms in a specially marked box. The study was approved by the IRB.

RESULTS
100 questionnaires were completed (79% by patients and 21% by their designee). Patients were satisfied with resident professionalism (M = 4.59, SD = 0.76), politeness (M = 4.53, SD = 0.68), explanation (M = 4.44, SD = 0.80) and knowledge (M = 4.47, SD = 0.83). The lowest scores were ease of setting up appointments (M = 4.19, SD = 1.01) and patients' comfort while waiting (M = 4.23, SD = 0.98).

CONCLUSION
Patients were generally satisfied with their care in the ambulatory center; however there is potential for improving the appointment setting process in terms of ease and efficiency.

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Abstract: An Atypical Presentation of a "Broken Heart Syndrome" in a Patient with Chronic Anxiety

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ABSTRACT
A broken heart syndrome or Takotsubo cardiomyopathy is an acute cause of transient left ventricular systolic dysfunction characterized by abrupt onset of chest symptoms, ECG changes and mild rise in myocardial enzymes mimicking acute myocardial infarction.[1] This condition is more common in postmenopausal women and is typically preceded by an intense emotional or physical stress or an acute illness. A higher prevalence of anxiety disorders have also been reported recently.[2] The absence of significant coronary artery obstruction and apical ballooning with left ventricular akinesis or dyskinesis of the distal one-third to two-thirds of the left ventricle is the typical ventriculographic finding. However, various morphologic variants with different ventricular region involvement have been reported including "an atypical variant" where left ventrular hypokinesis is restricted to the midventricular segment without involvement of the apex .[3]

We describe a 56-year-old female with a history of chronic anxiety who presented with retrosternal chest pain after her partner threatened to leave her. She developed diffuse T wave changes with prolonged QT intervals associated with an elevation of cardiac enzymes. A coronary artery angiogram did not show any significant coronary artery lesion but the left ventriculogram showed severe hypokinesis in the anterolateral, anteroapical, inferoapical and apical regions with preserved wall motion in the inferobasal region, which is an atypical morphology (Figs.1, 2). The patient was discharged with appropriate pharmacotherapy and remained asymptomatic. A follow up echocardiogram has been scheduled.

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Figure 1.

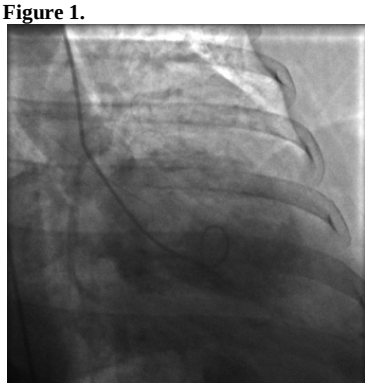
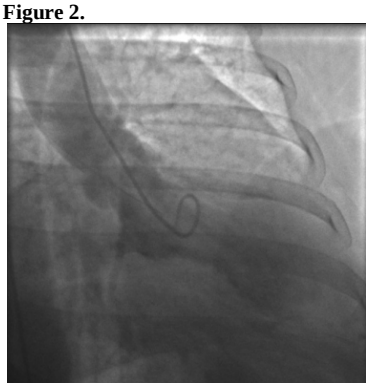


Figure 2.



Abstract: Bowel Wall Thickening on CT Scans in Asymptomatic Patients Is a Low Yield Endoscopic Indication

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OBJECTIVE
Wall thickening in the upper gastrointestinal tract (WTUGIT) noted on imaging is common and prompts a concern for neoplasia. There are no guidelines on how to approach these findings. We hypothesize that the yield of significant findings on esophagogastroduodenoscopy (EGD) in asymptomatic patients is low.

METHODS
This is a retrospective, single-center study performed between 2008 and 2009. Using the radiological database, we generated a list of individuals with WTUGIT described in CT scan reports. Significant findings were defined as strictures, neoplasia, ulceration, active gastritis and esophagitis. Statistical significance was calculated using Fisher's exact test.

RESULTS
1103 total CT scans generated 97 reports (9%) with WTUGIT. The mean age was 58(± 15.3SD) with 52% males. Overall, 51 patients (53%) underwent EGD with 60 different areas of WTUGIT. Patients with WTUGIT who underwent EGD had significant correlation with EGD findings with albumin < 3 ($p<.02$), white males ($p<.01$), nausea/vomiting ($p<.001$). However, abdominal pain, diarrhea, weight loss and age were not statistically associated. 10 patients were asymptomatic. 30% (3/10) asymptomatic WTUGI had a correlating EGD findings compared to 74% (37/50) with symptoms ($p<0.0116$). Weight loss was present in 90% (9/10) patients with neoplasia in the WTUGIT compared to 27% (11/41) without neoplasia ($p=0.0001$).

CONCLUSIONS
WTUGIT correlated with significant gastrointestinal pathology if patients had low albumin, weight loss, N/V and Caucasian race. Patients with incidental WTUGIT had a significantly lower rate of findings and none had neoplasia. Weight loss was present in virtually all patients with neoplasia and should prompt endoscopic evaluation with WTUGIT. No prior studies have demonstrated these findings.

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Abstract: Burden of Ventricular Arrhythmias in the Perioperative Period in Patients Receiving the Heartmate II Left Ventricular Assist Device

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OBJECTIVE
LVAD placement can reduce ventricular arrhythmias due to end stage CHF, potentially eliminating the need for ICD placement. The perioperative window surrounding an LVAD is a highly arrhythmogenic time due to hemodynamic instability, proarrhythmic pharmacotherapy, metabolic derangements, and underlying heart failure.

METHODS
We present our single center experience with the burden of ventricular arrhythmias in our Heart Mate II patients. A retrospective chart review of outpatient and inpatient hospital charts examined arrhythmia burden logged by their ICD in the 1 year pre and post LVAD placement.

RESULTS
We reviewed the charts of 24 consecutive patients between 7/2007 and 11/2010 who received a Heart Mate II with an ICD. 8 patients (33%) had a higher incidence of arrhythmia prior to LVAD and 12 patients (50%) had more after implantation. There was no change in their arrhythmia burden for 4 patients. Of the 19 patients who had arrhythmias following an LVAD, 15 (62.5%) had a greater preponderance of arrhythmia in the 1 month immediately following surgery. 2 (8.3%) of these patients had high burden of arrhythmia and were noted to have continuous runs of VT and NSVT. 4 (16.7%) patients had more arrhythmia in the late period following an LVAD, rather than immediately after surgery. 12 patients (50%) continued to have arrhythmia documented more than 1 month following surgery up to 1 year.

CONCLUSIONS
The incidence of ventricular arrhythmias is highest in the perioperative period immediately preceding and following LVAD placement suggesting that a high number of patients following an LVAD will require an ICD.

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Abstract: Cardiovascular Computed Tomographic Angiography (CTA) Can Facilitate a Previously Failed Attempt at Coronary Sinus Lead Placement

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OBJECTIVE
Indications for cardiac resynchronization therapy (CRT) are expanding. However, coronary sinus (CS) lead placement may be challenging, with failure rates of 5-10%. CTA has been used to facilitate CS lead placement in new CRT implants. However there are no reports to date of CTA in previously attempted CS lead placement. We reported a case in which CTA facilitated CS lead placement after a prior failed attempt.

RESULTS
A 79 year old male with ischemic cardiomyopathy with ejection fraction of 10% originally had a dual pacemaker placement in 1999 for intermittent complete heart block. He had subsequent upgrade to ICD in 2006, and a failed CS lead upgrade in March 2010 at another center. In September 2010 he had a chest CTA to evaluate a pulmonary nodule. His heart failure symptoms worsened, and he presented in November 2010 for re-attempt of CS lead placement. The chest CTA was reviewed to identify the CS system. The CS lead implant was subsequently successful, with placement in the postero-lateral branch with excellent sensing, pacing thresholds, and no diaphragmatic stimulation.

CONCLUSIONS
Preprocedure CTA to evaluate coronary venous anatomy may facilitate the CS lead placement by identifying the CS ostium and target branches in patients with a failed prior attempt.

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Abstract: Cold Snare and Cold Biopsy Are Equally Effective in Adenoma Resection

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OBJECTIVE
In 1973, hot biopsy forceps were initially described for eliminating diminutive polyps in the colon. Recent studies show that the excisional biopsy technique is safe and effective. Few studies exist in the literature that evaluate the efficacy of cold biopsy versus cold snare when polyp incidence in a follow up colonoscopy is explored.

METHODS
With over 2500 charts reviewed, data from 218 specific polypectomies was evaluated.

RESULTS
Adenomas removed from the transverse and descending colon showed a similar incidence of adenomas in the follow up colonoscopy regardless of removal method. A similar pattern was found in the ascending colon where 51.2% of adenomas removed by cold snare and 46.7% of adenomas removed by cold biopsy showed no recurrence in the follow up colonoscopy. This pattern was repeated in the tortuous portions of the colon. Adenomas from the cecum demonstrated a 38.3% rate of no further incidence after cold snare and 41.4% after cold biopsy while the sigmoid adenomas yielded a 51.3% and 48.9% rate of no further incidence for cold snare and cold biopsy respectively(NS).

CONCLUSIONS
This retrospective study shows that in both the tortuous and straight portions of the colon there was no difference in adenoma incidence in a subsequent colonoscopy whether the initial adenoma was removed by cold biopsy or cold snare. Thus piecemeal biopsy and cold snare appear to be equally effective techniques to remove adenomas.

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Abstract: Endovascular Neurosurgical Interventions via Trans-Brachial Route: Case Series and Literature Review

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OBJECTIVE
Endovascular recanalization of intracranial and extracranial atherosclerotic disease is an accepted treatment option in a select group of patients. The majority of patients can be treated via a femoral approach. However, there is a subset of patients, including those with severe peripheral vascular disease, ilio-femoral bypass grafts, aorto-iliac occlusion, and unfavorable aortic arch and great vessel geometry that require an alternative access route.

METHODS/RESULTS
We describe 3 cases of endovascular stent assisted angioplasty via the trans-brachial approach in 2 patients with unfavorable aortic arch configurations and 1 patient with severe ilio-femoral atherosclerotic disease. A right vertebral ostial lesion, a distal right vertebral artery lesion, and a left internal carotid artery lesion were successfully treated. The technical aspects of the procedures via the brachial

approach and related literature are discussed. Institutional IRB approval was granted for this report.

CONCLUSION
The trans-brachial approach is a viable and safe alternative route for stent assisted angioplasty in patients with unfavorable aortic arch anatomy and severe ilio-femoral atherosclerotic disease.

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Abstract: Gestational Hypertension in HIV Positive Women in Philadelphia

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OBJECTIVES
To determine whether HIV positive women treated with ART are at comparable risk of developing gestational hypertension as the seronegative inner-city Philadelphia population.

METHODS
A case series was performed between 2001 and 2010 in an inner city HIV+ pregnant Philadelphia population. Demographic information and delivery information were collected including antiretroviral therapy.

RESULTS
Upon initial data analysis, 13% of HIV positive pregnant women were diagnosed with gestational hypertension over this time period which is higher than the general population of 5-8%.

DISCUSSION
Inflammation plays a key role in causing gestational hypertension. Immune compromised women, such as HIV positive women, may not mount a normal response to the increased systemic inflammatory response that typically occurs with pregnant women affected by gestational hypertension. In patients who are treated with antiretroviral therapy and therefore have a recovered immune system, there may exist an overwhelming inflammatory response that paradoxically makes the occurrence of gestational hypertension more prevalent.

Abstract: Hysteroscopic Office Surgery: A Comparison between an Urban University Practice and a Suburban Community Practice

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OBJECTIVES
Safety and complications of office based gynecologic procedures has not been well studied. Recent studies have focused primarily on pain management and patient satisfaction but not safety. This study seeks to compare the types and number of hysteroscopic office procedures performed in a university urban practice and a suburban community practice. Secondly, we will evaluate the complication rates associated with these procedures.

DESIGN
A retrospective chart review of hysteroscopic office procedures performed in both the university practice and community practice between January 2007 and June 2010. We specifically focused on procedure type, complications and failures. Our study population included women between ages 25-70yo. Procedures studied included Essure® sterilization, diagnostic hysteroscopy with dilation and curettage (DHC), simple hysteroscopic myomectomy and polypectomy, endometrial ablation (i.e. HTA, Novasure). Procedures excluded were LEEP and Dilation and Evacuation. In addition to procedure number, both major and minor complication rates were calculated. Complications included uterine perforation, hospital admission, failure to complete procedure and vasovagal response.

RESULTS
In the university setting, 216 cases were completed by 7 providers with resident participation. This included 105 DHCs, 49 endometrial ablations and 62 ESSURE sterilizations. The suburban site accounted for a total of 565 cases completed by 3 providers without resident participation. These cases included 333 DHCs, 109 endometrial ablations and 123 ESSURE sterilizations. Complication rates are shown in Figure 1.

CONCLUSIONS
Gynecologic hysteroscopic office surgery is a safe alternative to similarly performed hospital operative procedures. There was no significant statistical difference in complication rates between the urban university practice and the suburban private practice.

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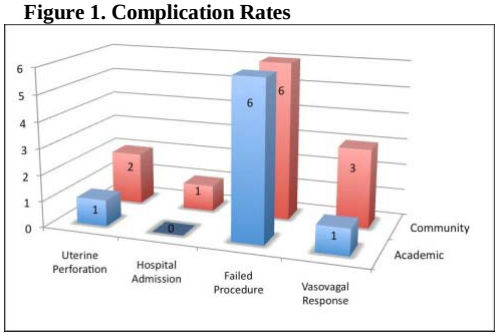
Figure 1. Complication Rates



Abstract: Lead Extraction Utilizing the Evolution Mechanical Dilator Sheath in a Single Center

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OBJECTIVE
Lead extraction has been performed due to lead malfunction, infection, or the inability to implant new leads due to vascular congestion. Leads can be removed by using dilation sheaths, mechanical dilator sheaths, laser extraction systems, or snare extraction. We report our lead extraction experience utilizing the Evolution mechanical dilator sheath.

METHODS
We reviewed the extraction database of patients who underwent extraction from 1/2009 through 11/2010 at Hahnemann University Hospital. A cohort of 13 patients was included in this analysis.

RESULTS
Most patients (62%) had a dual chamber ICD, 31% had a dual chamber pacemaker, and 8 % had a biventricular defibrillator. Median implant duration was 92 months, ranging from 52 to 192 months. The extracted leads included 4 right atrial leads (31 %), 4 right ventricular ICD leads (31 %), 4 right ventricular pacing leads(31 %), and 1 coronary sinus leads (8 %),. The indication for extraction included lead endocarditis (54%), lead malfunction or fracture (39%), vascular congestion (8 %). The areas of fibrosis, where the Evolution mechanical dilator sheaths were used, were axillary sites (15%), subclavian sites (23 %), brachiocephalic sites (31%), subclavian-right atrial junction (8%), and right ventricular apex (23%). There were no cardiovascular complications (chest wall hematoma, pneumothorax, stroke, myocardial avulsion) in 12 patients (92%) and no mortality associated with the extractions. There was one right subclavian artery injury requiring surgical repair.

CONCLUSION
The Evolution mechanical dilator sheath can be used to remove fibrous binding sites from the leads with low cardiovascular complication risk.

Figure 1. Demographics

Number of patients	13
Average age (years)	63
Female	54%
Device types:	
Dual chamber ICD	62%
Dual chamber pacemaker	31%
Biventricular defibrillator	8%
Median implant duration (months)	92
Range (months) of implant duration	55 to 192
Extracted leads:	
Atrial leads	31%
Right ventricular ICD leads	31%
Right ventricular pacing leads	31%
Coronary sinus lead	8%
Indication for extraction:	
Lead endocarditis	54%
Lead malfunction or fracture	39%
Vascular congestion	8%

Figure 2. Findings

Areas of fibrosis:	
Axillary area	15%
Subclavian area	23%
Brachiocephalic area	31%
Superior vena cava-right atrial junction	8%
Right ventricular apex	23%
Complications	
Mortality	0%
Vascular injury required surgical intervention	8%
Myocardial avulsion	0%
chest wall hematoma	0%
pneumothorax	0%
Stroke	0%

Abstract: Lower Serum Anti-Mullerian Hormone Levels Are Associated with Longer Gonadotropin Stimulations

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OBJECTIVE
To determine the relationship between an initial AMH level and duration of gonadotropin stimulation for IVF.

MATERIALS AND METHODS
Retrospective cohort study with a total of 98 serum samples from patients undergoing IVF were measured for AMH (Beckman Coulter, Inc. Chaska, MN). Patients were divided into two groups based on days of stimulation, ten days of stimulation was considered optimal. Group 1 were patients that were stimulated less or greater then 10 days (71 patients), and group 2 were patients that were stimulated 10 days (27 patients).

RESULTS
Patient age between group 1 (34.2±4.5 years) and group 2 (35.0±4.0 years) were not significant (P=NS). FSH was not significant between group 1 and group 2, 7.7±4.5 ng/ml and 7.4±2.5 ng/ml, respectively (P=NS). AMH levels between group 1 (0.4±0.3 ng/ml) and group 2 (3.7±2.2 ng/ml) were significant (<0.0001). Number of eggs was significant between group 1 and 2, 10.3±6.7 eggs and 13.9±5.8 eggs, respectively (P=0.0156). Pregnancy rate (hCG) between group 1 (40 of 71) and group 2 (22 of 27) was significant (P=0.0335).

CONCLUSION
Ovarian response to gonadotrophins varies considerably among women. Optimal stimulation would balance the number of oocytes retrieved to the potential for hyperstimulation and the severe iatrogenic complications of ovarian hyperstimulation syndrome. Predicting duration of gonadotropin administration would allow tailoring of ovarian stimulation regiments, potentially increasing rates of oocyte transfer, decreasing future stimulation cycles and limiting patients to iatrogenic complications. Here we show how AMH is superior to day 3 FSH values in predicting optimal stimulation.

Figure 1. Results

	Number of Patients	Age	AMH levels	Number of Eggs	Pregnancy Rate
Group 1	71	34.2±4.5 years	0.4±0.3 ng/ml	10.3±6.7	57.14%
Group 2	27	35.0±4.0 years	3.7±2.2 ng/ml	13.9±5.8	81.48%
P Value		NS	<0.0001	0.016	0.034

Abstract: Resident Initiated Alteplase(rt-PA) Administration in Acute Ischemic Stroke: A Comparison with National Data

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OBJECTIVE
In the US, approximately 795,000 individuals experience a new or recurrent stroke annually. Alteplase or rt-PA is the only recommended thrombolytic therapy for acute ischemic stroke which improves long term outcome. In our program, the senior neurology

resident (PGY-3 or 4 level) is responsible to respond to the "stroke page" and is first contact with the patient. They take the history, perform a physical examination and complete the NIHSS. The case is discussed with the attending physician and a decision is made to administer Alteplase. Here we study the efficacy and safety of resident-driven Alteplase administration at a tertiary care teaching hospital and to compare it with available national data.

DESIGN/METHODS
A retrospective chart review was conducted and data was collected from November 2006 to June 2010. ICD codes (international Classification of Disease, 9th Revision) 433-437 were used to conduct the search in medical records.

RESULTS
The Total number of acute ischemic events was 449 patients. Residents helped administer Alteplase to 42 patients (9.3%), of which, 37 cases (88%) received it intravenously. Complications were seen in three patients (7.1%). Intracranial hemorrhage was seen in two patients (4.7%), of which, one was symptomatic. Based on recent available national data, the rate of Alteplase administration is 2.4% and intracranial hemorrhage rate ranges from 5.9% to 11% in separate studies.

CONCLUSIONS
A stroke protocol initiated by an upper year neurology resident may be associated with improved rates of rt-PA administration and lesser hemorrhagic complication rates in a tertiary-care inner city teaching hospital.

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Abstract: Short Term IUD Discontinuation at an Urban Center

Ga Lee, MD
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OBJECTIVE
To determine the one year discontinuation rate of intrauterine contraceptive devices (IUD) as well as the causes and related discontinuation factors at an urban center. To determine if proper patient counseling prior to insertion alleviates the reasons for discontinuation.

METHODS
Retrospective chart review comprised of women who had an IUD inserted during January 2007-October 2009 in an urban OBGYN clinic (Women's Care Center) located in Philadelphia, Pennsylvania. Study subjects were healthy and sexually active women, between age 18 and 50, with no contraindications for IUD use. The main outcome measure was IUD discontinuation. Data was obtained from Allscripts electronic medical records. Baseline sociodemographic characteristics and reproductive history data was collected. Once patients were identified, reasons for discontinuation were collected and discontinuation rates were calculated.

RESULTS
The incidence of IUD discontinuation in the first year following insertion was 19.58%, whereas discontinuation in the first 18 months was 26.67%. Pain was the predominate reason for discontinuation, with bleeding as a secondary reason.

DISCUSSION
The discontinuation rates at our institution are consistent with other published reports of IUD discontinuation in several multi-center trials.

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Abstract: Short Term Retention of Hysteroscopic Knowledge

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OBJECTIVES
To evaluate whether simulation is an appropriate alternative to patient-driven operating room experience and whether residents retain knowledge gained through a hysteroscopic skills course.

METHODS
This project consists of a 16-question multiple choice test prior to a didactic session presenting basic hysteroscopy knowledge. Each resident then attended a hands-on lab consisting of three tasks: assembly, device placement and diagnostic hysteroscopy before the post-test. After four months, each resident took the mid-term test. All test sessions were compared to each other: pre-didactic to post, post-didactic to midterm test and midterm to pre-didactic test.

RESULTS
All but two residents did better on the post-test when compared to the pre-test; whereas 12 of 24 residents scored lower when comparing their post-test to midterm testing. Only one resident scored equally on post and midterm testing. Interns improved the most when comparing pre- to post-test and fourth year residents had the highest percent correct at midterm. Of note, female residents did better than males at each test session.

DISCUSSION
This course is effective at providing hysteroscopic knowledge that is retained in the short term. Much of the information from the lecture was not retained at four months. This would not be effective on its' own merits. However, as duty hours continue to shorten, this project shows that it is possible to use simulations in conjunction with traditional teaching methods. Projects like this can be packaged to residency programs as standardized educational modules and possibly improve both resident education and patient safety.

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Abstract: Single Port Access Gynecologic Surgery: A Three-Year Experience with Standard Instrumentation

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**Drexel University College of Medicine: Department of Surgery

OBJECTIVES
Single port laparoscopy has been practiced in gynecologic surgery for decades with a recent resurgence. Concerns include effects on patients, economic costs and ease of adoption. Short and long term results need to be considered. We offer a 3-year experience applying Single Port Access (SPA) to gynecologic surgery addressing these concerns.

METHODS
A retrospective analysis of 200+ patients from 5/2007 - 4/2010 undergoing reduced port laparoscopy was performed.

RESULTS
All procedures were initiated with the SPA technique. No specialized access devices were used. Procedures included oophorectomy, hysterectomy and staging with lymph node dissections. Operative safety mandated additional reduced port techniques in some patients. Greater than 50% of procedures were completed with Single Port Access. The remaining procedures were completed with a combination of SPA, needlescopic retraction, transvaginal node dissection and additional port sites. Results are comparable to similar multiport procedures. 3-year follow-up demonstrates no access-site hernias.

DISCUSSION
With the use of standard instruments/trocars, we demonstrate reduced costs compared to multiport techniques. Reduced number of trocars and use of less expensive very low profile trocars allows us to avoid the use of single port access devices. 98% of all procedures were performed using standard rigid instrumentation. We report successful application of Reduced Port Surgery toward the goal of Single Port Access gynecologic surgery. Current data comparison demonstrates it to be comparable to multiport procedures. We maintain the use of standard, familiar instrumentation to ease adoption into practice and demonstrate lower costs. We have not seen any improvement compared to multiport surgery other than cosmetics.

Abstract: Small Bowel Obstruction Secondary to an Inflatable Penile Prosthesis Reservoir

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ABSTRACT
A 70 year old male with a penile prosthesis presented with abdominal pain. Radiographic imaging revealed right sided pleural effusions and distended loops of small bowel. The patient had signs of peritonitis and was taken to the operating room. At the time of operative exploration, we found adhesions and loops of small bowel wrapped around the penile prosthesis reservoir catheter. The small bowel loops were markedly distended proximal to the reservoir catheter. Adhesiolysis was performed along with explantation of the reservoir. The patient's recovery was uneventful and he was discharged home.

DISCUSSION
The treatment of erectile dysfunction has been approached by urologists for the past century with the help of penile prostheses. The most important milestone in penile prosthesis surgery is Scott et al's description in 1973 of intracavernosal, inflatable silicone cylinders. Complications from the various prostheses have been well documented. Commonly encountered complications include mechanical malfunctions; corporal crossovers; corporal perforation/erosion; urethral perforation; infection; glans bowing; reservoir herniation; deep venous thrombosis; reservoir erosion into adjacent viscera (bladder, sigmoid, colon). A unique complication is that of the prosthesis reservoir causing a small-bowel obstruction. Prevention of this complication could be attained by placing these reservoirs extra-peritoneally. Explantation of the reservoir still allows the prosthesis to function as a semi-rigid device. The implantation of a penile prosthesis is a definitive solution for the treatment of organic erectile dysfunction, even in the era of effective oral medications. With increased prosthesis longevity, more pathologic complications are present and recognition and management is necessary.

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Figure 1. Penile Prosthesis Reservoir Catheter

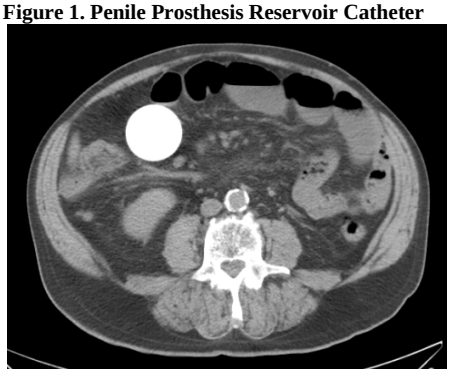
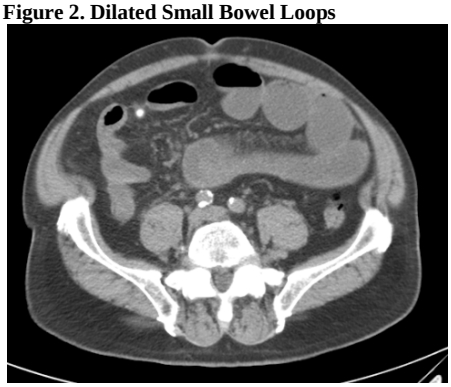


Figure 2. Dilated Small Bowel Loops



Abstract: Surgical and Medical Treatment To Cure Mucormycosis in a Young Woman

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OBJECTIVES
To report successful treatment of a 33-year-old woman with a history of acute lymphoblastic leukemia who presented with rhino-orbital mucormycosis and successfully underwent right orbital exenteration and treatment of her mucormycosis.

METHODS
Interventional case report. The patient was treated with intravenous antifungal agents, debridements with local drug delivery, hyperbaric oxygen, deferasirox, and right orbital exenteration. Outcome was clinical improvement of mucormycosis infection.

RESULTS
Integration of numerous therapeutic modalities led to a successful outcome. The patient is alive and well more than 1 year later.

CONCLUSIONS
Surgical excision is traditionally considered the only treatment for

mucormycosis. This case is a reminder of the adjunctive forms of treatment.

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Figure 1. Mucormycosis

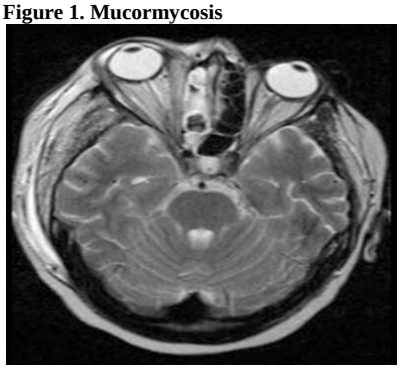
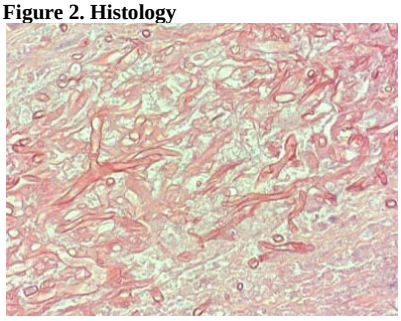


Figure 2. Histology



Abstract: The Urine Microalbumin Testing Rate in Patients with Type II Diabetes Mellitus (Type II DM) at an Academic Community Health Center: A Retrospective Analysis

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OBJECTIVE

To examine the usage rate and follow-up of urine microalbumin testing and adherence to American Diabetes Association (ADA) guidelines in type II diabetic patients at a resident-run community clinic.

METHODS

We reviewed the charts of 141 type II diabetic patients. Data regarding age, sex, body mass index (BMI), medications, the date and results of urine microalbumin tests were compiled for patients seen by the clinic between 2004 and 2010.

RESULTS

Out of 141 patients, 40% were male and 60% female with average age of 57.5 years and mean BMI of 35.5. 78% of patients had been tested for urine microalbumin at least once after 2004. Of those tested, only 10% had received tests annually after the diagnosis of type II DM. On average patients were tested on 47% of occasions of which they should have been tested regularly. Among those tested, 69% were classified as negative, 23% as microalbuminuria and 8% as macroalbuminuria.

DISCUSSION

Microalbuminuria is an early clinical finding in diabetic nephropathy.[1] The urine microalbumin test should be performed annually at diagnosis in all type II diabetic patients.[2] Unfortunately, urine microalbumin test in diabetic patients is frequently underutilized.[1,3] According to Quest Diagnostics, the rate of urine microalbumin testing in diabetic patients is 43.1% [4] while at our clinic; the rate is 78%. As part of a quality measure, our goal is 100% compliance with testing guidelines therefore a follow-up study is needed to optimize our diabetic patients care.

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Abstract: What Physicians Don't Know about the Tests They Perform

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OBJECTIVES

An outcry ensued when the USPS Task Force recommended starting routine breast cancer screening at age 50, opposing other medical societies (AMA, ACS, NCI), who recommends screening at 40.[1-3] This raises the question of why there is a discrepancy on opinion in the professional community. This study was performed to assess physicians understanding of the statistics.

METHODS

The respondents included all 25 Easton Hospital internal medicine residents (8 first year, 8 second year and 9 third year residents). 7 attending physicians with less then 10 years experience and 4 physicians with more then 10 years experience also responded.

RESULTS

The correct answer to the problem is 9.39%. We then studied the pattern of the incorrect responses and found that there was one underestimation (2.7%) and 26 overestimations (70.3%). 23 of the 26 incorrect responses were 10 times more than the value of the correct response (mean of the overestimated responses- 88%) (Fig. 2).

DISCUSSION AND CONCLUSIONS

The results showed physicians don't have a grasp on statistical problems. This affects how they communicate these results with

patients. In the given example, the woman with a positive mammogram would feel a lot differently if she were told that the positive mammogram meant a 9% chance of cancer versus a 90% chance. Younger physicians, while still at low rates, understand statistics better. We conclude that better training in statistics is needed to help physicians interpret the meaning of numbers in various facets of medicine, including but not limited to test results.

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Figure 1. Statistical Problem

Estimate the probability that a woman with a positive mammogram actually has breast cancer, even though she's in a low-risk group: 40 to 50 years old, with no symptoms or family history of breast cancer.

The probability that one of these women has breast cancer is 0.8 percent. If a woman has breast cancer, the probability is 90 percent that she will have a positive mammogram. If a woman does not have breast cancer, the probability is 7 percent that she will still have a positive mammogram.

Imagine a woman who has a positive mammogram. What is the probability that she actually has breast cancer?

Figure 2. Answers to Statistical Problem

	Residents	Attendings with greater 10 years experience.	Attendings with greater then 10 years experience.	Total
Correct Answer	(8) 32.00%	(2) 28.57%	(0) 0%	(10) 27.7%
Wrong Answer	(17) 68.00%	(5) 71.43%	(4) 100.00%	(26) 72.3%
Total	(25) 100.00%	(7) 100.00%	(4) 100.00%	(36) 100%

Case Report: A Rare Case of Anomalous Origin of the Right Coronary Artery as a Branch from Left Anterior Descending Artery

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**Easton Hospital: Department of Medicine, Division of Cardiology

INTRODUCTION

A single coronary artery is rare, occurring in approximately 0.024%-0.044% of the population.[1] We report a case of an anomalous right Coronary Artery (RCA) originating from the proximal left anterior descending artery (LAD) (Figs. 1, 2).

CASE REPORT

A 54-year-male with a history of hypertension and smoking presented with recurrent left-sided chest pain. A physical exam, EKG, serial cardiac enzymes and cardiac stress test were unremarkable. Recurrent chest pain prompted coronary angiography revealing a single left main (LM) coronary artery, which bifurcated into a co-dominant left circumflex artery (LCX) and a large LAD. The large LAD further bifurcated into a main LAD as well as a RCA, which originated from the proximal LAD just before bifurcation of the LAD and diagonal arteries.

DISCUSSION

A single coronary artery with an RCA originating from the LAD is very rare.[2,3] Our case is a variant of the modified L-II Lipton classification.[4,5] Most coronary artery anomalies are benign. An anomalous coronary artery passing through the aorta and pulmonary artery (PA) is associated with sudden death in young individuals. It has been attributed to myocardial ischemia due to a slit-like opening of the ostium with acute takeoff. Our patient has anomalous RCA which has a course superior to PA. It is not considered as high-risk anomaly and the blood flow to the RCA was not compromised. The patient's chest pain was thought to be musculoskeletal in nature; he is on regular follow-up and remains asymptomatic.

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Figure 1.

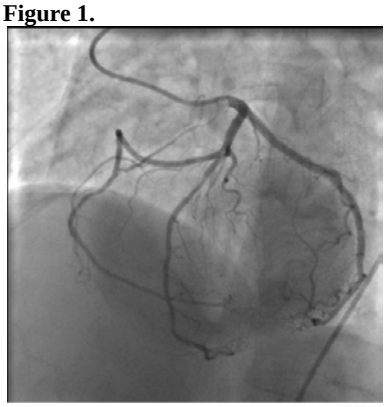
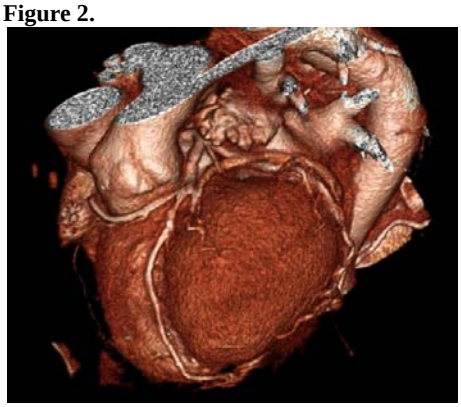


Figure 2.



Case Report: A Rare Condition Causing a Grave Problem: Idiopathic Hypertrophic Pachymeningitis (IHPM)

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CASE REPORT

A 29-year-old Brazilian immigrant presented with complaints of one month of recurrent headaches associated with intermittent horizontal diplopia, ataxia, and parasthesias in upper extremities. Tetraparesis with power of 4/5 was noted in all extremities with diffuse hyperreflexia, and decreased sensation below C8-level. Cranial nerve exam was normal. Patient had similar

symptoms lasting one week about 4 years ago. CT, MRI was non-revealing at that time and she refused LP. Meanwhile her symptoms resolved spontaneously.

Initial lab-work for CBC, CMP, ESR, CRP, ANA, RF, ANCA, Lyme's serology and RPR were negative. CT head was unremarkable. MRI brain and spine showed extra-medullary dural thickening at the base of the skull and spine to T4 level compressing the spinal-cord. CSF analysis was suggestive of chronic inflammation and culture was negative. Diagnosis of Idiopathic Hypertrophic cranio-spinal Pachymeningitis was made. Patient was treated with highdose steroids and had decompression surgery. Patient underwent excision of thickened meninges, C2-T5 laminecomies with dural augmentation using bovine pericardium. There was a significant improvement in patient's condition and at 3 years of follow-up patient is still on low-dose steroids without any neurological deficit.

DISCUSSION

IHPM was associated with tuberculosis and syphilis in the past and recently has been associated with some infections, autoimmune disorders and cancers. IHPM is a diagnosis of exclusion and is characterized by chronic inflammation of the dura and can mimic multiple sclerosis (MS). Steroids and immunosuppressive agents are the main-stay of treatment in initial stages and are used to maintain remission. Radiation and surgical-decompression are used in some cases to relieve compression symptoms.

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Case Report: A Unique Case of Hemosuccus Pancreaticus in a Teenage Woman with Idiopathic Pancreatitis

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*Drexel University College of Medicine: Department of Medicine
**Drexel University College of Medicine: Department of Medicine, Division of Gastroenterology and Hepatology

INTRODUCTION

Hemosuccus pancreaticus (HP) is defined as GI bleeding (GIB) secondary to rupture of a pseudoaneurysm into the pancreatic duct. The most common cause of HP is chronic pancreatitis, accounting for 1/1,500 cases of GIB.

CASE REPORT

A 17yo Caucasian female presented with hematemesis. She denied other GI symptoms and epistaxis, but did report taking ibuprofen for the past 2 weeks. She was diagnosed with idiopathic pancreatitis (IP) 6 weeks prior and reported 4 similar episodes. Family history was unremarkable. She denied tobacco, alcohol, or drug use. On physical exam she was hemodynamically stable. Abdomen was soft, non-tender, with normal bowel sounds and heme-positive stool. Hemoglobin was 9.0mg/dl, MCV 89FL, BUN 12mg/dl, and creatinine 0.7mg/dl. Liver enzymes, amylase and lipase were normal. EGD revealed mild gastritis, a deep, non-bleeding duodenal ulcer, and deformity at the duodenal bulb and antrum. CT scan revealed a 4.6 x 4.4 x 6.8 cm pancreatic pseudocyst abutting the antrum and duodenum and an ovid focus extending from the gastroduodenal artery suggestive of vascular erosion and pseudoaneurysm formation. She proceeded to interventional radiology, where a gastroduodenal artery pseudoaneurysm was identified and embolized. The patient was discharged without complications.

DISCUSSION

IP comprises 30% of cases of acute pancreatitis (AP). Pseudocysts occur in 10% of all cases of AP, of which 0.2-1% can develop GIB secondary to HP. The sporadic nature of bleeding and difficulty in endoscopically identifying the bleeding source, can delay the diagnosis of HP. Interventional radiology is essential for early diagnosis and treatment. We found no reported cases of HP in adolescents with IP.

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Case Report: Abdominal Pain, Weight Gain and Headaches - Where Is the Connecting Link?

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Monmouth Medical Center: Department of Medicine

CASE REPORT

A 54-year-old man was admitted with one day history of right upper quadrant (RUQ) abdominal pain, associated with nausea and vomiting, and frontal headaches. Intermittent RUQ abdominal pain had been occurring for 2 years and chronic frontal headaches for the past few years. Systems review was positive for weight gain, tiredness and cold intolerance. He was treated many years earlier for

transient hyperthyroidism with methimazole. Systemic examination revealed right upper quadrant tenderness. Low sodium of 133 meq/L was the only abnormal lab finding. Ultrasound and CT scan of abdomen were normal. HIDA scan revealed severe biliary dyskinesia (Fig. 1). CT and MRI of brain revealed pituitary macroadenoma (Fig. 2). Further lab work showed low free T3 0.35ng/dL, low free T4 173pg/dL, normal TSH 3.56mcIU/ml, elevated thyroid peroxidase and thyroglobulin antibodies, and a high prolactin 511ng/mL. A diagnosis of combined primary and secondary hypothyroidism was made. Cabergoline was initiated to treat prolactinoma. Due to severe pain, the patient underwent cholecystectomy; however, his postoperative course was complicated by prolonged ileus, which resolved only after effective thyroxine replacement.

DISCUSSION

Reported cases of combined primary and secondary hypothyroidism are in association with radiation treatment for head and neck tumors. To our knowledge there are no reported cases of combined central hypothyroidism secondary to a prolactinoma and primary autoimmune hypothyroidism. A literature review revealed a definite association of delayed biliary emptying with hypothyroidism. One should rule out hypothyroidism in patients with long standing RUQ pain with no identified anatomical pathology.

Figure 1. HIDA Scan

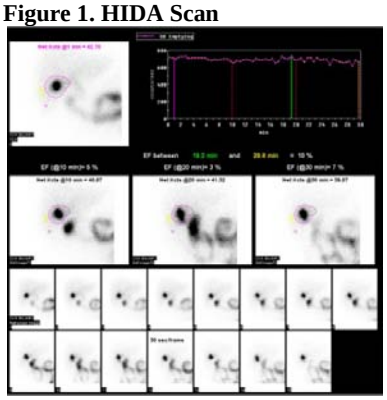
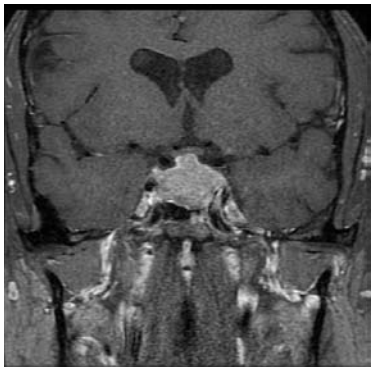


Figure 2. Pituitary Adenoma



Case Report: Acute Renal Infarcts from Severe Aortic Atherosclerosis

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CASE REPORT

A 67 year old female presented to the ER with sudden onset of acute left sided flank pain for 14 hours. The pain was, continuous with paroxysmal aggravation, non-radiating with no apparent relationship with respiration or position changes. Patient provided a history of nausea, vomiting and chills but no fever. Examination revealed mild tenderness in the periumbilical region with no rebound tenderness, guarding or costovertebral angle tenderness elicited. A right femoral bruit was present on auscultation. An elevated WBC count of 17000/ml was the only notable laboratory finding. EKG and Chest X-ray did not reveal any abnormalities. A CT scan with contrast was interpreted as left renal infarct vs focal lobar nephronia. These findings were corroborated on MRI. Patient had a febrile spike of 101°F. Blood cultures were drawn and broad spectrum antibiotics were initiated with a suspicion of infective endocarditis. A transthoracic echocardiogram revealed severe pulmonary HTN but no cardiac source of embolus. TEE revealed no shunt or a cardiogenic source of emboli. Severe atherosclerosis in the descending aorta and moderate atherosclerosis in the aortic arch was however noted. Antibiotics were discontinued. Patient was started on dual antiplatelet therapy with aspirin and Clopidogrel.[4] Coumadin was added to the regimen.[5] Patient was discharged with complete resolution of symptoms.

DISCUSSION

Acute renal infarction may occur in previously healthy individuals. It should be suspected in patients with flank pain without prior lithiasis.[2] CT to assess must be considered when serum LDH is high even in the absence of atrial fibrillation.[3]

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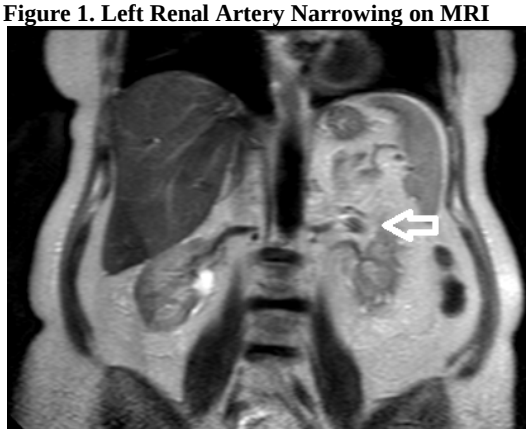
Figure 1. Left Renal Artery Narrowing on MRI



Case Report: Acute Sarcoidosis Presenting with Polyarthritis, Erythema Nodosum and Hilar Lymphadenopathy: A Typical Presentation of Löfgren's Syndrome

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CASE REPORT

A 51 year old Caucasian female presented to the emergency department with migratory arthritis for the previous 3 weeks. Patient also noticed low grade fevers, dry cough and a rash on her bilateral lower extremities for the last one week. There was no history of tick bites, sick contacts or recent travel. Her presenting vitals were temperature 98.6, pulse 78, blood pressure 130/70, respiratory rate 20, pulse oximetry 99% on room air. On examination, patient had swelling of bilateral ankles, knees and the left wrist. There was a tender, nodular rash on bilateral lower extremities from knees down to the ankles. Her labs were significant for an ESR 43 and CRP 91. Patient's chest x-ray (Fig. 1a) was significant for bilateral hilar lymphadenopathy, left greater than right. Findings were confirmed by CT scan (Fig. 1b). Her serology was negative for rheumatoid arthritis and lupus. Joint fluid on aspiration was normal. Eventually, she had mediastinoscopy with lymph node biopsy that showed non-caseating granulomas suggesting sarcoidosis (Fig. 2). The triad of arthritis, hilar lymphadenopathy and tender nodular rash (erythema nodosum) made the diagnosis of Löfgren's Syndrome. Patient was treated with corticosteroids leading to improvement of her symptoms.

DISCUSSION

Löfgren's Syndrome is an acute form of sarcoidosis which presents with fever, erythema nodosum, arthritis and unilateral or bilateral hilar lymphadenopathy.[1,2] In Europe and United States, approximately 10% of the patients with sarcoidosis present with Löfgren's syndrome.[3] This presentation is more common in females.[3] Severe symptoms are treated with corticosteroids.

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Figure 1. Hilar adenopathy

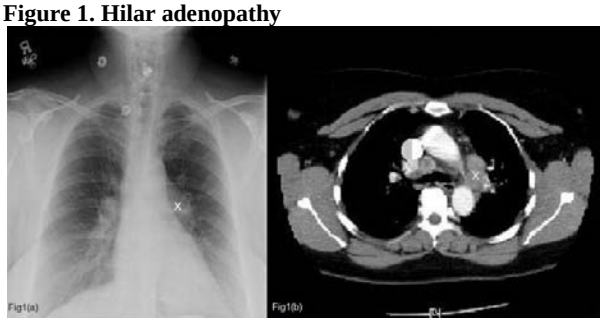
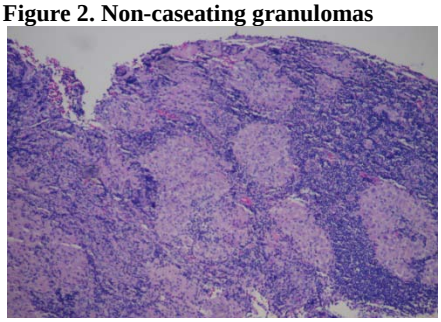


Figure 2. Non-caseating granulomas



Case Report: Anomalous Origin of the Left Coronary Artery from the Right Coronary Cusp

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INTRODUCTION

An anomalous left main coronary artery is a cardiac anomaly often found on autopsy for athletes who have sudden cardiac arrest.[1,2] Rarely do athletes survive such incidents. We present a case of a healthy individual who experienced near sudden cardiac death, attributed to an anomalous left main coronary artery, while running the Philadelphia Marathon.

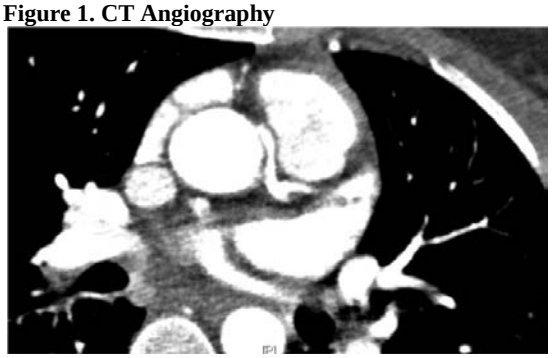
CASE REPORT

A 38-year-old Caucasian woman with no past medical history collapsed while running the Philadelphia marathon. The patient was found to be in ventricular fibrillation and was then shocked twice. The patient then converted to sinus tachycardia and was sent immediately to the cardiac catheterization lab.Cardiac catheterization revealed that the left main coronary artery arose from the right coronary cusp and had a separate origin from the right coronary artery. The left coronary was found to originate from the right sinus of Valsalva and traveled between the aorta and the pulmonary artery. No obstructive disease was present.

DISCUSSION

Cases of an anomalous left coronary artery are rarely found during an individual's life; but, rather more often on autopsy.[3] The mainstay of treatment of this anomaly is surgical intervention to re-implant the artery to the left coronary cusp.[4]

Figure 1. CT Angiography



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Case Report: Antepartum Hemoperitoneum Secondary to Uterine Sacculation Attributed to D&C

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***St. George's School of Medicine

CASE REPORT

A 34 year old Hispanic G2P0101 at 22 weeks, 5 days gestational age presented to labor and delivery with signs of acute abdomen. Ultrasound showed a large amount of free fluid in the cul-de-sac, a complete placenta previa, and a possible placenta accreta. Worsening anemia prompted an exploratory laparotomy, revealing 1500 cc of blood in the abdomen with bleeding localized to exposed uterine vessels on the posterior fundus (Fig. 1). Perinatal evaluation thereafter reported placentomegaly inscribing the uterus with an accreta in the left fundal cornua. A successful cesarean section was performed at 36 weeks with a subsequent hysterectomy due to placental findings. Pathology confirmed placentomegaly and accreta along with uterine sacculation at the left cornual area (Fig. 2).

DISCUSSION

This placental accreta may be a result of the D&C for retained products of conception performed <3 weeks postpartum and 14 months prior to the patient's initial

presentation. Previous uterine intervention, including curettage, has been associated with increased risk for abnormal placentation.[1] In another case report, placental accreta was also attributed to a prior D&C as the patient, similar to ours, had no other known risk factors.[2] In addition, since the risk of uterine perforation due to a D&C is significantly higher when performed within 15 weeks post partum, a uterine perforation could have gone undetected.[3,4] This would explain the presence of uterine sacculation as secondary to a myometrial defect.[5] Prospectively, less traumatic techniques to remove products of conception may be considered.

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Figure 1. Uterine vessels on posterior fundus

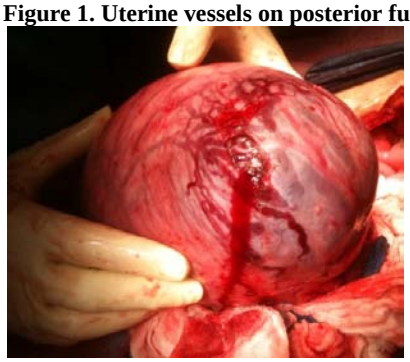
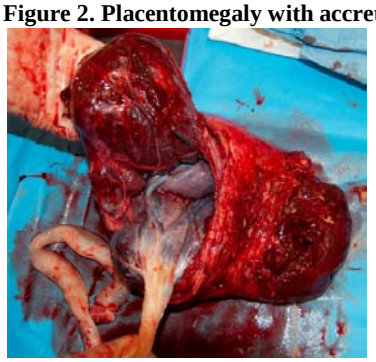


Figure 2. Placentomegaly with accrete and sacculation



Case Report: Appendicular Mucocele, Case Report and Literature Review

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INTRODUCTION

Mucocoele of the appendix is a condition characterized by a cystic dilation of the lumen due to obstruction and consequent accumulation of mucus. It was first recognized as a pathologic entity by Rokitansky in 1842 and was named by Feren in 1876. There are four pathological entities described according to the characteristics of the epithelium: Simple mucocoeles result from obstruction of the appendiceal outflow, characterized by normal epithelium; mucoceles with hyperplastic epithelium; mucinous adenoma/cystadenoma is the commonest, exhibiting epithelial villous adenomatous changes with some degree of epithelial atypia; malignant mucinous cystadenocarcinomas.

CASE REPORT

A 78-year-old male presents with complaints of fatigue and abdominal pain for the last 2 months accompanied by weight loss, family history positive for colon cancer. Physical exam is significant for RLQ fullness, FOB was negative, but found to be anemic on CBC. He was referred for colonoscopy and found to have cecal compression. CT scan of abdomen and pelvis detected 14 x 6 cm ovoid mass projecting from the cecum, which it indents, extending to the right side of the pelvis, suspicious of appendiceal mucocele. Patient underwent exploratory laparotomy, carried out with resection of the appendiceal mucocele, cecum and terminal two inches of ileum (Fig 1). Post operative course was uneventful, liquid diet started second day post surgery, and patient was discharged on the 4th day after surgery. Pathology report was mucinous cyst adenoma with low grade dysplasia at the base of the appendix, cecal and ileal portions were free of the disease.

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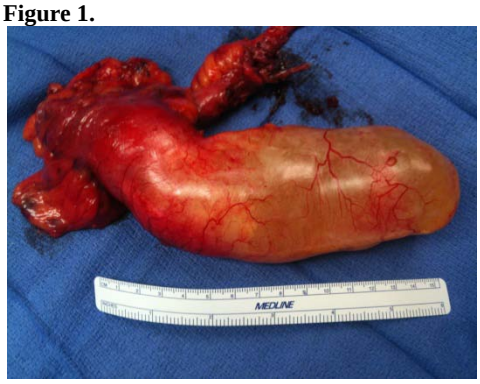
Figure 1.



Case Report: Capnocytophaga Brain Abscess

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INTRODUCTION
Capnocytophaga spp. are capnophilic, facultative anaerobic, Gram-negative rods residing in the mouths of dogs and cats.[1,2] Human infection can present a wide range of clinical symptoms, including flu-like symptoms, cellulitis, sepsis, endocarditis, and meningitis.[3]

CASE REPORT
A 40-year-old African American male with a past medical history of a left-sided gunshot wound to head 18 years prior presented to the emergency room after 1-hour of left-sided headache, photophobia, and fever. He denied trauma; drug screen was negative. The patient seized in triage. Serum WBC 13.2. Lumbar puncture revealed protein 135, glucose 63, WBC 620 with 73% neutrophils, 3% lymphs and 190 RBCs. Head CT showed multiple metallic densities in the left temporal lobe region, presumed to be bullet fragments. Left maxillary sinus showed encephalomalacia. Blood and CSF cultures were negative. Empiric antibiotics were begun. Day 3 of admission he seized again. Head CT showed pneumocephalus and fluid surrounding the left temporal lobe. A left-sided mini-pterion craniotomy with evacuation of abscess from the temporal lobe was completed without complications. Abscess cultures grew capnocytophaga. Antibiotics were switched to penicillin. The patient's symptoms resolved and he was discharged.

DISCUSSION
Capnocytophaga infection is rare, 0.67 per million population, but may be underreported due to fastidious growth requirements and long culture period.[4] Our patient had no recent contact with animals. This case highlights how an extremely rare infection can present with non-specific symptoms and demonstrates the importance of diligent microbial identification to initiate appropriate life-saving treatment.

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Case Report: Cardiac Arrest Following Consumption of an Energy Drink

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**Easton Hospital: Department of Medicine, Division of Cardiology
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INTRODUCTION
During the past few years, energy drinks have become more popular. Such products are aggressively marketed with claims that they provide immediate energy and improved cognitive performance.[1] We present a case of cardiac arrest with a new popular energy drink marketed as Liquid Cocaine®.

CASE REPORT
A 69 year old male with no significant past medical history and on no regular medications consumed an initial morning cup of espresso. One hour later he consumed an energy

drink. In less than 30 minutes, he experienced palpitations, lightheadedness and shortness of breath, with no chest pain. Despite resting, his symptoms progressively worsened. He reported that he had consumed 2-3 cans a day of the same energy drink during the past four weeks with no adverse symptoms. Physical examination was unremarkable with no evidence of heart failure. Electrocardiogram showed nonspecific ST-T changes. An echocardiogram and coronary angiogram were unremarkable. The patient was discharged on a beta- blocker with instructions to avoid caffeinated energy drinks. A subsequent electrophysiology study was normal. On regular follow-ups within one year off beta -blocker therapy the patient denied any symptoms and there was no evidence of further arrhythmia.

DISCUSSION

Our patient with no underlying structural heart disease and no coronary artery disease developed a life threatening arrhythmia directly associated with the energy drink. This potentially lethal side effect is alarming. Public awareness of such potential side effects of caffeine-based energy drinks and proper public education in regard to limiting caffeine intake seem to be of prime importance in this matter.

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Table 1. Amount of Caffeine in 250 ml of beverage

Brewed Coffee	Instant Coffee/Tea	Coca Cola	Diet Pepsi Max	Red bull	Liquid Cocaine
112 -200 mg	40 -146 mg	38 mg	30 mg	80 mg	280 mg

Case Report: Catheter Associated Pantoea sp. Bacteremia

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**Drexel University College of Medicine: Department of Medicine, Division of Infectious Disease

INTRODUCTION

Bloodstream infections are a known complication of intravenous therapy via a peripherally inserted central venous catheter (PICC). Pathogens isolated are usually Gram positive organisms commonly found on the skin, i.e. staphylococci. We present a rare case of PICC-associated Pantoea spp. bacteremia.

CASE REPORT

A 64 year-old woman with dilated cardiomyopathy and an implantable cardioverter-defibrillator (ICD) was admitted with complaints of fevers and chills of 2 weeks duration. She had been receiving home infusion with milrinone through a PICC that had been placed 6 months prior. On presentation, she was febrile but had a normal white blood cell count. History and physical exam failed to reveal any obvious source of infection; the PICC was thus removed and empiric broad-spectrum antibiotics were started. Both sets of blood cultures grew Pantoea species sensitive to levofloxacin. Antibiotic therapy was adjusted accordingly and repeat blood cultures were negative. A trans-esophageal echocardiogram did not show any vegetation on either valves or ICD leads. The patient was discharged on oral antibiotics to finish two weeks of treatment.

DISCUSSION

Pantoea (previously Enterobacter/Erwinia) spp. are gram-negative rods commonly found in plants and fecal matter that can rarely cause bacteremia. Species level identification is often not possible through VITEK 2 testing. When analysed by 16 S rRNA sequencing, P. agglomerans is the most common species causing human infections. Penetrating trauma by vegetation remains the usual portal of entry. However, line-related infections and contaminated infusate can also lead to clinical disease. Pantoea spp are generally susceptible to aminoglycosides and fluoroquinolones.

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Case Report: Cellulitis Following Sea Water Exposure

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**Abington Memorial Hospital: Department of Medicine, Division of Infectious Disease

INTRODUCTION
Mycobacterium marinum is a nontuberculous mycobacterium that is ubiquitously found in aquatic environments. Infection occurs in immunocompetent and immunocompromised hosts who come in contact with the organism via infected water, fish tanks, nonchlorinated swimming pools, and sea animals.

CASE REPORT
A 62-year-old woman with rheumatoid arthritis on methotrexate and adalimumab cut her left thumb cleaning barnacles off her boat in the Chesapeake Bay. The wound failed to respond to ciprofloxacin and amoxicillin/clavulanate. A month later she noticed a raised nodular lesion over the interphalangeal joint of her left thumb with surrounding redness, and several more proximal nodules on the forearm and cord like lymphangitis up to the antecubital fossa. She had surgical excision of the thumb nodule, and pathology showed granulation and necrosis as well as acid-fast bacilli. Culture grew Mycobacterium marinum. The patient was started on ethambutol and clarithromycin. Adalimumab was held.

DISCUSSION
This case highlights the importance of history taking (water exposure) in a patient with cellulitis, and also that vancomycin is not the answer for all cellulitis. Mycobacterium marinum infection in humans is mostly restricted to the skin, but tenosynovitis, septic arthritis and osteomyelitis are seen. Disseminated infection is rare. Clarithromycin and ethambutol are a reliable combination, with rifampin added for more complicated infection. Typically 3 to 4 months of therapy is needed, although longer courses are sometimes required. Patients receiving anti-tumor necrosis factor-α therapy are at increased risk for granulomatous diseases. Whether anti-TNF-α therapy can be safely continued during antimycobacterial therapy is not clear.

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Case Report: Central Pontine Myelinolysis after Liver Transplant Surgery and Role of Sodium

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**Drexel University College of Medicine: Department of Medicine, Division of Nephrology

INTRODUCTION
Central pontine myelinolysis (CPM) is a serious complication that can occur in patients who undergo orthotopic liver transplantation (OLTx). Exact etiology of CPM is unclear but severity of preoperative hyponatremia and intraoperative rise in serum sodium are few possible factors. Other electrolyte changes during the surgery can play a role as well.

CASE REPORT
We report a case of a 47 year old female admitted for liver failure from autoimmune hepatitis. She was listed for liver transplantation and soon a donor become available. Her serum Na concentration 1 day before and at time of surgery was 144 and 141 mEq/L respectively. Her immediate post operative Na was 152 mEq/L with a rise of 11 mEq at a rate of 0.9 mEq/hr. During surgery she received 100 mEq of NaHCO3, 1500 ml Albumin, 1000 ml of Isolyte and multiple blood products. Serum Na increased to154 mEq/L on first post operative day. Patient developed respiratory distress on POD 2 and was reintubated. She remained stuporous and developed focal neurological deficit by POD 4. A brain MRI was performed which showed findings consistent with central pontine myelinolysis. Patient remained in the hospital for more than 3 months due to multiple complications. She had partial recovery from neurological deficit. Patient died few weeks later from pulmonary complications.

DISCUSSION
Significant change in serum Na and other electrolytes can occur during OLTx which are the likely cause of CPM. It is unclear based on current literature whether serum Na alone is responsible for CPM in these patients.

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Case Report: Chronic Myelomonocytic Leukemia (CMML) and Marginal B-cell Lymphoma (MZBCL) presenting as Autoimmune Hemolytic Anemia and Jaundice in an Elderly Patient

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Monmouth Medical Center: Department of Medicine

INTRODUCTION

We present a unique case of a patient who presented with increasing bilirubin and autoimmune hemolytic anemia, and was found to have CMML and splenic MZBCL.

CASE REPORT

An 81-year-old man with atrial fibrillation, for which he was on warfarin, presented with significant bleeding from the right side of his scrotum after trivial trauma. Examination was normal except for the presence of scleral icterus. Labs showed a total bilirubin 12.1 (direct bilirubin 5.7), AST 78, ALT 19, LDH 588, reticulocyte count 6.5%, haptaglobin <10 and INR was 5.7. Coomb's test was positive, with complement positive and immunoglobulin G negative. WBC was 12,400 K/CMM with 20% monocytes; previous laboratory studies over the prior 2 years showed persistent monocytes elevation. Ultrasound of liver, vascular flow assessment, HIDA scan, and MRCP were non-diagnostic. High dose prednisone was initiated, but the bilirubin increased to 43.6 mg/dl. Bone marrow biopsy showed markedly hypercellular marrow for age with bilineage dysplasia and persistent monocytosis in peripheral blood consistent with CMML. Given the continued rise in bilirubin, a liver biopsy was performed. The liver was infiltrated by small mature B lymphocytes (CD20+, CD5-, CD10-, and Cyclin G1-) that formed clusters and filled up the sinuses. In addition, they were positive for BCL-2, suggestive of splenic MZBCL.

DISCUSSION

This unique case of concordance of CMML and splenic MZBCL underlines the importance of searching for underlying myelodysplastic syndromes or myeloproliferative disorders in an autoimmune presentation, keeping in mind the possibility of two underlying disorders as the cause of the symptoms.

Case Report: Coronary Cameral Fistula as a Reult of Endomyocardial Biopsy

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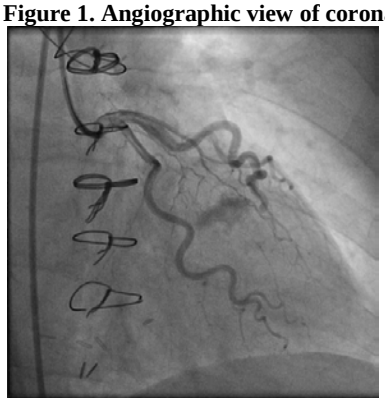
CASE REPORT

Patient is a 58 year-old female who presented for routine right heart catheterization endomyocardial biopsy and intravascular ultrasound post orthotopic heart transplant approximately 1year prior. She underwent right heart catheterization first, then biopsy sampling through a right femoral access. After this she underwent angiography of her coronary arteries and then intravascular ultrasound. Angiography (Fig. 1) shows a clear coronary cameral fistula from a septal artery to her right ventricle. This fistula was not present on her prior catheterization.

DISCUSSION

Cornary cameral fistulas are seen at a rate of 16/208 post orthotopic heart transplant patients. Seven (3.4%) of those patients were fistulas from the coronary artery to the right ventricle. With an increase in endomyocardial biopsies post transplant and coronary angiography to monitor for vasculopathy, we can expect to see more coronary cameral fistulas.

Figure 1. Angiographic view of coronary cameral fistula from a septal branch of LAD into right ventricle



Case Report: Cyclic Vomiting Syndrome (CVS): An Often Overlooked Diagnosis

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CASE REPORT
A 41-year-old female with a history of anxiety, depression and panic attack presented to the emergency room with complaints of nausea, abdominal pain and 15 episodes of vomiting of one day duration. She appeared anxious and restless upon admission. She reported experiencing 4-5 such episodes per year lasting about 3-4 days. These episodes were typically accompanied by anxiety. Previously, she had received an extensive work-up which included an upper and lower gastrointestinal endoscopy, an abdominal CT scan, an ultrasonography and a gastric emptying study. None of the tests confirmed any organic etiology that could explain her symptoms. Her previous hospital admissions also pointed out a questionable history of CVS. After ruling out all possibilities, she was diagnosed with CVS.

DISCUSSION
CVS is an idiopathic disorder characterized by recurrent episodes of vomiting with symptom-free intervals of weeks or months. CVS was initially considered to be a pediatric disorder but it can also occur in adults.[1] The diagnosis is frequently delayed by 8-21 years following onset of symptoms due to absence of specific diagnostic laboratory or imaging tests. Erratic behaviors induced by the emetic phase of CVS are often mistaken for psychiatric or bulimic disorders.[1-3] CVS is often missed even in patients with an established diagnosis due to a lack of awareness. Therefore it is important to be highly suspicious of CVS in patients with recurrent vomiting without any organic causes.[4] Once the diagnosis is confirmed based on history, it is unnecessary to order further diagnostic tests otherwise clinically indicated.

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Case Report: Cytomegalovirus Colitis in the Immunocompetent Patient

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INTRODUCTION
The severity of damage by cytomegalovirus in immunocompromised patient causes problems, especially among transplant and HIV patients.[1] Infection in immunocompetent host is generally asymptomatic; however primary CMV infection can lead to complications with significant morbidity and mortality.

CASE REPORT
A 78 y/o female brought to ED for 1 week history of abdominal pain, complaining of persistent non-bloody diarrhea and nausea. Pain described as constant soreness. Nothing made pain better or worse. Abdominal CT scan showed signs of ischemic bowel. She later developed an acute abdomen and was taken to OR for emergent hemicolectomy and colostomy creation. Biopsy showed viral cytopathic effects and positive staining with CMV immunostain consistent with CMV colitis. She was treated with IV Gancyclovir and recovered uneventfully.

DISCUSSION
Based on patient location, 40-100% of the general population are exposed to CMV.[2] A meta-analysis on CMV colitis showed complete resolution of symptoms with age < 55 years old. This may be a result of co-morbidities versus age related dysfunction of B-cell and T-cell lymphocytes.[2] Diarrhea is most common presenting symptom while fever and abdominal pain were seen in over 50% cases.[1] It is essential to include CMV colitis in the differential for patients with bloody diarrhea and colonic lesions.

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Case Report: Development of a Cutaneous Hypersensitivity Reaction to Clopidogrel (Plavix)

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INTRODUCTION
Clopidogrel is a known anti-platelet drug that acts by antagonism of platelet adenosine diphosphate receptors. According to data from IMS health Clopidogrel (Plavix) was fourth in overall drug sales within the United States. Side effects include GI bleeding, CVA, and TTP, and less commonly a hypersensitivity allergic reaction.

CASE REPORT
A 68 year old female presented with unstable angina, requiring PCI and intra coronary stenting. Subsequently, she was started on Aspirin and Plavix. 2 weeks later the patient presented with a maculapapular rash over her torso and limbs. Clopidogrel was held, and her rash resolved shortly thereafter. She was then started on Prasugrel (Effient).

DISCUSSION
The mechanism of clopidogrel allergy occurs as both an immediate and delayed-type hypersensitivity. Reported incidence of Clopidogrel rash in the CAPRIE study was 0.26 %. Ticlopidine has been associated with higher adverse effects, including increase incidences of rashes, hypersensitivity rxn, and agranulocytosis. Prusegrel appears to have lower risk associated with its utility.

The number of patients on clopidogrel will continue to rise. Physicians should become familiar with the signs and symptoms of hypersensitivity reactions and acknowledge therapeutic alternatives including Prusegrel and lesser recommended Ticlopidine.

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Case Report: Diagnostic Challenge of Infective Endocarditis: Rethinking Duke Criteria

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INTRODUCTION
Infective endocarditis (IE), characterized by microbial infection of the heart endothelium, can present with numerous signs and symptoms. We describe a case of "Possible IE" using Duke criteria.

CASE
A 23-year-old female admitted for right hand abscess with foreign body of 1 week duration. Vital signs were stable; there was a scar from previous incision on the dorsum of the right hand with induration. There was erythema with an area of cellulitis about 5 cm x 5 cm around it. Our concern was an abscess and probable osteomyelitis secondary to a foreign body. She was started on cefazolin. Small amount of purulent fluid was expressed. On hospital day 2 patient had fever of 100.1°F. Gram stain showed gram-positive cocci in pairs and clusters in both blood and wound. Transesophageal echocardiograph showed no valve vegetation. On hospital day 4 patient had fever of 103°F along with auditory hallucination. Left hand abscess improved significantly without signs of infection. Day 5 after discharge she was re-hospitalized after developing fever (101.3°F) and shaking chills. Blood culture revealed polymicrobial sepsis. CT scan revealed scattered small ill-defined nodular opacities, marked splenomegaly and striated nephrograms (Fig. 1). Endocarditis was therefore presumed as source of multiorgan septisemia.

DISCUSSION
Duke criteria, though validated by several authors[1,2] do have some shortcomings, one of which is the overly broad categorization of the group "possible IE." Appropriate diagnosis is important for length of treatment and proper follow-up. Duke criteria should remain a clinical guide for diagnosing IE and should never replace clinical judgment.

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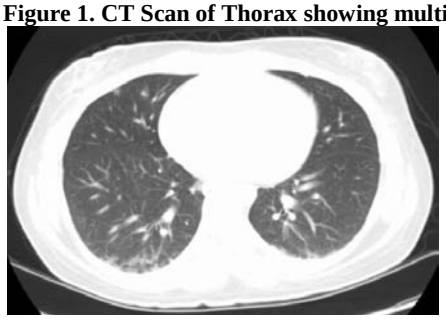
Figure 1. CT Scan of Thorax showing multiple ill-defined nodular opacities



Case Report: Early Diagnosis of Multiple Sclerosis

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BACKGROUND
Multiple sclerosis is a progressive demyleinating disease of the central nervous system. Early diagnosis and treatment can delay progression of the disease.

CASE REPORT
21 year old African American female presented for a school physical office visit. Over past 2 weeks, she had noticed right leg weakness, paresthesias on right abdomen, dysgraphia and unsteady gait. She denied any diplopia, alteration in vision or auditory acquity, vertigo, headaches, and urinary or bowel incontinence. Social history is noncontributory. Physical examination revealed normal cranial nerves, normal sensation and motor strength 5/5. However, she had difficulty completing finger-to-nose testing on right side and Rhomberg positive. Labs showed normal vitamin B12 and folate levels, RPR nonreactive. MRI of the brain with contrast showed 2.4 cm left periventricular lesion demonstrating enhancement without mass effect. Focal multiple sclerosis plaque is the most likely etiology. Patient was then referred to Neurology.

DISCUSSION
Multiple scleroisis (MS) is a chronic, progressive, demyleinating disease of the central nervous system. In the United States, 400, 000 people are affected by MS.[1] MS has peak onset between ages of 20 to 40, has female to male ratio of 2:1 and seen in temperate climates. Initial clinical presentation can vary from weakness, paresthesias, gait disturbances, optic neuritis and bladder or bowel disturbance.[2] Primary care physicians who evaluate patients with isolated clinical events should ensure prompt assessment with MRI of the brain and a neurological consult. Both early diagnosis and early treatment can help prevent long term sequelae in patients with MS.[1]

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Case Report: Early Onset Cardiotoxicity with Low-dose Citalopram

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CASE REPORT
An 86-year-old Caucasian female was admitted with symptoms of congestive heart failure. Her past medical history was significant for myocardial infarction and ischemic cardiomyopathy with ejection fraction of 40% a year ago. The ECG showed atrial fibrillation at 100 bpm, with corrected QT interval of 428msec. Her electrolytes were normal. She was treated with metoprolol for rate control and heparin for anticoagulation, and subsequently converted to sinus rhythm. For depression she was started on citalopram 10mg at night daily. After 2 doses of citalopram and about 27 hours after the first dose, she developed short runs of Torsades de Pointes (TdP) (Fig. 1). Her citalopram was discontinued and she was started on a Magnesium sulfate drip. With a serum Mg level of 1.9 and drip still running, she went into sustained TdP (Fig. 2) and cardiac arrest. Post-resuscitation she received a transvenous pacemaker and was overdrive paced for the next 48 hours. After discontinuation of the pacemaker, she did not have any more ventricular arrhythmias.

DISCUSSION
When citalopram is metabolized by the hepatic CYPs the generation of a cardiotoxic metabolite is responsible for the arrhythmias.[1] The CYPs either demonstrate significant genetic variability (2C19, 2D6) or are highly susceptible to inhibitors (3A4), thus creating the possibility of individuals with either unique sensitivity (extensive metabolizers forming disproportionate amounts of cardiotoxic metabolite) or those with delayed toxicity (slow metabolizers).[1]

CONCLUSION
We presume our patient was an extensive metabolizer and thus had early onset toxicity with a very low dose.

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Figure 1.

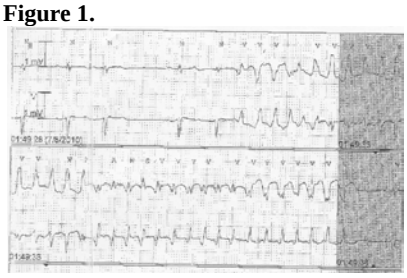
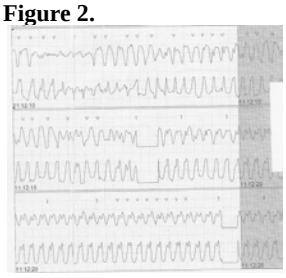


Figure 2.



Case Report: Endoscopic Retrograde Cholagniopancreatography: A Rare Cause of Splenic Avulsion

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INTRODUCTION

Endoscopic Retrograde Cholangiopancreatography (ERCP) is an invasive diagnostic and therapeutic procedure used for over fourty years. ERCP carries a complication rate close to 16% and a mortality of 1%. Splenic injuries post ERCP are extremely rare and only less than ten cases have been documented around the world. Here we present a 55 year old female who suffered from splenic capsular avulsion post ERCP.

CASE REPORT

A 55 year old female was admitted to the surgical service for diagnosis of acute choelcystitis with elevated liver enzymes. Her past medical and surgical history were significant for hypothyroidism, cesarian-section, tonsillectomy and right lower extremety fracture. The patient underwent laparoscopic cholecystectomy with common bile duct exploration and an intraoperative cholangiogram. No evidence of choledocholithiasis was noted. Her post operative course was complicated by elevation of her liver enzymes. An MRCP was performed which did not yield any stones in common bile duct. Despite conservative management, the patient continued to have elevated liver enzymes. The patient underwent an ERCP with sphincterotomy on post operative day six which showed sludge in the CBD. Soon after the procedure the patient was complaining of generalized abdominal pain. Within 12 hours, the patient became hypotensive and tachycardic and developed a rigid abdomen. Laboratory work up was significant for a hemoglobin level of 5.7 g/dL from 11.2 g/dL prior to ERCP. An enhanced CT scan of abdomen and pelvis (Fig. 1) revealed a large amount of free fluid with capsular avulsion of the spleen. An urgent exploratory laparotomy confirmed splenic capsular avulsion with massive hemoperitonium and a splenectomy was performed. Pathology reports were significant for a ruptured spleen. The patient's postoperative course was uneventful and she was discharged home on the third postoperative day.

DISCUSSION

ERCP is a very useful tool in conducting billiary procedures. However, despite of it's liberate utilities it is associated with several well known complications such as; pancreastitis (3-7%), hemorrhage (2-4%), cholangitis (1-3%), duodenal or esophageal perforation (less than 1%) with overall mortality of 0.5-1 percent. Splenic injury is a along with transverse colon ischemia and hepatic injuries are rare complications of the ERCP. This is the tenth case reported world wide with the splenic injury post ERCP and the third case of the splenic capsular avulsion.[4,5]

The mechanism of the splenic injury is attributed by many authors to looping of the endoscope with traction on the greater curvature of the stomach, short gastric vessels, and splenic capsule. Over insufflation of the stomach and the presents of intraabdominal adhesion may play some role in the splenic injury as well. In the majority of these cases (Table 1), the splenic injuries were discovered incidentally during work up of abdominal pain post ERCP. These reports clearly show the importance of prompt recognition of splenic injuries. Many of the practicing endoscopist have never encounter such a complication and they may not consider these injuries in their priority lists.

CONCLUSION

Splenic avulsion from ERCP is extremely rare; however, recognizing the importance of an early diagnosis of such injuries is pertinent to patient safety.

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Figure 1. Splenic Avulsion on CT

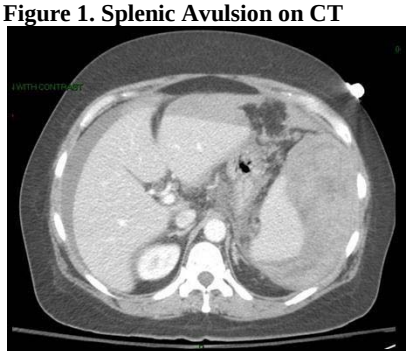

Table 1. Cases with injuries after ERCP

Reference	Intervention	Time to diagnosis	Pathological findings	Therapy	Outcome
Lewis et al[5]	ERCP, stenting	9 hours	Avulsion of short gastric vessels	Splenectomy	Full recovery
Zyromski and Camp[6]	ERCP, sphincterotomy	72 hours	Avulsion of short gastric vessels	Splenectomy	Full recovery
Trondsen et al[7]	ERCP, sphincterotomy	15 hours	Spleen 'decapsulated'	Splenectomy	Full recovery
Wu and Katon[8]	ERCP	68 hours	Splenic capsular avulsion	Splenectomy	Full recovery
Furman and morgenster[9]	ERCP, sphincterotomy	Not available	Splenic abscess	Conservative	Full recovery
Lo et al[10]	ERCP, sphincterotomy	48 hours	Subcapsular haematoma	Conservative	Full recovery
Ong et al[11]	ERCP	48 hours	Splenic laceration	Splenectomy	Full recovery
Badaoui et al[12]	ERCP	20 minutes	Splenic laceration	Splenectomy	Full recovery
Kingsley et al[13]	ERCP, stenting	24 hours	Not reported	Splenectomy	Death
Choi et al[14]	ERCP	18 hours	Splenic laceration	Splenectomy	Full recovery
Present Case	ERCP, sphincterotomy	8 hours	Splenic capsular avulsion	Splenectomy	Full recovery

Case Report: Epiploic Appendagitis in an 8 Year Old Male

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CASE REPORT

A 9 year male old presented with a 2 day history of worsening sharp right lower quadrant pain associated with occasional episodes of loose stools, decreased PO intake and urine output. No fever, nausea, vomiting, sick contacts, recent travel, medication use or trauma. Vital signs were within normal range. He appeared in moderate distress with significant right lower quadrant tenderness on palpation. Further evaluation revealed a normal CBC and comprehensive metabolic panel, ESR 28 mm/hr, CRP 29 mg/L, normal lipase, amylase and urine analysis. Abdominal CT scan (Fig. 1) was consistent with the rare diagnosis of epiploic appendagitis. The patient was managed conservatively, and discharged home within two days.

DISCUSSION

Epiploic appendages are small, fat-filled, serosa covered structures located at the colon's antimesenteric surface.[1] Primary epiploic appendagitis is caused by torsion of these appendages. Patients present with acute abdominal pain, predominantly in the lower quadrants mimicking symptoms of acute appendicitis.[2] Epiploic appendagitis is usually a self limiting condition.[3] The pathognomic appearance on computerized tomography is typically a 1 to 4 cm oval-shaped, fat density lesion with an enhancing rim adjacent to the colon, thickened visceral peritoneal lining and periappendaceal fat stranding.[4] Epiploic appendagitis is an uncommon cause of abdominal pain in pediatric patients. Only a few cases have been reported.[5]

CONCLUSION

Epiploic appendagitis, although rare, may be a cause of acute abdominal pain in children possibly confused with acute appendicitis. After radiological confirmation conservative management is suggested and surgery may be avoided.

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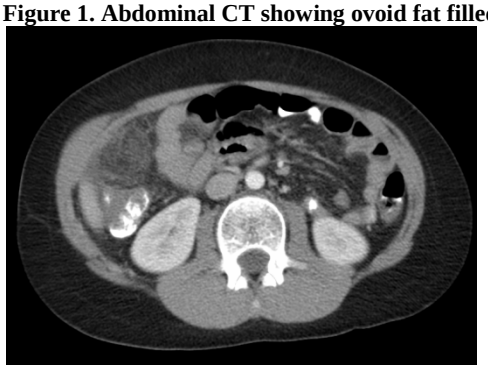
Figure 1. Abdominal CT showing ovoid fat filled lesion with an enhancing rim on the anti-mesenteric border of the colon



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Case Report: Erythema Nodosum: Subtle Sign of Systemic Illness

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INTRODUCTION

Erythema nodosum (EN) is characterized by red or violet exquisitely tender subcutaneous nodules that are usually located in the pretibial area. EN often appears as a sign of a serious illness that is potentially treatable.

CASE

A 32 year old female with history of ulcerative colitis (UC) presented with bilateral lower extremity pain and redness of one week duration. She described the pain as constant, sharp, followed by a prolong burning sensation that resolved slowly in about 30 minutes. Her last UC flare was 3 months prior. She had a fever of 100.3F and a 12cm raised extremely tender erythematus macule on the extensor surface of the left anterior tibia. There was a 5cm erythematus tender nodule on right leg(Fig. 1). There was no evidence of phlebitis.

DISCUSSION

EN probably is a delayed hypersensitivity reaction to a various antigens. Circulating immune complexes have not been found in idiopathic or uncomplicated cases but may be found in patients with inflammatory bowel disease (IBD).[1] The annual incidence of EN is approximately 1 to 5/100,000 persons, most often women ages 15 to 40 years.[2] Mert and colleagues showed primary streptococcal pharyngitis, tuberculosis sarcoidosis, IBD, and Behçet's syndrome as the main etiologies of EN.[3] Biopsy is required only in atypical cases. Differential diagnosis should include erysipelas, insect bites, urticaria, familial Mediterranean fever and superficial migratory thrombophlebitis.

EN in this patient was presumed to be secondary to ulcerative colitis, and treated with prednisone. NSAIDs were avoided since they have been reported to precipitate relapse of inflammatory bowel disease.[4]

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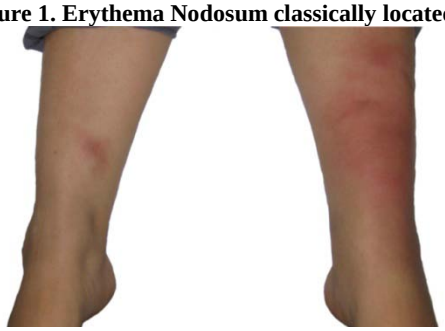
Figure 1. Erythema Nodosum classically located on pretibial surface of bilateral lower extremitis



Case Report: Fever in a Returning Traveler

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INTRODUCTION

Fever is a common cause of hospitalization among returning travelers. Obtaining a thorough history is important in the evaluation of these patients.

CASE REPORT

A 27-year-old female presented to the hospital with fever, abdominal discomfort and diarrhea for 2 days. The pain was diffuse and associated with non-bloody diarrhea. On further questioning she admitted to visiting family one week prior in Bolivia. She stated that she drank bottled water, and while she attempted to only eat well-cooked food, she did have several pieces of fruit from a market. She appeared well nourished but had a fever to 102.3F. Physical examination revealed mild diffuse abdominal tenderness, but no signs of rebound. The heart, lungs, and skin exam were unremarkable. Laboratory exam showed a normal white cell count. AST was 59 but the rest of the liver enzymes were normal. A peripheral smear for parasites was negative. CT of the abdomen showed mural thickening of the terminal ileum and ileocecal valve. She was started on Ceftriaxone and was placed in enteric precautions. Blood cultures grew Salmonella paratyphi-B. A diagnosis of paratyphoid fever was made.

DISCUSSION

This case highlights the importance of obtaining a thorough travel history when evaluating patients with fever. Though malaria is the most common cause of fever in returning travelers, typhoid fever must also be kept in mind. The incubation period ranges from 1-3 weeks. Patient can experience high fever, abdominal pain, and diarrhea. The diagnosis can be made by blood cultures or bone marrow biopsy. The treatment includes third-generation cephalosporins.

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Case Report: Fever of Unknown Origin Explained by Isolated Splenic Vein Thrombus

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INTRODUCTION

Fever of unknown origin (FUO) is defined as temperatures greater than 38.3°C (101°F), more than three weeks duration of illness, and failure to reach a diagnosis despite three days of inpatient investigation or three outpatient visits.

CASE REPORT

In this case, a 61 year old man with history of hepatitis C presented to our institution for work-up of a four-week history of intermittent fevers, chills, and night sweats. He had no symptoms involving his respiratory, gastrointestinal, or urinary tract. CBC revealed microcytic anemia and leukocytosis without a left shift. Liver and pancreatic enzymes were mildly elevated. Cultures of blood, urine, stool, and sputum were negative. Triple-phase CT of his abdomen revealed portal hypertension with varices, splenomegaly, and a filling defect in the splenic vein consistent with thrombosis and resultant infarcts in the anterior spleen (Figs 1,2).

DISCUSSION

Deep vein thrombosis, including portal vein or splenic vein thrombosis (SVT), has been found to be an important cause of FUO. Fever may result from leukocyte recruitment, pyrogenic cytokines, or a superimposed infection. SVT is usually due to pancreatic pathology, although SVT has been associated with long standing hepatitis C.[2] Our patient underwent an extensive inpatient work-up, defervesced, and was discharged home without antibiotic therapy, supporting our conclusion that his fever was due to an isolated SVT.

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Figure 1.

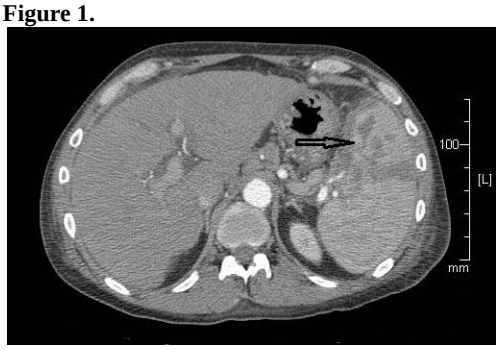
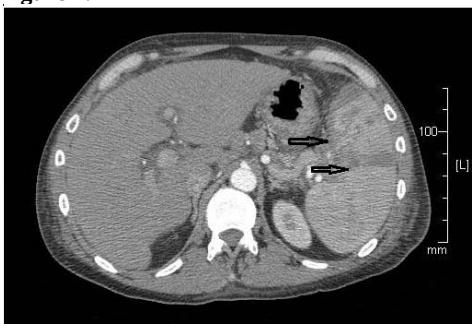


Figure 2.



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Case Report: Global Hypokinesis of Left Ventricle Following Acute Methadone Intoxication

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CASE REPORT

An 18-year-old opioid naive male was brought to the ED for hypoxia, pin-point pupils and coma after taking 50mg of methadone for suicidal intent. He had a past history of depression and asthma. Patient was tachycardic, hypoventilating, and lethargic with a GCS of 12. Remaining physical examination was normal on presentation. Patient was given naloxone in the ED which made him awake and alert. The labs were significant for an elevated Troponin-I of 0.61ng/ml. Urine-drug-screen showed an opiate level of>300ng/ml. EKG showed sinus tachycardia at 128-bpm with a Qtc=458ms and no acute ST- T wave changes. Trans-thoracic echocardiogram revealed severe global hypokinesis of left ventricle with EF of 10-15%. Patient was admitted to the ICU for monitoring. The cardiac enzymes trended down. He did not have any signs or symptoms of ischemia or congestive heart failure and was started on ACE inhibitor and beta blocker. Patient was discharged to outpatient psychiatric rehabilitation. A follow-up echocardiogram at one month showed normal left ventricle systolic function with EF 50-55%. The patient

did not develop symptoms of heart failure in the follow up period.

DISCUSSION

Methadone is known to cause prolongation of the QT interval leading to ventricular tachycardias such as Torsades-de-pointes.[1] This case shows a potential but rare side effect of methadone on the heart in acute intoxication. A literature review revealed similar case-reports showing association of methadone overdose with acute systolic dysfunction of the heart.[2] The exact mechanism of this finding is unknown.

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Case Report: Gastric Ulcer Eroding into the Left Gastric Artery after Gastric Bypass Surgery

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CASE REPORT

We present the case of a 60 year old Caucasian female brought to our emergency room after being found in her home unconscious. The patient awoke and complained of severe abdominal pain and was noted to have massive hematemesis. In our emergency room, the patient was noted to be hemodynamically unstable. Initial laboratory data revealed Hgb 8.1, Lactic Acid 12.7, Cr 1.0. Initial resuscitative measures were instituted with crystalloids and vasopressors. A review of the patient's medical history was significant for the following: open gastric bypass (5 years prior to her hospital admission), cholecystectomy, peptic ulcer disease, rheumatoid arthritis, and diabetes mellitus. The patient was also a devout Jehovah's Witness (refusing any and all blood products). An urgent esophagogastroduodenoscopy was performed in the ER. A large marginal ulcer was noted at the anastamosis between the stomach pouch and the jejunal Roux limb. The ulcer had fresh clot and when manipulated produced torrential bleeding. The patient was taken urgently to the operating room for control of bleeding.

Intra-operatively we found dense intraperitoneal adhesions in the right upper quadrant, the jejunal Roux limb was grossly dilated as was the remnant stomach. There was a large marginal ulcer present at the anastamosis between the stomach pouch and the jejunal Roux limb. Exsanguinating bleeding was present from a large defect in the left gastric artery caused by the marginal ulcer. By the time control of the arterial perforation had occurred, the patient's hemoglobin was 5 and the systolic blood pressure was 50. It was apparent that the patient had sustained a non-survivable hemorrhage. The patient was transferred to the recovery room and the family agreed to the termination of all supportive measures.

DISCUSSION

As of 2002, 5.1% of the US population had a body mass index of 40 and greater. In the US alone, bariatric surgical procedures have risen from 13,365 in 1998 to 72,177 in 2002.[1] Post-operative upper gastrointestinal bleeding is a potentially fatal complication and needs to be diagnosed and treated emergently. The most common cause of post-operative bleeding in patients who have undergone Roux-en-Y gastric bypass is marginal ulceration at the gastro-jejunal anastamosis.[2] Incidence of these marginal ulcers has been noted as high as 7%.[3] Patient factors such as smoking, NSAID use and H pylori infections also increase the chance of ulcer formation. In our patient, we knew that all three factors were not present. In fact, an EGD performed one month earlier showed no abnormalities. Localization of bleeding can be performed via technetium Tc 99m red blood cells, celiac angiogram, or intra-operative gastrotomy with subsequent endoscopic evaluation.[4]

We report an unusual case of upper gastrointestinal hemorrhage due to a marginal ulcer eroding into the left gastric artery. Our patient had refused any blood products and this made resuscitation even more difficult. In addition, intra-operative localization of the bleeding was complicated by her dense intra-peritoneal adhesions. After Roux-en-Y gastric bypass, there have been reports of perforated marginal ulcers. Risk factors included steroid use, NSAID use, smoking, prior marginal ulcers.[5] In our patient we do not have a definitive cause of how this marginal ulcer evolved so rapidly (one month after a normal EGD).

CONCLUSION

Marginal ulcer erosion into the left gastric artery is a rare and potentially fatal complication noted after gastric bypass surgery. When patients with prior Roux-en-Y bypass present with massive hematemesis this condition should be considered in one's differential. Options for treatment will require operative exploration and an upper endoscopy can be performed intra-operatively.

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Case Report: Inflammatory Reaction to Hemostatic Agents Mimics Empyema after Partial Lobectomy

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INTRODUCTION

The hemostatic agents owe their recent popularity to the growth of minimally invasive surgeries, complex reconstructive procedures or combination of both. Contrary to their popularity, their off-label utilization surpasses their true indications with little consideration given to their side effects. Complications from these agents pose serious risks to patients and are very challenging to treat. Here we present a patient who developed signs of infection with an air-fluid collection mimicking an empyema on radiologic studies post-coronary artery bypass grafting and right middle lobe lateral segmentectomy and right upper lobe wedge resection. Based on the patient's clinical presentation we were able to link his morbidity to the intra-operative utilization of Gelfoam, Surgicel and Tisseel.

CASE REPORT

A 70-year-old male, with no significant past medical history and a long history of smoking, was referred to Easton Hospital cardiac surgery team after he was found to have high grade coronary artery triple vessel disease with an incidental right upper middle lobe 1.7 x 1.8 cm nodule with SUV of 7.9. Due to his severe heart disease, we performed a quadruple coronary artery bypass using saphenous vein graft with left internal mammary to left anterior descending artery followed by right middle lobe lateral segmentectomy and right upper lobe wedge resection. Intraoperative bleeding from the right chest was controlled with combination of electrocauterization and packing with a large amount of Gelfoam, Tisseel and Surgicel. The patient's perioperative course was only complicated with an episode of hematemesis. A bronchoscopy examination did not yield anything of significance. The pathology report of the specimen was positive for adenocarcinoma with clear margins and scar tissue from the wedge resection of the upper lobe. The patient was discharged home on postoperative day fifteen. Eight days after discharge, the patient returned to the Emergency Department complaining of fever, shortness of breath and lethargy for a duration of 48 hours. Initial work up by the ER physician revealed an air-fluid level in the right chest (Fig. 1) accompanied by leukocytosis. The patient was admitted to critical care unit and was resuscitated with intravenous fluid and started on piperacillin/sulbactam and vancomycin. The chest CT scan (Fig. 2) revealed an empyema over the site of the previous middle lobe which was drained by IR team with a 14 F chest tube. Cultures were sent and the collection grew streptococcus constellatus and prevotella oralis group, both of which may have been skin contaminants. His chest tube was discontinued on fifth admission day and he was discharged home off antibiotics on admission day seven.

DISCUSSION

In this case we utilized three hemostatic agents to control the bleeding in our surgical field. Surgicel, an oxidized cellulose, works by providing a mesh like platform for platelets adherence leading to creating a clot. In many surgical procedures it is left in the wound for better hemostasis. Complications from Surgicel are few but well documented in the literature as case reports. In all the reports, foreign body granuloma formations have been seen after cytological examinations of the specimens. These granuloma formations are created by incomplete digestion of the oxidized cellulose particles by macrophages. In all the cases, patients have presented either with the symptoms of abscess formation or recurrence of their tumor.[1-3]

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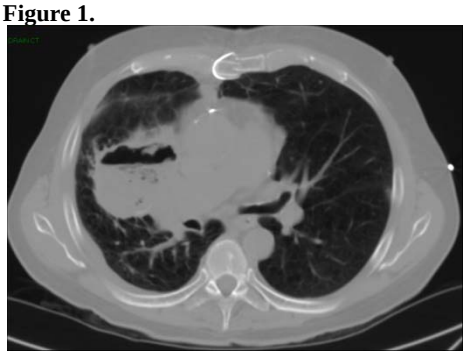
Figure 1.



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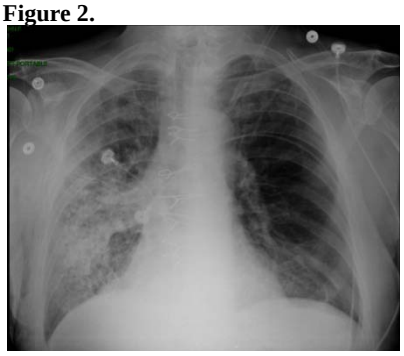

Case Report: Management of Unilateral Pheochromocytoma During Pregnancy

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INTRODUCTION
Pheochromocytoma during pregnancy is often missed because it can mimic preeclampsia, delaying diagnosis and appropriate treatment. Antenatal diagnosis is imperative to avoid maternal and fetal morbidity and mortality.

CASE REPORT
We reviewed the management of a 34-year-old African American at 19.4 weeks gestation with severe hypertension and a right adrenal mass diagnosed pheochromocytoma. Biochemical confirmation of excess catecholemine production and magnetic resonance imaging helped to establish the correct diagnosis. The patient responded to alpha-adrenergic blockade prior to undergoing robotic assisted adrenalectomy at 21weeks gestation. The patient's post-operative course was unremarkable, and she delivered a viable male infant at term via an uncomplicated cesarean section.

CONCLUSION
Pheochromocytoma has a reported incidence of < 0.2 per 10,000 pregnancies. Despite its rarity, untreated pheochromocytoma carries a risk of mortality for both mother and fetus, as high as 58%. However, antepartum diagnosis reduces both maternal and fetal mortality, allowing for safe resection of the tumor in the second trimester.

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Figure 1. US of R kidney/adrenal mass

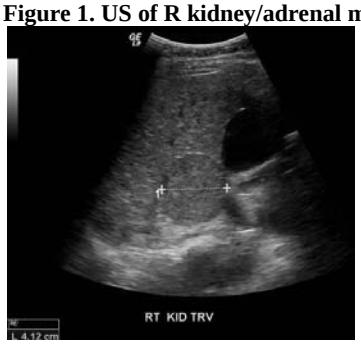
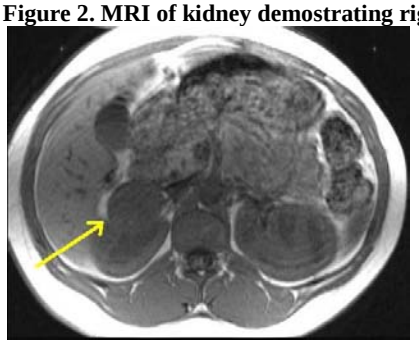


Figure 2. MRI of kidney demostrating right adrenal mass



Case Report: Mesenteric Vein Thrombosis due to Polycythemia Rubra Vera: Analysis and Review of Management

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Easton Hospital: Department of Surgery

CASE REPORT
A 73-year-old Caucasian female with history of longstanding polycythemia vera associated with organomegaly, portal hypertension, portal vein thrombosis, and esophageal variceal bleeding presented to our emergency room with severe abdominal pain. The patient had pain for 48 hours with associated episodes of emesis, diarrhea, and decreased po intake. Labaratory data was significant for a white count of 34,000 and a Hematocrit of 50.9. A CT scan of the abdomen and pelvis revealed findings that were consistent with hepatic cirrhosis, portal hypertension, and portal vein thrombosis. The liver was small and the spleen was enlarged. There was a large amount of ascites in the upper abdomen and paraesophageal areas. A thrombus was noted at the portosplenic confluence extending into the portal vein. There were multiple small bowel loops which appeared thickened. The patient's records indicated that she had a mesenteric vein thrombosis for the past 10 years. Radiographically, the mesenteric vein thrombosis was impressive. Clinically, the thrombosis was not significant; management was conservative given the past history of esophageal variceal bleeding and chronicity of the thrombus. The cause of her abdominal pain was secondary

to spontaneous bacterial peritonitis, treatment of which was with intravenous antibiotics. Unfortunately, the patient's clinical course deteriorated and the patient subsequently expired from her illness and co-morbidities.

DISCUSSION

Polycythemia vera (PV) is a stem cell disorder characterized as a panhyperplastic, malignant and neoplastic marrow disorder. PV is relatively rare, occurring in 0.6-1.6 persons per million population. The disease is characterized by an elevated absolute red blood cell mass because of uncontrolled red blood cell production. In addition, there is increased white blood cell (myeloid) and platelet (megakaryocytic) production, due to an abnormal clone of the hematopoietic stem cells. Thrombosis and bleeding are frequent in persons with PV. This clinical sequale is due to a disruption of hemostatic mechanisms because of an increased level of red blood cells and an elevation of the platelet count. There are findings that indicate the additional roles of tissue factor and polymorphonuclear leukocytes in clotting, platelet surface as a contributor to phospholipid-dependent coagulation reactions, and the entity of microparticles. Tissue factor is also synthesized by blood leukocytes, the level of which is increased and can contribute to thrombosis.

Thrombosis of major abdominal vessels, including 6 with hepatic vein thrombosis (Budd-Chiari syndrome) was seen in 14 of 140 (10%) patients with PV.[1] Leading symptoms and signs were abdominal pain, progressive splenomegaly, widening abdominal girth, ascites, venous collaterals, and nausea and vomiting. The diagnostic modalities with highest specificity were angiography and explorative laparotomy. The *JAK2*V617F mutation is recurrent in PV, a myeloproliferative neoplasm frequently associated with arterial and/or venous thromboembolism. More recently, the *JAK2*V617F mutation has been identified as a surrogate marker for subclinical or "occult" clonal myeloproliferation in patients with splanchnic venous thrombosis.[2]

When dealing with a patient with abdominal pain and a history of PV, one must entertain the possibility of mesenteric vein thrombosis. Diagnostic modalities include the use of CT scans. Therapy has to be tailored to the acuity of the thrombus (anticoagulation, laparotomy…) and to the comorbididtes at hand. Mesenteric vein thrombosis has a very poor prognosis in patients with myeloproliferative disorders and patients and their families should be aware of this.

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Case Report: Hemoglobin of 2.2 g/dl - A Case of Severe Iron Deficiency Anemia

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CASE REPORT

A 28y AA female presented with dyspnea on exertion and bilateral lower extremity swelling for two weeks. Patient had not undergone medical evaluation in recent years. She had a thirty day menstrual cycle with heavy bleeding lasting six days. There was no other significant past medical or family history and she was not on medications. Examination revealed an obese female without apparent distress. Vital signs were remarkable only for a pulse of 106. Pallor was evident in her mucous membranes. Auscultation revealed clear lungs and regular heart sounds without any murmurs. Abdominal exam showed a firm, smooth, non-tender mobile suprapubic mass extending up to the umbilicus. Her stools were hemoccult neagtive. Mild pitting edema was noted on bilateral lower extremities. Initial laboratory studies revealed low hemoglobin. Further investigations were conducted to determine the cause of anemia (Table 1). Peripheral smear showed a dimorphic population – patient's hypochromic microcytic cells mixed with normal transfused cells, with occasional schistocytes, rare nucleated RBC and reticulocytes. Abdominal ultrasound showed a 12x8.9x10.6cm fibroid in the uterus. She was transfused six units of packed RBC and intravenous iron therapy was administered. At the time of discharge, her hemoglobin was 8.6 gm/dL.

DISCUSSION

Our search for the lowest reported hemoglobin, regardless of the etiology, revealed a hemoglobin of 1.6gm/dl in an acute hemolytic anemia and hemoglobin of 2.1gm/dl caused by parvovirus infection. In both cases, anemia resulted from acute causes. In contrast, this case exemplifies the body's ability to compensate for extremely low hemoglobin levels resulting from chronic conditions.

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Table 1. Lab Values

Test	Value	Range
Hemoglobin	2.2 gm/dl	12 – 16 G/DL
MCV	53 fl	81 – 99 FL
MCH	15 pg	27 -33.6 PG
MCHC	28%	32 – 36%
RDW	22%	11.5 – 15%
Ferritin	0 ng/dl	10 – 170 NG/ML
Serun Iron	33 ug/dl	40 – 150UG/DL
TIBC	387 ug/dl	240 – 450 UG/DL
Iron saturation	9%	23 – 59%
Reticulocyte corrected index	0.13%	
Lactate Dehydrogenase	241	120 – 228 IU
Erythropoietin levels	>2000	2.6 – 34 MU/ML
WBC, Folate, B12, Haptoglobin, LDH, Direct Coomb's, ANA screen, TSH, UA, ESR, HCG, Gliadin IgG/IgA, TTG IgG/IgA, Parvo IgG/IgM, EBV IgM were within nl range.		

Case Report: Inflammatory Abdominal Aortic Aneurysm (IAAA) Presenting as Acute Bilateral Obstructive Uropathy in a Patient with Chronic Pancreatitis

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CASE REPORT

A 44 year old man presented with one day history of severe generalized abdominal pain associated with nausea and vomiting. His past medical history include chronic pancreatitis (Fig. 1), IAAA status post endovascular repair, and hypertension. Physical examination was remarkable for mild generalized tenderness over the abdomen and both costovertebral angles. Labs: BUN 49 mg/dL, creatinine 10.8 mg/dL, potassium 5.3 MEQ/L, and sedimentation rate 116 mm/hr. CT scan revealed bilateral hydroureteronephrosis and IAAA, with inflammatory tissue encroaching onto both ureters (Fig. 2). Right sided nephrostomy was placed and left sided nephrostomy was attempted without success. With only minimal improvement in renal function, bilateral retrograde ureteral stents were inserted. Steroids were initiated to treat the periaortitis. Creatinine prior to discharge was 1.7 mg/dl.

DISCUSSION

Inflammation is a component of most aortic aneurysms, but there is a clinical entity called inflammatory aneurysm. Approximately five percent of patients in a case series of aortic aneurysms have inflammatory aneurysms.[1] IAAA can be complicated by retroperitoneal fibrosis. Presenting symptoms are often low back pain, flank or abdominal pain in the early stages. Elevated sedimentation rate is classically seen. A delayed presentation is common since the early symptoms can be nonspecific and patients may present with bilateral obstructive uropathy as in our case. Also our case raises the possibility of an association between chronic pancreatitis and IAAA which is reported in literature.[2]

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Figure 1. Chronic Pancreatitis

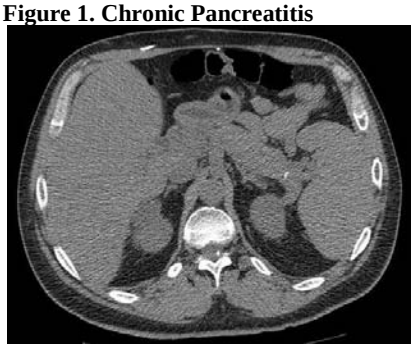
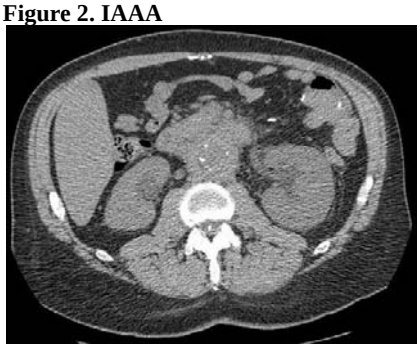


Figure 2. IAAA



Case Report: Interstitial Pneumonitis and Adult Respiratory Distress Syndrome Associated with Rituximab Therapy

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INTRODUCTION
We report a patient with non-Hodgkin's lymphoma (NHL) who was treated with Rituximab as part of his chemotherapeutic regimen and developed interstitial pneumonitis progressing to ARDS and ventilator-dependent respiratory failure.

CASE REPORT
A 47-year-old man with diffuse large B cell lymphoma, completed 6 cycles of chemotherapy with R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine and Prednisolone) and presented with fever, chills, and cough for 1 week and shortness of breath for 1 day. He was febrile and tachycardic. Lung examination was normal. Chest radiograph showed bilateral diffuse interstitial infiltrates. The patient was started on levofloxacin, but his condition worsened with a drop in pulse oxymetry to 70% on room air. A repeat chest radiograph revealed worsening bilateral interstitial infiltrates and dense consolidation. Antimicrobial therapy was changed to piperacillin-tazobactam and vancomycin, along with trimethroprim-sulfamethoxazole and prednisone to treat for the possibility of Pneumocystis jirovecii pneumonia. He developed ARDS and was intubated. Testing for Influenza A and B, blood culture and sputum culture were negative. Bronchoalveolar lavage was negative for malignant cells, P. jirovecii and other fungi, and mycobacteria; biopsy revealed rare atypical cells. A 2D-echocardiogram showed an EF of 61% .He was started on intravenous methylprednisolone for likely interstitial pneumonitis. The patient's clinical condition subsequently improved and he was eventually extubated and discharged home. He remained on corticosteroids for four weeks.

CONCLUSION
R-ILD is a rare, but potentially fatal, pulmonary toxicity due to Rituximab, and should be considered in patients who present with dyspnea, fever, and cough when there is no clear evidence of infection.

Case Report: Invasive Aspergillosis in an Immunocompetent Adult: An Uncommon Event Following Short Term Corticosteroid Use in a Critically Ill Patient

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*Monmouth Medical Center: Department of Medicine
**Monmouth Medical Center: Department of Pathology

INTRODUCTION
Invasive aspergillosis (IA) is a rare event in normal hosts. We present a case of IA in an immunocompetent critically ill patient without any known underlying lung disease who was treated with a short course of corticosteroids.

CASE REPORT
A 59-year-old man with a history of cigarette smoking presented with shortness of breath and a non-productive cough, not responding to azithromycin and fluticasone-salmeterol. On examination he was febrile, tachycardic and tachypneic. Lung examination revealed mild wheezing, decreased air entry bilaterally, and crackles half the way up on the right and at the left base. Labs revealed normal CBC and ABG showed pH 7.52, paCO2 32, and pO2 70 on 100% FIO2. Chest radiograph revealed air space densities bilaterally; CT scan of the chest with contrast showed diffuse bilateral ground glass and air space densities. He was treated with vancomycin, cefepime, levofloxacin, oseltamivir, bronchodilators and IV corticosteroids. His condition deteriorated requiring intubation. Initial testing for influenza A and B, H1N1, Legionella, HIV, and blood and sputum cultures were negative. Fourteen days into therapy, a sputum culture grew Aspergillus fumigatus; the family withdrew care, and he subsequently expired. Autopsy revealed bilateral bronchopneumonia with abscess formation, and acute angle branching septated filaments on microscopic examination (Figs 1,2). Aspergillus fumigatus was cultured from histologic sections of the lungs, heart, and kidney.

CONCLUSION
The diagnosis of IA should be considered in critically ill patients receiving short courses of corticosteroid and whose disease is progressing despite appropriate therapy for community-acquired bacterial pneumonia.

Figure 1.

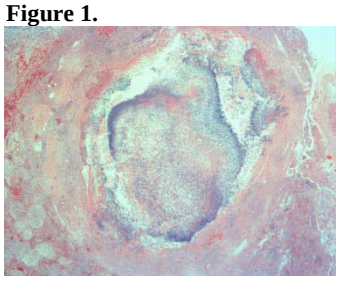
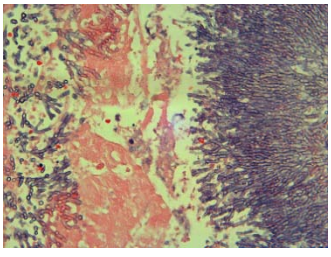


Figure 2.



Case Report: Is Chest Pain in Heart Transplant Patients a Reliable Marker of Disease?

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INTRODUCTION

Cardiac allograft vasculopathy (CAV) is the second most common cause of mortality in heart transplant patients. This multifactorial disease takes many years to progress, but in some can rapidly develop in a few months.[1] CAV usually has a silent clinical presentation but there is evidence of partial sympathetic reinnervation late after transplantation.[2] Since traditional ischemic symptoms can be elusive, improving outcomes via early diagnosis must be implemented by screening studies rather than by waiting for the onset of symptoms.[3]

CASE REPORT

A 66 y/o male with PMH of ischemic cardiomyopathy s/p heart transplant, HTN, DM, PVD presented to the ED with substernal chest pain associated with diaphoresis, left arm numbness and tingling. Labs including cardiac enzymes were unremarkable and EKG was unchanged. Physical exam revealed no pertinent findings. An echocardiogram showed an ejection fraction of 60-65%. Cardiac catheterization showed non-obstructive disease. Chest pain resolved on admission and did not recur. The patient's medical regimen was optimized.

DISCUSSION

It is important to note that in heart transplant recipients that reinnervation is sparse and may not be sufficient to cause the sensation of chest pain as in the patient described.[4] As a result screening is essential, and recommendations call for invasive coronary angiography to be performed a few weeks after transplantation and then annually up to five years. Dobutamine stress echocardiography may be used instead, however, if patients become symptomatic, then coronary angiography is indicated.

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Case Report: Jejunal Intussusception – Diagnosis and Management

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CASE REPORT

We present the case of a 48 year old male who presented with severe abdominal pain. His past medical history was significant for recurrent small bowel intussusception and diverticulosis. His past surgeries included sigmoidectomy, laparscopic cholycystectomy, and appendectomy. The patient had a computed tomographic scan of the abdomen and pelvis which revealed evidence of a small bowel obstruction and intussusception of a loop of mid jejunum. The patient underwent a small bowel follow through series which showed evidence of a target pattern and findings consistent with a non-obstructing jejunal intussusception. The patient continued to experience nausea, vomiting, and abdominal pain. Due to the persistence of his symptoms, along with recurrent attacks of intussusception, the decision was made to proceed with an operative intervention. Intra-operatively, only minor adhesions were noted. No discernable mass was palpated in the jejunum and no evidence of intussusception was noted. The patient had an uneventful post operative course.

DISCUSSION

It is estimated that 5% of all intussusceptions occur in adults and 5% of bowel obstructions in adults are the result of intussusceptions.[1] In a large study of 745 surgically diagnosed adult intussusceptions, 52% were from the small bowel, 39% enteroenteric, and 13% ileocolic.[2] Preoperative diagnosis is made correctly only 32% to 50% of the time.[4] Patients with a malignant colonic lesion had a much higher likelihood of being diagnosed correctly (67%).[5] Persistent symptoms of intussusception in adults are treated surgically due to the high incidence of malignancy.[4]

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Figure 1. Small Bowel Follow Through

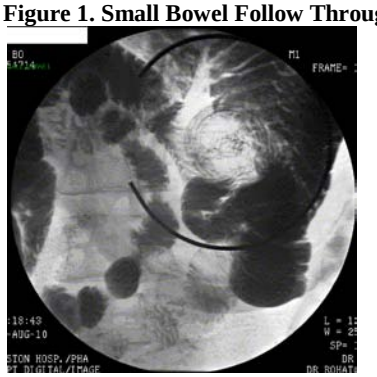
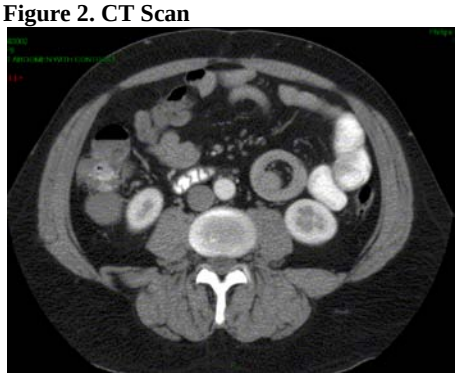


Figure 2. CT Scan



Case Report: Kawasaki Disease or Evolving Systemic Juvenile Idiopathic Arthritis: A Diagnostic Dilemma

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INTRODUCTION
Kawasaki disease is a leading cause of acquired heart disease in children in USA.[1] It can closely mimic conditions including systemic juvenile idiopathic arthritis, Stevens-Johnson syndrome, and viral exanthema.[2]

CASE REPORT
We present a case of a 4 year old non-irritable Asian boy with a history of prolonged fever, left cervical lymphadenopathy, conjunctival congestion, oral erythema, strawberry tongue, swollen extremities and maculopapular rashes. Diagnosis of Kawasaki disease was made. Work up showed raised white cell count (23.1 × 109/L), C-reactive protein (60 mg/dl) and ESR (70 mm/hr) with normal echocardiogram. Intravenous immunoglobulin was administered. Course was complicated as the child developed cracking of lips with eschar formation, erythema around both eyes, and later on bilateral knee arthritis with high platelets (648) and low hemoglobin (9.9). His repeat echocardiogram was also normal. Diagnoses of Stevens-Johnson syndrome and systemic juvenile idiopathic arthritis were considered. His second immunoglobulin could not be completed due to allergic reactions. He was started on methylprednisolone to which he responded dramatically. The diagnostic dilemma was whether this is a case of Kawasaki Disease refractory to intravenous immunoglobulin therapy or systemic juvenile idiopathic arthritis responding to methylprednisolone or Stevens-Johnson syndrome.

DISCUSSION
We suggest that physicians should be cognizant of the fact that Kawasaki Disease can easily mimic other disease processes and conditions.

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Case Report: Mammary Carcinoma Metastatic to the Thyroid

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INTRODUCTION
Metastatic disease to the thyroid is a relatively rare event; however, it should always be in the differential for patients with a thyroid nodule and a prior history of cancer.

CASE REPORT
A 57 year old female with a history of ER+ mammary carcinoma 16 years prior presented with shortness of breath and unintentional weight loss. CT scan revealed multiple subcentimeter pulmonary nodules and a solitary 3.4 x 2.1 cm left thyroid nodule causing tracheal deviation. Fine needle aspiration (FNA) was performed on the thyroid nodule and showed normal thyroid follicles and rare atypical cells with enlarged nuclei and abundant eosinophilic cytoplasm, similar to thyroid Hürthle cells. Immunohistochemistry (IHC) showed these cells to be ER positive and TTF-1 negative, however, and therefore consistent with metastatic mammary carcinoma. Biopsy of a lung nodule also revealed metastatic mammary carcinoma.

DISCUSSION
A new thyroid mass in a patient with a history of cancer should be considered metastatic until proven otherwise.[1-5]

The most common primary sites for metastases to the thyroid are kidney, breast and lung.[1-5] Breast cancer metastases to the thyroid can occur many years after initial diagnosis, with reports as long as 22 years.[1-4] Most patients with metastases to the thyroid have or have had metastases elsewhere, which may signify poor prognosis.[1-4] FNA is a reliable tool for diagnosing thyroid nodules even when the nodule represents metastatic disease, though IHC may be needed. Clinicians should inform the pathologist of the patient's prior history to facilitate diagnosis.

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Figure 1. Carcinoma cells with surrounding normal thyroid follicular cells, H&E at 60x magnification

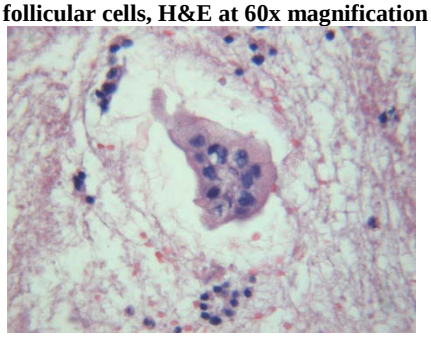
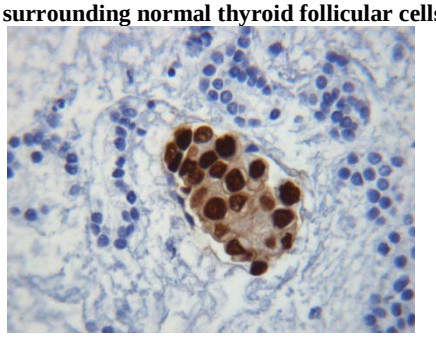


Figure 2. Carcinoma cells are positive (brown) for ER, surrounding normal thyroid follicular cells are negative



Case Report: Monomorphic Ventricular Tachycardia Associated with Sunitinib Therapy for Metastatic Renal Cancer

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Abington Memorial Hospital: Department of Medicine

CASE REPORT

An 81 yr old male with metastatic renal cell carcinoma on a trial of chemotherapy with sunitinib for 2 years presented as an office visit for evaluation of increased fatigue, dizziness, variability in his BP readings, and lower extremity edema since 3 weeks. Patient had no prior history of coronary or structural heart disease, but had a recent episode of syncope a month prior for which he was admitted and had a negative EEG, MRI, and cardiac enzymes. EKG during the office visit revealed wide complex tachycardia consistent with monomorphic ventricular tachycardia (Fig. 1), BP 116/89, pulse 99 regular, and was sent to the ER. Pt was admitted to the CCU had a right and left heart cath that revealed moderate LAD disease. ECHO showed normal LV function. Sunitinib was held from the day of admission and the patient was placed on low dose Cardizem for rate control. Patient remained asymptomatic throughout his stay in the hospital and the ectopy eventually subsided on telemetry monitoring. EKG on discharge (Fig. 2) showed no abnormality and he was discharged home on low dose Cardizem. He will follow up with his oncologist to consider alternatives for sunitinib as his ectopy was considered secondary to cardiotoxicity of the drug.

DISCUSSION

Patients treated with sunitinib should be closely monitored for hypertension and LVEF reduction, especially those with a history of coronary artery disease or cardiac risk factors. This case illustrates the possibility of monomorphic V-tach with sunatinib therapy.

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Figure 1. Office EKG showing V-tach

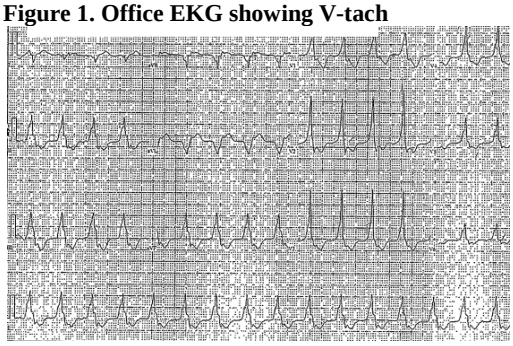
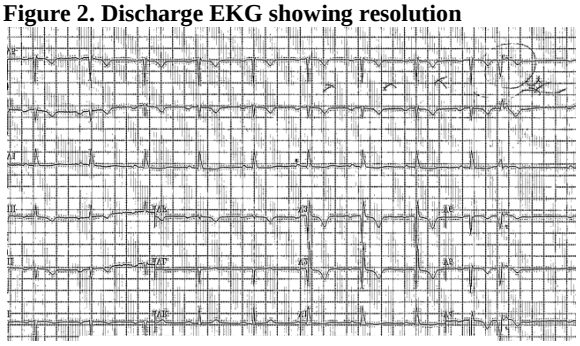


Figure 2. Discharge EKG showing resolution



Case Report: Mycobacterium Tuberculosis as a Mimic of Lung Cancer

Rebecca Heintzelman, MD, Xiaoli Chen, MD
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INTRODUCTION

Pulmonary infections, such as tuberculosis, occasionally can mimic lung neoplasms both clinically and on radiologic scans.

CASE PRESENTATION

A 64 year old male with an extensive smoking history presented with significant weight loss, intermittent night sweats, and dry cough with a negative PPD. A chest CT identified a new spiculated lung nodule, concerning for malignancy, which had an SUV of 1.9 by PET/CT (Fig. 1). The patient opted for resection. A left upper lobe lobectomy with lymph node dissection was performed. Frozen section demonstrated granulomatous inflammation with submission of tissue for culture. Grossly, the nodule was 1.5 cm, gray-white, and irregular (Fig. 2, insert). Histologically, caseating granulomas (Fig. 2) and an acid fast bacillus was identified. Culture returned positive for Mycobacterium with PCR confirmation of Mycobacterium tuberculosis complex.

DISCUSSION

In this case, infection with Mycobacterium tuberculosis presented as a solitary pulmonary nodule. The most common clinical manifestations are non-specific, including cough and chest pain.[1] PET/CT is often helpful in the diagnosis of these lesions, but lacks specificity.[2] For example, low SUVs are typically associated with benign lesions, but bronchoalveolar carcinoma can have similar levels. It is important to always consider an infectious process in patients with solitary pulmonary nodules, since it can be indistinguishable from a neoplastic process.[1,3] A radiologically-guided FNA/biopsy demonstrates both sensitivity and specificity, and can not only distinguish benign from malignant lesions, but can also be helpful in separating out those patients who would benefit from non-invasive treatment.[2,3]

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Figure 1. CT image of lung nodule

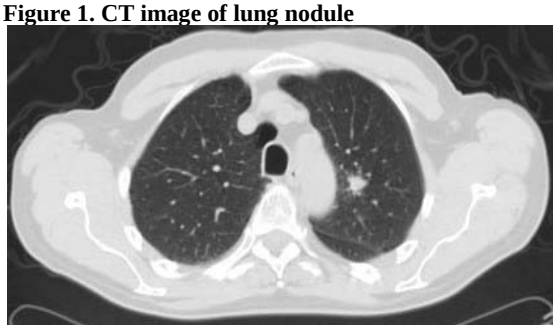
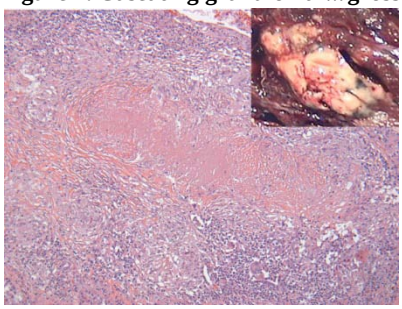


Figure 2. Caseating granuloma w/gross image of nodule (insert)



Case Report: Myxedema Coma and Chronic Lymphocytic Leukemia: Association or Coincidence?

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INTRODUCTION

Thyroid disease has been associated with hematologic malignancies.[1] However its role in lymphocyte proliferation is not well defined. We report a rare case of concomitant myxedema coma and chronic lymphocytic leukemia (CLL).

CASE REPORT

An 83-year-old woman was brought to the emergency room unresponsive, hypotensive, hypothermic and bradycardic. She was diagnosed with myxedema coma and was admitted to the ICU. TSH was 85.83 uIU/ml, free T4 less than 0.25ng/dl, and total T3 13ng/dl. Serum cortisol was 11 ug/dl. Intravenous synthroid and hydrocortisone were administered. By day three, her conciousness improved. Steroids were tapered and synthroid was adjusted to maintenance dose. Concurrent investigations revealed CLL. Chlorambucil was started and she made an uneventful recovery. Six months later, she is well. TSH is 1.63mIU/L and WBC count is 6.3 x 103 U/L.

DISCUSSION

Reviewing the literature, we found one report about thyroid disease and CLL.[2] In a study of patients with myelodysplastic syndrome and primary hypothyroidism, the authors concluded that thyroid insufficiency prevents the full-blown bone marrow features of MDS from manifesting.[3] Data from several animal research models also suggest that lymphocyte proliferation is increased in the presence of thyroid hormones.[4-5] Our observation suggests otherwise and is quite intriguing. Abnormal lymphoproliferative response was evident despite the patient's profound hypothyroid state. This rare association may be of importance and further investigation of the exact role of thyroid hormones on lymphopoeisis and leukemogenesis is warranted.

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Case Report: Necrotizing Cellulitis Caused by Aeromonas

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**Abington Memorial Hospital: Department of Medicine, Division of Infectious Disease

CASE REPORT

A 62 year-old-female with history of multiple myeloma presented with confusion and right leg pain. There was no reported trauma to her right leg. She was oriented to self-only. Blood pressure was 68/48, core body temperature was 95.8 F and right leg was erythematous, swollen and tender with ecchymosis. White blood cell count was 1.8 with 17% bands. She was started on vasopressors, broad-spectrum antibiotics and immediately taken to the operating room (OR) for extensive debridement of her right leg. Based on gross examination in the OR (Fig 1) and pathology of debrided tissue, she had necrosis and inflammation of skin and subcutaneous tissue with underlying healthy fascia and muscle. The cultures from debrided tissue, OR fluid and blood all grew aeromonas species. She improved clinically and was discharged home after receiving two weeks of intravenous antibiotics and skin graft on her right leg.

DISCUSSION

Aeromonas is a gram-negative bacillus commonly found in fresh, brackish and sewage water.[1] It can rarely cause necrotizing fasciitis and myonecrosis with a high mortality in immunocompromised patients such as those with underlying malignancy.[2] Often there is a history of fresh or brackish water exposure such as swimming or water trauma.[1,3] However in our case there was no water trauma or exposure out of regular bathing reported by the patient. Limited skin, subcutaneous tissue involvement with sparing of muscle and fascia, prompt diagnosis, early antibiotic usage and surgical management led to a favorable outcome in this case.

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Figure 1. OR Debridement

Case Report: Novel Use of a Fully-Covered Esophageal Metal Stent in the Treatment of Resistant Anastomotic Stricture Following Gastric Bypass

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**Drexel University College of Medicine: Department of Surgery
***Drexel University College of Medicine: Department of Medicine, Division of Gastroenterologyand Hepatology

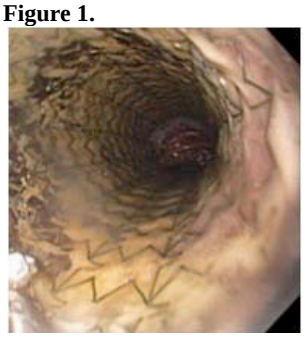
INTRODUCTION

Self-expanding fully covered metal stents have often been used to treat esophageal strictures secondary to malignancy and post-operative anastomotic leaks. Here, we report the use of a stent in the treatment of a recurrent/resistant post-Roux-en-Y gastric bypass anastomotic stricture.

CASE REPORT

A 41 year-old African American morbidly obese gentleman underwent a laparoscopic Roux-en-Y gastric bypass and presented in the early post-operative period with complaints of nausea and vomiting. He was diagnosed with a high-grade gastro-jejunal anastomotic stricture and underwent through the scope (TTS) balloon dilation but symptoms soon recurred. After failed dilations and a surgical stomal revision, the placement of a fully covered esophageal metal stent (Alimaxx® 22x100 mm, Merit Medical Systems) bridging the stricture (Fig 1) alleviated all symptoms of obstruction. The stent was attached to the gastric mucosa with hemostatic clips to prevent stent migration. 4 weeks after stent placement, the stent was successfully removed endoscopically with no complications. The patient remained symptom free 6 months after successful stent removal and has continued to lose weight.

Figure 1.



DISCUSSION

Though TTS balloon dilation has long been accepted as the standard of care for such resistant strictures, this case specifically describes the novel use and possible consequences of the fully covered esophageal stent system when used for resistant stomal strictures.

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Case Report: Percutaneous Lead Extraction of a Fractured Pacemaker Atrial Lead by a Retained Stylet

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CASE REPORT

A 78-year-old male CAD, SSS s/p PPM 2003 presented with complaints to his cardiologist of fatigue, palpitations and presyncope. His pacemaker generator was noted to be ERI with nonfunctioning atrial and ventricular leads. He underwent a generator change, where fluoroscopy revealed fracture of the atrial lead with protrusion of a stylet into the right atrium originating back to initial implant. Patient was referred for device explantation. Following placement of arterial and venous femoral sheaths, intracardiac echo probe was inserted to survey the RA. Thrombus measuring 2 x 3.5 cm and moderate size pericardial effusion were appreciated without tamponade physiology. The right prepectoral area was incised and both lead caps exposed. The atrial lead was cut and a bulldog lock was placed on the stylet with silk tie placed around the lead body. A 10 Fr Byrd dilator sheath was advanced over the lead, however the lead fractured in the mid RA, leaving behind 4-5 cm. A 16 Fr femoral workstation was advanced into the RA, and using a needles-eye snare was able to successfully grasp the remaining portion of the lead into the extraction sheath and out of the body. Atrial lead extraction time was 58 minutes without complication.

DISCUSSION

The number of patients referred for lead extraction has been increasing as the number of device implantations rise. Here we present an interesting case of lead extraction requiring a multifaceted approach. Device malfunction and perforation demanded complete hardware removal in a controlled environment with experience in complex lead extraction.

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Figure 1. Fractured atrial lead with protruding stylet

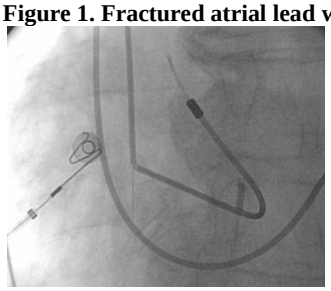
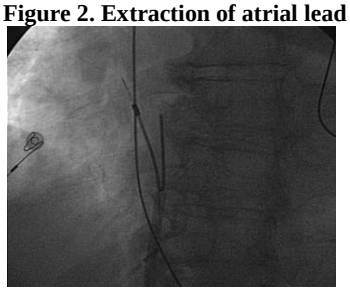


Figure 2. Extraction of atrial lead via femoral workstation



Case Report: Percutaneous Repair of AngioSeal-related Common Femoral Artery Stenosis

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INTRODUCTION

Vascular closure devices are used extensively to seal the femoral artery puncture site to reduce time to hemostasis after coronary angiography. This report presents a rare complication of AngioSeal with endovascular treatment.

CASE REPORT

A 53 yo man with history of CAD and coronary stents had intermittent claudication after cardiac catheterization. An AngioSeal device had been used for closure of the right common femoral artery. His ABI was 0.83 on the left, and 0.53 on the right. Diagnostic angiography revealed significant stenosis at the level of the right common femoral artery (site of AngioSeal deployment - Fig. 1). An endovascular procedure was then performed on the right CFA. An 8 mm x 40 mm stent (SMART stent, Cordis, J&J) was placed in the area of the stenosis with excellent result (Fig. 2). Post-procedurally, the patient's symptoms resolved completely.

DISCUSSION

AngioSeal failure is extremely rare and accounts for a small number of complications (as low as 0.26% in small series). Femoral artery stenosis and occlusion leading to limb ischemia have been described. There are single case reports on the stenting/angioplasty given the low overall incidence of the problem. The largest follow-up series was reported by Steinkamp: the authors used laser

recanalization in 16 patients with a follow-up in 6 months. A series by Thalhammer reported fifteen patients treated with angioplasty and stent implantation: excellent results were reported.[1] Therefore, it is important for interventionalists to be aware of this rare complication of AngioSeal deployment and the use of endovascular techniques and stents for therapy.

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Figure 1.

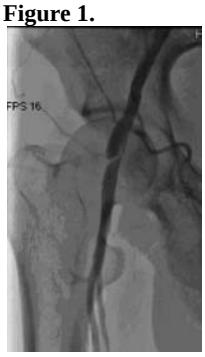
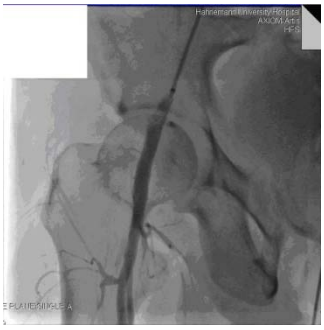


Figure 2.



Case Report: Plasma Cell Leukemia: A Case Report

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CASE REPORT

A 63 year-old male presented with fatigue, shortness of breath and intermittent fever for one week. Physical examination was normal. Serum immunofixation showed an IgA kappa monoclonal protein spike. Urine immunofixation was negative. Plasma cells were 50 % on peripheral blood and 25% on bone marrow biopsy. Cytogenetic analysis showed multiple trisomies and P53 on chromosome 17. Skeletal survey showed no lytic bone disease. The diagnosis of plasma cell leukemia (PCL) was made.

Attempts were made to achieve remission with full cycles of VMP (bortezomib, melphalan, prednsone), VDT (bortezomib, thalidomide, dexamethasone) and VDT-PACE (bortezomib, dexamethasone, thalidomide, cisplatin, adriamycin, cyclophosphamide, andetoposide) all of which failed to induce remission. Patient died four months after the diagnosis of PCL.

DISCUSSION

PCL is a rare variant of multiple myeloma with incidence in the general population of 1 per million.[1] The diagnosis of PCL is made when plasma cells are more than 20 % on peripheral blood smear or absolute plasma cell count is greater than 2000.[2,3] Current treatment recommendations are based on small retrospective case series, case reports, and extrapolation of data from patients with multiple myeloma. In general, patients are treated with aggressive induction chemotherapy followed by hematopoietic cell transplantation (HCT). Currently used induction therapies include VDT, VDT-PACE or VMP.[4,5] When remission induction is successful, HCT is done. The treatment of PCL is still largely ineffective and further works are needed.

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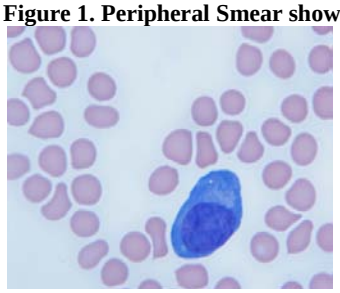
Figure 1. Peripheral Smear showing a plasma cell with numerous nucleoli



Case Report: Primary Cutaneous Aspergillosis in a Patient with Acute Myelogenous Leukemia

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*Easton Hospital: Department of Medicine
**Easton Hospital: Department of Medicine, Division of Infectious Disease

INTRODUCTION

Aspergillus has a worldwide distribution but usually causes invasive disease in severely immunosuppressed hosts such as hematopoietic stem cell transplant recipients or patients with prolonged neutropenia.

CASE REPORT

A 55-year-old female with history of diabetes mellitus, and slowly healing abdominal wound after perforated bowel repair, was admitted to Easton Hospital with generalized weakness, fatigue, low grade fever, and severe anemia. The peripheral smear showed 9% blasts and abnormal dysplastic cells. The bone marrow was suggestive of acute myelogenous leukemia. Our patient received chemotherapy with a 3-day course of daunorubicin and 7-day of cytarabine, which caused severe pancytopenia requiring hemotransfusions and neupogen injections. The patient developed two erythematous, tender 2 cm x 2 cm lesions on the right shoulder and anterior chest wall 10 days after chemotherapy was finished. The lesions progressed to necrotic, black-colored ulcerations with surrounding erythema and minimal serous drainage. We performed skin biopsies; tissue culture showed Aspergillus, non-fumigatus species, a definitive type was not identified. After biopsy, we initiated antifungal therapy with voriconazole for 8 weeks. The patient responded well; both wounds healed in 2 months.

DISCUSSION

This case demonstrates an unusual presentation of cutaneous aspergillosis. Isolated skin aspergillosis is uncommon, usually developing after trauma, burn, at the site of IV catheter insertion, or from dissemination of a primary respiratory tract infection. Our patient had an unhealed abdominal wound, but developed aspergillosis on uninjured skin at a different site after only two weeks of being neutropenic. The lesions resolved completely after antifungal therapy with azoles and neutrophil recovery.

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Case Report: Red Man Syndrome: Highlighting Clinical Features, Pathophysiology, and Treatment

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*Allegheny General Hospital: Department of Medicine, Division of Cardiology
**Allegheny General Hospital: Department of Medicine

INTRODUCTION

An adverse effect seen with administration of accelerated doses of vancomycin is "Red Man Syndrome" (RMS) which presents within minutes and resolves within hours.[1] In RMS, patients complain of upper body and extremity flushing with pruritic rash.[2] Other adverse reactions to vancomycin include nephrotoxicity, ototoxicity, and neutropenia.[2]

CASE REPORT

A 49 year old Caucasian male presented with lethargy, fever, myalgias, sore throat, and worsening rash localized to his legs, arms and chest of 4 days. Before admission, the patient underwent humeral debridement secondary to osteomyelitis and was discharged on vancomycin intravenous home therapy. Exam showed facial flushing and maculopapular rash involving chest, face, and upper extremities with petechiae on shins and hands (Figs 1,2).

Kidney function showed BUN 49 and creatinine 7.5. A random vancomycin level was 181mcg/mL (NL: 15-20). Renal biopsy demonstrated predominant acute tubular necrosis and patchy foci of acute interstitial nephritis. Vancomycin was held, diphenhydramine administered for pruritis and rash, and acetaminophen for pyrexia and pain. The maculopapular rash improved and vancomycin levels decreased to 67.8mcg/mL at discharge.

DISCUSSION

RMS is a rate-dependent vancomycin infusion reaction and is commonly witnessed when exceeding rates of 33mg/min(1g/30 minutes) while administration of 10mg/min(1g/1.67 hours) rarely causes symptoms.[1,5] Once symptoms are recognized, one should stop the administration and clinical severity should be assessed. For mild cases, cessation and re-administration at 1/2 the previous dose should relieve symptoms. Many are susceptible to the adverse effects of vancomycin due to inappropriate monitoring of the rate of administration. More stringent monitoring of drug levels could reduce vancomycin morbidity in the future.

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Figure 1.

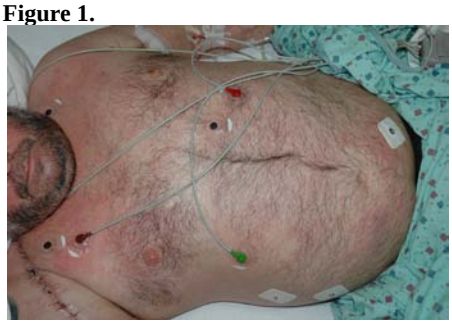
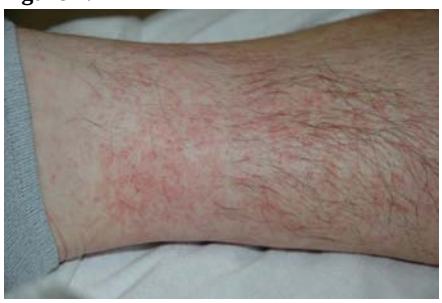


Figure 2.



Case Report: Right Atrial Mass

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CASE REPORT

A 36-year-old female with no medical history presented to the emergency department with three days of progressive shortness of breath. Examination showed the patient to be tachycardic with a heart rate of 140 bpm. A CT scan of her chest showed large bilateral acute pulmonary emboli. A transthoracic echocardiogram showed 2.7 x 1.7 cm mass in the right atrium. The patient was taken for excision of the mass. Intraoperative transesophagel echocardiogram is shown (Fig. 1). The mass (3.2 x 1.5 cm) was found to be attached to the inferior vena cava - coronary sinus junction and was removed. A pathological examination determined the mass to be a polypoid mural thrombus with dystrophic calcifications (Fig. 2). The patient had a full recovery and was discharged four days following surgery.

DISCUSSION

The presence of acute onset of shortness of breath and a right atrial mass raises the possibility that a mass is a thrombus. However, when developing a differential diagnosis, primary cardiac tumors need to be taken into account. The most common primary cardiac tumor is a myxoma, accounting for 30-50% of all primary cardaic tumors. Other benign tumors of the heart include papillary tumors involving heart valves, rhabdomyomas, and fibromas. Malignant tumors account for about 25% of primary cardiac tumors and include angiosarcomas, rhabdomyosarcomas, and leiomyosarcomas.

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Figure 1. Intraoperative Echocardiogram

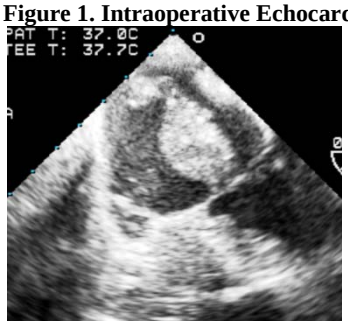
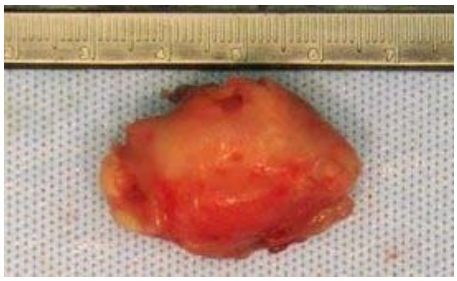


Figure 2. RA Mass



Case Report: Right Atrial Thrombus Mimicking Myxoma in a 36-year-old Patient with Bilateral Pulmonary Embolisms

Yassir Nawaz, MD, Gayathri Murthy, MD, Mrinalini Sarkar, MD, Rizwan Tariq, MD
Abington Memorial Hospital: Department of Medicine

CASE REPORT

A 36-year-old female presented to the Emergency Department with complains of shortness of breath and pleuritic chest pain for 2 days. Patient had no past history of thromboembolic episodes, malignancy, or hypercoagulability disorders in her family. On presentation her vitals were BP 133/79, HR 140, and SO2 92% on room air, and she had a normal physical examination. EKG showed S1Q3T3 pattern and a right bundle-branch-block. CT angiography showed extensive bilateral pulmonary embolisms. Patient was started on IV unfractionated heparin. To evaluate the hemodynamic parameters, transthoracic echocardiogram was done and revealed a 2.6 x 1.7 cm mass in the right atrium (Fig. 1). The mass appeared to be attached to the inferior vena cava by a stalk mimicking a myxoma. Trans-esophageal echocardiogram confirmed the presence of the pedunculated mass connected to superior-vena-cava and right atrial junction (Fig. 2). Considering the size, the diagnostic uncertainty, and a possibility of embolism to the lungs patient underwent excision of the mass. The pathology report concluded it to be a mural thrombus. Patient's post-operative course was uneventful. She was discharged home on anticoagulation with warfarin and to follow up for outpatient hypercoagulability workup.

DISCUSSION

The incidence of right heart thrombi in the setting of acute pulmonary embolism is around 5%.[1] Mortality from pulmonary embolism with presence of right heart thrombi is around 21%, compared to 11% without right heart thrombi.[2] This case stresses the importance of diagnostic echocardiography for patients with pulmonary embolism. The pedunculated appearance of the thrombus made this case unique and a diagnostic challenge.

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Figure 1. TTE Mass (*) in Right Atrium

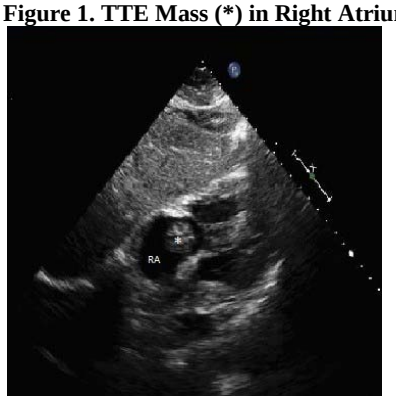
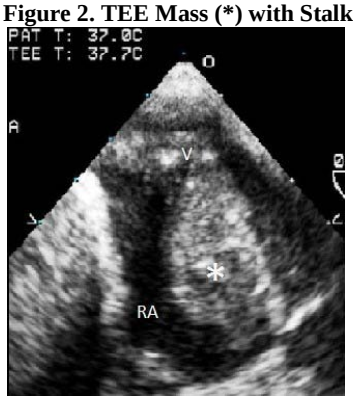


Figure 2. TEE Mass (*) with Stalk (V)



Case Report: Small Bowel Obstruction due to Ureteric Obstruction

Jason Cumbers, MD, Victor Dy, MD, Hamed Taheri, MD, Kalyan Vunnamadala, MD
Easton Hospital: Department of Surgery

CASE REPORT

A 66 year old female presented with right lower quadrant abdominal pain. Radiologic imaging revealed right sided hydronephrosis. The patient had a prior TAH-BSO for cervical cancer. Our patient initially underwent a cystoscopy and placement of a right ureteral stent. At the time of her ureterosocopy it was noted that the right ureter was being compressed extrinsically. A repeat CT scan revealed partial small bowel obstruction (SBO). Our patient was then taken to the operating room for an exploratory laparotomy. A loop of distal ileum was herniating under the extra peritonealized right ureter causing strangulation. Both ureters were extra peritonealized with clear gap between the ureters and the pelvic wall acting as the source for internal herniation. We performed a small bowel resection and fixed the ureters against the pelvic sidewall to prevent further complications.

DISCUSSION

SBO has been afflicting people since the dawn of civilization. Praxagoras of the 3rd and 4th century BC was credited with the first reported operation for obstruction when he reduced a strangulated inguinal hernia. This paper presents a case of SBO that is rarely discussed in literature. Similar to our patient, SBO has been reported due to ureteric band obstruction following transperitoneal ureteric implantation for vesicoureteric reflux. In addition, inflatable penile prosthesis implantation has led to SBO in a few documented cases. Ventriculoperitoneal shunts and peritoneal dialysis catheters have also been implicated in causing SBO. When dealing with patients afflicted with SBO, the above mentioned clinical situation must be entertained.

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Figure 1. Right ureter stent compressing small bowel

Case Report: Surgical Treatment of Early Stage Cervical Cancer in Pregnancy

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CASE REPORT

A 38 year old female, G4P3, during a prenatal care visit at 6 weeks gestation, was found to have an abnormal PAP (cervical cancer) with no visible cervical lesions. Colposcopy with 1mm punch biopsy demonstrated invasive cervical cancer. Patient denied any history of vaginal bleeding/discharge, pelvic pain, previous abnormal PAPs, or STDs. She had three prior vaginal deliveries and a positive family history of breast cancer. She was evaluated by gyn-oncology and diagnosed with stage I cervical cancer. She underwent cold knife conization at 9 weeks gestation, 4.5 cm in diameter and 1.7 cm in depth. Pathology showed diffusely invasive squamous carcinoma, poorly differentiated, lymphoepithelioma-like, with positive margins. Patient chose to continue pregnancy. At 13 weeks gestation, she underwent radical trachelectomy with pelvic and aortic lymphadenectomy. Cervical margins and nodes were negative for malignancy. The above procedure was complicated by 'kinking' of the left ureter and increased blood loss. A ureteral stent was placed. During the second trimester, she developed complications of recurrent UTI and one episode of pyelonephritis, resulting in removal of the stent. Patient delivered a newborn female (APGAR 9/9) at 39 weeks by scheduled C-section, followed by hysterectomy/BSO to complete treatment. The pathology report confirmed no residual tumor.

DISCUSSION

Cervical cancer is present in 1 of every 10,000 pregnancies.

Surgical management of early stage disease during pregnancy offers a new treatment option, allowing pregnancy to be carried to term while avoiding the complications of preterm delivery.

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Case Report: Uterine Necrosis with Dehiscence Following Repeat Cesarean Section

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*Monmouth Medical Center: Department of Obstetrics and Gynecology
**Drexel University College of Medicine

CASE REPORT

A 30-year-old G6P4 female presented to labor and delivery for an elective repeat cesarean section. She received 2 grams of cefazolin thirty minutes preoperatively and the surgery was uneventful. Postoperative course was unremarkable and patient was discharged on day 3. Post-op day 5, the patient was readmitted with a 2-day history of diffuse abdominal pain and nausea. She was afebrile, without peritoneal signs or vaginal/incisional drainage. Bowel sounds were present; patient was tachycardic at 130 with WBC of 24,100. Computed tomography revealed air/fluid extending from the endometrial into the peritoneal cavity, consistent with uterine dehiscence. Patient was taken to the OR for an exploratory laparatomy. Operative findings included extensive hemorrhagic fluid, abdominal-uterine adhesions and inflamed uterus necessitating hysterectomy. Uterine cultures grew Enterococcus faecalis and staphylococcus chromogenes. Prior placental pathology was reviewed which reported acute necrotizing chorioamnionitis. Postoperative course was uneventful.

DISCUSSION

A MEDLINE search yielded few reports. Diagnosis relies heavily on clinical suspicion, and is often made at surgery.[1] Imaging studies show abdominal free fluid as the most common finding, with MRI being the more sensitive modality.[2,3] Risk factors for this condition, though poorly characterized, are likely the same factors influencing other postcesarean infections/sepsis.[1] Management centers around hysterectomy unless the patient desires future fertility, where conservative debridement has been reported.[4] Extensive involvement of margins and adnexal structures, as in this patient, necessitate hysterectomy.

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Figure 1. Abdominal Fluid

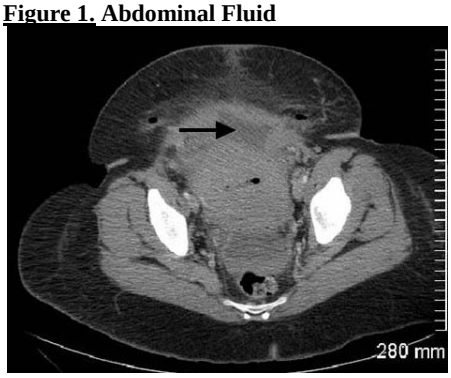
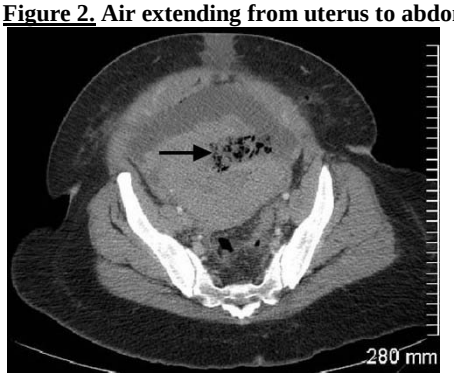


Figure 2. Air extending from uterus to abdomen



Article: Acquired Methemoglobinemia from Baby Orajel (Benzocaine 7.5%) Ingestion

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Saint Peter's University Hospital: Department of Pediatrics

ABSTRACT
Methemoglobinemia is a rare condition in which oxygen delivery to tissues is impaired due to the reduced oxygen-carrying capacity of methemoglobin (MHg). Most cases of methemoglobinemia are acquired, only a small percentage is hereditary. Medications, especially topical anesthetics in spray form, are known to cause acquired methemoglobinemia. We report a case of methemoglobinemia secondary to the ingestion of Baby Orajel (Benzocaine 7.5%). A 2-year old boy presented with cyanosis, persistently low oxygen saturations despite high arterial oxygen tension, and chocolate-colored blood. Our patient was treated with one dose of Methylene Blue (1mg/kg) with rapid resolution of symptoms. Pediatricians should be aware of this potential adverse effect of Orajel and make sure to adequately educate the parents of their patients.

PRESENTATION
A 2-year old boy presented to our Emergency Department with progressive generalized cyanosis, somnolence, and tachypnea. His mother had noticed a bluish discoloration of his lower extremities while bathing him. She brought him into the sunlight and noted that the discoloration was not only limited to his legs, but also involved his lips and tongue and quickly spread to the rest of his body. She had found an empty tube of Baby Orajel (Benzocaine 7.5%) earlier that day, which had been used for the boy's teething pain several months prior. Only half of the tube had been used at that time. The boy's past medical, social and family history was unremarkable. He had no known allergies and did not take any medications regularly. Review of systems was noncontributory.

Physical examination revealed a well developed cyanotic boy, sneezing occasionally and thrusting his tongue in and out of his mouth. His temperature was 98.1°F (36.7°C), heart rate 135 beats/min, respiratory rate 24 breaths/min, blood pressure 100/48 mmHg and oxygen saturation 87% on room air. The boy was awake but appeared tired. His skin was warm and dry to touch, however there was cyanosis of the whole body. Capillary refill was mildly prolonged. He coughed and gagged periodically, but his breath sounds were clear bilaterally. The rest of his physical examination was normal.

HOSPITAL COURSE
100% oxygen was applied via a non-rebreather mask, but oxygen saturations improved only marginally to 89%. While drawing blood for basic laboratory studies, the blood was noted to be chocolate brown in color, which prompted a methemoglobin level to be added to routine laboratory studies. An arterial blood gas showed pH 7.335, PaCO2 39.9 mmHg, PaO2 198 mmHg, HCO3- 20.7 mmol/L, base excess -4.2 mmol/L and O2 saturation 80%. Carboxyhemoglobin and methemoglobin were 0.3% and 36.1% respectively. The remainders of his laboratory results were within normal limits. The electrocardiogram showed a normal sinus rhythm.

Based on the history, clinical and laboratory findings, the diagnosis of Benzocaine-induced methemoglobinemia was made. The boy received one dose of Methylene Blue (1mg/kg/dose), administered by slow IV push. This resulted in a gradual resolution of the cyanosis. He was admitted to the hospital for observation and kept on oxygen overnight. The methemoglobin level eight hours after the administration of Methylene Blue was 3% with oxygen saturations of 99%. The boy was discharged home the following morning and the parents were educated to keep all medications out of his reach.

DISCUSSION
Methemoglobinemia can be either acquired, as in this case, or hereditary. Agents most commonly reported to cause methemoglobinemia include aniline dyes, pesticides, dapsone, and various local anesthetics, such as benzocaine, prilocaine and lidocaine (i.e., EMLA topical cream). Another well documented cause of acquired methemoglobinemia is nitrates. This happens after ingestion of well water or vegetables high in nitrates, mostly seen in young infants. Hereditary forms of methemoglobinemia are much rarer. The best known association is a congenital deficiency of NADH-cytochrome-b5-reductase. Clinically these patients show little or no respiratory symptoms, except on exertion, even though about half of the circulating hemoglobin in these patients is MHg.[4]

A proper knowledge of the physiology of oxygen transport in the body is essential for understanding the mechanism

by which methemoglobinemia develops. All red blood cells contain four globin chains associated with four heme groups. Each heme group contains iron in a reduced, or ferrous, state (Fe2+). This is essential for its oxygen carrying capacity since oxygen can only bind to iron in its ferrous state. When the iron in hemoglobin becomes oxidized, it is converted to the ferric (Fe3+) state, known as MHg. At any given time, about 1% of the iron in hemoglobin is in the ferric state, which is physiologically incapable of oxygen transport.[5] MHg can be reduced back to its functional state via three known pathways. These pathways involve a NADH or NADPH-dependent reaction. Methylene blue is used as an electron acceptor in these pathways of reduction. For this reason it is important to rule out G6PD deficiency in any patient requiring methylene blue due to the risk of red blood cell oxidative hemolysis. The third, non-enzymatic pathway results in reduction of Fe3+ by ascorbic acid, riboflavin and cysteine.[1]

The most common clinical feature of methemoglobinemia is cyanosis caused by the varying absorbance spectrums of methemoglobin and oxyhemoglobin. Other features due to impaired oxygen delivery to tissues include headache, fatigue, dyspnea, lethargy and vomiting. More serious signs of MHg include altered mental status, respiratory depression, shock, seizures, and cardiac collapse through myocardial ischemia, and ultimately death. The presence of chocolate-colored blood along with low oxygen saturations despite O2 administration and high arterial oxygen tension (PaO2) are pathognomonic signs of methemoglobinemia. Patients are usually asymptomatic as long as MHg levels are below 15%. Levels greater than 30% are significantly elevated and require treatment. MHg levels of 70% or greater are lethal.[1] Acquired forms of methemoglobinemia are treated with methylene blue at a dose of 1mg/kg given IV over 5 minutes. Hereditary forms of methemoglobinemia are not treated with methylene blue, but with oral ascorbic acid at doses between 200-500mg daily. Ascorbic acid is an alternative treatment of acquired methemoglobinemia for levels >30%. If treated promptly, methemoglobinemia is a reversible condition with little or no sequelae.

Most physicians prescribing Orajel for teething pain are not aware of methemoglobinemia as a potential complication. Only 2 cases similar to our's have been reported.[2,3] Most cases of benzocaine-induced methemoglobinemia are associated with the spray form used during endoscopic or dental procedures. Pediatricians should be aware of this potential side effect of Orajel when prescribing it for teething pain.

CONCLUSION

Physicians should be aware of methemoglobinemia as a possible adverse effect when prescribing Benzocaine gel or any topical anesthetic to the pediatric patient. While the appropriate dose that should be prescribed for teething pain to safely prevent this complication is difficult to assess, it is fair to conclude that Orajel should be used sparingly and with caution. In addition, one should be cognizant of the key clinical features of methemoglobinemia which include cyanosis and low oxygen saturations despite high arterial oxygen tension (PaO2), and of course the presence of chocolate-colored blood. One of the most important lessons to be learned here is to always advise parents to keep medications and toxic agents out of reach of children.

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Article: Bladder Outlet Obstruction in patients with Interstitial Cystitis/Painful Bladder Syndrome

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INTRODUCTION

Interstitial cystitis/painful bladder syndrome (IC/PBS) is diagnosed on the basis of clinical symptoms including urinary frequency, urgency and bladder pain, pressure, and/or discomfort in the absence of other pathological findings.[1–5] The Rand Interstitial Cystitis Epidemiology Study recently reported a prevalence of 3% to 6%[6], which indicates that IC/PBS may be considerably more common than once thought. The current paradigm for IC/PBS diagnosis relies on history and physical examination and places less emphasis on diagnostic tests.[7] Validated questionnaires used to help with the diagnosis of IC/PBS include the O'Leary-Sant Interstitial Cystitis Symptom (ICSI) and Problem Index (ICPI).[8] Obstructive urinary and voiding dysfunction symptoms such as slow stream, incomplete emptying, dribbling, and straining are often reported by patients with IC/PBS, which might indicate a functional bladder outlet obstruction (BOO). BOO on UDT is characterized by a maximum flow rate (Qmax)≤ 12 ml/sec and detrusor pressure at maximum flow (PdetQmax)≥ 25 cm H2O .[9] Prior studies demonstrated a role for UDT in diagnosing IC/PBS and revealing associations between diagnostic parameters.[10-13] A recent study demonstrated a correlation between the severity of symptoms and the abnormalities seen on the filling phase of UDT, which included significantly lower volumes, MCC, and a strong desire to void in subjects with high pain scores on the Likert scale (≥ 7), ICPI ≥ 9, and ICSI ≥ 10.[11] Several studies demonstrated the role of cystoscopy and mastocyte count from bladder biopsy to support the diagnosis and estimate the severity of IC/PBS.[10,14] Cameron et al., comparing IC/PBS patients with and without ulcers on cystoscopic examination, showed that 48% of patients with IC/PBS had BOO. Patients with ulcers had more severe BOO and lower MCC compared with those without ulcers; however, validated questionnaires were not used to evaluate the severity of the symptoms.[10]The objective of this study was to compare the severity of symptoms using ICSI and ICPI, voiding dysfunction, and cystoscopic and UDT findings in patients with IC/PBS associated with BOO with those of patients without evidence of BOO.

MATERIAL AND METHODS

IRB approval was obtained before the start of the study. We performed a retrospective chart review of 87 patients with IC/PBS who underwent cystoscopy, bladder overdistention, and bladder biopsy between April 2008 and December 2009 at a tertiary care center in Philadelphia. All charts were reviewed for patient demographics, questionnaire responses, UDT results, and results of cystoscopy, bladder overdistention, and biopsy. Of those who were examined cystoscopically, 59 had UDT before the surgery (Fig. 1).

Questionnaires were given to the patients on enrollment into the practice. The questionnaires included urgency, frequency, and Lickert scores for pain (from 0 to 10) and ICSI and ICPI values. Eighteen patients were excluded from the analysis. Exclusion criteria included incomplete questionnaires, incomplete UDT readings, prior radical pelvic surgery, reconstructive bladder surgery, urethral surgery or pelvic radiation, stage 3 or 4 prolapse, neurological disorders affecting bladder function, or malignancy found during the procedure.

Forty-one subjects were stratified into two groups based on UDT criteria for BOO. Data from nine patients (group I) with BOO (Qmax≤ 12 ml/sec and PdetQmax≥ 25 cm H2o) and 32 (group II) without BOO (Qmax >12 ml/sec and PdetQmax <25 cm H2o) were compared and analyzed.

UDT was performed as described by the International Continence Society. Findings collected included MCC, MUCP, Qmax, Pdet Qmax, and the uroflow curve, which was interpreted as normal (bell-shaped) or abnormal (intermittent, interrupted, or slow and prolonged). Cystoscopic examinations and bladder overdistentions were performed by a single surgeon in one institution. Results from cystoscopy and bladder overdistention were taken from the operative reports in the chart. Glomerulations (0–5), the presence of Hunner's ulcers, and mast cell counts were recorded.[15] Mast cell counts per mm^2 were obtained from bladder biopsies performed during cystoscopy. Specimens were sent to the pathology laboratory where immunohistochemical staining using antitryptase was performed and mast cells were counted per mm^2.

Data were analyzed using SPSS 16.0 (SPSS Inc., Chicago, IL); the independent t test and the Mann-Whitney U test were performed on the questionnaire responses, urodynamic data, and cystoscopic findings. The t test was used for

continuous variables; the Mann-Whitney U test, for ordinal variables; and the chi-square test, for categorical variables. The P value was set < 0.05 for statistical significance.

RESULTS

A total of 87 charts were reviewed, of which 42 met the inclusion criteria (Fig. 1). All subjects had the diagnosis of IC/PBS, filled out the preoperative questionnaires, and had urodynamic analysis, cystoscopic examination, a bladder biopsy, and hydrodistention.The majority of the patients had one or more pelvic comorbidities: 74% (30/42) had high-tone pelvic floor muscle dysfunction (pelvic floor hypertonus); 45% (19/42) had vulvodynia; and 24% (10/42) had irritable bowel syndrome. All subjects were women and were divided in two groups on the basis of the presence or absence of BOO on pressure flow studies during urodynamic evaluation. Twenty-eight percent (9/42; group I) had BOO; 72% (31/42; Group II) did not. The demographics of the patients are described in Table 1. There were no differences between the two groups in age, body mass index, and duration of symptoms (p=0.68; p=0.06; p=0.99, respectively).

Eighty-two percent of all patients had dysparenuria: 67% of group I and 88% of group II, with no difference between them (p=0.10). Eighty-seven percent of all subjects had bladder base tenderness on physical examination: 78% of group I and 93% of group II (p=0.20).

The subjects' symptoms and questionnaire scores are listed in Table 2. Mean frequency per day was 15.67 (± 9.30) for patients with BOO and 12.81 (± 6.20) for patients without BOO (p=0.41). VAS scores (Likert scale) for frequency, urgency, and pain were similar between the two groups (p=0.16, p=0.70, p=0.42, respectively). Nocturia was slightly worse in patients with BOO (mean, 2.67) compared with that in patients without BOO (mean 2.02) but did not reach statistical significance (p=0.24).

Patients with BOO had significantly higher ICPI and ICSI scores compared with patients without BOO. Mean ICPI scores were 13.00 (±2.06) for group I and 9.34 (±4.98) for group II, with p=0.02; the mean ICSI scores were12.22 (± 2.77) for group I and 9.44 (± 4.05) for group I, with p=0.03.

When we compared UDT findings (Table 3), 21% (9/42) of subjects had detrusor overactivity on UDT (2/9 for group I and 7/32 for group II). Seventy-six percent of all patients had an abnormal uroflow curve on pressure flow studies, but the results did not differ between the two groups (group I, 78%; group II, 58%; P = 0.27). Patients with BOO had significantly lower MCC on UDT compared with patients without BOO. Mean MCC values were 294.22 ml (±91.51) in group I and 398.28 ml (±147.72) in group II (P = 0.02). Mean maximum urethral closure pressure was similar in both groups. The mean MUCP of patients with BOO was 118.11 cm H2O (±39.61) compared to 119.41 cm H2O (±46.70) in patients without BOO (p=0.94).

During cystoscopy (Table 3), gomerulations were significantly more severe in patients with evidence of BOO (mean, 3.33) than in patients without BOO (mean, 2.22, p= 0.01). Hunner's ulcers were detected in 2 patients in the group without obstruction; none were detected in the BOO group. The mean mastocyte cell count/mm^2 on bladder biopsy was slightly higher in patients with BOO than in patients without BOO (67.11 and 53.20, respectively), but the difference did not reach statistical significance (p=0.51).

DISCUSSION

All patients in this study were women (average age, 39.6 years) with a prolonged history (3 to 4 years; average 46.7 months) of urgency, frequency, bladder discomfort, and/or pain. These finding were consistent with those of prior studies that demonstrated average symptom duration of 5 to 8 years and a delay in diagnosing IC/PBS because of a lack of objective data.[1,2] The frequencies of pelvic comorbidities and symptom distribution were similar to those found in other studies.[2,4] Peters et al. found that 94% of their patients with IC/PBS had concomitant levator pain and > 50% had a diagnosis of vulvar vestibulitis.[2] In our study, the majority of patients had one or more pelvic co-morbidities: 74% had high-tone pelvic floor muscle dysfunction; 45% had vulvar vestibulitis; and 24% had concomitant irritable bowel syndrome.

In our study, 82% of all patients had dyspareunia and 87% had bladder base tenderness on physical examination. Butrick et al. reported that 43.3% of 157 patients with IC/PBS had dyspareunia, 67.6% had pelvic floor hypertonus, and 82% had bladder base tenderness on examination.[12] Our study reconfirms a strong association between IC/PBS and pelvic floor dysfunction, which suggests a beneficial effect when addressing this dysfunction during therapy.

Defreitas et al. compared 20 control women volunteers with no urologic complaints who had undergone UDT to three groups of women with BOO; 20 patients had stage III-IV cystocele; 23 had had anti-incontinence surgery; and 39 had distal periurethral fibrosis or stricture. The combination of a maximum flow rate (Qmax)≤ 12 ml/sec and a detrusor pressure at maximum flow (PdetQmax)≥ 25 cm H2O on UDT was most predictive of BOO.[9] We divided our cohort into those with BOO and those without BOO using the same criteria. We excluded patients with stages 3 and 4 prolapse and those with prior urethral surgery to eliminate confounding factors. Our goal was to support the hypothesis that urethral obstruction in patients with IC/PBS is not always anatomical (prolapse, stricture, or prior sling) but can be functional secondary to urethral spasticity or contraction of the pelvic floor muscles. Other authors agree with this hypothesis, which suggests that external sphincter spasticity syndrome or failure of pelvic floor relaxation can arise from inflammatory conditions or pain in the lower urinary tract.[16-19]

This paper is the second to demonstrate a high prevalence of BOO in patients with IC/PBS. In our study, subjects with evidence of BOO on UDT had more severe symptoms and obstructive voiding dysfunction. Cameron et al. used the same cutoff for BOO: 231 women with IC/PBS were analyzed,;48% met the criteria for BOO. Patients with more severe IC/PBS had higher voiding pressures and greater frequency of BOO.[10] However, the authors used a scoring system from 0 to 4 for frequency, urgency, nocturia, and suprapubic pain. We used ICPI and ICSI as validated questionnaires to evaluate symptom severity. We demonstrated that patients with BOO had a mean ICPI score of 13.00 (±2.06) whereas those without BOO had a mean ICPI score of 9.34 (±4.98, p=0.02); the mean ICSI score was12.22 (± 2.77) for those with BOO and 9.44 (± 4.05) for those without BOO (p=0.03).

Previous reports showed that patients with IC/PBS had low MCC. Cameron et al. reported that MCC was 298 ml in the nonobstructed group and 214 ml in the obstructed group (p<0.0001).[10] Similarly, in our study, the mean MCC was 294.22 ml (±91.51) in patients with BOO and 398.28 ml (±147.72) in patients without (p=0.02), indicating more severe and advanced disease. Prior studies demonstrated similar findings of decreased bladder capacity in patients with IC/PBS.[1,4,11,13] Detrusor overactivity was seen in 21% of our subjects, which lies within the range found in previous studies (5%–18%).[1,11]

We also found high urethral pressures in patients with IC/PBS. The average MUCP was similar in both groups (mean MUCP of patients with BOO, 118.11 compared with 119.41 in patients without BOO); the average MUCP for the whole sample was 118.76 cm H2O. This finding was consistent with those of prior studies showing that patients with severe IC/PBS had an increased MUCP. Butrick et al. showed that patients with IC/PBS had a mean MUCP of 125.1 cm H_2O.[12] These increased levels of MUCP were high compared to the average for normal individuals in this age group, which is 60 to 80 cmH_2O.[20]

We also analyzed uroflow curves. Seventy-six percent of all patients had an abnormal uroflow curve on pressure flow studies, but it did not differ between the groups: 78% for subjects with BOO compared with 58% for subjects without BOO (p=0.27). Butrick et al. reported similar results, with abnormal uroflow curves in 76.4% (non-bell curve).[12] This finding adds another criterion for a significant correlation between the severity of IC/PBS and the presence of abnormal voiding function.

The associations found between ICPI, ICSI, and UDT parameters in this study suggest that UDT may be of value in diagnosis and possibly in determining the response to treatment of patients with IC/PBS. This study demonstrated that the presence of signs of BOO in patients with IC/PBS was significantly associated with higher scores on ICSI and ICPI questionnaires, more voiding dysfunction, lower MCC, and worse glomerations on cystoscopic findings. Patients with BOO had more glomerulations on cystoscopic examinations, probably indicating more severe disease. The average mastocyte cell count was 60.15 per mm^2 on bladder biopsy, which is higher than the previously reported level of more than 27 mast cells per mm^2 for patients with IC/PBS.[14,21] However, no difference was found between the two groups.

The limitations of this study are the small sample size and its retrospective nature. However, this is the second report to study and analyze the presence of functional BOO in patients with IC/PBS using strict urodynamic criteria. Further prospective trials should be considered to confirm our findings and to demonstrate the beneficial effect of tailoring therapy for patients with IC/PBS toward pelvic floor muscles and urethral relaxation treatment modalities. The assessment of pressure flow in patients with IC/PBS is key during UDT to detect the presence of BOO.

CONCLUSION

The presence of functional BOO on UDT in patients with IC/PBS is associated with more severe symptoms and voiding phase dysfunction. Clinical findings on UDT might provide additional information to confirm the diagnosis of IC/PBS. Patients with IC/PBS have significant pelvic floor dysfunction and increased urethral pressures, which might need to be addressed during therapy.

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Figure 1.

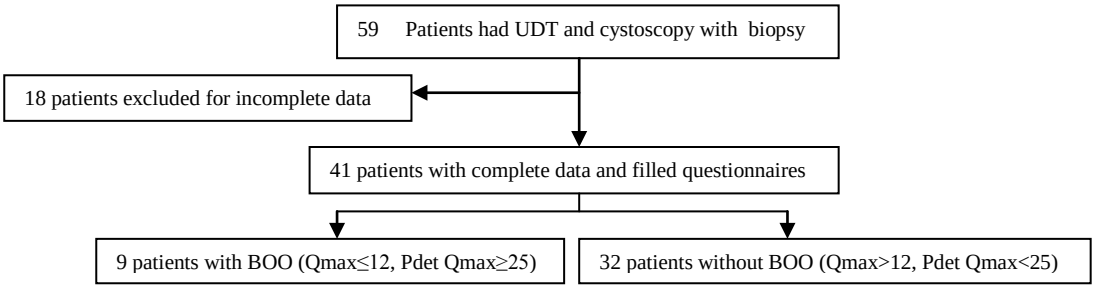

Table 1: Demographic characteristics of patients with and without BOO

Symptoms	Group I w/BOO Mean (SD) (N = 9)	Group II w/out BOO Mean (SD) (N = 32)	*t* value	*p* value[+]
Frequency/day	15.67 (9.30)	12.81 (6.20)	-0.87	.41
VAS-Frequency	7.17 (2.03)	5.90 (2.88)	-1.48	.16
VAS-Urgency	6.28 (2.33)	5.92 (2.63)	-.40	.70
VAS-Pain	6.33 (2.18)	5.56 (3.24)	-.83	.42
Nocturia	2.67 (1.23)	2.02 (2.17)	-1.23	.24
ICPI-Q	13.00 (2.06)	9.34 (4.98)	-3.28	.002**
ICSI-Q	12.22 (2.77)	9.44 (4.05)	-2.32	.03**

BMI: body mass index; BOO: bladder outlet obstruction
*Mann-Whitney test; **chi-square test

Table 2: Comparison of symptoms of patients with and without BOO

Patient Characteristics	Group I with BOO Mean (SD) (N = 9)	Group II without BOO Mean (SD) (N = 32)	p value* (Mann-Whitney test)
Age (years)	39.9 (11.7)	39.4 (14.8)	.68 *
BMI (kg/m2)	22.2 (2.2)	25.6 (5.7)	.06 *
Months of symptoms	50.1 (73.9)	43.3 (55.4)	.99 *
Dyspareunia	6 (67%)	28 (88%)	.10 **
Bladder base tenderness	7 (78%)	30 (93%)	.20 **

BOO: bladder outlet obstruction; ICPI, ICSI: O'Leary-Sant problem index and symptoms index; VAS: visual analogue scale
** $p < 0.05$; [+]2 tailed *t* test

Table 3. Comparison of urodynamic findings and cystoscopy between patients with and without BOO

Urodynamic and Cystoscopic Findings	Group I with BOO Mean (SD) (N = 9)	Group II w/out BOO Mean (SD) (N = 32)	*t* value	*p* value (2-tailed)
Abnormal uroflow curve[#]	7 (78 %)	25 (58 %)	1.21	.27
Glomerulations*	3.33 (1.00)	2.22 (1.00)	-2.6	.01**
Mastocyte count[#] on biopsy/mm^2	67.11 (68.69)	53.20 (50.48)	-0.57	.51
MCC (ml) [#]	294.22 (91.51)	398.28 (147.72)	2.59	.02**
MUCP (cm H_2O) [#]	118.11 (39.61)	119.41 (46.70)	0.08	.94

BOO: bladder outlet obstruction; MCC: maximum cystometric capacity on urodynamics; MUCP: maximum urethral closure pressure.
** $P < 0.05$; * Mann-Whitney test; [#] *t* test

Article: Cost Analysis Comparison of Traditional Circumcision Versus New AccuCirc Technology

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INTRODUCTION

Circumcision dates back several thousand years ago, to the time of Abraham (Genesis 17:24) who, at the age of 99, circumcised himself.[1] Although the technique has not likely changed much, its cost has skyrocketed. Local anesthesia is a mandate. Surgicel for hemostasis is advocated, one on one nursing care needs to be reimbursed, and prevention of staphylococcal infection policies often require use of gowns, gloves and mask. The initial investment of the circumcision tray with the Mogen clamp is approximately $465.49, and with the Gomco clamp $357.94. Factor in local anesthesia, needle and syringe, gloves and gowns, scalpel, betadine, and the cost to resterilize these trays, and we can begin to see a more economical solution may exist: the $41.00 AccuCirc. It is important to investigate the cost-effectiveness of the different methods of circumcision considering the marked variablity of reimbursement by Medicaid from state-to-state and from private insurance providers.[2]

MATERIALS AND METHODS

Costs of neonatal circumcision were studied using data compiled from Monmouth Medical Center in Long Branch, NJ. We compared costs of reusable materials, non-reusable items, and those of the AccuCirc. Data were largely gathered from our hospital's central supply offices. We provided central supply with a list of the instruments included in a standard circumcision tray and they in turn provided us with Current Procedural Terminology (CPT) codes and cost per item.

RESULTS

The lifespan of the Mogen and Gomco surgical instruments was approximated to be two to ten years, and for the purposes of this study we used a median of six years. The other reusable surgical supplies in the circumcision trays have an indefinite use, and we chose a decade for the purposes of our calculations. Our facility carries 12 trays at any one time: six of which contain the Mogen and six include the Gomco. Annually at our institution, we estimate that approximately 4,500 births occur, of which approximately 600 circumcisions are performed. We estimate our use of the Mogen clamp to be approximately 400/600 annual circumcisions and the Gomco to be approximately 200/600. These numbers are derived from circumcisions performed before July 2009, at which point the AccuCirc was introduced to our institution. Table 1 illustrates the cost of each item provided by central supply.

Each Mogen and Gomco clamp is used approximately 50 times per year, for an average of two to ten years. The total cost of a circumcision tray was determined by adding up the cost of the reusable supplies, divided by the approximate number of uses per year and the number of years used, and then adding in the cost of the disposable supplies.

Total cost of circumcision tray = Reusable supplies/(10 years X 50 uses per year) + Clamp/(6 years X 50 uses per year) + Disposable supplies

Each Mogan tray totals $13.87 per circumcision procedure performed. Each Gomco tray totals $13.51 per circumcision procedure performed. The reimbursement rates by Medicaid for each state are provided in Table 2 below.

The cosmetic results were similar for all three methods. The parents' satisfaction was measured at the maternal 2 week post-partum visit by direct questioning.

DISCUSSION

Many circumcision clamps currently in use offer a quick and safe procedure for neonatal circumcision. Most of these are reusable clamps such as the Mogen and Gomco. It was hypothesized and anticipated that the AccuCirc is more cost-effective than the older methods adopted by our institution. However, based on our cost analysis comparison, the reusable clamps are clearly more economical assuming that the tools are maintained and reused over a long period of time. The point at which the Gomco and Mogen clamps become equally or less cost-effective

than the AccuCirc is at an institution that performs a third of the circumcisions performed yearly at Monmouth Medical Center assuming the institution has access to the same number of clamps. This would be approximately 200 circumcisions a year compared to 600.

The ease of obtaining a Mogen and Gomco tray should be factored in, as central supply maintains a steady stock of these, whereas the AccuCirc must be ordered and shipped; there is a possibility of not having one available if demand exceeds supply.

There were several limitations of our study. One was that central supply was not able to give us an estimate of how many times a Mogen or Gomco clamp is normally reused, prior to damage requiring replacement. The frequency of the procedure will vary from hospital to hospital and region to region, which would influence the cost of purchasing a reusable versus disposable circumcision system. Another limitation was determining the cost of having one-on-one nursing care during the circumcision procedure – this would undoubtedly vary by state, as well as by nursing experience and seniority. The last limitation is that while many of the reusable supplies may be resterilized and thus reused indefinitely (ie cups, tray), other supplies are used interchangeably in other surgical procedures (i.e., scissors, clamps) and thus depend on handling by other surgeons and technicians.

CONCLUSION

Male circumcision is one of the oldest and most common surgical procedures worldwide and is undertaken for many reasons: medical, cultural, and religious. The reusable circumcision tools are more cost-effective with increasing frequency of the procedure. While the AccuCirc is not cost-effective, it is beneficial in locations where sterilization techniques are not readily accessible. Clearly institutions with higher volume would benefit by investing in a reusable clamp, compared to an institution which performs fewer circumcisions annually.

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Table 1. Cost of Supplies

Supplies	Cost
Reusable supplies:	
Straight scissors (1)	$43.89
Pickups (1)	3.76
Curved clamp (2)	15.22 (total)
Straight kelly clamp (2)	14.94 (total)
Probe (1)	3.92
Towels (2)	0.44 (total)
Cups (2)	27.76 (total)
Tray (1)	41.38
Scalpel handle (1)	4.70
Total cost of reusable supplies	**156.01**
Mogen clamp	297.35
Total	**453.36**
Gomco clamp	189.80
Total	**345.81**

Supplies	Cost
Disposable supplies:	
Betadyne (1)	1.32
Gauze (6)	3.60
Scalpel (1)	0.59
Sterile saline (small bottle)	0.71
Tuberculin 27 gauge needle syringe (1)	0.29
1% lidocaine without epinephrine (5mL)	2.21
Sterile gloves	0.57
Surgical gown	2.66
Mask	0.62
Total cost of disposable supplies	**12.57**
Initial cost of circumcision tray with Mogen clamp	**465.93**
Initial cost of circumcision tray with Gomco clamp	**358.38**

Table 2. Medicare Reimbursement

State	CPT 54150	State	CPT 54150
AL	$172.00	MO	$68.60
AK	$187.22	MT	$184.85
AZ	Unavailable	NE	$84.51
AR	$197.22	NV	$244.30
CA	Not covered	NH	$80.00
CO	$39.42	NJ	$14.00
CT	$139.55	NM	$231.61
DE	$128.84	NY	$12.00
DC	$148.49	NC	$114.99
FL	$91.09	ND	Not covered
GA	Unavailable	OH	$104.74
HI	$84.95	OK	$115.75
ID	$279.62	OR	$164.26
IL	$77.50	PA	$79.00
IN	$65.45	RI	$25.00
IA	$166.62	SC	$185.76
KS	$181.08	SD	$116.84
KY	$67.93	TX	$80.48
LA	$81.00	UT	$166.72
ME	$116.87	VT	$58.66
MD	$66.31	VA	$96.81
MA	$103.73	WA	$78.84
MI	$136.28	WV	$82.78
MN	$54.84	WI	$60.03
MS	Not covered	WY	$277.50

Article: Curriculum Innovation: A New Pathway for Excellence in Cardiothoracic and Vascular Surgery Training

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ABSTRACT
In order to attract well-qualified applicants to these allied fields, we need improve the quality and relevance of the educational model for cardiothoracic and vascular surgery training. To achieve this goal we have conducted an assessment of workforce trends in the surgical disciplines, collaborated with noted surgical educators, and held discussions with medical undergraduates and current surgical residents. Through this we have developed and implemented an innovative seven-year surgical curriculum leading to board certification in both cardiothoracic and vascular surgery at Allegheny General Hospital (AGH). We look to increase in quality and number the applicants to the Allegheny Programs in cardiothoracic and vascular surgery. With our current success it appears that curriculum innovation is key to increased recruitment of talented medical students into cardiothoracic and vascular surgery training programs.

INTRODUCTION
In an era of change, cardiovascular surgeons continue to express a high level of satisfaction with the intellectual challenges and rewards of their profession. However, the interest in pursuing a career in cardiovascular surgery among American medical students and general surgery residents is unquestionably in decline. Statistics from the Thoracic Surgery Match are concerning. In appointment year 2000 there were 156 total applicants in the Thoracic Surgery Match.[1] The most recent Match in June, 2010 had 99 applicants, a decrease of 36%.[2] Similarly, the number of matched US medical graduates dropped from 96 to 62 during the same time period.[1,2] A recent article in Thoracic Surgery News has summarized the results of the June, 2010 Match and concluded that these data are likely indicative of a declining pool of well-qualified applicants.[2] In response, an inventive seven-year sequential curriculum which will allow residents to sit for board examinations in both vascular and thoracic surgery has been developed and initiated within the Department of Thoracic and Cardiovascular Surgery at AGH.

The reasons for the decline in interest in cardiovascular surgery are multiple and complex; some are real and some perceived. The length of residency training for cardiovascular surgeons is arduous. More than half of all medical students enter residency carrying a debt of at least $150,000 a year, which continues to accrue interest during postgraduate training.[3] Over the past decade the reimbursement for many cardiovascular surgical procedures has declined, making the traditional fields less financially rewarding.

While acknowledging the professional satisfaction found in the practice of cardiovascular surgery, many medical students and general surgery residents view these specialties as not conducive to normal family life and leisure activities. Especially in cardiothoracic surgery, lengthy operations coupled with complex, high risk and time-consuming post-operative intensive care and restrictive call schedules are considered to be an inextricable part of this career choice. Interventional cardiologists are now using catheter-based technologies to perform procedures previously done with an open-heart approach. The drug-eluting stent is responsible for a significant decline in the need for traditional coronary artery bypass procedures. Some types of valvular heart disease are now treatable with percutaneous implants. With few exceptions, cardiothoracic surgery training does not offer significant experience in major interventional vascular procedures, as compared with programs in vascular surgery and interventional radiology.

Although workforce analyses predict a coming shortage of cardiovascular surgeons, current graduates are already having difficulty securing positions in major metropolitan areas and may be relegated to joining a small program in an isolated community setting. The emphasis in many thoracic surgery and vascular surgery residency programs now includes intense exposure to thoracic transplantation, assist device surgery, thoracic aortic surgery and sophisticated catheter-based procedures, including percutaneous aortic valve implantation. Unfortunately, the majority of job opportunities are in locations where these advanced fields are rarely practiced.

New technologies are evolving and the need for well-trained surgeons in major metropolitan centers will expand, particularly since the segment of the U.S. population most likely to require cardiovascular care continues to grow, heavily front-loaded by the wave of "baby-boomers" now entering the higher-risk age group.[4] Conservative projections demonstrate a deficit of thoracic surgeons reaching well over 30% in the next 20 years.[5] Similar results are predicted for vascular surgeons.[6]

In a recent editorial, Kim et al. state that thoracic surgeons must be even more focused and committed to recruitment of the "best and brightest" to cardiothoracic surgery.[7] In order to accomplish this goal, the Joint Council for Thoracic Surgical Education, headed by Edward Verrier, M.D., has undertaken a multi-faceted approach to improve cardiothoracic surgery education by developing innovative techniques (including simulation) and redesigning the standard resident training model. Doing so affirms the fact that curriculum innovation, such as the new seven-year program at Allegheny, is the solution to recruitment of the top medical school graduates into cardiovascular surgery. This unique training pathway was specifically developed to answer the concerns voiced by medical students as they consider a career path in surgery.

METHODS

The critical feature of this new program is the curriculum for PGY 1, in which the resident works directly with faculty mentors from the Department of Thoracic and Cardiovascular Surgery. The fundamentals of surgery are taught in four-month blocks supervised by vascular surgery faculty (block 1), general thoracic surgery faculty (block 2), and cardiac surgery faculty (block 3). A faculty member meets with the first year resident twice each month for one-on-one medical knowledge review and mentoring. A skills laboratory under the direction of program surgeons is held bi-monthly during years one through three, with additional and/or remedial training available in subsequent years (Fig. 1). An added advantage of this mentored approach is that the resident will be primarily trained by faculty members who are actively involved in, and committed to, the goal of graduating residents who have achieved board certification in both thoracic and vascular surgery.

Because the curriculum is designed to give the PGY-1 resident exposure to daily clinical decision-making, operative and perioperative skills, and to the professionalism of mature vascular and cardiothoracic surgeons, the "delayed gratification" of having to wade through years of general surgery training has been greatly reduced. As a result, the number of applicants to this program has exploded. In the past several years the number of applicants to the established two-year residencies in vascular and thoracic surgery has typically numbered less than a dozen. The sequential integrated program has seen over 70 applications this year.

The advantage of the sequential integrated program in thoracic and cardiovascular surgery is flexibility in training and career pathways. The medical school graduate entering the program is not obligated to finish the sixth and seventh years of formal thoracic surgery training. Although it is expected that students selected to the program should have a genuine and strong interest in both fields, the final decision to finish the thoracic surgery program will not be made until the fourth year of the vascular surgery residency. By this time, the resident will have had in-depth exposure to and mentoring from all three specialties and as such, an informed and mature decision can be made. The resident will be confident in his/her aptitude for mastering cardiothoracic surgery and understand the scope of the commitment to complete the combined program.

This curriculum provides not only a robust exposure to training and catheter-based techniques, but also to highly complex open procedures on the thoracic and thoracoabdominal aorta. There is concern that the next generations of pure vascular surgeons may not have enough exposure to open vascular procedures as interventional techniques evolve. Such cross-pollination of technologies and educational programs should produce a highly confident, innovative surgeon for the next generation.

DISCUSSION

Graduates of the combined program will have the flexibility of pursuing a career not only in adult cardiothoracic surgery, but also in cardiovascular surgery, thoracic and vascular surgery, pure general thoracic surgery, pure vascular surgery, pure cardiac surgery, or pediatric surgery. This training program will also allow the resident to choose to practice in a cutting edge, high-powered university hospital setting or in a more conventional community hospital setting, possibly in a rural environment. The university environment would certainly be ideal for the percutaneous valve technology, robotic surgery, thoracic and peripheral vascular endovascular procedures, as well as heart and lung transplantation, and left ventricular assist device implantation. On the other hand, if the resident so chooses, he could practice more traditional general thoracic surgery and cardiac surgery in a large community hospital, or possibly practice vascular and thoracic surgery in a smaller more rural setting.

Job opportunities should be more plentiful, as residents will have a more diverse set of operations they are board certified to perform. Hospitals could elect to hire one surgeon to perform thoracic and vascular surgery as opposed to hiring two surgeons as is presently the case. In addition, a university practice could hire a cardiovascular surgery specialist who would be current in treating the aorta from the aortic valve to the lower extremities.

The primary disadvantage of this program is that the curriculum is not fully integrated. Some residents may choose to forego the cardiothoracic surgery training that follows the vascular surgery residency for personal or professional reasons. Because the psychomotor and cognitive competencies necessary for medical students to succeed in cardiothoracic surgery are not yet well understood, the sequential approach of this program certainly allows the resident to decide over time whether the combined career path is the proper choice. In large part, the resident's decision to finish his training in cardiothoracic surgery will be determined by the quality of the exposures and mentoring provided by the cardiothoracic faculty. With a high-quality, engaged faculty, the chances that the resident will finish are strong.

A second disadvantage of a combined program is the fact that it may not be a practical solution in many centers with little interaction between residency programs in vascular and cardiothoracic surgery. Both of these specialties will need to provide exciting elective rotations to third and fourth year medical students in order to inform the choice of a combined career path. At present, it is certainly not uncommon in some centers for program directors in vascular surgery and cardiothoracic surgery to find themselves competing for residents, resources, and clinical material. In this setting, it is unlikely that the two programs would see the advantages of a combined, sequential and partially integrated approach. However, when viewed as a component of resident education, and the training of the cardiovascular surgeon for the next generation, this pathway provides clear benefits to hospitals, patients and the residents who choose this option. Finally, if the sequential integrated program is a success, it could easily lead to a fully integrated seven-year curriculum with one board exam.

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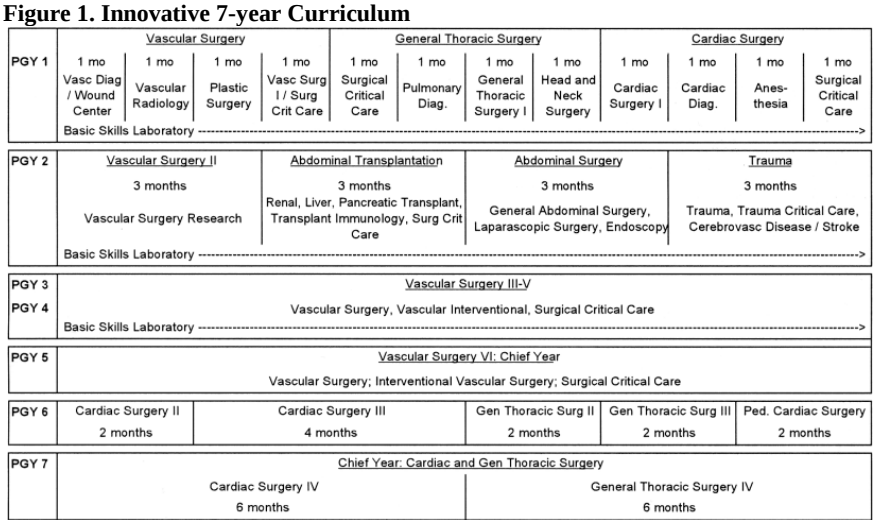
Figure 1. Innovative 7-year Curriculum



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Article: Glycemic Control in Patients with Type 2 Diabetes Mellitus: Is Control Better in Patients Who Follow Evidence-Based Guidelines for Management?

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BACKGROUND

The World Health Organization has described diabetes mellitus (DM) as an epidemic. By 2025, it is estimated that 366 million people world-wide will have diabetes. Data from the 2007 National Diabetes Fact Sheet showed that about 7.8% of the US population has diabetes; 1.6 million new cases are diagnosed annually in people age 20 years and older. The total cost reached $174 billion in 2007, which included direct medical costs and indirect costs as a result of disability, premature death and work loss.

Lifestyle interventions, which include appropriate nutrition therapy and exercise, are the main components of disease prevention and treatment. However, the majority of patients with type 2 diabetes will eventually require pharmacotherapy to attain glycemic control. The treatment of type 2 DM requires an integrated, yet individualized, approach. For this reason, evidence-based guidelines and treatment algorithms were developed to help manage this multifaceted disease. The American Association of Clinical Endocrinologists (AACE) and the American College of Endocrinology (ACE) published an algorithm in October 2009 to assist physicians in the management of type 2 DM. This tool was designed to minimize the varied complications of diabetes by achieving an HBA1c goal of 6.5% or less. The algorithm emphasizes not only safety and efficacy, but also simplicity and cost of therapy.

The purpose of this study is to evaluate the care rendered to type 2 DM patients in a federally-qualified health center (FQHC) in Long Branch, NJ, which is affiliated with Monmouth Medical Center. The specific aims are to investigate whether patients on a regimen consistent with AACE/ACE guidelines have better control of their diabetes compared to those who are not, and to determine if other specific factors correlate with poor diabetes control.

METHODS

The study population consisted of adult, type 2 DM patients with an ICD-9 code of 250.00 from January 2009 through March 2010. Type 1 diabetics and patients who have not been evaluated in the clinic for more than a year were excluded from the study. Also excluded were patients who died or transferred to another state or county. All charts of eligible patients were reviewed. HBA1c levels were recorded as well as the patients' current diabetes regimen, known DM complications, age, sex, ethnicity and type of insurance. The AACE/ACE algorithm was then used to categorize each patient as to whether they are on a diabetes regimen consistent with established recommendations (on protocol), and correlating this with their HBA1c levels.

RESULTS

There were 516 patients followed at the FQHC with the ICD-9 code 250.00. After eliminating patients based on exclusion criteria, a total of 424 charts were carefully reviewed. Of these, 26 did not have an HBA1c measured, leaving 398 patients to be included in the analysis. Age range was from 21-90 years. The demographics of the eligible patients are presented in Table 1.

The majority of patients (53%) cared for at the FQHC have health insurance. The average HBA1c of insured patients was 7.4%, compared to 8.2% for those who had no insurance. Male patients had higher HBA1c of 8.1% as compared to 7.5% in the female population.

The 398 patients were then divided into two groups: those who were on a glycemic regimen consistent with guidelines (on protocol) and those who were on a regimen not consistent with guidelines (not on protocol). As can be seen in Table 2, patients on protocol were more likely to be female, of White race, and to have health insurance. Patients following evidence-based guidelines were more likely to have better glycemic control with a lower average HBA1c level.

DISCUSSION

Better glycemic control, as assessed by HBA1c levels, has been associated with better outcome in patients with diabetes. We found that 70% of type 2 DM patients followed at the FQHC were being treated commensurate with the AACE/ACE glycemic control guidelines. Furthermore, as would be predicted, those patients on the recommended regimen were more likely to have better average HBA1c levels (7.4% compared to 8.8%). Looking closely in the subgroup populations who are on the protocol, the majority was women, of white race, and had health insurance. We would surmise that those patients with health insurance experienced fewer barriers in being able to obtain the appropriate medications to treat their diabetes.

Based on these results, we plan to institute the AACE/ACE algorithm for the management of patients with type 2 DM for all patients at the FQHC; the expectation is that initiation of established guidelines for all patients will lead to better glycemic control, even in those who are currently on the recommended protocol. This often requires use of combination therapies, which may be difficult to achieve in a population in which 47% of patients currently do not have health insurance. While caring for patients with type 2 DM diabetes, it is very important to monitor treatment with measurement of the HBA1c every 3 months until the appropriate goal is reached. Adjustments to each patient's regimen are made based on the target HBA1c and any associated co-morbid conditions, including renal and cardiovascular disease. Achieving glycemic control will have a major impact on prevention of diabetes-associated complications.

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Table 1. Demographics of 398 patients with type 2 DM

Demographic	Number	Ave HBA1c
Male patients (%)	164 (41%)	8.1%
Female patients (%)	234 (59%)	7.5%
Insured (%)	211 (53%)	7.4%
Uninsured (%)	187 (47%)	8.2%

Table 2. Characteristics of patients on protocol compared to those not on protocol

Demographic	On protocol	Not on protocol
No. of Patients	281	117
Male patients (%)	106 (37.7%)	56 (48%)
Female patients (%)	175 (62.3%)	59 (52%)
Age	24-90 years old	21-89 years old
Insured (%)	160 (57%)	51 (43.6%)
Uninsured (%)	121 (43%)	66 (56.4%)
Ethnicity - White - African-American - Hispanic - Asian	 - 94 (33.5%) - 67 (23.8%) - 112 (39.9%) - 8 (2.8%)	 - 31 (26.5%) - 36 (30.7%) - 47 (40.2%) - 3 (2.6%)

Article: Hardiness as a Factor that Mediates Stress and Burnout in Internal Medicine Residents

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INTRODUCTION

Hardiness is a personality construct composed of three dimensions: commitment, control, and challenge.[1] Those individuals high in commitment find life meaningful and believe that they have influence over their personal and professional situations; they are active and curious, rather than passive and alienated. Those high in control act with a sense of mastery and seek to exercise the influence which they believe they have. Individuals high on the challenge parameter expect and accept change, rather than stability, as a part of life; they are not threatened by change and value it for its growth and development potential.[2]

Previous research has evaluated hardiness as a factor that mediates the effect of stress on illness and job satisfaction. Results have been mixed, with some studies indicating that hardiness had a significant direct effect on illness while others have not.[3-5] Hardiness has also been found to be a better mediator of stress than either exercise or social supports.[6]

Stress and burnout are commonly reported, not only by internal medicine residents, but by physicians and physician trainees in other medical specialties.[7,8] Effective July 2003, resident work hours across all specialties were restricted to a maximum of 80 hours per week when averaged over a four week period with no more than 30 hours of continuous duty permitted for patient care and educational conferences. This change was due to recognition that the stress of long work hours may compromise patient care.

The relationship between stress and physical and/or psychological health has been well documented in previous studies.[9] Stress is the body's natural response to pressure or a specific situation that requires higher energy levels for the ability to concentrate and meet demands. The level of stress influences to what has been termed burnout.

Burnout refers to a process beginning with high and sustained levels of stress that result in irritability, fatigue, detachment, cynicism, resentment and failure. Maslach described burnout as a syndrome of emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment among individuals who work with people in some capacity. Maslach created an inventory to measure subjective levels of emotional exhaustion, depersonalization and achievement.[10] Research by Gopal et al. suggested that internal medicine residents are at high risk for burnout because of the stress of long work hours and limited control over schedules and work environment.[11] The increased complexity of health care, combined with extended hours caring for acutely ill patients, puts residents at even greater risk, thus impacting their personal health as well as patient care.

The principal aim of this pilot study was to determine whether hardiness affects the levels of perceived stress and whether hardiness interacts with stress, such that it buffers the effects that stress can have on health. In addition, because it is a pilot study, this research considered whether various demographic variables such as gender, sex, and marital and financial status correlated with hardiness and perceived stress levels.

METHODS

Participants

All internal medicine residents at Monmouth Medical Center (MMC) were eligible to participate in this confidential pilot study. The three year MMC internal medicine training program includes a total of 36 residents; 34 residents responded, 12 in postgraduate year one, 12 in postgraduate year two and 10 in postgraduate year three. There was no need to survey non-responders to the pilot study as the two residents who did not respond were involved in the administration of the study. Data transformations were performed to correct for extreme skewness and for the existence of outliers among the scores.

Data Collection

Approval for the study was obtained from the MMC Institutional Review Board. During the academic year 2006 - 2007, each resident was asked to answer a general demographic questionnaire and three standardized, validated survey instruments.

Survey Measures

General demographic data included in the study were age, gender, marital status, number of children, native language, year of medical degree, prior medical experience before residency, financial stress, exercise frequency, sleep hours, subjective reporting of social support system, satisfaction with residency program, ability to communicate with patients, and methods of relaxation. It should be noted that items such as native language and year of medical degree were included because MMC is a community teaching hospital and the majority of its residents are international medical graduates.

The General Health Questionnaire12 was a self-administered 12-item questionnaire that assessed symptoms of psychiatric morbidity using a score of zero or one on the basis of how often the subject experienced the symptom in the recent past. Recent research has found it to be a reliable measure of anxiety, depression, somatic symptoms, and social dysfunction.[13] In this pilot study, these items are referred to as illness, although they do not measure physical health, but rather psychological well-being across a continuum.

The Maslach Burnout Inventory (MBI) consists of a 22 item self-administered 7 point likert-scale questionnaire organized into 3 sub-scales: emotional exhaustion, depersonalization, and personal accomplishment. Emotional exhaustion is defined as drained, depleted feelings resulting from excessive psychological and emotional demands. Depersonalization results from treating others in a detached, impersonal, and cynical manner. Personal accomplishment refers to a sense of competency and subjective feeling of achievement.[7]

Hardiness was measured using an instrument called the Personal Views Survey (PVS).[1] This self -report instrument measures the degree to which a respondent displays the characteristics of commitment, challenge and control. The PVS consists of 50 questions which share the same format and the participants are asked to indicate their views. Respondents rate items on a three point scale from “not true at all” to “completely true.”

Statistical Analysis

Logistical regression was used to analyze the relationships between the independent variables of hardiness and stress/burnout and dependent variable of illness. Stepwise regression analysis examined the interaction effect of

stress and hardiness on illness. Pearson and Spearman correlation tests were used to determine if there was a relationship between demographic factors and levels of hardiness.

RESULTS

First-year medical residents experienced greater emotional exhaustion and depression. In addition, residents in the second and third years of training had greater subjective experiences of personal accomplishment and hardiness. Subjective impression of faculty support was the only demographic factor that came close to being significant ($p=0.066$, Table 1). There was a significant inverse relationship between hardiness and stress/burnout. The relationships between hardiness and illness, and stress and illness, were not found to be significant but both showed a trend, and might have been significant if the sample were larger. There was no significant interaction effect between stress and hardiness on illness.

DISCUSSION

Many investigators conceptualize stress and burnout during postgraduate medical education as the result either of the work itself or the long work hours. In order to reduce resident stress and burnout, the goal of this pilot was to identify factors that could be assessed and introduced into hiring decisions and training. The three components of hardiness - commitment, control and challenge - impact the way medical residents perceive and interact in their daily life. As previously mentioned, individuals with hardiness as a strong personality construct will seek to engage these three components in the most beneficial way possible.

Stress and burnout are commonly reported across other medical specialties.[13] The overall burnout rate was 50% and ranged from 27% to 75% among different specialties.[14] Burnout can contribute to multiple physical symptoms, psychological symptoms and substance abuse all of which can impact the resident's quality of life. Burnout also impacts patient care by increasing the potential for medical errors and patient safety risks, compromising quality of care. Other negative consequences of burnout in residents include depression, suicidal tendencies and medical illnesses.

The case of Libby Zion in 1984 prompted the Accreditation Council for Graduate Medical Education, in 2003, to restrict resident work hours across all specialties to a maximum of 80 hours per week when averaged over a 4-week period with no more than 24 consecutive hours with 6 additional hours for transfer of care and educational activities. The work hour limitations were intended to decrease resident fatigue, enhance resident education and improve patient safety. A recent publication suggests that the decrease in work hours has had mixed results. On one hand, residents report benefits to their well-being. However, residents also report negative effects on patient care and resident education.[15,16]

The concept of hardiness has a long investigative history in the realm of stress and burnout studies, but has not been used in connection to medical residents. This unique approach to examining stress and burnout might avoid the many pitfalls of trying to re-examine work hours and still be potentially useful withing the complex medical systems of today's hospitals. This study provides clear evidence of an increase in hardiness in medical residents as their training increases, presumably as they grow in confidence and learn to work within their hospital's system. Since it is clear that stress among medical residents can affect the quality of patient care, consideration should be given to examining hardiness and using it as a factor in resident selection.

One of the most striking findings of this study, albeit not statistically significant in this pilot investigation, was the connection between the residents' perception of faculty support and lower levels of stress. Although one might hypothesize that more resilient residents can more easily form relationships with faculty, a specific mentoring program either with faculty or attendings could enhance the residents' perceptions of support systems as well as enhancing their stress resistance.

CONCLUSIONS

As the level of hardiness increased with each post graduate year, stress and burnout decreased. Since burnout was found to be greater for first year internal medicine residents, residency programs may wish to put in place interventions to help reduce stress during this crucial training year. These interventions could include relaxation training, retreats, and increases in protected time.

More controversial, but worthy of discussion, would be the use of the hardiness instrument, the Personal Views

Survey, as an adjunct to interviewing potential candidates for the residency training program. Since hardiness has been shown to have an inverse relationship with stress and burnout, this instrument might be useful in selecting medical residents who are more resilient (due to higher levels of hardiness) and therefore more able to cope appropriately with stress, thus avoiding burnout.

Finally, since the subjective impression of faculty support was the only demographic other than postgraduate training level that approached significance, consideration should be given to creating a specific faculty-resident mentoring program.

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Table 1. The relationship of hardiness and characteristics

Description	Relationship	p-value
Hardiness and Stress	inverse	<0.05*
Hardiness and PGY level	inverse	<0.05*
Hardiness and Faculty Support	Direct	<0.10

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Article: Mollaret's Meningitis: A Case Report and Review

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ABSTRACT
Mollaret's meningitis, a benign recurrent aseptic meningitis, is a rare but well known self-limited disease. It was first described in 1944 and to date only a small number of cases have been described in the literature. The most common causative agent is Herpes Simplex Virus (HSV) type 2, although there are several less common etiologies.[1] We report a case of a 59 year old white female who experienced four episodes of recurrent aseptic meningitis. On her fourth admission HSV type 2 was isolated in the CSF by PCR. Patients with recurrent meningitis must be screened for HSV. The patient was diagnosed with Mollaret's meningitis and was treated with acyclovir.

INTRODUCTION
Mollaret's meningitis is a benign recurrent aseptic meningitis most commonly caused by HSV type 2. HSV type 1, Coxsackievirus, echovirus, Varicella-Zoster and HIV are less common etiologies. The disease is well described, but the lack of cases limits any epidemiologic descriptors. Symptoms include fever, nuchal rigidity, photophobia, myalgias, and meningisimus. Detection of HSV-2 DNA in the patient's CSF via polymerase chain reaction has come to be accepted as the gold standard of diagnosis with the test yielding a sensitivity of 95% and specificity of 100%. Even though HSV-2 is responsible for most cases, patients do not usually present with evidence of genital lesions. We report a case of a 59 year old female diagnosed with Mollaret's meningitis on her fourth recurrence.

CASE REPORT
A 59-year-old white female with a past medical history significant for hypertension, recurrent meningitis and hypothyroidism, currently not taking medicines, presented to the ED with a 1-day history of severe headache rated as 10 out of 10. The patient stated that the pain woke her from sleep one day prior and since that time had a constant pain located diffusely in her forehead and the top of her head. She described the pain as dull, but stated at times the pain became very sharp and pulsatile in nature. She denied any alleviating factors but stated that noise and light exacerbated the pain. No exacerbation of symptoms occurred with changes in position. She did complain of three episodes of nausea and vomiting. She also stated that she had a waxing and waning fever, as well as nuchal rigidity and lethargy. On admission, the patient had no photophobia but stated that she had photophobia in the past. She also stated that when she had these episodes of headache and nuchal rigidity that she developed a skin lesion on the posterior aspect of her right thigh. She stated this current rash began 3-4 days prior to admission. The lesions did not itch or cause her any pain. The patient stated that she has lacrimation and rhinorrhea but that they had been ongoing for weeks and were unrelated to her current headache. She does have a history of migraines, but her last episode was years ago. She denied any sick contacts or acute traumatic events in the preceding few days, chest pain, palpatations, and shortness of breath, abdominal pain, or changes in bowel or bladder function.

The patient had been hospitalized three separate episodes for meningitis and with no etiology discovered. Her first episode was in 1996. She remembered it as viral meningitis that resolved after several days in the hospital. She was then hospitalized again in 2002 and 2007 for episodes of viral meningitis. Both of these episodes were complicated by encephalitis. Still no exact etiology was identified. She has noticed she typically has one episode of meningitis every 3-5 years and recognizes when an episode is about to occur because she develops a papular lesion on her posterior right thigh about 4cm by 6cm. She does not report any vaginal lesions prior to these episodes of meningitis. The patient currently lives at home with her sister and is employed as an armored truck driver. She denied any tobacco, alcohol or illicit drug abuse. She has not been sexually active for years.

On admission her temperature was 98.9 degrees Fahrenheit, pulse 18 and blood pressure 136/81. She was alert and oriented to person, place and time, but was lethargic and in obvious discomfort. She was resting in a dark room as that seemed to provide relief of her headache. Her pupils were equal and reactive to light and extraocular muscles were intact. Her neck was supple without lymphadenopathy, JVD, or bruits. Cardiac exam revealed a normal rate with regular rhythm, normal S1S2 without murmur, rubs, or gallops. The lungs were clear to auscultation bilaterally. The abdomen was soft, nontender, nondistended, with positive bowel sounds. There was a 4cm by 6cm healing pustular lesion to the posterior right thigh. Otherwise, the skin was dry, pink, warm, and perfused. Neurologically cranial nerves 2-12 were intact, she had mild decreased sensation to pin prick and soft touch in the bilateral lower extremities. Strength was 5/5 in bilateral upper extremities and 4/5 in bilateral lower extremities. She also demonstrated positive Kernig and Brudzinski signs. BMP and CBC were within normal limits. CSF obtained on admission revealed the following: tube 1 glucose 52 (40-70), protein 81 (12-45), WBC 69 (0-5), lymphocytes 98% (40-80%); tube 4 WBC 62 (0-5) and lymphocytes of 95% (40-80%). PCR of CSF was positive for HSV-2 DNA. No microorganisms were seen in the gram stain of the CSF indicating the sample was sterile. CSF Epstein-Barr Virus was negative. CSF India Ink, cryptococcal antigen, and VDRL were not ordered. Blood cultures demonstrated no

growth. Tzank stain of skin lesion was negative for inclusion bodies (but drawn around 5 days after patient noticed lesion). CT head without contrast showed no acute abnormalities.

The patient was initially started on IV ampicillin, ceftriaxone, and acyclovir until cultures and PCR results were received. Once the CSF and PCR results were received all antibiotics were discontinued. The patient was diagnosed with Mollaret's meningitis and was started on IV acyclovir 10mg/kg every 8 hours. She was then discharged on acyclovir with a loading dose of 4000 mg (800 mg X 5 doses for 1 day) then 400mg T.I.D. for prophylaxis.

DISCUSSION

Benign recurrent aseptic meningitis, also known as Mollaret's meningitis, is an extremely rare disease. A recent analysis of pertinent literature produced a miniscule incidence of under sixty cases[1] in the almost seventy years which have passed since it was first described in 1944 by French neurologist Pierre Mollaret.[2] The small number of cases which have been reported in literature makes it difficult to construct any useful epidemiologic descriptors of the patient population beyond the implication of HSV type 2 as the most common isolated causative agent.[3]The difficulty of analyzing data with such a small n is reflected in the fact that Ruben[4] describes the disease as "equally divided among the sexes" in his 1994 case report while more recent data published in 2004[5] provides us with a female: male ratio of 3.82:1, suggesting that women are nearly four times more likely to be victims of this benign process. Additionally, with the age at first episode of meningitis ranging from 5 to 57 years[1] or 5 to 83 years[4] it is difficult to make claims about the average age of onset. With such roadblocks to characterizing the typical patient population susceptible to Mollaret's meningitis, a good physician must always entertain the idea of this exotic disease when constructing a differential diagnosis for aseptic lymphocytic meningitis with a past medical history significant for recurrent meningitis.

The clinical presentation of Mollaret's meningitis is similar to other forms of meningitis with symptoms of headache, fever, photophobia, neck stiffness, back pain, nausea, vomiting, and myalgias associated with signs of meningisimus (Kernig's and Brudzinski's signs).[2,6-8] Symptoms tend to recur over a period of 3-5 years. Analysis of cerebrospinal fluid obtained via lumbar puncture will be remarkable for hypercellularity and prominent pleocytosis[9] with protein concentration less than 100 mg/ml and an often normal glucose concentration.[3] Another interesting, albeit unreliable, finding in the patient's CSF is the Mollaret's cell, a large monocyte with blunt psuedopods and bean-shaped or bi-lobed nuclei on May-Grunwald-Giemsa[9] or Papanicolou staining.[10] Detection of HSV-2 DNA in the patient's CSF via polymerase chain reaction has come to be accepted as the gold standard of diagnosis with the test yielding a sensitivity of 95% and specificity of 100%.[1] Although HSV-2 is the most common etiology of Mollaret's meningitis, most patients do not present with evidence of genital lesions.

Another helpful diagnostic tool is a set of criteria originally developed by Bruyn et al.[8] The parameters which must be met for clinical diagnosis of Mollaret's meningitis include 1) attacks separated by symptom-free periods of weeks to months or years, 2) spontaneous remission of symptoms and signs, 3) recurrent episodes of headache, fever, and meningisimus, 4) cerebrospinal fluid pleocytosis with large endothelial cells, neutrophils, and lymphocytes, 5) No causative agent has been identified although HSV-2 is the culprit in most cases. The differential diagnosis includes a variety of conditions which include Behcet's syndrome, ruptured pineal cyst Vogt-Koyanagi Harada syndrome, neurenteric cyst of the foramen magnum, and sarcoidosis.[1]

Since the majority of cases are caused by HSV-2, the treatment of choice begins with acyclovir 10mg/kg every 8 hours along with symptomatic care. Despite acyclovir being safe, specific for HSV-2, effective, and affordable, no evidence exists that this medication alters the progression of the disease.[12] Numerous studies have been completed evaluating the efficacy of estrogens, colchicine, steroids, antihistamines, and phenylbutazonum for the treatment of Mollaret's meningitis, which have been relatively unsuccessful.[1] However, there has been a case presented by Mora et al. that demonstrated resolution after treatment with colchicines.[1] Valcyclovir could also be used as a prophylactic agent for the prevention of recurrent HSV-2 infections. There are no guidelines with respect to dose and duration of treatment. It is also unknown whether patients with Mollaret's meningitis should be treated with daily doses of acyclovir or if they should take larger doses of acyclovir with the prodrome of the illness. These uncertainties stem from the rarity of the disease as well as the typical 3-5 year period between infections. In this cases we discharged the patient with a loading dose of acyclovir 4000 mg PO on day one then 400 mg PO T.I.D. for life.

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Article: PICC-Associated Upper Extremity Deep Venous Thrombosis

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PURPOSE

Given the large number of patients who get a peripherally inserted central catheter (PICC) this study looks at PICC-associated deep venous thrombosis (DVT).We looked at patient characteristics, mean PICC duration, location of the patients in the hospital and location of thrombi.

METHODS

This was a retrospective chart review analyzing data on patients admitted to Abington Memorial Hospital who developed a PICC-associated DVT. A list of 282 patients with PICC-associated DVT between November 2006 and November 2008 was obtained and randomized. Thirty patients were selected who met the inclusion and exclusion criteria. Patients over the age of 18 with a PICC-associated DVT were included in the study and exclusion criteria included pregnancy, post-operative, and hemodialysis patients. Data was summarized using descriptive statistics such as means, frequencies and standard deviations. A p value of ≤ 0.05 was considered statistically significant. We also compared the diagnoses of the patients to see if there was any difference in the PICC duration between the patients with infection, cancer, and other diagnoses before they developed clots.

RESULTS

The average age of the patients was 65.9 +/- 18.3yrs. 50% were male and 50% females. Approximately 83% of patients had an axillary thrombus, 63.3% subclavian and 46.7% brachial (Table 1). 80% had unilateral clots and 20% had bilateral clots. 3.3% had concomitant LE DVT. 56.7% were on medical floors and 43.3% in the ICU. The

mean number of PICC days before clot development was 13.5 +/-10.029 (Table 2).

Although not statistically significant, mean PICC days for patients in the ICU was 16.6+/-12.5 in comparison with floor patients with 10.8+/-6.5. The patients with infection developed a clot in 12.2 days, those with cancer in 15.7 days, and the other category in 13.2 days.The mean number of PICC days after which patients developed a clot was 13.5 days. Looking at the vessels that were thrombosed, 83% had an axillary thrombus. It is interesting to note that 20% patients had bilateral DVT.

DISCUSSION

UE DVT is an increasingly important clinical condition with potential consequences of significant morbidity and mortality. The venous pathway of the upper limb is less likely to develop DVT compared with the lower limb because of relatively high blood flow rate, gravitational effects and lack of stasis. There are three obvious reasons that may account for the apparent increase in the incidence of inpatient UE DVT: widespread use of long-term intravenous catheters, more liberal use of duplex scans, and increased awareness of this condition by clinicians. The pathogenesis of thrombosis associated with PICC lines is thought to be multifactorial including endothelial trauma, hypercoagulable state of malignancy, and irritant effects of solutions infused.[1] Position of the PICC was not related to thrombosis in the study by Ong et al.[2]

Although much attention has been focused on LE DVT, there is a relative paucity of data regarding frequency of UE DVT in patients with PICC lines and their optimal treatment. All central venous catheters including PICC have been implicated in UE DVT. However, there have been few studies examining thrombosis related to PICC. The incidence of thrombosis in PICC was reported in a single series at approximately 4%.[1]This study by Grove and Pevec included basilic and cephalic vein thrombosis and was not strictly looking at DVT. Based on the diagnosis, thrombosis rate for cancer was significantly higher when compared to the benign diagnosis of infection or need for parenteral nutrition. Ong et al reported a symptomatic thrombosis rate of 2.6% with PICC lines. 80% of the study participants had malignancy and needed the PICC for chemo.[2] Most of the thrombosis occurred within 14-20 days after the PICC insertion.[1,2]

Recent publications have focused on aggressive diagnostic and treatment protocols that have included thrombolysis, balloon angioplasties and stent placement.[3] The data on medical management of patients with UE DVT are extrapolated from studies on lower extremity DVT.[4]

Looking at IV solutions for which the PICC was used, the study by Grov eand Pevec showed a thrombosis rate of 8.3% for cancer chemotherapy, 1.6% for antibiotics, 4.2% for TPN, and 5.8% other . The most significant factor affecting venous thrombosis was catheter diameter. Secondary factors affecting venous thrombosis rate were diagnosis and solution infused.[1]

The mean number of PICC days after which patients developed a clot in our study was 13.5 days, which is in keeping with data so far of 14-20 days. This would imply that the PICC lines need to come out before 2 weeks. The fact that 83% had an axillary thrombus may imply that the anatomy of the axillary vein and the maneuvering of the PICC during insertion causing endothelial injury, increasing the risk of thrombosis. Alternative insertion techniques should be investigated.

It is interesting to note that 20% patients had bilateral DVT. This raises the question regarding other factors that may be playing a role besides the PICC line. The role of prophylactic anticoagulation in patients who have PICC lines for longer than 2 weeks should be evaluated further. Boraks et al. found mini-dose warfarin to decrease rate of thrombosis with no increase in hemorrhagic complications in patients with hematological malignancies with central lines or tunnelled catheters.

Limitations of our study include small sample size, lack of assessment of contributing anatomic causes like cervical rib, differences in PICC placement technique by nursing and radiology, and thrombogenic properties of IV solutions the patients received.

In summary, PICC lines have become a means of outpatient management of multiple medical problems including infections, cancer chemotherapy, heart failure and parenteral nutrition. They can be inserted with relative safety and cost less than port-a-caths and tunnelled catheters.They are well tolerated by patients and can frequently be

maintained for long periods of time.Administration of drugs or fluids can occur in the outpatient setting, enabling early discharge from hospital. However, PICC lines can cause venous thrombosis, post thrombotic upper extremity swelling, pulmonary embolism, and loss of access.

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Table 1. Distribution of UE DVT

VEIN	FREQUENCY (%)
Axillary	25/30 (83.3)
Subclavian	19/30 (63.3)
Brachial	14/30 (46.7)

Table 2. Comparison of PICC Days

DIAGNOSIS	FREQUENCY (%)	MEAN (SD)
Cancer	7/26 (30.0)	15.7 $\pm$ 13.9
Infection	10/26 (36.6)	12.2 $\pm$ 7.2
Other	9/26 (33.3)	13.2 $\pm$ 10.2

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Article: Simulation-based Training: Filling the Void of Procedural Experience for Medical Students

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ABSTRACT
In 1998 the United States Association of American Medical Colleges (AAMC) published learning objectives guidelines that stated “In recent years, many observers of medicine have expressed concerns that new doctors are not as well prepared as they should be to meet society’s expectations of them.” The authors conducted a study to determine students’ previous experience with central venous catheter (CVC) placement and assess students’ perception of the impact of a procedural simulation CVC task trainer insertion workshop. In a prospective study conducted in a United States urban medical school from March 2008 through February 2009, 27 fourth-year medical students identified as the study group participated in a simulation CVC workshop. Twenty-nine fourth-year control group students viewed the same didactic and video presentations but participated in an equivalent question-and-answer session in lieu of the simulation experience. Study and control groups completed identical 10-point Likert scale evaluations prior to and at the completion of each workshop. The simulation workshop improved novice learners’ self-reported knowledge of indications and complications (3 vs. 1 point change, $p = 0.038$), comfort level with the procedure (4 vs. 1 point change, $p < 0.001$), and self-reported confidence (4 vs. 1.5 point change, $p < 0.001$) to perform intrajugular CVC compared to controls. Students’ perception of a simulation workshop was superior to didactic training in the placement of intrajugular CVCs. Simulation-based training is an important component to augment medical school curricula to fill the void in the lack of CVC procedural experience of today’s trainees.

BACKGROUND
The teaching of procedural competencies in medical school has long centered on the old adages “see one, do one, teach one” and “practice makes perfect.” Medical students were expected to develop procedural mastery through trial and error without formal instruction or practice. In fact, in a 1992 survey, 78% of US medical schools surveyed did not provide any formal procedural skills training other than that for basic phlebotomy.[1,2] In 1998 the AAMC published Learning Objectives for Medical Student Education: Guidelines for Medical School, which began with the phrase “In recent years, many observers of medicine have expressed concerns that new doctors are not as well prepared as they should be to meet society’s expectations of them” and declared that schools must ensure that

students have "demonstrated to the satisfaction of the faculty" the ability to perform the following procedures at a minimum: venipuncture, insertion of an intravenous catheter, arterial puncture, thoracocentesis, lumbar puncture, insertion of a nasogastric tube, insertion of a Foley catheter, and suture lacerations.[3]
As medical educators, we believe that a lack of basic procedural competencies persists as an international public health problem among today's medical school graduates. Educational experiences for student learners are often restricted. It is no longer considered commonplace to "practice on patients".[4] Although the benefit of reduced patient risk is understandable, we have created a new dilemma: lack of procedural experiences for student and resident practitioners.[5-8] As attending and senior clinicians deal with increasing clinical demands, their ability to spend more time teaching medical students at the bedside is limited.[5] As a consequence of this change in practice, fewer opportunities exist for medical students to participate in procedural experiences in the clinical environment.[3,6] The changing clinical environment as well as the reduction in duty hours for house officers mandates the need to define and implement more effective and time-efficient methods of clinical instruction. The future education of medical school trainees in the most efficient, reliable and effective methods is an essential public health issue as it effects quality of care, patient safety, and financial costs of care of the healthcare system.

Fortunately, new technologies such as simulation-based training (SBT), whether using high-fidelity patient simulators or specific procedural task models, have been developed to offer learners an opportunity to practice procedural experiences in a controlled environment without risk to patients.[9] In addition, SBT can be used to measure many of the Accreditation Council for Graduate Medical Education (ACGME) core competencies[10], especially procedural skills.[11-19] SBT, otherwise known as simulation-based medical education (SBME), is an effective instructional method for many other reasons as well. The following points were articulated by Rosen et al.[17]: First, SBT is an error-tolerant environment that eliminates competing goals of patient care and trainee education. Because the environment can be focused on education, learners are provided with immediate feedback—which improves learning.[20] Second, the learners' experiences can be controlled with scripted content with the educational goals of the learner in mind as opposed to the variable experience that a trainee might encounter in the clinical environment. Lastly, when the educational experience of the learner can be controlled, structured observational assessment tools can be used to guide feedback. Using structured feedback in dynamic situations also allows for more reliable and valid measures of learner performance.[17] SBT offers an opportunity to train and remediate complex skills while simultaneously performing outcomes-based assessments of the learners.

We conducted a prospective cohort study in which we compared the effectiveness of a simulation-based experience with that of traditional instructional methods to instruct novice learners regarding the proper technique for placement of an internal jugular (IJ) central venous catheter (CVC). The purposes of this study were to determine students' previous experiences with CVC placement and to assess students' perception of the impact of a hands-on procedural simulation involving a CVC task trainer insertion session compared with that of traditional instructional methods. We hypothesized that hands-on experience using central line task trainers could improve a novice learner's level of comfort with the procedure as well as his or her knowledge of complications and indications for the procedure more effectively than traditional instructional methods.

METHODS

Study Design

A prospective cohort study of 56 fourth-year medical students was conducted from March 2008 through February 2009. All research was carried out in accordance with the World Medical Association Declaration of Helsinki ethical principles involving human subjects[21] and institutional review board approval.

Study Setting and Population

Twenty-seven fourth-year medical students at a large urban United States academic medical center who volunteered to participate in a simulation workshop comprised the study group. Twenty-nine fourth-year students identified as the control group were voluntarily recruited during emergency medicine elective rotations.

Study Protocol

The study group viewed 90 minutes of standardized Web-based instruction including a New England Journal of Medicine IJ procedural video[22] and a standardized PowerPoint lecture. Additionally, the study group participated in a 30-minute IJ CVC workshop using CentraLineMan central line procedural task trainers (Simulab Corporation, Seattle, WA, USA) (Fig. 1). The control group viewed the same didactic and video presentations but participated in an equivalent 30-minute interactive question-and-answer session in lieu of the procedural task trainers experience.

Data Analysis
A survey of the students' prior clinical and simulation experiences with CVC placement was collected at the beginning of the study. All study participants completed identical 10-point Likert scale evaluations before and after each workshop. Students' responses to the survey were collected and median results of the study versus control groups were compared using Wilcoxon signed rank test using STATA 10 (StataCorp, College Station, TX, USA). The change in median values was reported to compare the change in paired rankings value of individual responses before and after the educational sessions. Median data were reported to provide an accurate reflection of the typical response not influenced by single outliers because the data were nonparametric.

RESULTS

All 27 study subjects and 29 control subjects completed the workshop. One study subject did not complete the survey and was excluded from data analysis. Eight-one percent of participants in the study group and 69% in the control group reported no prior CVC placement opportunities. The hands-on simulation workshop improved novice learners' self-reported knowledge of indications and complications compared to that of the controls (3- vs 1-point change; $p = 0.038$).

The simulation study group's self perception of exposure to adequate CVC procedural opportunities increased more than that of the control group (2.5 vs 0 point change; $p < 0.001$) (Fig. 2). Novice learners' level of comfort with IJ CVC placement skills improved significantly in the hands-on study group compared to that of the control group (4- vs. 1-point change; $p < 0.001$) (Fig. 3). Lastly, there was significant difference in the median improvement level in both groups when learners were queried if they felt they knew how to place IJ CVCs independently (study group = 2.5- and control groups = 0-point change; $p < 0.001$). When asked at the completion of the activity if they felt the educational session was a valuable learning experience, members of both groups demonstrated a positive median change (study group median = 10; the control group median = 7; $p < 0.001$) (Table 1).

DISCUSSION

One must learn by doing, and experiential learning is a more effective method of learning.[23] In the clinical environment, patients are often reluctant to allow medical students to perform procedures on them.[24,25] This situation has resulted in senior medical students having much greater theoretical knowledge of a given procedure than successful performance of that procedure.[26] However, patients may be more likely to allow a medical student to perform a procedure if they know that the student has had prior simulation training in that procedure.[27] SBT is an optimal method for allowing learners to practice without risk to patients and also offers the opportunity for learners to practice in a controlled environment with immediate feedback. All of these conditions help to facilitate learning[28] and to shift the burden of teaching procedural skills to residency training. This state of affairs is especially true with inexperienced students or as the complexity or invasiveness of a procedure increases.[27]

Our study confirmed that medical students do not have frequent opportunities to practice and perform invasive procedures such as CVC insertion. In fact, many medical schools are actively considering what content and procedural experience medical students need to master in the curriculum. We asked students about their experience with CVC placement, specifically if they had had the opportunity to attempt the needlestick portion of the procedure. Only 25% of fourth-year medical student participants had had an opportunity to attempt the needlestick for CVC insertion either in a clinical or simulated environment prior to the workshop (19% in the study group; 31% in the control group). This lack of experience translates into first-year residents who are uncomfortable and inexperienced in the placement of central lines when they arrive as newly graduated physicians. In 1998 the AAMC stated that US medical schools must ensure that students have "demonstrated to the satisfaction of the faculty" the ability to perform the following procedures at a minimum: venipuncture, insertion of an intravenous catheter, arterial puncture, thoracocentesis, lumbar puncture, insertion of a nasogastric tube, insertion of a Foley catheter, and suture lacerations.[3] Unquestionably, the opportunities for learners to acquire procedural experience to perform these and other procedures such as endotracheal intubation, thoracostomy tube insertion, and other invasive procedures are diminishing.[3,5,7,8] Simulation-based training, whether using specific animal or cadaver models or procedural task trainers, offers learners an opportunity to practice in a controlled environment without patient risk. SBT to teach competency in CVC skills has been established in the literature as an effective modality.[29,30]

All participants felt that the workshops were valuable learning experiences. However, the hands-on simulation group had a more valued experience. The workshop helped to improve students' self-reported knowledge of indications and complications of IJ placement and their level of comfort with their IJ CVC placement skills. Thus, a workshop can provide an excellent experience for novice learners and significantly improve self-reported knowledge of

indications and complications of a procedure as well as novice learner level of comfort with the procedure. As students acquire more experience in a simulated environment, patients may feel more comfortable allowing a student to perform a procedure on them. Simulated clinical experiences alone cannot replace actual clinical experience but may offer students more exposure to clinically related experiences.

Educational experiences using CVC simulation task trainers have been proven to improve technique.[29-31] In fact, recent articles have begun to report transfer to the clinical setting[30], retention of acquired knowledge[18,32], cost savings[32] and improved quality of care[33] as benefits of simulation-based training. Ongoing studies are demonstrating that simulation-based training results in skill transfer from the practice environment to the clinical environment and truly improve practitioners' central line placement skills and consequently reduce complications from the procedure.[30] In fact a recent study by Cohen et al demonstrated a significant reduction in central line catheter related blood stream infections in the year after a simulation based education intervention for CVC placement. This study demonstrated a significant medical care cost savings with a 7$ saved to 1$ spent rate of return on the investment of the simulation training intervention. There is no substitute for practice in learning the motor skills associated with invasive procedures, and SBT can offer an opportunity to practice high-risk, low-frequency procedures without risk to patients.

LIMITATIONS

This study has several potential limitations. First, this study measured students' perceptions of their educational experience rather than their actual performance in central line placement. It is well understood to simulation educators that adult learners prefer experiential learning rather than the traditional classroom environment. This study simply describes that preference in a scientifically sound study. However, would the study group with the simulated experience actually be better at placing IJs in patients? Would their patients have fewer complications? We believe so, but further studies are needed and are underway. Studies in the clinical arena that accurately assess patient outcomes are extremely difficult, expensive to conduct and may not yet be feasible for some education researchers. Secondly, our study and control groups were not randomly collected. In fact the procedural experience between the two groups was different and could account for some of the differences of the results. Lastly, simulation educators are keenly aware that adult learners prefer interactive learning modalities during formative education. This study simply documents that participants preferred the simulation hands on component over traditional classroom methods. The objective portion of the simulation group participation during the central line workshop has been previously published.[35]

CONCLUSIONS

We found that students' perceptions of simulation-based training were superior to didactic training in teaching students to place IJ CVCs. Medical students who experienced simulation-based training reported higher knowledge levels of indications/contraindications and adequacy of exposure to and comfort with placement of IJ CVCs. SBT is a necessary component to augment medical school curricula to fill the void in the lack of procedural clinical experience of today's trainees. Students who have practiced procedures in a simulated environment are more likely to be permitted to perform the procedure on patients.[24,27] These data add to the growing body of literature supporting the use of simulation-based training in medical student education. As Confucius said "I hear and I forget, I see and I remember, I do and I understand."

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Figure 1. CentraLineMan procedural task trainer (Simulab Corporation, Seattle, WA).

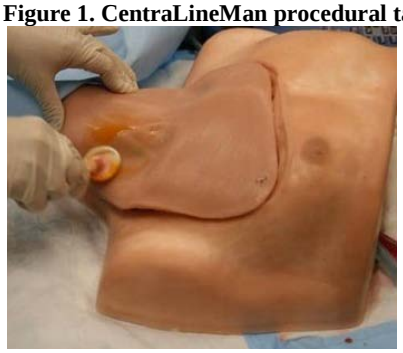

Figure 2. Change in scores of "I have had adequate exposure to central line placement"

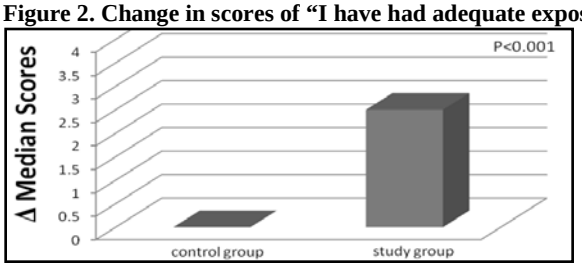

Figure 3. Change in scores of "I feel comfortable with my CVC placement skills"

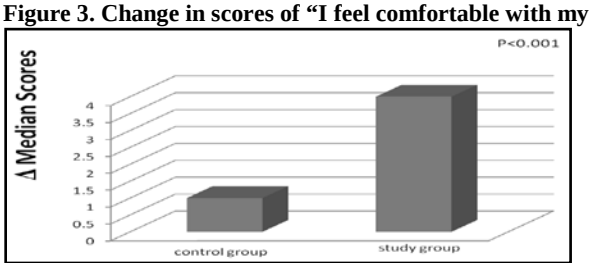

Table 1. Comparison of pre- and post- median scores on 10-point Likert scale

Perception	Control Group (N =28)	Simulation Group (N = 26)	p-value
I have had adequate exposure to central line procedure opportunities.			
Before Intervention	2	3	
After Intervention	3	6	
Difference in Median Scores	0	2.5	< 0.001
I feel that I know how to place a central venous catheter.			
Before Intervention	2	2	
After Intervention	4	6.5	
Difference in Median Scores	1.5	4	< 0.001
I feel that I am knowledgeable of the indications and complications of central venous catheter placement.			
Before Intervention	4	4	
After Intervention	5	7	
Difference in Median Scores	1	3	= 0.038
I feel comfortable with my central venous catheter placement skills.			
Before Intervention	1	2	
After Intervention	3	6	
Difference in Median Scores	1	4	< 0.001
I feel that the educational session today was a valuable learning experience.			
At completion of activity	7	10	<0.001

Article: Sonographic Findings in Patients with Fibromyalgia with Clinical Diagnosis of Associated Tendinitis: A Case-Control Study

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BACKGROUND
Fibromyalgia (FM) is a chronic condition characterized by diffuse musculoskeletal pain. For decades, classification of FM in clinical and epidemiological studies has been based on specific tender areas on palpation called tender points.[1] However, tender points (TPs) count has been criticized for lack of objectivity and uncertain pathophysiology connection with FM.[2] It can be present in the general population and also its interpretation can be confusing in referred pain or regional pain syndromes such as epicondylitis and greater trochanteric pain syndrome.[3-5] In our practice, a common observation is a clinical suspicion of tendinitis in patients with FM by referring practitioners.

METHODS
To determine whether patients with FM are at risk to develop tendinitis, sonographic findings were retrospectively assessed in a total of 66 patients. These included 33 female FM patients according to ACR criteria[1] with an average age of 42 years (27-60 years), and 33 female controls (8 RA and 25 OA) with an average age of 33 years (29- 60 years), referred to rheumatology clinic for musculoskeletal ultrasound (MSU) with a clinical diagnosis of tendinitis. All subjects were examined using an Aloka-500 machine with a linear transducer of 7.5 MHz. Doppler signal was not evaluated in any case. The diagnosis of tendinitis was made according to echotexture changes in the tendon following standard reference values for musculoskeletal ultrasonography.[6,7]

RESULTS
Tendinitis observed by MSU represented 6% of FM patients (odds ratio 0.2) versus 20% of controls, which was statistically significant ($P < 0.011$ by uncorrected Chi-square) with a decreased risk (CI 0.06 – 0.746) for FM patients. A global diagnostic agreement between clinical diagnosis and ultrasonography was observed in 8 (47%) of 17 patients with tendinitis.

DISCUSSION
One explanation of high rates of tendinitis by referring doctors in FM patients could be omission of specific clinical maneuvers during the physical examination, a misinterpretation of TPs, or both. Conditions in which TPs can be particularly confusing as was aforementioned are the greater trochanteric pain syndrome and epicondylitis. Because TPs can be present in the general population[3] this may explain the over-diagnosis of tendinitis observed by US in controls, in which the possibility of associated FM was ruled out in 90 % of them.

NSAIDs and corticosteroid injections (CI) were used in 81% and 45% of FM patients, and in 90% and 51% of controls, respectively. Of the patients with FM who received CI, only three had actual tendinitis. Six of these with normal MSU had the same treatment for greater trochanteric pain syndrome, five due to epicondylitis, and one by anserine tendinobursitis. Curiously, two FM patients with "refractory epicondilytis" and negative MSU have had surgery in the opposite elbow due to the same problem and intractable pain.

Nine of the control patients with actual tendinitis utilized CI. Six with clinical diagnosis of anserine tendinobursitis, one with epicondylitis, and one by greater trochanteric pain syndrome; all these with normal MSU, also were treated with corticoid injections.

Although positive outcomes have been reported for pain and TPs count with physical therapy in FM patients[8,9], our data showed this modality was utilized by only 15% of FM patients compared with 51% of controls. Regarding employment status, it was similar in FM patients and controls. As opposed to patients with FM the most common cause of disability in the control group, which included patients with RA and OA, was related to the underlying condition. Three patients with FM were on disability due to tendinitis, two because of intractable epicondylitis and one from DeQuervain's syndrome. Patients with FM have increased frequency of medically certified absences, very similar to patients with RA.[10] Their rates of disability are as high as in patients with ankylosing spondylitis and RA.[11,12]

The main limitation of this study is retrospective. Concerning doppler, which was not used by us, we considered a

limitation in two ways: we probably missed some patients with early tendinitis without abnormalities in the size or tendon echotexture, and patients with tendinitis in resolution could not be recognized. However, doppler should be carefully interpreted. Different images have been obtained in the tendon with changes in patient position.[13]

In this study, MSU showed a lower incidence for tendinitis in FM patients compared with controls. Tendinitis was an overestimated clinical diagnosis in both groups leading to unnecessary treatment. Therefore, we highly recommend a sonographic scan before choosing any aggressive treatment in FM patients with clinical suspicion of tendinitis.

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Article: The American College of Radiology (ACR) Diagnostic Radiology In-training Examination

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INTRODUCTION

The American College of Radiology is the principal organization of radiologists, radiation oncologists, interventional radiologists, nuclear medicine physicians, and clinical medical physicists in the United States. The ACR conducts an annual in-training examination for residents in diagnostic radiology across the country. The ACR's mission statement for the in-training exam is as follows: This educational tool is designed to help residents, faculty members, and program directors assess trainees' progress over the course of their radiology residencies and to highlight areas for possible improvement for residents and programs alike. Rather than correlated to a specific endpoint, the examination is a comparative assessment given at the national level and has been a stand-alone test throughout its history.

RATIONALE AND OBJECTIVES

The purpose of this study is to assess radiology program directors' perception of the impact of the ACR Diagnostic Radiology In-training examination on their residents and their residency training program.

MATERIALS AND METHODS

The questionnaire consisted of 26 questions designed to elicit opinions regarding the annual ACR in-training exams. The questions covered various topics including the appropriateness of the timing and content of the exam, evaluation methods, feedback to residents, and overall usefulness. A questionnaire (Figure 1) was sent out to radiology Program Directors (PDs) across America. We used the Survey Monkey website as our medium and the survey was sent to the members of the Association of Program Directors in Radiology (APDR). The results illuminated the perceived impact that the exam has on some aspects of residency training in radiology.

RESULTS

A total of 157 PDs responded to the survey, out of which 124 (79%) completed the survey. The APDR does not have a separate list of PDs for diagnostic radiology; all physician program directors, associate and assistant program directors of programs in radiology, nuclear medicine and subspecialty fellowships in the United States, Canada and Puerto Rico are eligible for active membership. As our questionnaire was designed to have PDs in diagnostic radiology as responders, we estimate our target group to comprise of 186 members (from AMA FRIEDA website). This gives us a total response rate of 84.41% and a completed response rate of 66.67%. 78.3% of responders felt that it was instructive for residents to take the exam every year. 81.5% felt that the exam should be taken once every year; 14.6% felt that it should be held twice a year; less than 5% felt that it should be held more than twice a year. In order to assess whether it would be useful for PDs to have the results of the exam at their disposal before the annual resident assessments, we asked if they felt that the exam should take place earlier. 70.7% felt that the timing was appropriate and there was no need to change it. Of the remaining 29.3% of responders, 37.8% felt that it should be held in October, 35.6% in November, 8.9% inDecember, and 17.8% in January.

Roughly half of the responders felt that the exam was a fair and adequate tool to measure competency. About three-fourths felt that the exam tested knowledge in radiology whereas the rest felt that it was a test of medicine in general with emphasis on radiology. 62% felt that the difficulty level of the exam should be set at different points for different levels of training. However, only 44.1% felt the need to have subspecialty/imaging modality specific exams during training. We asked PDs to rank the difficulty level of the exam on a scale of 1-5 (1-very easy; 5-very hard). It is interesting to note that 99.2% felt that it was at level 3 or higher, with the remaining 0.8% answers at level 2. A 54.3% majority felt that the exam was a level 4 on the difficulty scale. 68.2% felt that the difficulty level of the exam was appropriate; while 29% felt that in future, the exam should be easier, only 2.8% felt that it should be made more difficult infuture. 86% felt that their residents did not set aside time to specifically study for the exam. Of the 14% who felt that residents spent time preparing for the exam, the estimated prep time ranged from 2 hours to several weeks. It was interesting to note that two programs actually had dedicated sessions as part of training to help residents prepare for the exams. Remarkably, 70% of the responders felt that this exam was a test of cumulated knowledge and therefore, residents should not study in any special way for it. Most (80.6%) felt that residents had adequate access to resources to prepare for the exam. The rest felt that there should be better access to Q-banks, image libraries, exam oriented teaching and books. Opinions were divided on whether it was fair to include all modalities for the first year residents; 52.8% felt that it was fair. However, a 63% majority felt that it was not instructive for final year residents to take up the exam even after written boards.

Regarding the residents' confidence level after the exam, 61.4% felt that it depended on the score, 20.5% felt that it decreased, 13.4% felt that it should not depend on the score, and only 4.7% felt that it increased. Most (87.9%) felt that the existing system of calculating percentiles based on training level was fair. Given a choice, 86.3% would still prefer a percentile score, 10.5% would like a pass/fail grade, and 3.2% would favor a lettered grade. Most (74.2%) felt that the residents' scores should not be made known to all attending in the department. A comfortable majority (74.2%) felt that their feedback after the results was comprehensive. However, less than half (46.7%) felt that their residency training program adequately tailored training to match their residents' performance (and deficits) in the exam. A good number (77.9%) felt that it was unfair to give awards/prizes based on performance in the exam alone. For the most part (84.4%), it was felt that 3 or more failures in the exam should not disqualify the candidate from taking up the boards. Finally, a good number (60.7%) did not feel the need to link ABR and ACR exams in order to reduce redundancy.

DISCUSSION

Overall, a preponderance of program directors seems to be satisfied with the present format of the ACR diagnostic radiology in-training examination. Regarding the frequency of the exam, more than three quarters felt that the examination should be conducted every year. More than 80% of the responders felt that the current annual frequency is appropriate and greater than 70% felt that the timing of the exam was appropriate too. A great majority felt that the existing system of calculating percentiles based on training level was fair, and given a choice, a large proportion would still prefer the percentile score as opposed to other systems such as a pass/fail or a lettered grade. Nearly all felt that the exam was at a level 3 or more on a difficulty scale of 1 to 5, with most responders satisfied with the appropriateness of the difficulty level. However, it is interesting to note that only about half the responders felt that the exam was a fair and adequate tool to measure competency. This is particularly significant as the exam is administered on a yearly basis by virtually all accredited radiology programs as part of their annual resident evaluation.[1] The ACGME requires that a resident has to have a yearly objective evaluation and the ACR in-training exam is the established standard for this. The ACGME mandates that if residents in a particular program do not take the ACR exam, then it will be necessary for the program to formulate a credible exam for the program, administer it annually, and archive the results in residents' portfolios. In view of this, the ACR in-training exam is a comfortable alternative and most PDs follow this path. Regarding the content of the exam, the opinions did not lean very strongly to one side. A fair majority felt that the difficulty level of the exam should be set at different points for different levels of training. Currently, the examination is designed as a single exam for all residents across various levels of training. Residents are ranked by how they perform in relation to others of similar years in training.[2] Therefore, the percentile score is a peer comparison score. There was no clear majority on whether it was fair to include all modalities for first year residents. Since first year residents do not necessarily rotate through all subspecialties, it was surprising to see that the PDs were divided in their opinions in this matter. Only 43.8% felt the need to have subspecialty/imaging modality specific exams during training. This may reflect on the importance of a well-balanced, broad and comprehensive training during residency. The current format of the exam has 13 subsections: 11 clinical plus physics and general competencies.[2] However, the questions cover a broad range of topics and are not considered to be biased towards any specific modality/specialty.

On the subject of exam preparation, most felt that the exam was a test of cumulated knowledge and therefore special preparations were unnecessary. Most also felt that the residents concurred and did not set aside time to specifically train for the exam. This is in agreement with the objective of the exam, which is to use the exam as an educational evaluation tool to assess trainees' progress over the course of their radiology residencies and to highlight areas for possible improvement.

Finally, concerning the connection with the ABR board exams, it was interesting to note that most felt that three or more failures should not disqualify a candidate from taking up board exams. Majority also did not feel the need to link these exams in order to reduce redundancy. This is particularly significant in light of articles in the past highlighting the strong prediction value of the ACR exam in determining performance in the board exams.[1,3]

CONCLUSION

Overall, most PDs seem to be satisfied with the exam. For most part, the exam fulfils its purpose. At present, the exam is designed to be a teaching tool and not an instrument to predict performance on the ABR written examination. However, the ACR "would strongly prefer to have direct outcomes data, ideally final certification in radiology and possibly even maintenance of certification data, and would pursue any reasonable opportunity to attain it." In view of this, further efforts should be made to increase the impact of this exam by linking it to measurable outcomes.

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Figure 1. Questionnaire given to PDs

1. Do you feel that it is necessary for residents to take the exam every year during training ?	Yes [ ] No [ ]
2. How frequently should the exam be conducted to derive maximum benefit for residents? (per year)	Once [ ] Twice [ ] Thrice [ ] 4 times [ ]
3. Do you feel that the exam should take place earlier so that you will have results at your disposal in the early months of the year?	Yes [ ] No [ ]
If yes, what month should it be held in?	Oct [ ] Nov [ ] Dec [ ] Jan[ ]
4. Do you feel that the exam is a fair & adequate tool to measure competency at each training level?	Yes [ ] No [ ]
5. What do you feel the exam tests knowledge of?	Radiology Medicine in general with emphasis on radiology
6. Should the difficulty of the exam be set at different points for different training levels?	Yes [ ] No [ ]
7. Should there be sub-specialty/imaging modality specific exams during training?	Yes [ ] No [ ]
8. In future, according to you, the exam should	remain the same [ ] be more difficult [ ] be easier [ ]
ACR In-training Exam- impact perception	
9. Do your residents set aside time for studying for the exam?	Yes [ ] No [ ]
If yes, on an average, how much time do they spend studying for the exam? _____	
10. Ideally, do you feel that it is a test of cumulated knowledge and therefore residents must not study in any special way for the exam?	Yes [ ] No [ ]
11. Do you feel that residents have adequate access to resources to prepare for the exam?	Yes [ ] No [ ]
If not, what resources would you like for them to have at their disposal? (tick all that apply)	Q bank [ ] Image library [ ] Exam-oriented teaching [ ] Exam-oriented books [ ]
12. Do you feel that it is fair to include all modalities for the 1st year residents? (Since all specialties may not be covered in 1st year)	Yes [ ] No [ ]
13. Do you feel that it is instructive for final year residents to take the exams even after written boards?	Yes [ ] No [ ]
14. On a scale of 1-5 (1-lowest; 5-highest), how do you perceive the difficulty level of the exam?	1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]
15. What happens to your residents'confidence level after the exam?	Increases [ ] Decreases [ ] Depends on score [ ] Should not depend on exam/scores [ ]
16. Is the existing system of calculating percentiles based on training level fair?	Yes [ ] No [ ]
ACR In-training Exam- impact perception	
17. Given a choice, what would you rather have?	A percentile score [ ] A lettered grade [ ] A pass/fail grade [ ]
18. Do you feel that the scores should be made known to all attendings in the department?	Yes [ ] No [ ]
19. Do you feel that your feedback after the results is comprehensive and helps the residents?	Yes [ ] No [ ]
20. Do you feel that your residency training program adequately tailors training to match your residents' performance/deficits in the exam?	Yes [ ] No [ ]
21. Do you feel that it is fair to award prizes based on performance in the exam alone?	Yes [ ] No [ ]
22. Do you feel that 3 failures should result in a disqualification from taking up the ABR boards?	Yes [ ] No [ ]
23. Do you feel that the ACR and ABR exams should be linked in order to reduce redundancy and increase the overall usefulness of these exams?	Yes [ ] No [ ]

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Review Article: Long-term Side Effects of Inferior Vena Cava Filters

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ABSTRACT
Wide spread use of inferior vena cava (IVC) filters have led to a surge in a variety of complications. This is a case report of a 48 years old female with chronic right lower quadrant abdominal pain which was explained by compression of her spinal nerve and adjacent organs by IVC filter struts.

INTRODUCTION

The reported incidence of venous thromboembolism is about 1 in 1000 per year.[22-23] Diagnosis and treatment of deep venous thrombosis (DVT) and pulmonary emboli (PE) have always been a challenge for many clinicians across the world. Medical anticoagulation and insertion of an IVC filter have been helpful in many cases. However, complications from IVC filters can pose a serious threat to patients. This is a case report of a 48-year-old female who under went IVC filter placement after a diagnosis of PE. The distal migration and perforation of the IVC was not diagnosed until a year later. Subsequently, a celiotomy with extraction of the IVC filter was performed.

CASE REPORT

A 48-year-old female was seen in the emergency room with a complaint of right lower quadrant pain for one year which had exacerbated in the previous two weeks. Her past medical history was significant for DVT of the right lower extremity and PE and abnormal coagulation profile (genetic), with a past surgical history of an IVC filter placement. She denied nausea or vomiting. Her pain was 7/10, exacerbated after meals. She related her pain to the time when the IVC filter was inserted. The patient reported that she had a work up done, including a psychiatric evaluation, with negative outcome. On examination, the patient had tenderness in the right upper quadrant and peri-umbilical area with guarding but no rebound. The initial workup in the emergency room with abdominal CT scan (Figure 1) revealed IVC filter struts perforating the IVC into the adjacent organs. One of the struts pierced the nearby mesentery with suspicion of perforation of the small bowel anteriorly. A second strut was seen piercing into the lumen of the aorta posteriorly with no active extravasations from the aorta; a third strut was pressing against the spinal column. An exploratory celiotomy with the intention of recovering of the IVC filter was planned after bowel preparation with antibiotics. The whole length of the small bowel was inspected which was viable without any sign of perforation. The small bowel was retracted out by lifting the colon out of the body cavity. Then, the ligament of Trietz was opened medially to the inferior mesenteric vein, exposing the aorta and IVC. A careful dissection was performed along the side of the aorta and IVC extending inferiorly to the renal vein. Proximal and distal control of the aorta and IVC were performed. At this point, the IVC filter struts were appreciated (Figure 2). Three struts penetrated adjacent structures: one into the nearby mesentery, one into the wall of the aorta and one into a lumbar vein. After systemic heparinization, the IVC was entered. The struts were either bent inward or cut at the exit points from the IVC. The filter was extracted from the IVC, which was thoroughly irrigated and closed with a single layer of 4-0 nylon. The postoperative course was uneventful; the patient was discharged home on postoperative day 5.

DISCUSSION

An estimated 400,000 to 650,000 people develop PE in United States each year. The incidence of venous thromboembolism (VTE) is estimated to be 120 cases per 100,000 each year in United States.[19-21] This number increases exponentially from <5 cases per 100,000 for ages <15yrs old to approximately 500 cases per 100,000 at age 80. About one-third of patients with symptomatic VTE manifest PE, whereas two-thirds manifest DVT alone. Cushman et al noted a 28-day case fatality rate of 9.4% after first-time DVT. Among people with idiopathic VTE, the 28-day rate was 5.2% compared with 7.3% after secondary VTE and 25.4% among patients with cancer.[21] The presentation of PE can vary from clinically unimportant thromboemboli to massive saddle embolism.[23] The International Cooperative Pulmonary Embolism Registry (ICOPER) was established to set baseline mortality for PE, and identifying factors associated with death.[6,23,25] The 3 month overall mortality was 17.4%. Systolic arterial hypotension, congestive heart failure, cancer, tachypnea, right-ventricular hypokinesis on echocardiography, chronic obstructive pulmonary disease, and age>70 years were significantly associated with increased mortality risk in patients with PE.[25] Historically, there have been many attempts to prevent PE by direct inferior vena cava interruption in the face of failure of medical therapies. The first recorded attempt was by John Hunter, in 1874, whose performed ligation of the femoral veins went out of favor due to recurrent pulmonary emboli. Later on during the 1940s, ligation of the IVC was attempted which lead to significant mortality and morbidity.[1] IVC filters have been used since the first clinical application of the Mobin-Uddin filter in 1970s. They are utilized in cases in which anticoagulation has failed or is contraindicated with low mortality and morbidity.[11,12] Acceptable indications for IVC filter placement are proximal DVT or PE in a setting of absolute contraindication to full anticoagulation.[2,13,16,25] Absolute contraindications to full anticoagulation are 1) active hemorrhage with or without a blood transfusion, 2) concomitant intracranial hemorrhage, and 3) thrombocytopenia, or an impending or recent major operation.[25] The success rate of the IVC filter in preventing PE was demonstrated by Young et al over an eight-year period. This study did not show an improvement in mortality. The majority of deaths were due to cancer or cardiovascular disease.[26] The complications from IVC filter placement could present as misplacement, distal or proximal migration, perforation of vena cava, fracture and distal migration of struts, penetration of struts into the bowel, or penetration to retroperitoneal structures.[1,2,5] Also procedure-related issues, device complications, and secondary VTE must be considered.[27] Myahara et al, demonstrated overall major filter complication to be 27.3%, including, 12.1% filter

dislocation, 9.1% filter fracture and 3.0% catheter related infection.[27]

CONCLUSION

Technological advances in developing and deploying IVC filters have caused a surge in the usage of these devices. However, the fatal comorbidity of IVC filter placement still remains unchanged. Current practice guidelines still emphasize using IVC filters in the presence of an absolute contraindication to medical anticoagulation. These indications may be expanded the in near future but caution should be taken in deploying IVC filters with close follow-up of the patient postoperatively.

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Figure 1. Red Arrow shows strut in mesentery, Blue Arrow shows strut in aorta

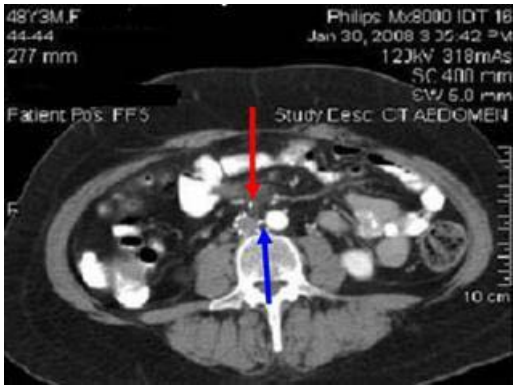
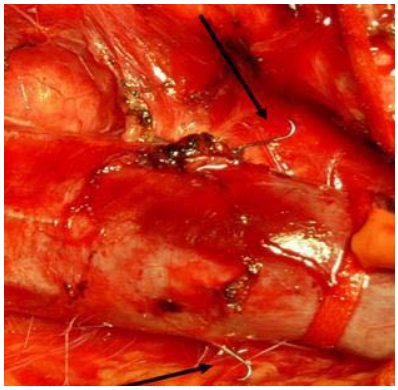


Figure 2. Black arrows show struts piercing IVC



Review Article: Pathologic Fractures Secondary to Metastatic Non-Small Cell Lung Carcinoma

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ABSTRACT
Metastases from carcinomas are the most common malignant tumors involving bone. The changes in bone architecture predispose the patient to a variety of skeletal-related events (SRE), which are associated with increased morbidity and decreased survival leading to a loss of functional independence. Early identification of bone metastases and management of SREs are important to maintain a patient's quality of life. Patients with osteoblastic bone metastases from lung cancer may experience a SRE due to aberrant new bone formation. In a clinical trial, most patients with bone metastases from NSCLC experienced a SRE within 5 months on the study. The consequences may include loss of mobility and cause significant impairment. In addition, SREs are associated with increased healthcare costs. Therefore, it is imperative to identify risk factors to optimize screening, and implement early treatment to prevent or delay the onset of a potentially debilitating SRE. Skeletal morbidity from bone metastases can add to the overall burden of disease and loss of function. The purpose of this review is to describe the clinical presentation of a SRE, the pathophysiology of osteoblastic lesions, increased morbidity associated with SRE, the need to optimize screening, and the increased healthcare costs.

INTRODUCTION
Although its incidence is declining, lung cancer is the leading cause of cancer-related mortality not only in the United States, but also around the world. Lung cancer has a 5-year survival rate of approximately 15%.[1] The two main types are classified as small cell lung carcinoma (SCLC) and non-small cell lung carcinoma (NSCLC). NSCLC accounts for approximately 85% of all cases of lung cancer, and pulmonary adenocarcinoma is classified as a type of NSCLC.[1]

Metastases from carcinomas are the most common malignant tumors involving bone. The duration of survival after the diagnosis of metastatic bone disease often depends on the histological characteristics of the primary

carcinoma. Approximately 30-40% of patients with NSCLC develop bone metastases.[2] Patients who have metastatic bone disease secondary to lung cancer generally have a prognosis of less than twelve months.[3] This number is only an estimate, and the duration of survival can vary widely.

Bone metastasis is associated with increased morbidity and portends a poor outcome, with decreased survival in cancer patients.[3] Bone metastases are classified as osteolytic, osteoblastic or mixed based on radiographic appearance. These changes in bone architecture predispose the patient to a variety of skeletal- related events (SRE), including pathologic fractures.[4] Skeletal morbidity from bone metastases can add substantially to the overall burden of disease and loss of functional independence.[5] This may result in impaired mobility and a reduced quality of life.

During their lifetime, patients with bone metastases from lung cancer may experience SREs. Pathologic fractures have been reported to occur in 9-29% of patients who have bone metastasis depending on the location of the lesion.[6] Five types of primary carcinoma account for 80% of pathologic fractures; lung carcinoma accounts for 10% of these.[7] Most of these lesions appear to be osteolytic on plain radiographs, and there is a strong relationship between the presence of an osteolytic lesion and the risk of fracture. SREs can occur regardless of the radiographic appearance of bone lesions (e.g., osteolytic or osteoblastic); both types of lesions are associated with increased levels of bone destruction by osteoclasts (osteolysis).[8-10]

PATHOPHYSIOLOGY

Tumor cells in osteoblastic lesions secrete factors that stimulate osteoblasts, the cells responsible for osteogenesis. Levels of osteolysis are enhanced in response to increased osteogenesis and other stimuli, releasing growth factors from the bone matrix.[11] Therefore, although bone destruction may be more apparent for osteolytic bone lesions, osteoblastic lesions also contain a strong osteolytic component that can decrease bone integrity.[3] Irregular new bone formation in osteoblastic lesions produces bone tissue that is malformed and does not contribute to overall bone strength.[12]

Bone metastases are usually multifocal and have a predilection for the hematopoietic marrow sites in the proximal long bones and axial skeleton.[13] The dynamic turnover of bone matrix and marrow provides a fertile ground for tumor cells to proliferate. The bone microenvironment has characteristics that make it especially conducive to the development of metastatic lesions, such as the release of growth factors from the bone matrix during osteoclast-mediated osteolysis.[4] The interaction of receptor molecules in the bone marrow stroma (urokinase receptor, vascular cell adhesion molecule-1, and fibronectin) with the ligands that are over-expressed on the tumor cells (β1, α4β1 and α5β1 integrins, cadherin-11, connective tissue growth factor, and CXCR4) promotes colonization of circulating malignant cells in the bone marrow.[14] The release of insulin-like growth factor, TGF-b, bone morphogenetic protein (BMP), PDGF and VEGF during the formation of both osteolytic and osteoblastic lesions stimulates a vicious cycle of tumor growth that leads to tumor cell proliferation and progression of bone lesions.

CLINICAL PRESENTATION AND DIAGNOSIS

In a phase III clinical trial performed by Rosen et al., most patients with bone metastases from NSCLC experienced a SRE within the first 5 months on study.[15] Bone lesions may be overlooked and often are not diagnosed until they manifest as bone pain or a SRE.[16] The consequences of a SRE, such as bone pain and loss of mobility, may persist throughout the lifetime of the patient and cause significant impairment. Therefore, detection and treatment of bone metastases before the onset of a SRE could help preserve a patient's quality of life and functional independence.[17]

Bone metastases can easily be overlooked in the NSCLC setting. Bone metastases are typically detectable via bone scans before they reach an advanced stage, but many oncologists do not order bone scans in patients who do not report bone pain or do not have other signs of bone involvement such as elevated bone-specific alkaline phosphatase (BALP).[18] In a study performed by Iordanidou et al., whole-body scanning was performed on 60 patients whose initial evaluation indicated they had operable (non-metastatic) NSCLC.[16] Of 11 patients that had bone pain or laboratory values consistent with early bone lesions, bone metastasis were confirmed in 3 (27.3%). Among the other 49 patients, bone metastases were detected in 8 (16.3%) although no clinical symptoms of bone metastases had been reported. The incorrect staging of these patients may result in suboptimal treatment decisions.

IMAGING

Current guidelines set by the American Society of Clinical Oncology (ASCO) suggest that bone scans can be performed on patients with NSCLC with abnormal clinical evaluations.[19] Imaging may be performed on patients

with advanced disease at presentation, especially if patients are symptomatic. Suspicious lesions identified on bone scan generally warrant further investigation using x-ray, computed tomography, magnetic-resonance imaging, metabolic-labeling positron emission tomography or biopsy.[16]

TREATMENT

Most patients with a pathologic fracture of the lower extremity should have operative stabilization or reconstruction. The goals and benefits of fixation of pathologic fractures include pain relief, restoration of the ability to walk, increased duration of survival and improved fracture healing. Habermann et al. reported that 264 (90%) of 292 patients who had a pathologic fracture and had survived the initial postoperative period had good or excellent relief of pain after internal fixation.[10] Although operative treatment has little impact on the neoplastic process, regaining the ability to walk and avoiding the risks of extended bed rest is imperative for survival.

HEALTHCARE COSTS

SREs are associated with increased healthcare costs. In a retrospective analysis in which 534 patients with bone metastases from NSCLC were identified, 295 patients had medical claims associated with a SRE.[20] Based on 2004 costs, the estimated lifetime cost per patient with bone metastases directly related to a SRE was approximately $12,000 US dollars. When including the acute management of a SRE, the medical costs were an average of $27,982 higher per patient with a SRE compared to a patient who did not experience a SRE. Prevention of a SRE in patients with NSCLC could have a substantial economic impact.[21]

CONCLUSION

In conclusion, malignant bone disease is one of the most frequent causes of chronic cancer-associated pain. It is relatively common in patients with advanced cancer and is associated with a decreased quality of life.[17] SREs add to the burden of disease, and can permanently impair mobility and functional independence. Pathologic fractures have been associated with decreased survival in multiple tumor types.[22] As such, early identification of bone metastases and management of SREs are important to maintain a patient's quality of life. Delaying the onset and reducing the risks of a SRE could provide meaningful and significant benefits to patients with bone metastases from NSCLC. Early treatment may especially help the patient's performance status, which is an important predictive factor for survival. Therefore, it is imperative to identify risk factors for skeletal metastases in patients with NSCLC, optimize screening and implement early treatment to prevent or delay the onset of a potentially debilitating SRE.[23]

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Reprint: Retained Viable Single Intrauterine Pregnancy after Vacuum Aspiration for a Dichorionic-Diamniotic Twin Pregnancy

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ABSTRACT

Case

A patient presented to the emergency department reporting vaginal spotting, breast engorgement and lower abdominal cramping for the past 2 weeks. The patient had an electiveabortion 2 months previously. Transvaginal ultrasound revealed an apparent twin gestational sac within the uterus. The presenting gestational sac contained a mixture of blood clot and tissue, with no discernible fetal parts. The second sac contained a live fetus of approximately 15 weeks of gestation.

Conclusion

An underreported complication of vacuum aspiration is a retained viable intrauterinepregnancy. There is a role for postoperative ultrasound in complicated cases such as twingestations or in very early pregnancies to avoid retained products of conception or the infrequent case of retained viable intrauterine pregnancy.

As one of the most commonly performed procedures in the field of obstetrics and gynecology, vacuum aspiration is integral in the management of elective pregnancy termination, spontaneous abortion, fetal death, retained products of conception, and gestational trophoblastic neoplasia.[1,2] Well-documented complications of vacuum aspiration include hemorrhage, cervical laceration and uterine perforation, endometritis, and retained products of conception. Retainedviable intrauterine pregnancy is an infrequent complication of vacuum aspiration. Here we report the complication of a live retained single intrauterine pregnancy after vacuum aspiration of a dichorionic-diamniotic twin gestation.

CASE

A multigravida presented to the emergency department reporting vaginal spotting, lower abdominal cramping, and breast tenderness for the past 2 weeks. On review of systems thepatient denied fever, chills, chest pain, shortness of breath, and dysuria. She had had an electiveabortion approximately 2 months previously and since then had been using a norelgestromin/ethinyl estradiol patch (the Ortho Evra Transdermal System; Ortho-McNeil-Janssen Pharmaceuticals, Raritan, NJ). The patient‘s obstetric history consisted of two full-term vaginal deliveries and two prior elective abortions, for which she had undergone vacuum aspirations. She had no other relevant medical or surgical history. The patient’s vital signs werestable and physical examination findings were unremarkable except for a fundal height ofapproximately 15 cm. Laboratory investigations revealed O+ blood type, normal complete blood count, urinalysis, and comprehensive metabolic panel. 74 Serum β-human chorionic gonadotropin level was 69,476 mIU/ml. Complete fetal ultrasound showed an apparent twin gestational sac within the uterus. The presenting gestational sac contained a mixture of blood clot and tissue, with no discernible fetal parts. The second sac contained a live fetus of approximately 15 weeks’ gestation (Fig. 1).

A review of the patient’s medical records from the facility where she had the elective abortionincluded an official transvaginal ultrasound revealing a dichorionic-diamniotic twin pregnancy at 7 weeks. Tissue from the procedure was examined with low-intensity background lighting documenting the presence of villi and fetal sac. No fetal parts were noted or expected, typical ofa 7-week gestation. After we discussed with the patient the findings of live singleton intrauterine pregnancy, the patient elected to have a repeat procedure for termination of pregnancy.

COMMENT

Known complications of vacuum aspiration have been well documented. Hakim-Elahi et al.[3] reviewed complications of first-trimester abortion from a Planned Parenthood series of 170,000 cases in New York between 1971 and 1987. In this series 0.07% of women required hospitalization because of incomplete abortion, sepsis, uterine perforation, hemorrhage, inabilityto complete the procedure, or combined (intrauterine and tubal) pregnancy. In 0.84% of cases, minor complications such as mild infection, incomplete abortion requiring resuction in an outpatient setting, cervical stenosis or laceration, orconvulsive seizure due to administration oflocal anesthetic occurred. Overall complications occurred in 0.6% of 170,000 consecutive cases. One underreported complication of

vacuum aspiration is ongoing pregnancy. This is acomplication of early rather than late abortion. An ongoing intrauterine pregnancy may occur after an attempted pregnancy termination if the products of conception are not closely examined at the end of the procedure to verify successful completion. Alternatively, ongoing pregnancy occasionally results from a multiple gestation in which only one of the sacs was aborted, as in our case. Comprehensive searches of MEDLINE via Ovid, MD Consult, and Google Scholarrevealed no other cases of reported intrauterine pregnancy after vacuum aspiration of a dichorionic-diamniotic twin pregnancy. Fielding et al.[4] reviewed one series of 12,138 consecutive abortions in which the pathologic specimens were carefully examined; three continuing pregnancies were later diagnosed and attributed to physician error, two at 6 weeks of gestation and one at 8 weeks of gestation.

Most studies have looked at complications of vacuum aspiration; very few have examined ways to prevent these complications. Debby et al.[5] 107 conducted a prospective randomized study involving 809 women undergoing first-trimester uterine evacuation. A total of 404 women in thestudy group had transvaginal sonography performed at the end of the procedure and the controlgroup comprised 405 women who did not undergo ultrasound examination. In addition, in the study group, recurettage was immediately performed if the endometrium appeared irregular but in the control group recurettage was performed only if the endometrial thickness appeared to be 8 mm or greater. These authors' 113 results showed the total complication rate to be 4.3%. Retained products of conception presented in three women in the study group (0.7%) and in 15 women in the control group (3.7%, $P < 0.05$). Vaginal bleeding requiring hospitalization occurred in two women in the study group (0.5%) vs. seven in the control group (1.7%, $P = 0.2$). Endometritis was diagnosed in one woman in the study group (0.2%) vs. six in the control group (1.5%) and 118 uterine perforation occurred in one woman in the control group vs. none in the study group. The authors concluded that transvaginal ultrasound immediately following first-trimester uterine evacuation may reduce the incidence of retained products of conception and reduce the total complication rate. They also suggested reevacuation of the uterine cavity when the endometrial thickness is 8 mm or greater. Because vacuum aspiration is an integral part of obstetrics and gynecology practice, it is important to know how to manage potential complications such as hemorrhage, infection, perforation, and retained products of conception. Although an infrequent complication, retained intrauterine pregnancy is clinically important and may carry emotional liability for the patient. We recognize that routine use of ultrasound either intra- or postoperatively may not be feasible or practical in all cases of vacuum aspiration, such as in low-resource settings, and that some morbidity may be associated with routine reevacuation of the uterus in response to ultrasound (rather than clinical) findings. However, our case suggests it may be worthwhile to study the use of postoperative ultrasound in complicated cases such as twin gestations or early pregnancies. We believe based on our case that there is a role for postoperative ultrasound in complicated cases such as twin gestations or in very early pregnancies to avoid retained products of conception or the infrequent case of retained viable intrauterine pregnancy.

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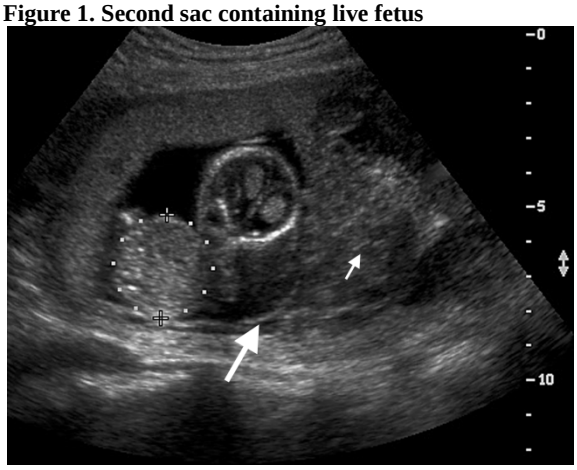
Figure 1. Second sac containing live fetus



RESIDENCY RESEARCH FELLOWS 2007 - 2011

2010-2011 – Anna Katsman, M.D.

As part of the NEXT initiative of the Drexel University College of Medicine Strategic Plan 2007-12, the Resident Research Committee awarded **Anna Katsman, M.D.** with the 2010-2011 Resident Research Fellowship for her project "Electrospun Chitosan Scaffolds Crosslinked with Genipin and Mineralized with Hydroxyapatite as a Novel Microenvironment for Osteogenic Differentiation of Human Bone Marrow Derived Mesenchymal Stem Cells in ex vivo."

Katsman received her M.D. from DUCOM and is currently a resident at Orthopaedic Surgery at DUCOM/Hahnemann University Hospital. The award is for a period of one year and provides support for salary and research-related costs.

Resident Research Fellowships (RRF) represent the commitment of Drexel University College of Medicine to provide support and "protected time" to individuals in a residency program for an intensive, supervised, research career development experience in the field of biomedical research, with a particular focus on translational research. The goal of the fellowship is to establish unique strengths in translational research by blending the talents of physicians, engineers and biologists.

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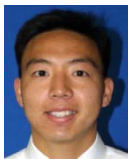
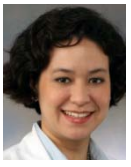
2010-2011 – Rekha Bhat, M.D.
Research Project: "Astrocyte Senescence in Vivo and Age-Related Pathology."

2009-2010 - Alexander Poor, M.D.
Research Project: "Elucidating the Mechanisms of Iodine Activation of AhR in Breast Cancer."

2008-2009 - Monique Ruberu, M.D.
Research Project: "Development of Quantitative Sensory Testing as a Tool to Assess Vulvar Sensory Processing."



2008-2009 - Andrew Wu, M.D.
Research Project: "LCL™ Polyurethane Vascular Graft Implantation into Small Caliber Vessels."



2007-2008 - Octavia N. Devon, M.D.
Research Project: "Long-Term Sustainability of a Human Liver Transplant."

For information, please contact Stephanie Hasson, at (215) 991-8146 or shasson@drexelmed.edu.