

---

## Table of Contents

5	<b>EDITORIAL COMMENTS and DEAN’S RECOGNITION</b>
	<b>ABSTRACTS</b>
6	A Rare Case of Small Bowel Volvulus after Right Hemicolectomy
6	A Safety Net: Implementation of an Office Surgery Safety Protocol
6	An Unusual Presentation of Recurrent Tricuspid Regurgitation Post-Annuloplasty
7	Clinical Applications of Procalcitonin in Pediatrics: An Advanced Biomarker for Inflammation and Infection. Can it also be used in trauma?
7	Coronary Artery Thrombosis in Patient Status-Post Emergent Aortic Dissection Repair Found by Intraoperative Transesophageal Echocardiography (TEE)
8	Do Serum Anti-Mullerian Hormone Levels Correlate with Embryo Quality?
8	Efficacy of Intrapartum PCR-based Testing for Maternal Group B Streptococcus Status
9	Evaluation of Acute Kidney Injury (AKI) in an Orthopedic Population in a Community Hospital
9	Health Information Exchange in Pregnancy and Delivery: A Cost Analysis
9	IC/BPS Patients with Bladder Mucosal Cracks: Who are they and can they Benefit from Corticosteroid Treatment?
10	Non-Albicans Candidal Vulvovaginitis
10	Obtaining Medicaid-funded Abortions under the Hyde Amendment in Pennsylvania: Barriers and Policy Solutions
10	Outcomes of ST Elevation Myocardial Infarction patients after Primary Percutaneous Coronary Intervention
11	Patient Exposure to Pelvic Organ Prolapse Surgery on YouTube
11	Success of Interferon Alpha 2b in a Rare Metastatic Epitheloid Vascular Tumor
12	The Effect of Pregnancy on Interstitial Cystitis/Bladder Pain Syndrome
12	The Expression of Focal Adhesion Kinase and Src in Neuroblastoma
	<b>CASE REPORTS</b>
13	A Case of Massive Ascites with Peritoneal Lymphomatosis
13	A Rare Complication – Septic Thrombophlebitis of Inferior Mesenteric Vein Secondary to Sigmoid Diverticulitis
14	A Scorpion Sting in Pennsylvania
15	A Ticking Time Bomb: Interstitial Ectopic Pregnancy

- 
- 15 A Unique Case of Gas Gangrene of the Foot Caused by *Fusobacterium Necrophorum* in a Diabetic Patient
- 16 Adrenal Hematoma Presenting as Large Adrenal Mass
- 17 An Interesting Case of Uterine Fibroids
- 18 Asexuality - The No Longer Invisible Orientation
- 18 Aspiration Pneumonia Seen In a Patient with Bronchial Diverticula
- 19 Blastoid Histopathological Subtype of Mantle Cell Lymphoma - An Indicator of Poor Prognosis, Independent of Standard Predictive Scores
- 20 C3 Glomerulonephritis Manifesting as Recurrent Episodes of Acute Kidney Injury during times of Infection
- 20 Calcified Common Femoral Artery Stenosis treated with Rotational Atherectomy and Balloon Angioplasty
- 21 Catastrophic Antiphospholipid Syndrome and Heparin-Induced Thrombocytopenia – Related Diseases or Chance Association?
- 22 Crack Lung Syndrome
- 22 Emergent Type A Aortic Dissection Repair in Jehovah Witness (JW) with Bloodless Medicine
- 23 Insulin Edema Syndrome: Doctor – Why am I gaining so much weight?
- 23 Mesh Repair of Recurrent Vaginal Evisceration following Radical Hysterectomy and Adjuvant Pelvic Radiation
- 24 Necrotizing Fasciitis after Cesarean Section
- 24 Obstructive Congenital Epulis: a Delivery-room Surprise
- 25 Peripherally Inserted Central Catheter (PICC) Line and Dialysis Catheter
- 26 Prolonged Third Remission with Recovery of Donor Engraftment following Treatment of Post-transplant Relapse with Bortezomib in a 9 year old male with Precursor B-Cell Acute Lymphoblastic Leukemia
- 26 Small Bowel Ileus: An Uncommon Complication of Colonoscopy
- 27 *Stenotrophomonas maltophilia* Pneumonia found in Inhalation Injury Burn Patient
- 28 Subclavian/Coronary Steal Treated with Hybrid Bypass Surgery and Carotid Stenting
- 29 Successful early Carotid Endarterectomy for Critical Carotid Artery Stenosis following Thrombolysis in Acute Ischemic Stroke
- 29 There is More to Swallowing than just the Esophagus
- 30 Unusual Case of Apical Hypertrophic Cardiomyopathy and Narrow Complex Tachycardia
- 31 Use of Atherectomy for Severe Peripheral Vascular Disease
- 32 Zinc Phosphide Rodenticide Ingestion in a Toddler

---

	<b>ORIGINAL ARTICLES</b>
33	A Rare Case of Hepatic Flexure Diverticulitis after Pelvic Laparoscopy and Review of Literature for Management
35	Evaluation of Patients seen in the Emergency Department during two Philadelphia Marathons
40	Is Obesity a Risk Factor for Iron Deficiency Anemia?
43	Posterior Scalp Melanoma: a Rare Location for a Common Skin Cancer
45	Splenic Artery Embolization for Post Gastric Bypass Marginal Ulcer
48	A Preliminary Retrospective Study of the Epidemiologic Characteristics of Pediatric Iron Deficiency Anemia in a Large Well Child Clinic in New Brunswick, New Jersey, USA
	<b>MEDICAL ESSAYS</b>
52	An Essay on the PPACA
	<b>REVIEW ARTICLES</b>
54	A Unique Case of Vaginal Foreign Body Leading to Rectovaginal Fistula in an Adolescent Female - A Case Report and Review of Literature
57	Evidence Based Review on Impact of Modern Day Technology and Mobile Health on Doctor-Patient Communication
59	Ovarian Macrocyst - Case Report with Review of the Literature
61	Pituitary Apoplexy: A Rare Cause of Third Nerve Palsy and Central Diabetes Insipidus
63	Pulseless Electrical Activity

---

## Editorial Staff

Editor-in-Chief: David Berkson, MD  
Associate Editors: Mark B. Woodland, MS, MD  
Jay M. Yanoff, EdD

**Affiliates:**

- Abington Memorial Hospital**
- Allegheny General Hospital**
- Easton Hospital**
- Friends Hospital**
- Hahnemann University Hospital**
- Mercy Health System**
- Monmouth Medical Center**
- St. Christopher's Hospital for Children**
- St. Peter's University Hospital**
- Virtua Health**
- York Hospital**

## 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 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 welcomes original research, reviews, case reports, and technical reports alike.

*DMJ* is an internal document for the exclusive use of DUCOM and its participating affiliates and is intended for distribution internally only. *DMJ* publishes abstracts, original articles, review articles, medical essays, editorials, and letters that reflect the ongoing research and work of graduate medical education. Any original, full submission that has been accepted for publication in the *DMJ* is protected by copyright and cannot be published elsewhere, except in abstract form or by the express consent of the Editor. Only abstracts that have been published in the *DMJ* may be reproduced elsewhere in abstract and/or full paper form. *DMJ* is funded by an unrestricted grant from DUCOM and is value added to its affiliates. The journal is archived internally in our library and the libraries of our affiliate sites.

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 Vice 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:

**[www.drexelmed.edu/drexelmedjournal](http://www.drexelmed.edu/drexelmedjournal)**

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

All requests for reprint permission can be addressed to: [DMJEditor@Drexelmed.edu](mailto:DMJEditor@Drexelmed.edu).

**Disclaimer:** The statements and opinions contained in this document belong solely to the authors and do not reflect the opinions, beliefs, or stances 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, or Virtua Health. Philadelphia Health & Education Corporation d/b/a Drexel University College of Medicine is a separate not-for-profit subsidiary of Drexel University. Drexel University is not involved in patient care. This document is intended for internal use only and not for public distribution.



### EDITORIAL COMMENTS

We are happy to present the eighth 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, Friends Hospital, Virtua Health and York Hospital.

Special Recognition from the Editorial Board:

The *DrexelMed Journal* Editorial Board has selected the cover of this edition to honor the contributions that Dr. Barbara Schindler has made to the University and to the College of Medicine. Her leadership has provided consistent guidance through the transitions of the medical school, which included the merger of the Medical College of Pennsylvania and Hahnemann University as well as the creation of the Drexel University College of Medicine. She steps down from her current role as Vice Dean for Educational and Academic Affairs in March 2014, but her significance and importance to the institution as well as students, faculty and alumni will continue to be strong and apparent. Dr. Schindler will remain an active member of the Department of Psychiatry. Dr. Schindler is pictured here congratulating an incoming student during the White Coat Ceremony.

**David Berkson, MD**  
Editor-in-Chief  
Associate Professor, Program  
Director, Family Medicine

**Mark B. Woodland, MS, MD**  
Program Director, OB-GYN  
Vice Dean, GME  
Clinical Professor, OB-GYN

**Jay M. Yanoff, EdD**  
Chief GME Officer, DIO  
Hahnemann University Hospital

### DEAN'S RECOGNITION

I offer my congratulations to Dr. 's Berkson, Woodland, and Yanoff for the 8<sup>th</sup> Edition of the *DrexelMed Journal*. Eight years ago when Drs. Yanoff and Woodland initiated this effort, it was whole heartedly supported by the College of Medicine to emphasize the scholarly activities of our residents. At the time it was in line with the Strategic Plan of the College of Medicine and the research mission of the College of Medicine. Since then, the challenge has been to continue to expand beyond the halls of our primary GME affiliates and I am pleased to see the participation of our affiliates continues 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 throughout your training programs and your professional careers that you continue your endeavors to move medicine forward.

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

## Abstract: A Rare Case of Small Bowel Volvulus after Right Hemicolectomy

Uchechuckwu Stanley Ogu, MD\*, Amy Javia\*\*, Pricha Boonswang, MD\*

\*Easton Hospital: Department of Surgery

\*\*MD Candidate, Drexel University College of Medicine

### CASE

We present a 69-year-old female with no significant past medical history who underwent a right hemicolectomy for a 2.5 cm sessile tubular adenoma of the ascending colon found on screening colonoscopy. After an initially uneventful post-operative period, the patient developed worsening nausea and abdominal pain. By the fifth post-operative day, CT scan showed mechanical small bowel obstruction due to internal hernia or volvulus. She underwent urgent exploratory laparotomy which confirmed the diagnosis of small bowel volvulus. The bowel was detorsed and eventually determined to be completely viable.

### DISCUSSION

Small bowel volvulus is an abnormal twisting of small bowel around its mesentery that can lead to mechanical obstruction, ischemia and bowel necrosis. It may occur due to an anatomic predisposition, usually in younger patients with long mesenteric length or secondary to post-operative adhesions in the older patient population(1). While multiple cases of volvulus have been reported as a complication of laparoscopic cholecystectomy (2), very few cases of small bowel volvulus occurring in the immediate post-operative period have been reported.

In our patient's case, a secondary small bowel volvulus presented in the acute post-operative period due to the patient's anatomic predisposition with a long mesentery and narrow base, exacerbated by surgery. The right hemi-colectomy created a space in the abdomen, which allowed the bowel to volvulize in a fashion similar to a primary volvulus. Although volvulus is a rare occurrence in adults, the possibility must always be considered in any patient who presents in the immediate postoperative period with mechanical bowel obstruction.

### REFERENCES

1. Valsdottir, E and Marks, JH. Volvulus: small bowel and colon. Clinics in Colon and Rectal Surgery. 2008;21(2):91-93.
2. Ferguson, L et al. Intestinal volvulus following laparoscopic surgery: a literature review and case report. J of Laparoscopic and Advanced Surgical Technique. 2008;18(3):405-410.

## Abstract: A Safety Net: Implementation of an Office Surgery Safety Protocol

Brandi Musselman, MD, Carl Della Badia, DO, Minda Green, MD, Irene Grias, DO  
Drexel University College of Medicine: Department of Obstetrics and Gynecology

### OBJECTIVE

To determine if a formal safety protocol improves the safety of patients undergoing gynecological surgical procedures in the office setting.

### METHODS

A retrospective chart review of 255 office surgery cases: 208 cases occurred before the implementation of the safety protocol (Cohort A), while 47 cases occurred after implementation the safety protocol (Cohort B). Procedure complications and cancellations were analyzed to see if there was a difference in morbidity and mortality between Cohort A and Cohort B.

### RESULTS

The results show fewer complications occurred in Cohort B (10% of cases versus 17% of cases in Cohort A), after the safety protocol was implemented. More cancellations occurred in Cohort B (10% versus 7% of cases in Cohort A). In Cohort B cancellations occurred prior to the start of the procedure, where procedures in Cohort A were most often cancelled after the procedure had started. These findings suggest that the protocol improved patient safety by decreasing complications and preventing procedures in the event of inappropriate circumstances. Unfortunately, our sample size was small, and these results are not statistically significant.

### DISCUSSION

As more procedures are moving from the operating room to the office surgery suite, maintaining patient safety is paramount. Formal safety protocols are likely to improve patient safety during office gynecological surgery, and have been recommended by the American Congress of Obstetricians and Gynecologists (1,2). More studies should be undertaken to evaluate this evolving and critical area of gynecology.

### REFERENCES

1. ACOG. "Report on the Presidential Task Force on Patient Safety in the Office Setting." 2010.
2. Erickson, TB et al. "Executive summary of the American College of Obstetricians and Gynecologists Presidential Task Force on Patient Safety in the Office Setting: reinvigorating safety in office-based gynecologic surgery." Obstetrics and Gynecology. 2010;115(1).

### Figure 1: Components of the Office Surgery Safety Protocol

Check list (pre-op, intra-op, post-op) and formal "time out"

Patient identification check points

Staff training and drills

Safety kits and equipment

Daily designation of safety personnel

### Figure 2: Types of Complications by Cohort

Complication	Cohort A (%)	Cohort B (%)
TOTAL Complications	36 (17%)	5 (10%)
Pain	12 (6%)	1 (2%)
Bleeding	9 (4%)	--
Anatomy	9 (4%)	1 (2%)
Infection	6 (3%)	--
Hospitalizations/ED	5 (2.5%)	1 (2%)
Product or Procedure Failure	3 (1%)	--
Abnormal Vital Signs	--	2 (4%)
Poor Healing	1 (0.5%)	--
Pregnancy	1 (0.5%)	2 (4%)
Miscellaneous	1 (0.5%)	--

## Abstract: An Unusual Presentation of Recurrent Tricuspid Regurgitation Post-Annuloplasty

Carson Philip, MD, Rosy Thachil, MD, Arif Jan, MD  
Drexel University College of Medicine: Department of Medicine, Division of Internal Medicine

### INTRODUCTION

Tricuspid repair with annuloplasty is the preferred surgical approach for tricuspid disease and has been shown to improve mortality. However, recurrence of tricuspid regurgitation (TR) post annuloplasty is not uncommon with rates between 14-20%(5). In this report, we present an uncommon presentation of recurrent TR,

and we examine the factors that underlie this phenomenon.

#### CASE

We present a 69 year old male with extensive medical history including successful tricuspid annuloplasty six years prior who presents with diffuse abdominal pain and nausea for three weeks. He was found on admission to have significant ascites and hepatic congestion as a result of right sided heart failure. Echocardiogram showed new recurrent tricuspid regurgitation six years post annuloplasty.

#### DISCUSSION

Failed tricuspid annuloplasty resulting in recurrent tricuspid regurgitation is a well-established phenomenon. However, resultant ascites and portal hypertension with no evidence of hepatic injury is unreported. A review of the published work shows that TR in conjunction with heart failure can cause hepatic injury, fibrosis and eventually cirrhosis(3). Our patient's presentation was unusual in the lack of hepatic injury but presence of ascites. The recurrence of tricuspid regurgitation post annuloplasty was likely multifactorial, as he had high grade TR preoperatively, severe PA hypertension and severe right sided heart failure, and severe concomitant mitral stenosis and regurgitation. Passive congestion with no transaminitis/cirrhosis is an uncommon presentation for recurrent tricuspid regurgitation, and will likely make for an interesting area of further research.

#### REFERENCES

1. Hwang HY, Chang HW, Jeong DS, Ahn H. "De Vega Annuloplasty for Functional Tricuspid Regurgitation: Concept of Tricuspid Valve Orifice Index to Optimize Tricuspid Valve Annular Reduction." *J Korean Med Sci* 2013;28:1756-1761
2. Jimenez-Romo F. "Tricuspid Liver." *Arch Inst Cardiol Mex* 1972;42:243-246
3. Gelow M, et al. "Clinical Predictors of Hepatic Fibrosis in Chronic Advanced Heart Failure." *Circ Heart Fail.* 2010;3:59-64
4. Lau G, Tan C, Kritharides L. "Type of Liver Dysfunction in Heart Failure and its Relation to the Severity of Tricuspid Regurgitation". *Amer Journal of Cardiology* 2002a;90:1405-1409
5. McCarthy PM, Bhudia SK, Rajeswaran J, Hoercher KJ, Lytle BW, Cosgrove DM, Blackstone EH. "Tricuspid valve repair: durability and risk factors for failure." *J Thorac Cardiovasc Surg.* 2004; 127: 674-685

-----

#### Abstract: Clinical Applications of Procalcitonin in Pediatrics: An Advanced Biomarker for Inflammation and Infection. Can it also be used in trauma?

Panagiotis Kratimenos, MD, Ioannis Koutroulis, MD, Steven Loscalzo, Vassiliki Syriopoulou, MD\*  
St. Christopher's Hospital for Children: Department of Pediatrics, Division of Neonatal-Perinatal Medicine  
\*University of Athens (Greece): Department of Pediatrics

#### INTRODUCTION

Procalcitonin is a small molecular peptide that has gained increased support as an adjunct diagnostic marker of infection in the adult population – the concordant body of evidence for the use of procalcitonin in pediatric populations is far less complete.

#### OBJECTIVE

The objective of this study is to review the current evidence supporting the utilization of procalcitonin in pediatric patients in a variety of clinical scenarios including SIRS, sepsis, burns, and trauma, and identify existing knowledge gaps that would benefit from future prospective studies.

#### METHODS

A thorough review of the literature was performed using the

Medline database through a PubMed search. The search protocol included a free-text query using the terms "procalcitonin", "sepsis", "SIRS", "trauma", "burns" and "children". We focused on utilizing meta-analysis from adult populations to review current practices in interpretation and methodology and, where possible, find concordant pediatric studies to determine if the same applications are validated in pediatric populations. The most important studies with supporting data were included in our review.

#### RESULTS

Current evidence supports the usage of procalcitonin as both a sensitive and specific marker for the differentiation of SIRS from sepsis in pediatric patients with increased diagnostic accuracy compared to commonly used biomarkers including complete blood counts and C-reactive protein.

#### DISCUSSION

Although the body of evidence is limited, initial observations suggest that procalcitonin can be used to pediatric trauma and burn patients as both a prognostic and diagnostic marker, aiding in the identification of infection in patients with extensive underlying inflammation.

#### REFERENCES

1. Assicot M, et al. High Serum Procalcitonin Concentrations in Patients with Sepsis and Infection. *Lancet.* 341:515-518
2. Castelli GP, Pognani C, Massimo C, & Paladini R. Procalcitonin as a prognostic and diagnostic tool for septic complications after major trauma. *Critical Care Medicine.* 37(6):1845-1849
3. Greenhalgh DG, et al. American Burn Association Consensus Conference to Define Sepsis and Infection in Burns. *Journal of Burn Care & Research.* 23(6):776-790
4. Neely AN, Fowler LA, Kagan RJ, & Warden GD. Procalcitonin in Pediatric Burn Patients: An Early Indicator of Sepsis? *Journal of Burn Care & Rehabilitation* 25(1):76-80
5. Simon L, et al. Procalcitonin and C-reactive protein as markers of bacterial infection in critically ill children at onset of systemic inflammatory response syndrome. *Pediatric Critical Care Medicine* 9(4):407-413

-----

#### Abstract: Coronary Artery Thrombosis in Patient Status-Post Emergent Aortic Dissection Repair Found by Intraoperative Transesophageal Echocardiography (TEE)

Michelle DaCosta, MD, Jeffrey Helkowski, MD  
Allegheny General Hospital: Department of Anesthesiology

#### CASE

A 64 year old female presented with pleuritic chest pain. Chest CT was negative for pulmonary embolism (PE) but showed type B aortic dissection with retrograde extension, large mediastinal and intramural hematoma at the arch and ascending aorta. Pre Pump TEE showed concentric left ventricular hypertrophy, normal left ventricular systolic function, normal right ventricular size and function, and a thoracic aortic dissection with mural thrombus extending to the ascending aorta. An ascending aortic and hemi-arch repair was performed. Post Pump TEE showed preserved right ventricular function and low normal left ventricular systolic function with hypokinesis in the apical and septal region. The patient returned to the OR for chest closure and the intraoperative TEE showed severe hypokinetic anterior wall dysfunction and the intraoperative EKG showed supraventricular tachycardia requiring cardioversion. The patient went emergently to the catheterization lab and a large thrombus in the LAD was found. The patient had a thrombectomy, two bare metal stents (BMS) placed in the proximal and mid LAD and one placed in the left circumflex.

#### DISCUSSION

TEE is the most sensitive bedside monitor of myocardial ischemia (1,3). Ischemia is visualized as new or reversible left ventricular segmental wall-motion abnormality on TEE (1). The ideal monitoring approach for ischemia should integrate EKG, TEE, and Pulmonary Artery (PA) catheter (1). Still, echocardiography, the newest and most sophisticated method, is very sensitive for detecting ischemia with systolic dysfunction, compared to PA catheter and EKG(1). TEE is essential for rapid and accurate decision-making during cardiac surgery (2,3).

#### REFERENCES

1. Mark, JB. Multimodal Detection of Perioperative Myocardial Ischemia. *Tex Heart Institute Journal*. 2005; 32(4): 461–6
2. Mishra M, et al. Real-time intraoperative transesophageal echocardiography-how useful? Experience of 5,016 cases. *J Cardiothorac Vasc Anesth*. 1998 Dec; 12(6):625-32
3. Akiyama K, Arisawa S, Ide M, Iwaya M, Naito Y. Intraoperative cardiac assessment with transesophageal echocardiography for decision-making in cardiac anesthesia. *General Thoracic and Cardiovascular Surgery*. 2013 Jun; 61(6):320-9

#### Abstract: Do Serum Anti-Mullerian Hormone Levels Correlate with Embryo Quality?

Pereira Nigel, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology

#### OBJECTIVE

To investigate the relationship between serum anti-mullerian hormone levels (AMH) and embryo quality

#### METHODS

Retrospective chart review. Patients undergoing in vitro fertilization (IVF) cycles between January 2012 and December 2012 were included. Data extracted from patient charts included age, body mass index (BMI, kg/m<sup>2</sup>), peak estradiol levels (pg/ml), serum AMH levels (ng/ml), number of follicles (# follicles) on the day of human chorionic gonadotropin (HCG) administration, and number of oocytes retrieved. Embryo quality was determined by estimating the mean cell count and fragmentation rate (%) in day 3 embryos. Means and standard deviations were measured for continuous variables. Correlations between serum AMH levels and other parameters were determined using Spearman's correlation coefficient, with P < 0.05 considered statistically significant.

#### RESULTS

Our findings are summarized in Table 1. For day 3 embryos, the mean cell number was 6.6 (±0.9) and the mean fragmentation rate was 6.2 (±3.3)%. There was a statistically significant (P=0.002) correlation between # follicles on the day of HCG and serum AMH levels. We observed a correlation between serum AMH levels and number of oocytes harvested, though this correlation was not statistically significant. We observed no correlations between serum AMH levels, mean cell count, or fragmentation rates in day 3 embryos.

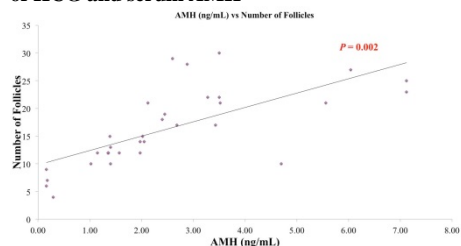
#### CONCLUSIONS

Conflicting results regarding the relationship between serum AMH levels and embryo quality exist in the medical literature. Our data reveals a strong correlation between serum AMH levels and number of follicles on the day of HCG, but no correlation between AMH levels and embryo quality.

**Table 1. Summary of Data Extracted from IVF Charts**

Parameter	Range	Mean (±SD)
Patient age (years)	30-48	34.9 (±3.4)
AMH (ng/ml)	0.16-33.0	3.17 (±2.95)
Peak E2 (pg/ml)	5927-6780	6334.3 (±249.01)
Mean Follicle Count	2-41	19.5 (±8.1)
Number of Oocytes Retrieved	1-43	17.7 (±7.4)
Number of Mature Oocytes	1-37	10.32 (±6.11)
Number of Oocytes Fertilized with IVF	0-29	7.79 (±5.38)
Number of Oocytes Fertilized with ICSI	0-24	6.78 (±4.28)

**Figure 1. Correlation between Number of Follicles on the day of HCG and serum AMH**



#### Abstract: Efficacy of Intrapartum PCR-based Testing for Maternal Group B Streptococcus Status

Alfredo de la Guardia, MD\*, Susanne Matias-Gomes, DO\*\*, Jamil Elfarrar, MD\*\*, Paul Bobby, MD\*\*  
\*Drexel University College of Medicine: Department of Obstetrics and Gynecology  
\*\*Stamford Hospital : Department of Medicine

#### INTRODUCTION

Current strategy for prevention of neonatal group B streptococcus (GBS) infection is based upon antenatal rectal-vaginal culture at 35-37 weeks' gestation. However, the recently revised CDC guidelines report a role for PCR testing for intrapartum maternal GBS status in women whose status is unknown. This study was designed to compare the efficacy of antenatal cultures with intrapartum polymerase chain reaction (PCR) assay.

#### METHODS

Pregnant women >17 years of age presenting to Stamford Hospital in labor, rupture of membranes, or for scheduled induction of labor at >37 weeks in 2010- 2012 were eligible to participate. Patients without documented results of antenatal GBS cultures were excluded from participation. Repeated rectal-vaginal sampling for GBS culture and PCR was performed in all participants at the time of admission. GBS culture was performed using selective media. PCR assay for GBS was performed using the Cepheid ID platform. Sensitivity, specificity, positive (PPV) and negative (NPV) predictive value of antenatal culture and intrapartum PCR for prediction of intrapartum GBS culture were compared.

#### RESULTS

142 patients completed the study. 3 patients' samples were not resulted due to lab error and were excluded. 26 (19%) of intrapartum GBS cultures were positive. Sensitivity, specificity, PPV and NPV of antenatal culture were 80%, 95%, 77% and 96%, respectively. Sensitivity, specificity, PPV and NPV of intrapartum PCR were 92%, 93%, 73% and 98%, respectively.



---

## CONCLUSION

Intrapartum PCR-based screening for maternal GBS colonization demonstrates similar sensitivity, specificity and predictive value as compared to antenatal culture using selective media at 35-37 weeks gestation.

## REFERENCES

1. ACOG. Prevention of Early-Onset Group B Streptococcal Disease in Newborns. Committee Opinion 485, April 2011
2. Alfa, MJ et al. Real-time PCR assay provides reliable assessment of intrapartum carriage of group B streptococcus. *J Clinical Microbiol* 2010 Sep;48(9)
3. Daniels, JP et al. Rapid testing for group B streptococcus during labour: a test accuracy study with evaluation of acceptability and cost-effectiveness. *Health Technol Assess* 2009 Sep;13(42)
4. Daniels, JP et al. Intrapartum tests for group B streptococcus: accuracy and acceptability of screening. *BJOG* 2011 Jan;118(2)
5. Helali, El et al. Cost and effectiveness of intrapartum group B streptococcus polymerase chain reaction screening for term deliveries. *Obstet Gynecol* 2012 Apr;119(4)

---

## Abstract: Evaluation of Acute Kidney Injury (AKI) in an Orthopedic Population in a Community Hospital

Myriam Vela-Ortiz, MD, Sukhminder Singh, MD, Elnaz Rakhshan, MD, Mohammad Farooq, MD, Richard Snyder, MD  
Easton Hospital: Department of Medicine

### INTRODUCTION

Common metabolic complications in patients undergoing orthopedic procedures may include the development of Acute Kidney Injury (AKI) and hyponatremia (HNA). The purpose of this retrospective study is twofold: first, to identify those risk factors that may contribute to the development of AKI and HNA in this patient population. Second, to develop a protocol checklist that identifies these risk factors and employs measures to try and prevent these metabolic derangement from occurring.

### METHODS

We reviewed the records of 40 patients who had undergone elective orthopedic procedures. Of these, 29 were female and 11 were male with a mean age of 60. We reviewed comorbidities, the type of orthopedic procedure, medications, and pertinent laboratory values at baseline, pre and post-surgery including Hgb and Cr levels.

### RESULTS

Eighteen out of fifty patients developed AKI. The highest risk of AKI was found in patients who underwent knee and hip surgery; interestingly the risk of AKI was higher for knee-focused procedures in our patient population. The risk of AKI and HNA presenting simultaneously was primarily seen in patients that underwent knee surgery; hyperkalemia was also demonstrated in this patient population. Risk factors for AKI were CKD, post-operative decrease in Hgb, advanced age, ACE inhibitor and NSAID use. Risk for AKI and HNA included those already mentioned above with the addition of diuretic use and knee surgery.

### CONCLUSION

In summary, this retrospective analysis shows that in evaluating patients who will undergo orthopedic procedures, there are factors that should be considered that increase the risk of developing ARF and HNA

---

## Abstract: Health Information Exchange in Pregnancy and Delivery: A Cost Analysis

Radhika Datar, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology

### INTRODUCTION

Shared electronic medical records (EMR) among local hospitals reduce hospital admissions and redundant testing, thus lowering costs. Few studies establish this for obstetrics, where patients receive months of prenatal care (PNC) in outpatient settings. Obstetrics may uniquely benefit from shared EMR by eliminating the need to recreate PNC when patients do not deliver at their planned hospital.

### OBJECTIVE

Estimate predictive factors and additional costs associated with the deliveries of patients who received PNC at a clinic not associated with Hahnemann University Hospital (HUH).

### METHODS

Review of HUH medical records of women who delivered at HUH between 1/1/2010 and 12/31/2012, and who received PNC at a clinic not associated with HUH. Analysis included baseline characteristics, intended delivery hospital, availability of prenatal records, and clinical need for redundant prenatal labs in the absence of records.

### RESULTS

The inability to easily share records results in substantial cost for the healthcare systems because of: (1) the expense of repeating prenatal labs when unable to obtain them in a timely manner; and (2) the less easily measured cost of time spent trying to obtain PNC records and repeat testing. Other observed effects included late treatment of positive GBS cultures and inability to perform tubal ligation without state-required paperwork.

### DISCUSSION

The costs of delivery care for patients without rapidly accessible prenatal records are substantial, though some are difficult to measure. Health information exchange in obstetrics, especially in areas where there is significant hospital overlap, should be encouraged to defray such costs.

### REFERENCES

1. Hebel, E et al. Bridging the Chasm: Effect of Health Information Exchange on Volume of Laboratory Testing. *Arch Intern Med* 2012; 172(6): 517-519
2. Frisse, M et al. The financial impact of health information exchange on emergency department care. *J Am Med Inform Assoc* 2011

---

## Abstract: IC/BPS Patients with Bladder Mucosal Cracks: Who are they and can they Benefit from Corticosteroid Treatment?

Darlene Morrissey, DO, Dominique El-Khawand, Peter O'Hare, MD, Lauren Rittenberg, DO, Natasha Ginzburg, MD, Kristene Whitmore, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology, Female Pelvic Medicine and Reconstructive Surgery

### INTRODUCTION

There is little data on the etiology of bladder mucosal cracks in patients with interstitial cystitis/bladder pain syndrome (IC/BPS).

### OBJECTIVE

Objective of this study is to evaluate effectiveness of treating bladder mucosal cracks with submucosal Kenalog injections.

---

## METHODS

This is a retrospective cohort of IC/BPS patients with bladder mucosal cracks found at hydrodistension. A Kenalog suspension was injected submucosally into the base and edges of the cracks. Data collected at baseline and 12 weeks postoperatively included demographics, urodynamic findings, and validated questionnaires.

## RESULTS

One hundred patients were included. Sixty percent (n=60) were sexually active, 36% (n=22) reporting dyspareunia. Pre-operative questionnaires revealed a baseline mean IC Problem Index (ICPI) of 10.44 (n=64; SD±4.1). Sixty-nine patients underwent urodynamics pre-operatively; mean bladder capacity was 429 ml (SD±214ml) and 45% (n=32) demonstrated sensory urgency. Mean maximum anesthetic cystometric capacity (MACC) was 788.8 ml (SD±246.6). Compared to baseline, the mean visual analog scale (VAS-D) score showed a non-statistically significant decrease from 5.1 to 4.0 post-operatively (p=0.435), and a significant decrease in urinary frequency from 11.7 to 9.1 daily episodes (p=0.05). Nocturia decreased from 3 to 1.6 nightly episodes (p=0.008). There was a negative correlation between VAS-D and MACC (Rho 0.34; p=0.003). A positive correlation was found between ICPI score and pre-operative maximal urethral closure pressure (Rho 0.4; p=0.02).

## CONCLUSION

This subset of IC/BPS patients have moderate symptom severity scores. Intramural corticosteroids may be beneficial to symptom control and improvement in QOL of IC/BPS patients by decreasing urinary frequency and nocturia.

---

### Abstract: Non-Albicans Candidal Vulvovaginitis

Anna Powell, MD, Paul Nyirjesy, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology

## INTRODUCTION

Vulvovaginal candidiasis is associated with significant morbidity. While *Candida albicans* is most frequently encountered, increasing infections of non-albicans *Candida* (NAC) species may also cause symptomatic yeast infections. Eradication of NAC infections may be more difficult due to antimicrobial resistance to commonly used agents.

## OBJECTIVES

The aims of this study included characterization of NAC vaginal yeast infections into symptomatic or non-symptomatic episodes, which were further analyzed for time to mycologic cure, time to clinical cure, and number of treatments.

## METHODS

A cohort from the Drexel Vaginitis Center between April 1, 2008 and January 31, 2011 was reviewed. Time to mycologic cure was defined as time to first negative culture. Clinical cure was defined as >50% improvement in patient symptoms.

## RESULTS

51% of infections were symptomatic compared to 48.1% of infections. *Candida glabrata* was found to be the most common organism (48.1%). The average length of time to mycologic cure and clinical cure were 124 days and 77 days, respectively. An average of 1.79 treatments was required to achieve clinical cure. Boric acid (51.8%) and fluconazole (30.4%) were the most common treatments prescribed.

## CONCLUSION

Clinical cure was achieved faster than mycologic cure. Approximately half of all NAC infections were symptomatic and

attributed to vulvovaginal candidiasis. Boric acid and fluconazole are acceptable treatments.

## REFERENCES

1. Sobel JD: Vulvovaginal candidosis. *Lancet* 2007;369:1961–71
2. Kennedy MA, Sobel JD: Vulvovaginal candidiasis caused by non-albicans *Candida* species: New Insights. *Curr Infect Dis Rep* 2010;12:465–470

---

### Abstract: Obtaining Medicaid-funded Abortions under the Hyde Amendment in Pennsylvania: Barriers and Policy Solutions

Aasta Mehta, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology

## OBJECTIVES

To (1) examine previous efforts by advocacy organizations to remove barriers that Medicaid eligible Pennsylvania women face when seeking funding for Hyde-exempt abortions, (2) identify additional and new barriers that may exist, and (3) recommend possible policy solutions to remove these barriers.

## METHODS

The methodology employed was largely qualitative in nature. In depth interviews were conducted with stakeholders in the Medicaid reimbursement process in Pennsylvania including reproductive and abortion rights advocates, abortion providers, and the state Medicaid office focusing on previous advocacy efforts, elucidation of the current Medicaid reimbursement process, and potential barriers that still exist.

## RESULTS

After meeting with abortion providers and advocacy organizations, four major barriers have been identified: (1) inconsistency among different Medicaid Managed Care Organizations in regards to policies for pre-authorization for procedures, (2) physician hesitancy to sign Medicaid forms, (3) requirement of physician signature for Medicaid forms, and (4) ultrasound requirement for Medicaid reimbursement.

## DISCUSSION

After conducting interviews with key stakeholders mentioned above, it has become clear that Pennsylvania has come a long way in regards to challenging illegal Medicaid denials for abortion services. Previous efforts by advocacy organizations have been successful to an extent. However barriers to access still exist and need to be addressed in order to ensure that women are being provided with services that they are guaranteed under the law.

---

### Abstract: Outcomes of ST Elevation Myocardial Infarction patients after Primary Percutaneous Coronary Intervention

Obiora Anusionwu, MD, Ronak Patel, MD, Eduard Koman, MD, Peter Kurnik, MD, Gary Ledley, MD  
Drexel University College of Medicine: Department of Medicine, Division of Cardiology

## INTRODUCTION

The prevalence of coronary artery disease has been increasing (1). Our objective was to evaluate whether ST elevation myocardial infarction (STEMI) outcomes after primary percutaneous coronary intervention (PPCI) have continued to improve in recent years (2).

## METHODS

The Institutional Review Board (IRB) approved the research protocol. We abstracted data from STEMI patients who went to the cardiac catheterization laboratory for PPCI from 12/21/2009 to 6/23/13. Primary endpoint was hospital length of stay and secondary endpoint was mortality.

## RESULTS

There were 136 patients who had PPCI for STEMI. Demographics included diabetics 38 (28%), hypertension 85 (63%), hyperlipidemia 66 (49%), current smokers 77 (57%), prior TIA/stroke 26 (19%) and prior myocardial infarction 35 (26%). The patients were divided into 2 groups. Group A were admitted from April 1, 2012 to June 23, 2013 while group B were admitted from December 21, 2009 to March 31, 2012. Group A had 39 patients while group B had 97 patients. Group A had a length of hospital stay of 5.6 days with no deaths while Group B had a length of hospital stay of 6.4 days with 11 deaths.

## CONCLUSION

Our research suggests that the length of stay and mortality of patients presenting with STEMI and undergoing PPCI have been decreasing. This could be attributed to the numerous quality improvement projects in our facility to improve patient outcomes and discharge from the hospital (3,4).

## REFERENCES

1. Mason H, et al. A cost effectiveness analysis of salt reduction policies to reduce coronary heart disease in four eastern mediterranean countries. *PLoS One*. 2014;9(1):e84445
2. Payvar S, et al. In-hospital outcomes of percutaneous coronary interventions in extremely obese and normal-weight patients: findings from the NCDR (National Cardiovascular Data Registry). *J Am Coll Cardiol*. 2013; 62(8):692-6
3. Anderson ML, et al. Differences in the profile, treatment, and prognosis of patients with cardiogenic shock by myocardial infarction classification: A report from NCDR. *Circ Cardiovasc Qual Outcomes*. 2013; 6(6):708-15
4. Wilson BH, et al. Achieving sustainable first door-to-balloon times of 90 minutes for regional transfer STEMI. *JACC Cardiovasc Interv*. 2013;6(10):1064-71

## Abstract: Patient Exposure to Pelvic Organ Prolapse Surgery on YouTube

Natasha Ginzburg, MD, Darlene Morrissey, DO, Peter O'Hare, MD, Kristene Whitmore, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology, Female Pelvic Medicine and Reconstructive Surgery

## INTRODUCTION

Many technically focused surgical videos are available online to physicians and patients. Pelvic organ prolapse (POP) is unique in its sensitive nature, graphic videos, and current legal controversies. We analyzed the currently available videos on YouTube to determine their character, popularity and relevance.

## METHODS

An analysis of YouTube was conducted by using search terms related to POP surgery. Matching videos in each category were examined and results sorted by relevance, length, and popularity. The themes of the videos were classified as educational, technical/surgical, marketing/advertising, legal, or other.

## RESULTS

A YouTube search performed using the terms above returning 3950 videos. After filtering by relevance and excluding all videos with less than 5 views, removing duplicates and other, 349 videos

remained. Patient educational videos accounted for 142 videos (40.7%); 121 surgical technique videos (34.7%). Legal issue videos accounted for 54 (15.5%), product marketing were the remaining 32 (9.2%). Total video views were 5,247,501. Of the total views, 1,243,727 (23.7%) were educational videos, 3,481,140 (66%) surgical/technical videos, 92,837 (1.8%) legal videos, and 429,797 (8.2%) direct marketing videos.

## CONCLUSION

Patients are gaining access not only to material intended for the lay person, but also to surgical and technical videos demonstrating live procedures. These patients are exposed to legal advertisements with graphic descriptions of risks of these procedures. Despite the large number of these legal videos, they are still the minority of views.

## REFERENCES

1. Steinberg PL, et al. YouTube as source of prostate cancer information. *Urology*. 2010;75(3):619-22.
2. Sood A., et al. YouTube as a source of information on kidney stone disease. *Urology*. 2011;77(3):558-62
3. Sajadi KP and Goldman HB. Social networks lack useful content for incontinence. *Urology*. 2011;78(4):764-7
4. Alas A., et al. The rapidly increasing usefulness of social media in urogynecology. *Female Pelvic Med Reconstr Surg*. 2013;19(4): 210-3
5. Anger J.T., et al. Health literacy and disease understanding among aging women with pelvic floor disorders. *Female Pelvic Med Reconstr Surg*. 2012;18(6):340-3

## Abstract: Success of Interferon Alpha 2b in a Rare Metastatic Epithelioid Vascular Tumor

Nay Tun, MD, Mariette Austin, MD  
Easton Hospital: Department of Medicine

## INTRODUCTION

Epithelioid hemangioendothelioma (EHE) is a variant of epithelioid vascular tumor that originates from vascular endothelium(1). EHE is a rare malignant tumor, with an incidence of only 1 in 1,000,000 worldwide(2). EHE was first described by Weiss and Enzinger(3) in 1982, and has been found in skin, lung, pleura, liver, bone, brain, heart, and other organs(3-5).

## CASE

We are presenting the case of a young woman who was diagnosed with metastatic EHE in liver and lung at the age of 26 years old. She was initially treated with Adriamycin, followed by chemoembolization of bulky left hepatic disease. Further progressive disease was managed with left lateral segmental hepatectomy, which was combined with cryoablation and radiofrequency ablation of multiple hepatic lesions. Unfortunately, the tumor relapsed about two and a half years after this aggressive surgical approach. She was then treated with interferon alpha 2b for approximately seven years, attaining a complete clinical remission on PET/CT after the first three years of treatment. She has been off treatment for more than three years, and to date she remains free of disease with a Karnofsky scale of 100.

## DISCUSSION

Management of EHE remains a therapeutic challenge due to the extremely low incidence of this vascular tumor, variable disease course with different response to surgery, chemotherapy or anti-angiogenic agents. In metastatic or recurrent metastatic EHE, alpha interferon should be considered as one of the treatments as our patient had durable complete clinical response to alpha interferon for more than a decade of the tumor control.

## REFERENCES

1. Hornick JL. Practical Soft Tissue Pathology: A Diagnostic Approach  
2. <http://www.childrenshospital.org/az/Site844/mainpageS844P1.html>
3. Weiss SW, Enzinger FM. Epithelioid hemangioendothelioma. A vasculat tumor often mistaken for a carcinoma. *Cancer*. 1982;50: 970-981
4. Van Kasteren ME, et al. Epithelioid hemangioendothelioma of the lung: clinical and pathological pitfalls. *Eur Respir J*. 1995;8: 1916-1919
5. Pokharna RK, Garg PK, Gupta SD, Dutta U, Tandon RK. Primary epithelioid hemangioendothelioma of the liver: case report and review of the literature. *J Clin Pathol* 1997; 50: 1029-1031

**Abstract: The Effect of Pregnancy on Interstitial Cystitis/Bladder Pain Syndrome**

Peter O'Hare III, MD\*, Kristene Whitmore, MD\*, Darlene Morrissey, DO\*, Dominique El-Khawand, MD\*\*  
 \*Drexel University College of Medicine: Department of Obstetrics and Gynecology, Female Pelvic Medicine and Reconstructive Surgery  
 \*\*York Hospital: Department of Obstetrics and Gynecology

**OBJECTIVE**

To describe the symptoms and course of Interstitial Cystitis/Bladder pain syndrome (IC/BPS) throughout pregnancy and with subsequent pregnancies.

**METHODS**

In February 2011, a survey of pregnant or postpartum women in the US, diagnosed with IC/BPS was conducted. Respondents rated their urinary symptoms in pre-pregnancy, each trimester, the postpartum period and for any prior pregnancies.

**RESULTS**

591 subjects responded to the survey; 564 confirmed IC/BPS diagnosis by a physician. Mean age was 39 (±11.4). Among 384 women who reported a pregnancy after their IC/BPS was diagnosed, their pre-gestational symptoms were rated mild (30%), moderate (52%) and severe (18%). Compared to pre-pregnancy levels, pain was rated better in the first trimester, second trimester and third trimester in 39.3%, 51.8% and 44.2, and worse in 25.1%, 28.8% and 39%, respectively (n=303). Similarly, urinary frequency was rated better in 27%, 35.8% and 27.6%, and worse in 39.5%, 42.8% and 56.3%, while urinary urgency was rated as better in 39.3%, 51.8% and 44.2% and worse in 25.1%, 28.8% and 39%, in the first, second and third trimesters respectively. Breastfeeding symptoms were rated as better in 52%, unchanged in 38% and worse in 10% compared to pre-gestation baseline. Post-partum symptom level returned to baseline in 63% of patients with a mean of 27 weeks (±66).

**CONCLUSION**

Pregnancy may improve pain in more than half of patients with IC/BPS in the second trimester. The effect of pregnancy on IC/BPS symptoms appears to remain stable throughout the gestation, breastfeeding and a subsequent pregnancy.

**REFERENCES**

1. Hanno P, Dmochowski R. Status of international consensus on interstitial cystitis/bladder pain syndrome/painful bladder syndrome: 2008 snapshot. *Urology* 2009;28:274-286
2. Berry SH, et al. Prevalence of symptoms of bladder pain syndrome/interstitial cystitis among adult females in the United States *J Urol*. 2011;Aug;186(2):540-4
3. Rackow BW, Novi JM, Arya LA, Pfeifer SM. Interstitial cystitis

- is an etiology of chronic pelvic pain in young women. *J Pediatr Adolesc Gynecol* 2009;22: 181-5
4. Curhan GC, et al. Epidemiology of interstitial cystitis: a population based study. *J Urol*. 1999;161:549-52
  5. Parsons CL, Tatsis V. Prevalence of interstitial cystitis in young women. *Urology* 2004; 64: 866-70

**Abstract: The Expression of Focal Adhesion Kinase and Src in Neuroblastoma**

Panagiotis Kratimenos, MD\*, Stamatios Theocharis, MD\*\*, Vasiliki Syriopoulou, MD\*\*  
 \* St. Christopher's Hospital for Children: Department of Pediatrics  
 \*\*University of Athens (Greece): Department of Pediatrics

**BACKGROUND**

Despite the immense progress in chemotherapeutic agents in recent years, the prognosis of pediatric patients with advanced malignancies has not significantly changed. One of the potential targets for cancer therapeutics is the area of Focal Adhesions (FA), large protein complexes through which the cytoskeleton of a cell connects to the extracellular matrix (ECM). The focal adhesion kinase (FAK) is a non-receptor protein tyrosine kinase that plays an important role along with other proteins, such as c-SRC and paxillin, in tumor progression.

**OBJECTIVE**

To assess the expression of ERK1, ERK2, pERK1, pERK2, Src, pSRC, FAK and b-actin in neuroblastoma and use them as potential therapeutic targets.

**METHODS**

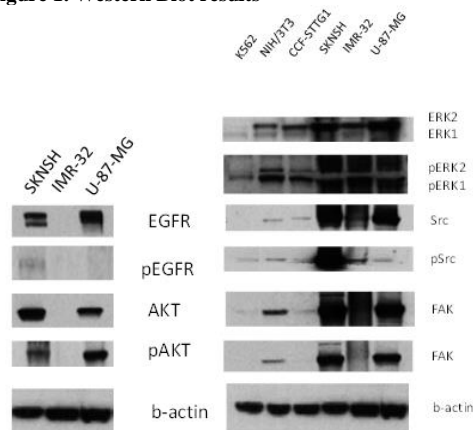
The expression of the proteins will be studied with Western Blot technique.

**RESULTS**

In cell lines SKNSH, IMR-32 και U-87-MG there is increased expression of pERK1, pERK2 and ERK1/ERK2. There is some mild increase of the expression of Src, FAK, pSRC and b-actin (Figure 1).

**Conclusions:** Data suggest that the expression of ERK1, ERK2, pERK1, pERK2, Src, pSRC, FAK and b-actin was increased in cell lines SKNSH, IMR-32 and U-87-MG of 16 patients with neuroblastoma. Those markers may be potential therapeutic targets.

**Figure 1. Western Blot results**



---

## Case Report: A Case of Massive Ascites with Peritoneal Lymphomatosis

Archana Kodali, MD, Nay Thi Tun, MD, Haider Shamsulddin, MD, Om Sharma, MD  
Easton Hospital: Department of Medicine

### INTRODUCTION

Lymphoma is a common disease with well-known imaging characteristics. Extensive infiltration of the peritoneum secondary to lymphoma is a rare occurrence and primary presentation with symptoms due to peritoneal disease is rarer still. Peritoneal lymphomatosis is uncommon, but when encountered it is associated with aggressive histological subtypes of Burkitt lymphomas. CT findings are linear or nodular peritoneal thickening, retroperitoneal lymphadenopathy, omental and mesenteric involvement with streak-like infiltrations or a bulky mass, bowel wall thickening, hepatosplenomegaly and ascites.

### CASE REPORT

A 54 year old male patient with history of recurrent Hodgkins and Non-hodgkins lymphoma presented with abdominal distention and discomfort. Serum LDH was elevated at 1304 and uric acid at 18.8. CT scan of the abdomen showed diffuse peritoneal disease with confluent opacification and thickening of omentum along with moderate ascites. Paracentesis was done and fluid analysis showed a white blood cell count of 247,500. Differential was not possible because of compromised cell integrity. Pathology showed large B-cell lymphocytes in a

background of apoptotic cells that were diffusely positive for CD20. Ultimately diagnosis of Burkitt Lymphoma was made and he was started on chemotherapy.

### DISCUSSION

Diagnosis is challenging since many other primary and secondary peritoneal neoplasms have similar imaging findings. Omental involvement in lymphoma is uncommon, as omentum does not contain lymphoid tissue and the route of this dissemination is unclear. However, biopsy and pathology can help make the diagnoses, as in this case. Treatment with chemotherapy resulted in complete resolution of the omental opacification on repeat imaging.

### REFERENCES

1. Park E, et al. Peritoneal Lymphomatosis Imaged by F-18 FDG PET/CT. Nucl Med Mol Imaging.2010;44(2):159-160
2. Karaosmanoglu D, et al. CT findings of lymphoma with peritoneal, omental and mesenteric involvement: Peritoneal lymphomatosis. Eur J Radiol. 2009;71(2):313-317
3. Wang X, Chen Z, Tang G, Zhang X. A child with Burkitt lymphoma with pleural, peritoneal, mesenteric, omental, and renal involvement: diagnostics by FDG PET/CT. Clin Nucl Med. July 2011:612-5.

Figure 1. CT showing diffuse peritoneal disease.

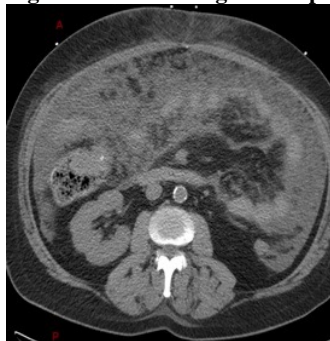


Figure 2. Post-chemo PET showing almost complete resolution



---

## Case Report: A Rare Complication – Septic Thrombophlebitis of Inferior Mesenteric Vein Secondary to Sigmoid Diverticulitis

Archana Kodali, MD, Chirag Mathukia, MD, Rupashree Vinay, MD  
Easton Hospital: Department of Medicine

### INTRODUCTION

Potential complications from diverticulitis include peritonitis, abscesses, enterocutaneous fistulas, and bowel obstruction. The purpose of this case is to present inferior mesenteric vein thrombophlebitis, an extremely rare complication of diverticulitis.

### CASE REPORT

A 52 year-old male presented with acute onset severe headache, neck stiffness, fever and vomiting. He had a temperature of 102.1, white blood cell count of 14.2 and a

heart rate of 120/min. A lumbar puncture did not demonstrate bacterial growth, so he was thought to be septic secondary to viral meningitis and was provided supportive care. On physical examination, he had mild lower abdominal tenderness without stool changes. CT scan of the abdomen showed sigmoid diverticulitis complicated by septic thrombophlebitis of inferior mesenteric vein extending to the portal vein. He was immediately started on antibiotics along with full dose anticoagulation. Blood cultures returned back positive for Escherichia coli. Repeat CT scan of the abdomen 4 weeks later showed resolution of

the diverticulitis and the thrombophlebitis.

#### DISCUSSION

The inferior mesenteric vein drains the descending and sigmoid colon. In acute diverticulitis, the inflammatory process can rarely involve the mesenteric veins, resulting in septic thrombophlebitis. In this case, it extended to the portal vein, causing significant symptoms. Untreated, further complications include gaseous formation and intrahepatic abscesses formation. It can be easily recognized on CT scan given the unique location and appearance of the inflamed vein and the adjacent mesocolon and prompt medical intervention can be lifesaving.

#### REFERENCES

1. Sywak M, Romano C, Raber E, Pasiaka J. Septic thrombophlebitis of the inferior mesenteric vein from

sigmoid diverticulitis. *Journal of the American College of Surgeons.* 2003;196(2):326-327

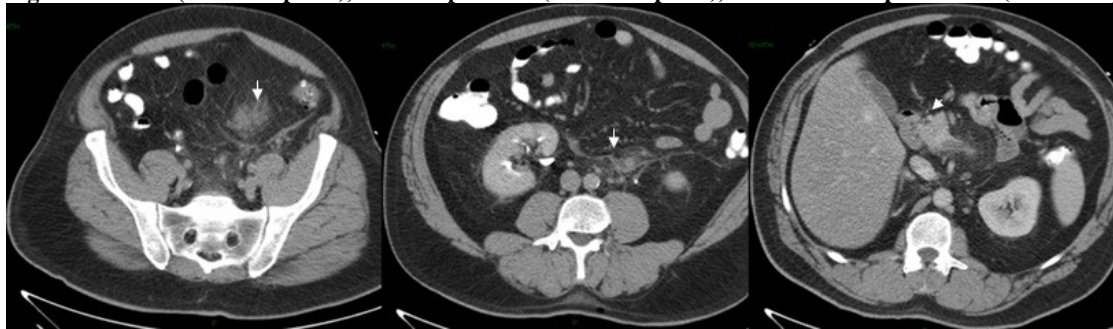
2. Domajnko B, Kumar A, Salloum RM. Mesenteric venous thrombophlebitis--septic thrombophlebitis of the inferior mesenteric vein: an unusual manifestation of diverticulitis. *AMSurg.* 2007;73(4):404-6

3. Gajendran M, Muniraj T, Yassin M. Diverticulitis complicated by pylephlebitis: a case report. *J Med Case Rep.* 2011;10(5):514

4. Nobili C, et al. Pylephlebitis and mesenteric thrombophlebitis in sigmoid diverticulitis: medical approach, delayed surgery. *Dig Liver Dis.* 2007;39(12):1088-90

5. Draghetti MJ, Salvo AF. Gas in the mesenteric veins as a nonfatal complication of diverticulitis: report of a case. *Dis Colon Rectum.* 1999;42(11):1497-8

**Figure 1. Colitis (arrow 1<sup>st</sup> panel), thrombophlebitis (arrow 2<sup>nd</sup> panel), & extension to portal vein (arrow 3<sup>rd</sup> panel)**



#### Case Report: A Scorpion Sting in Pennsylvania

Gregory LaSala, MD

Drexel University College of Medicine: Department of Emergency Medicine

#### INTRODUCTION

From 1995 -2003 the American Association of Poison Control Centers estimate around 11,000-14,000 scorpion stings annually in the US (1). The overwhelming majority of cases in the US occur in the southwest.

#### CASE REPORT

A 26-year-old male presented to a suburban hospital after being stung on the hand by a scorpion unloading a box of bananas from Honduras. Patient was stung on the 3rd digit of his right hand with swelling throughout. There was no erythema or necrosis. He denied paresthesias and had no other complaints. Patient was given morphine for pain and admitted for 24 hours of observation. His laboratory results were unremarkable and vitals remained stable throughout his stay. Patient discharged the next day with no complications.

#### DISCUSSION

The scorpion is of the genus *Centruroides*. The species native to Honduras are only mildly toxic to humans. The two known species of US scorpions that are lethal to humans are *Centruroides exilicauda* and *Centruroides sculpturatus*. Scorpion venom affects sodium-gated

channels, causing a catecholamine release. Severe pain, seen in 95% of cases (2), can begin within 15 minutes of the sting followed by swelling and erythema. Paresthesias are common. Systemic symptoms are due to an adrenergic storm: tachycardia, hypertension and convulsions. This can lead to pulmonary edema due to cardiogenic shock. A cholinergic syndrome can also be seen producing: bronchorrhea, hypersalivation and vomiting (3). Severity of envenomation is based on a grading system. Only grade 3 and 4 envenomations are treated with scorpion antivenom.

#### REFERENCES

1. Nelson L, et, al. Goldfrank's Toxicologic Emergencies. Ch 119:1570-1571

2. Chippaux J. Emerging Options for the management of Scorpion stings. *Drug Design, Development and Therapy.* 2012;6:165-178

3. Quan D. North American Poisonous Bites and Stings. *Crit Care Clin* 2012;28:633-659

4. Boyer LV, et al: Antivenom for critically ill children with neurotoxicity from scorpion stings. *N Engl J Med* 2009;360:2090-2098



---

## Case Report: A Ticking Time Bomb: Interstitial Ectopic Pregnancy

Glendell de Guzman, MD, David Tannenbaum, MD  
Abington Memorial Hospital: Department of Obstetrics and Gynecology

### CASE REPORT

A 41 year-old G3P2002 Jehovah's witness with a prior tubal ligation presented with an hcg level of 30,079 mIU/mL. Ultrasound imaging suggested a left interstitial ectopic pregnancy measuring 7 weeks 1 day without cardiac activity. She underwent a robotic-assisted total laparoscopic hysterectomy with concomitant removal of ectopic pregnancy without complications (Figure 1). Pathology confirmed an interstitial ectopic pregnancy of 6 x 4.5 x 4 cm.

### DISCUSSION

Interstitial ectopic pregnancy, also known as cornual pregnancy, is an implantation within the muscular wall of the uterus and located proximal to the fallopian tube. It represents 2.4% of all surgically treated ectopic pregnancies (1). Due to the distensible nature of the myometrium, a delay in rupture is commonly cited. However, there is a higher risk of hemorrhage given the close proximity to the uterine and ovarian vessels, and increased blood supply from the myometrium.

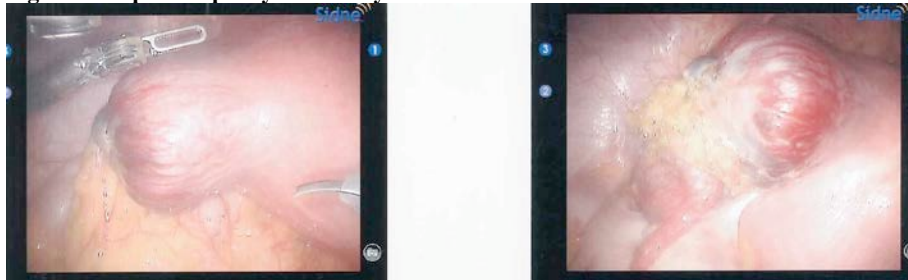
Management includes cornual resection via laparoscopy or

laparotomy, administration of methotrexate via local injection or systemic administration, or hysteroscopic resection (2-4). In this case, a robotic-assisted hysterectomy was performed to remove both leiomyomata and interstitial ectopic pregnancy. The risk of uterine rupture with subsequent pregnancies after cornual resection remains unknown, and elective cesarean delivery may be considered.

### REFERENCES

1. Schorge JO, et al. Williams Gynecology: McGraw-Hill. 2008
2. Jermy K, Thomas J, Doo A, Bourne T. The conservative management of interstitial pregnancy. BJOG. 2004;111:1283-8
3. MacRae R, Olowu O, Rizzuto MI, Odejinmi F. Diagnosis and laparoscopic management of 11 consecutive cases of cornual ectopic pregnancy. Arch Gynecol Obstet. 2009;280(1):59-64
4. Walid MS, Heaton RL. Diagnosis and laparoscopic treatment of cornual ectopic pregnancy. Ger Med Sci. 2010;27:8

Figure 1. Laparoscopic hysterectomy



---

## Case Report: A Unique Case of Gas Gangrene of the Foot Caused by Fusobacterium Necrophorum in a Diabetic Patient

Reem Sheikh, DPM, Seema Fatima, DPM, Allen Mirzae, DPM, Steven Boc, DPM  
Drexel University College of Medicine: Podiatric Medicine and Surgery

### CASE REPORT

A 46 year-old diabetic male presented with an infected ulceration and osteomyelitis to the right foot. Xrays revealed gas in soft tissue, WBC was increased to 30.4 x10<sup>9</sup>/L, T: 102.4F, HR: 99 bpm, RR: 18 bpm and BP: 200/72 mmHg. Upon admission, I&D was performed and IV Vancomycin and Zosyn were started. An MRI suggested osteomyelitis to the hallux with septic 1st MPJ (Figure 1). Wound cultures grew Streptococcus gordonii and anginosus, & Corynebacterium striatum. First metatarsal bone cultures taken in the OR grew Streptococcus constellatus, Corynebacterium species group G, Corynebacterium jeikeium, and Fusobacterium necrophorum. On Day 4, a partial first ray amputation was performed. Cultures and pathology of clean margin were

negative (Figure 2). Patient completed Linezolid 600mg PO Q12H and Augmentin 875mg PO Q12H for 14 days and continues to follow up in office for wound care.

### DISCUSSION

F. necrophorum is a gram-negative aerobic bacillus, which causes Lemierre's Syndrome, characterized by oropharyngeal abscesses, sepsis, cervical lymphadenopathy or jugular vein thrombosis (2,4,5). Treatment includes surgical intervention and antibiotics, often metronidazole with clindamycin or penicillin. Anticoagulation therapy is controversial due to limited clinical trials (4).

Diabetic foot infections are often polymicrobial. Common pathogens include Staphylococcus, Pseudomonas,

Enterococcus, Bacteroides, Finegoldia, and Clostridium (2). Cases reported with Fusobacterium necrophorum secondary to Lemierre's syndrome, are rare in the foot and ankle (2-5). Only one case of necrobacillosis in the foot caused by F. necrophorum, without Lemierre's Syndrome was noted (1).

In summary, F. necrophorum without Lemierre's syndrome is rare, however may present in a diabetic foot.

#### REFERENCES

1. Aisenberg G, Mehta N. Necrobacillosis without Lemierre's Syndrome. Lancet. 2006;367:1702
2. Dowd SE, et al. Polymicrobial Nature of Chronic Diabetic Foot Ulcer Biofilm Infections Determined Using Bacterial Tag Encoded FLX Amplicon Pyrosequencing

**Figure 1: MRI suggestive of osteo of first toe and metatarsal with septic IP joint**

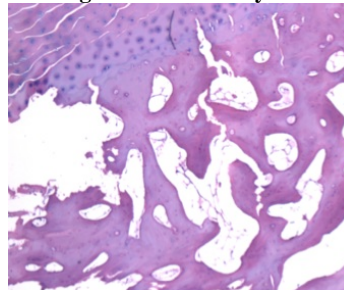


(bTEFAP). PLoS ONE. 2008;3(10):e3326

3. Gersht C, Primrose J. Septic Arthritis of the Ankle from Fusobacterium necrophorum. Academic Emergency Medicine. 1997;(4):1172-3
4. Riordan T. Human infection with Fusobacterium necrophorum (Necrobacillosis) with a Focus on Lemierre's Syndrome. Clinical Microbiology Reviews. 2007;622-659
5. Soave R, Kochar D. Bilateral forefoot gangrene secondary to Lemierre's disease. J Am Podiatr Med Assoc. 2001;147-9

Acknowledgement: Vitalii S Borodin, MD (Drexel University College of Medicine: Department of Pathology) for providing the clinical pathology image for this case

**Figure 2. Clinical pathology of first metatarsal bone margin, negative for osteomyelitis**



---

### Case Report: Adrenal Hematoma Presenting as Large Adrenal Mass

Myriam Vela-Ortiz, MD, Ramya Mallareddy, MD, Harvey Hakim, MD  
Easton Hospital: Department of Medicine

#### CASE REPORT

A 74-year-old male presented with chest pain and a significant history of atrial fibrillation on chronic warfarin therapy, but no known bleeding diathesis. Patient was normotensive and examination revealed splenomegaly. Laboratory results demonstrated thrombocytopenia (90,000) and INR of 3.1. Further evaluation with ultrasound and abdominal CT scan showed a large non-calcified adrenal mass (6.7 x 4.6 x 5.1 cm). Functional workup was negative. CT guided biopsy showed a hematoma. A follow up CT scan few months later showed the mass had increased in size (5 x 6.9 x 10.5 cm). Subsequently, the patient underwent elective laparoscopic left adrenalectomy and pathology revealed an old encapsulated hematoma of the left adrenal gland, likely due to warfarin therapy. No further complications or signs of adrenal insufficiency were noticed in the patient.

#### DISCUSSION

Spontaneous adrenal hematoma (SPAH) is very rare. It has been reported in 0.16% of random autopsies. Predisposing factors include anticoagulation, bleeding diathesis, recent surgery, severe sepsis and systemic illness. SPAH may

present as an incidentaloma or with abdominal pain, hypotension, and palpable mass. CT scan may show a heterogeneous mass, in case of a chronic bleed, with accumulation of old and new blood. In order to differentiate a hematoma from a hemorrhagic adrenal tumor, biopsy may be inconclusive thus surgery is essential.

#### CONCLUSION

Adrenal hematoma may present radiographically as an adrenal mass, indistinguishable from hemorrhagic adrenal tumor. Clinical presentation may be non-specific. Needle biopsy of adrenal mass may be inconclusive. Surgery is indicated for definitive diagnosis.

#### REFERENCES

1. Ishigami K, et al. Adrenal adenoma with organizing hematoma: diagnostic dilemma at MRI. Magn Reson Imaging. 2004;22(8):1157-9
2. Kobayashi T, Uenoyama S, Miura K, Takehara Y. Idiopathic unilateral adrenal hematoma: report of a case. Surg Today. 2004;34(3):279-82
3. Young w. Jr. The incidentally discovered adrenal mass. NEJM 356;6



**Figure 1. Adrenal Hematoma**



---

**Case Report: An Interesting Case of Uterine Fibroids**

Nima Patel, MD, Dipak Delvadia, DO

Drexel University College of Medicine: Department of Obstetrics and Gynecology

**CASE REPORT**

33 year-old nulligravid female presented with menorrhagia and pelvic pain. She reports cyclical menses lasting 14 days for the past 2 years. Her highest hemoglobin within the past 6 months was 8.5. She was diagnosed with uterine fibroids 2 years ago. Her past medical history includes obesity, hypertension, chronic renal failure, and diabetes. A pelvic sonogram showed a diffusely enlarged heterogeneous uterus measuring 20 x 15.5 x 10.5cm with multiple masses, the largest measuring 12.1cm, with echogenicity that is atypical for fibroids. Endometrial curetting was obtained showing no evidence of hyperplasia or carcinoma. She opted for a fertility sparing procedure, undergoing a myomectomy via laparotomy. Although the ultrasound showed multiple fibroids, intraoperatively one large soft cystic fibroid with ill-defined borders was noted (Figures 1 and 2). Pathology illustrated a degenerating fibroid weighing 1104grams.

**DISCUSSION**

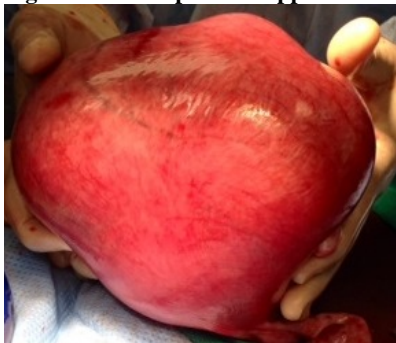
Uterine fibroids are the most common uterine neoplasm. They have a prevalence of 30% in women over the age of 30 (1). Ultrasonography is the initial modality for evaluating the uterus. Typically, fibroids appear as well-defined, solid masses with a whorled appearance. Degenerative fibroids may have a complex

appearance, with areas of cystic change (2). Although there has been a decrease in hysterectomies, it still remains the main treatment modality with approximately 200,000 performed annually (3). For women desiring to maintain their fertility, one alternative to hysterectomy is myomectomy. Although myomectomy can be performed laparoscopically, myomectomy via laparotomy is better used for atypical fibroids requiring dissection of unclear tissue planes as in our case.

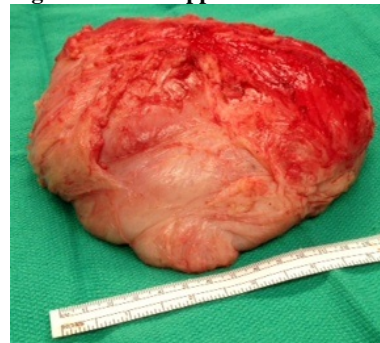
**REFERENCES**

1. Szklaruk J, Tamm EP, Choi H, Varavithya V. MR Imaging of common and uncommon large pelvic masses. *RadioGraphics* 2003;23:403-424
2. Wilde S, Scott-Barrett S. Radiologic appearances of uterine Fibroids. *Indian J Radiol Imaging*. 2009 August; 19(3): 222–231
3. Laughlin SK, Stewart S. Uterine Leiomyomas: Individualizing the Approach to a Heterogeneous Condition. *Obstet Gynecol*. 2011 February; 117(2 Pt 1): 396–403
4. Aydin C, Eris S, Yalçın Y, Sen Selim H. A giant cystic leiomyoma mimicking an ovarian malignancy. *Int J Surg Case Rep*. 2013; 4(11): 1010–1012

**Figure 1. Intra-operative appearance of uterus**



**Figure 2. Gross appearance of fibroid**



---

## Case Report: Asexuality - The No Longer Invisible Orientation

Mitali Patnaik, MD, Charles Stanfa, DO, Celia Varghese, MD, Wei Du, MD, Donald Kushon, MD  
Drexel University College of Medicine: Department of Psychiatry

### INTRODUCTION

Four different approaches have been proposed to define asexuality based on absence of sexual behavior, absence of sexual attraction, self-identification as asexual, or a combination of these. Currently, research focuses on an individual's lack of sexual attraction. Studies showed that asexual women were more vulnerable to have a psychiatric disorder compared with asexual men. We present a case of an asexual woman with bipolar disorder on SSRIs to explore management options and address sensitive sexuality issues.

### CASE REPORT

21 year-old Caucasian female admitted to psychiatric unit for suicidal attempt after overdose on topiramate, lamotrigine, buspirone and fluoxetine following fight with boyfriend. Patient reported neuro-vegetative symptoms of depression. She had never experienced sexual desire despite being involved in several romantic relationships. Additionally, she was a member of the online group, Asexual Visibility and Education Network (AVEN). Prior,

she had been on sertraline and it was restarted at 100 mg daily. Symptoms resolved with medications. Patient continued to voice lack of sexual attraction which appeared to be unrelated to the chronic treatment with sertraline.

### DISCUSSION

Loss of libido and sexual desire are well-known side effects of SSRIs and can also be part of depressive symptoms. However, it is vital to consider that sexuality is a personal choice and asexuality as a group is an emerging phenomenon in our society. For patients who suffer from mood disorder and are asexual, treatment response in affective symptoms may not lead to dissolution of asexuality. Therein, lies the importance of lifestyle choices in diagnosis and assessment of treatment response.

### REFERENCES

1. Van Houdenhove E, Gijs L, T'sjoen G, Enzlin P. Asexuality: Few Facts, Many Questions. Department of Development and Regeneration, Institute for Family and Sexuality Studies, KU Leuven, Belgium.

---

## Case Report: Aspiration Pneumonia Seen In a Patient with Bronchial Diverticula

Shahruq Sarela, MD  
Allegheny General Hospital: Department of Medicine

### CASE REPORT

A 54 y/o male with a history of tobacco abuse (25 pack years) presents to the ER for breathing difficulty over the past 2 months. He claims it's intermittent, and denies chest pain. He has wheezes and rales throughout. A CT chest reveals infiltrates in the right middle lobe reflecting a aspiration pneumonia plus the addition of a main stem bronchial diverticula 2 x 2 cm in size at the sub-carina seen in Figure 1 and 2.

### DISCUSSION

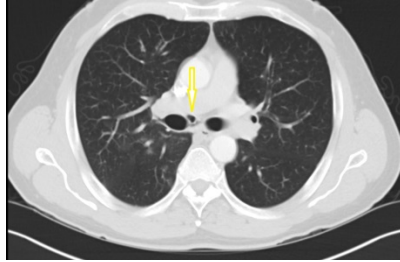
It was felt that the debris noted in the diverticula was seeding into the lung causing chronic aspiration and thus a pneumonia. Bronchial diverticula are formed by submicroscopic depressions and dilatations of the ducts of the bronchial gland that enlarge and herniate between smooth-muscle cellular bundles. Cough and weakened bronchial walls, for whatever cause, leads to diverticulosis (1). Miyara reports; average size is 1 – 2mm, usually in the subcarinal region, and M>F (58.7%). Observations of diverticula were reported more often in smokers (2). In addition, studies by Higuchi determined that there was no significant association between FEV(1)% and the presence

of subcarinal bronchial diverticula. He reported FEV(1)% with lesions ranged from 26 – 97.8 (mean 76.8), whereas the range was 28.1 – 94.4 (mean 73.7) in those without lesions,  $P > 0.05$  (3). Lastly Sverzellati showed that the level of smoking correlated to the number of diverticuli present. Multivariate regression analysis revealed that only bronchial wall thickness predicted the extent of the bronchial diverticula ( $P < 0.0001$ )(4).

### REFERENCES

1. Wang NS, Ying WL. Morphogenesis of human bronchial diverticulum. A scanning electron microscopic study. *Chest*. 1976; 69(2):201-4
2. Miyara T, et al. Bronchial diverticula detected by multidetector-row computed tomography; incidence and clinical features. *J Thorac Imaging*. 2011;26(3):204-8
3. Higuchi T, et al. Main bronchial diverticula in the subcarinal region: their relation to airflow limitations. *Acta Radiol*. 2012; 53(1):44-8
4. Sverzellat N, et al. Bronchial diverticula in smokers on thin – section CT. *Eur Radiol*. 2010;20(1):88-94

**Figure 1. Transverse Plane View of Bronchial Fistula**



**Figure 2. Coronal Plan View of Bronchial Fistula**



**Case Report: Blastoid Histopathological Subtype of Mantle Cell Lymphoma - An Indicator of Poor Prognosis, Independent of Standard Predictive Scores**

Santhosh Sadashiv, MD\*, Priyanka Karumanchi, MD\*\*, Antonios Christou, MD\*  
\*Allegheny General Hospital: Department of Medicine, Division of Hematology-Oncology  
\*\*Guntur Medical College, India: Department of Medicine

**CASE REPORT**

88 year old Caucasian male with history of stable coronary artery disease and atrial fibrillation presented with new onset worsening abdominal pain and loss of appetite. Physical exam was non-contributory. Computerized tomography (CT) of the neck, chest, abdomen and pelvis revealed diffuse lymphadenopathy without hepatosplenomegaly (Figure 1A,1B). Laboratory investigation was abnormal for elevated blood urea nitrogen, creatinine and lactate dehydrogenase. Given the laboratory, radiological and the biopsy results from supraclavicular lymph node (Figure 2A, 2B) he was diagnosed with high risk, stage IV Mantle Cell Lymphoma (MCL) of blastoid variant. Soon after, he was treated for tumor lysis syndrome and began therapy with rituximab. However his MCL progressed rapidly with significant clinical deterioration and he was transitioned to hospice, where he succumbed to his MCL disease within 10 weeks of diagnosis.

**DISCUSSION**

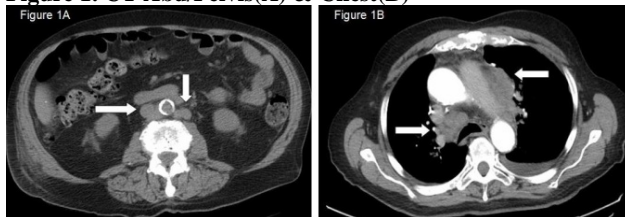
Blastoid variant is a rare histological subtype of MCL (1). It has been described to have an aggressive course, chemotherapy refractoriness, higher incidence of relapse following autologous stem cell transplantation and significantly poor median overall survival when compared to other histological subtypes of MCL (2). Mantle cell International Prognostic Index (MIPI) (3) and biologic

MIPI (MIPIb) (4) are the two prognostic tools used to risk stratify patients, but both do not include histopathological subtypes in risk assessment. With our case report we propose that physicians involved in taking care of such patients should communicate with pathologist and attempt to identify the specific histological subtype and should deem blastoid variant as an additional independent poor prognostic indicator irrespective of MIPI and MIPIb scores.

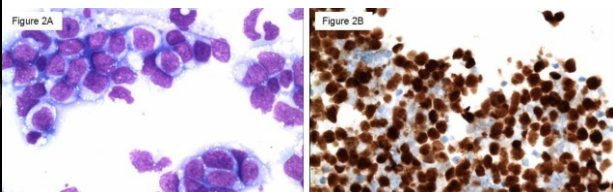
**REFERENCES**

1. Swerdlow SH, Campo E, Seto M, Muller-Hermelink HK. Mantle cell lymphoma. In: Swerdlow S, Campo E, Harris NL, et al., editors. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. Lyon, France: IARC; 2008. p.229-232
2. Bernard M, et al. Blastic variant of mantle cell lymphoma; a rare but highly aggressive subtype. *Leukemia*. 2001;15:1785-1791
3. Hoster E, et al. A new prognostic index (MIPI) for patients with advanced-stage mantle cell lymphoma. *Blood* 2008;111:558-565
4. Geisler C, et al. The Mantle Cell Lymphoma International Prognostic Index (MIPI) is superior to the International Prognostic Index (IPI) in predicting survival following intensive first-line immunochemotherapy and autologous stem cell transplantation (ASCT). *Blood* 2010;115:1530-1533

**Figure 1. CT Abd/Pelvis(A) & Chest(B)**



**Figure 2. Pap Stain(A) & Cyclin D1(B)**



---

## Case Report: C3 Glomerulonephritis Manifesting as Recurrent Episodes of Acute Kidney Injury during times of Infection

Myriam Vela-Ortiz, MD, Shawn Hazlett, MD, Sharif Ali, MD  
Easton Hospital: Department of Medicine

### CASE REPORT

41 year old male presented with decreased urinary output, cola colored urine following a presumed viral gastroenteritis with initial creatinine of 9.8 mg/dL hematuria and proteinuria. Serologic evaluation included low C3 and C4 (49 and 4.5 mg/dl, respectively) high C5 (19.2 mg/dL), and negative hepatitis and autoimmune serologies. Protein electrophoresis showed faint band of IgG kappa in the serum and no urine monoclonal protein. Kidney function improved with supportive treatment alone and the patient was discharged home with a creatinine of 1.0. The patient returned a day later with oliguria and creatinine at 2.1 mg/dL. A biopsy was performed showing diffuse membranoproliferative glomerulonephritis with diffuse capillary wall staining for C3- deposits, corresponding with dense deposit disease. No necrotizing or crescentic, but focal podocyte foot process effacement. A bone marrow biopsy was negative for plasma cell neoplasm. The kidney failure, again, spontaneously resolved with supportive therapy and the patient remained stable with persistent microscopic hematuria and proteinuria normal complement. Two years later the patient presented again with colored urine while receiving

antibiotic treatment for Lyme disease, proteinuria, hematuria and creatinine of 4.5 mg/dl, his kidney function normalized after several days. After five years of follow up since original presentation, the patient remains well with stable kidney function and normal complement levels.

### DISCUSSION

This case demonstrates a patient with C3 glomerulonephritis, manifesting as recurrent episodes of severe acute kidney injury during times of infectious illness with normalization of kidney function and complement levels between episodes.

### REFERENCES

1. Medjeral-Thomas N, et al. C3 Glomerulopathy: Clinicopathologic Features and Predictors of Outcome. *Clin J Am Soc Nephrol*. 2014;9:46–53
2. Sanjeev S, Fervenza F. Membranoproliferative Glomerulonephritis - A New Look at an Old Entity. *N Engl J Med* 366;12
3. Bridoux F, et al. Glomerulonephritis With Isolated C3 Deposits and Monoclonal Gammopathy: A Fortuitous Association? *Clin J Am Soc Nephrol* 2011;6:2165–2174

---

## Case Report: Calcified Common Femoral Artery Stenosis treated with Rotational Atherectomy and Balloon Angioplasty

Ali Rehan, MD, Michael Macciocca, MD, Daniel Ratliff, DO, Gary Ledley, MD  
Drexel University College of Medicine: Department of Medicine, Division of Cardiology

### CASE REPORT

A 64 year-old male with a past medical history of hypertension, hypercholesterolemia and tobacco abuse presented with complaints of claudication for the past 6 months. His symptoms were worse in his left leg and occurred after walking 2 blocks. The pain had failed to improve despite medical management and physical therapy. Physical exam revealed diminished pedal pulses bilaterally. Ankle brachial index as well as lower extremity arterial duplex were abnormal, and the patient was referred for lower extremity angiography. Angiography revealed heavily calcified vessels and multiple blockages. Most significantly, there was a 90% stenosis in the left common femoral artery extending into the superficial femoral artery. He underwent revascularization of the left lower extremity with rotational atherectomy utilizing a Jetstream device, after which balloons were able to be advanced through the vessel and angioplasty was performed. Subsequent angiography confirmed improvement in stenosis and flow. On follow up the patient reported decreased symptoms and improved exercise tolerance.

leading to symptoms of reduced blood flow. PVD is associated with a significantly elevated risk of cardiovascular disease morbidity and mortality, and affects more than 5 million adults in the US alone (1). Risk factors for PVD include hypertension, hyperlipidemia, and smoking, as seen in our patient (2). There are many treatment options for PVD including medicine, physical therapy, peripheral intervention and/or surgical intervention (3-5). We present a case using rotational atherectomy with balloon angioplasty as a means of revascularization.

### REFERENCES

1. Selvin et al. Prevalence of and Risk Factors for Peripheral Arterial Disease in the United States: Results From the National Health and Nutrition Examination Survey, 1999–2000. *Circulation*. 2004;110:738-743
2. Shammass. Epidemiology, classification, and modifiable risk factors of peripheral arterial disease. *Vasc Health Risk Manag*. 2007;3(2):229–234
3. Wolf et al. Surgery or balloon angioplasty for peripheral vascular disease: a randomized clinical trial. Principal investigators and their Associates of Veterans Administration Cooperative Study Number 199. *J Vasc Interv Radiol*. 1993;4(5):639
4. Zeller et al. Long-term results after directional

### DISCUSSION

Peripheral arterial disease (PVD) is defined as atherosclerosis causing peripheral artery obstruction

atherectomy of femoro-popliteal lesions. *J Am Coll Cardiol.* 2006;48(8):1573  
5. Sixt et al. The 1-year clinical impact of rotational

aspiration atherectomy of infrainguinal lesions. *Angiology.* 2011;62(8):645-56

**Figure 1. Left lower extremity prior to intervention**



**Figure 2. Left lower extremity after intervention**



---

### **Case Report: Catastrophic Antiphospholipid Syndrome and Heparin-Induced Thrombocytopenia – Related Diseases or Chance Association?**

Nay Tun, MD, Mahesh Krishnamurthy, MD  
Easton Hospital: Department of Medicine

#### **INTRODUCTION**

Antiphospholipid syndrome (APS) and heparin-induced thrombocytopenia (HIT) are immune-mediated thrombotic conditions caused by antibodies targeted to a protein-antigen complex (1). We describe a case of catastrophic APS (CAPS) coexisting with HIT, with near fatal outcome.

#### **CASE PRESENTATION**

A 42 year old female presented with dyspnea for 2 weeks, failing antibiotic treatment for pneumonia. CTA chest showed pulmonary embolism. While on heparin, she developed encephalopathy and had cold mottling of both lower extremities with abdominal pain overnight. Acute mesenteric ischaemia with infarcts in liver, spleen, left kidney (Figure 1) and right lower leg ischemia were found. Due to the presence of multi-organ infarctions, CAPS was clinically suspected. Anticardiolipin and beta-2 glycoproteins antibodies were negative. Lupus anticoagulant was positive. Due to high suspicion of CAPS, patient was treated with plasmapheresis for five cycles. Platelet count dropped from  $307 \times 10^9/L$  to  $115 \times 10^9/L$  over 7 days while on heparin drip. HIT antibody by ELISA was positive. Heparin was stopped and Arixtra was started. Thrombocytopenia resolved. Patient symptomatically improved in terms of mental status and discharged home.

#### **DISCUSSION**

CAPS and HIT share many clinical features in terms of causing thromboembolic complications with deep venous

thrombosis and pulmonary embolism being the most common thrombotic disorders (2-5). CAPS and HIT may be interrelated immune-mediated disease states with similar pathogenesis of producing antibody-mediated thrombosis and hypercoagulability. Better physician awareness could help early diagnosis and treatment of these two related conditions. Clinicians should be aware that HIT may occur after the patient is treated with heparin for CAPS.

#### **REFERENCES**

1. Hoppensteadt DA, Walenga J. The Relationship Between the Antiphospholipid Syndrome and Heparin-Induced Thrombocytopenia. *Hematol Oncol Clin N Am* 2008;22:1-18
2. Bick RL, Jakway J, Baker WF. Deep vein thrombosis: prevalence of etiologic factors and results of management in 100 consecutive patients. *Semin Thromb Hemost* 1992;18:267-74
3. Kunkel LA. Acquired circulating anticoagulants. *Hematol Oncol Clin North Am* 1992;6:1341-57
4. Alving BM. Antiphospholipid syndrome, lupus anticoagulants, and anticardiolipin antibodies. In: Loscalzo J, Schafer AI, editors. *Thrombosis and hemorrhage*. 2nd edition. Baltimore: Williams & Wilkins; 1998. 817-33
5. Warkentin TE, Greinacher A. Heparin-induced thrombocytopenia: recognition, treatment, and prevention. *Chest* 2004;126:311S-37S

**Figure 1. CT Scan**



---

**Case Report: Crack Lung Syndrome**

Aminah Shahid, MD\*, Rita McKeever, MD\*, Dan Mirsch\*\*, Michael Greenberg, MD\*  
\*Drexel University College of Medicine: Department of Emergency Medicine  
\*\*MD Candidate, Philadelphia College of Osteopathic Medicine

**CASE REPORT**

A 60-year-old male with a history of cocaine abuse and COPD presented with breathing difficulty on a morning with record low temperatures. Prior to presentation, he had smoked crack cocaine and developed sudden-onset wheezing, shortness of breath, and productive cough that worsened overnight. On physical exam, he was tachycardic, tachypneic, with audible wheezing and diffuse rhonchi on lung exam. Chest x-ray was normal. Labs revealed an eosinophilia of 11.8, and urine drug screen positive for cocaine. The patient was admitted and treated with albuterol-ipratropium nebulizers, Advair inhaler, and prednisone, and discharged 2 days later.

**DISCUSSION**

Crack cocaine is associated with many pulmonary complications including pneumothorax, pneumomediastinum, pulmonary hemorrhage, hypersensitivity pneumonitis, eosinophilic lung disease, interstitial pneumonitis, thermal airway injury, and non-cardiogenic pulmonary edema (1). Crack lung describes acute respiratory symptoms that develop within minutes to hours of inhalation of crack cocaine. The presenting symptoms can include hypoxia, fever, hemoptysis, cough

productive of carbonaceous sputum, chest pain, shortness of breath, and respiratory failure (1,3). Chest radiography may show alveolar and interstitial infiltrates. Crack lung has also been associated with eosinophilia. Histopathology can show hemorrhage, alveolar damage, inflammatory cells, and hemosiderin-laden macrophages. The syndrome is thought to occur because of the combustion products of crack cocaine, the impurities mixed with the crack, and the direct toxic effects of cocaine (3). Treatment is supportive including observation, supplemental oxygen, and corticosteroids (1,2). It is important to consider crack lung in the differential diagnosis of a patient with recent crack cocaine inhalation presenting with acute respiratory symptoms.

**REFERENCES**

1. Haim DY, et al. The Pulmonary Complications of Crack Cocaine. *Chest* 1995;107:233-40
2. Kon OM, et al. "Crack lung" Caused by an Impure Preparation. *Thorax* 1996;51:959-960
3. Nelson LS, et al. (2011). *Goldfrank's Toxicologic Emergencies*. 9th ed. New York: McGraw Hill Medical

---

**Case Report: Emergent Type A Aortic Dissection Repair in Jehovah Witness (JW) with Bloodless Medicine**

Michelle DaCosta, MD, Michael Dishart, MD, Christopher Troianos, MD  
Allegheny General Hospital: Department of Anesthesiology

**CASE REPORT**

A 64 year old male with a thoracic aortic aneurysm (4.9cm) and mild aortic insufficiency (AI) presented with acute chest pain. The patient refused blood products. The patient's initial hemoglobin (Hgb) was 13.8gm/dL. TEE showed normal left ventricular function, 1+ AI, aortic dissection with mural thrombus in the ascending aorta and dissection flap with false lumen in the arch. Type A aortic dissection repair was performed using antifibrinolytic therapy, right axillary artery cannulation, cardiopulmonary bypass (CPB) (155min) with hypothermic (24°C)

circulatory arrest (33min), and cerebral antegrade perfusion. The patient received 1L autologous hemodilution (ANH), 10 pooled units (50ml) cryoprecipitate (Cryo), 30mcg desmopressin, 3mg Factor VIIa, 250ml albumin, 600ml normal saline, while estimated blood loss was 165ml. The final intraoperative hemoglobin was 9.5gm/dL; 600ml cell saver (CS) was returned to the patient. Post CPB TEE showed preserved left ventricular function, trace AI, persistent false lumen in the aortic arch with diminished Doppler flow, no change in distal extent of dissection. Patient was discharged home ten days later.

---

## DISCUSSION

Bleeding requiring transfusion occurs in 5-30% of patients after CPB, which is amplified with hypothermic arrest (1). Desmopressin can minimize bleeding by improving thrombocyte function (3). Recombinant factor VIIa (rFVIIa) activates factors IX, X, and thrombin production (1,2). Cryo (50ml) contains 150 times more fibrinogen versus a 50mL bag of FFP, has high concentrations of factor VIII and VWF, and enhances platelet adhesion (2).

ANH can preserve platelets and coagulation factors (3). Alternative blood components can be invaluable for bleeding JW patients during emergent cardiothoracic surgeries (2).

## REFERENCES

1. Canadian Journal of Anesthesia 2006;53(4):353-56
2. Anesth Analg 2007;104:763-65
3. The Annals of Thoracic Surgery 2005;80(4):1507-10

---

## Case Report: Insulin Edema Syndrome: Doctor – Why am I gaining so much weight?

Sukhminder Singh, MD, A. Levine, MD  
Easton Hospital: Department of Medicine

### CASE REPORT

A 54-yr-old male was admitted to the hospital with a 40 lb weight gain over a 4-week period. His past medical history was significant for diabetes mellitus type 2, obesity-hypoventilation syndrome, hypertension, dyslipidemia, and fibromyalgia. He denied recent dietary changes. One month before admission, he was switched from insulin glargine and insulin aspart totaling 162 units daily to a regimen including U 500 insulin equivalent to 530 units of U-100 insulin daily. Other medications including pregabalin, losartan, metoprolol, baclofen, and amlodipine were unchanged. On examination vital signs were normal. BMI was 54 kg/m<sup>2</sup>. Generalized edema was present. The remainder of physical examination was unremarkable. Laboratory studies showed normal renal, hepatic and thyroid function, and normal electrolytes. HbA1c was 8.1. Urine analysis was negative for protein, red cells, or casts. Echocardiography was normal, including no evidence of pulmonary hypertension. Considering the negative workup for cardiac, renal and hepatic causes of anasarca, our patient was suspected to have insulin edema. Amlodipine was discontinued. The patient was started on a low salt diet and furosemide 40 mg daily.

### DISCUSSION

Insulin edema should be considered in patients on new or escalated doses of insulin or insulin sensitizers when other causes of generalized edema have been excluded. Proposed mechanisms include enhanced sodium reabsorption in the proximal and distal nephron and Henle's loop, arterial vasodilatation, and increased vascular permeability.

### REFERENCES

1. Kalambokis GN, Tsatsoulis AA, Tsianos EV. The edematogenic properties of insulin: American Journal of Kidney Diseases. 2004;44(4):575-590
2. Bas VN, et al. Insulin Oedema in Newly Diagnosed Type 1 Diabetes Mellitus. J Clin Res Pediatr Endocrinol. 2010;2(1):46-48
3. Chelliah A, Burge MR. Insulin Edema in the Twenty-first Century: Review of the Existing Literature Journal of Investigative Medicine. 2004;52(2):104-8
4. Leifer A. A case of insulin edema. JAMA 1928;90:610-611
5. Shaper AG. The insulin-oedema syndrome in African diabetic subjects. Trans R Soc Trop Med Hyg 1966;60:519-525

---

## Case Report: Mesh Repair of Recurrent Vaginal Evisceration following Radical Hysterectomy and Adjuvant Pelvic Radiation

Uchechuckwu Stanley Ogu, MD\*, Anand Kumar\*\*  
\*Easton Hospital: Department of Surgery  
\*\*MD Candidate, Drexel University College of Medicine

### INTRODUCTION

The vagina is an unusually robust organ, subjected to frequent sexual, obstetrical, and surgical trauma. Vaginal cuff dehiscence with evisceration is extremely rare among surgical emergencies.

### CASE REPORT

An 82-year-old female with history of cervical cancer nine years ago, status post radical hysterectomy and pelvic irradiation, presented to the emergency department with a protrusion of small bowel through the vagina following heavy coughing. She had presented eight months prior with vaginal evisceration of bowel and at that time underwent laparotomy with lysis of adhesions and suture repair of a

vaginal cuff defect. On current presentation, she emergently underwent an exploratory laparotomy. The eviscerated small bowel was seen to be viable and reducible. The vaginal cuff was necrotic, with dehiscence of the previous repair. The necrotic tissue was debrided and the vaginal cuff defect closed via linear stapler. A vicryl mesh was sutured into place over the repaired defect. Post-operatively the patient was ICU monitored for one day, and was discharged home 6 days later in stable condition, with no recurrence with thirty months follow-up.

### DISCUSSION

Case reporting of vaginal evisceration is insufficient from incomplete profiling of such women. Morbidity and



mortality can result from peritonitis, ileus, intestinal obstruction, and sepsis (1). Risk factors include post-menopausal status, and history of vaginal surgery, hysterectomy, radiotherapy, gynecological malignancy, chronic steroid administration, and trauma (2). Immediate precipitating factors often include trauma, coitus, foreign body, or elevated intra-abdominal pressure (3). Surgical intervention consists of inspection for necrotic bowel, visceral lavage, and closure of the defect, preferably with mesh.

## REFERENCES

1. Yew CC, Lindenauer SM. Vaginal Evisceration. *International Journal of Gynecology & Obstetrics*. 1981;19(4):313-17
2. Cattaneo R, Bellon M, Elshaikh M. Vaginal Cuff Dehiscence after Vaginal Cuff Brachytherapy for Uterine Cancer. A Case Report. *Journal of Contemporary Brachytherapy*. 2013;5(3):164-66
3. Virtanen HS, Ekholm E, Kiilholma PJA. Evisceration after Enterocele Repair: A Rare Complication of Vaginal Surgery. *International Urogynecology Journal and Pelvic Floor Dysfunction* 1996;7(6):344-47

---

## Case Report: Necrotizing Fasciitis after Cesarean Section

Alexis Balstad, MD, Jacqueline Roman, DO, Setareh Shams, MD  
Monmouth Medical Center: Department of Obstetrics and Gynecology

### CASE REPORT

A 25 year-old G1P1 female s/p PC/S six days prior noted to have incisional erythema with drainage at clinic was sent to the ED for evaluation. She denied pain, fever or chills, however reported a change in incisional color. Physical exam showed a 4cm x4cm necrotic area superior to the Pfannenstiel scar and lateral to a prior vertical scar with brown-serous drainage (Figure 1). Broad-spectrum antibiotics and IVIG was started and she was taken to the OR. Surgery included an extensive debridement of the abdominal wall, removal of subcutaneous tissue of the mons pubis, TAH with drain placement, right labial drain placement and reconstruction of the abdominal wall. She was placed in the ICU where serial abdominal exams were completed; however, no further debridement was required. She was extubated and remained hospitalized for 21 days before being discharged home. Months later, she returned for plastic repair of her abdomen complicated by outpatient treatment of cellulitis and is currently in good health (Figure 2).

### DISCUSSION

Necrotizing fasciitis is characterized by extensive necrosis of the subcutaneous tissues and fascia, often sparing the underlying muscle. Multiple studies have investigated the relationship between cesareans section and necrotizing fasciitis. Goepfert and Guinn developed a plan for diagnosis and Gallup et al not only described the diagnosis of necrotizing fasciitis but also the importance of early and wide debridement of affected areas. In concordance with these studies, we found that early diagnosis, antibiotic supplementation and wide debridement can successfully treat necrotizing fasciitis.

### REFERENCES

1. Goepfert AR, Guinn DA, Andrews WW, Hauth JC. Necrotizing fasciitis after cesarean delivery. *Obstet Gynecol*. 1997;89(3):409-12
2. Gallup DG, et al. Necrotizing Fasciitis in gynecologic and obstetric patients: a surgical emergency. *Am J Obstet Gynecol*. 2002;187(2):305-10

Figure 1.



Figure 2.



---

## Case Report: Obstructive Congenital Epulis: a Delivery-room Surprise

Andrew Jovanovski, MD, Dana Farabaugh, MD  
Drexel University College of Medicine: Department of Obstetrics and Gynecology

### INTRODUCTION

First described by Neumann in 1871, congenital epulis



(also known as congenital granular cell tumor of the newborn) is an uncommon and sometimes grotesque neonatal oral lesion arising from the alveolar ridge and consisting of non-tender, fleshy pedunculations with overlying oral mucosal epithelium (1,2). The pathogenesis remains unelucidated, but it is thought to arise from mesenchymal cells through cellular reactivity to maternal hormonal factors (3,4). When congenital epulis is encountered in the delivery room, the birth attendant should remain vigilant for mechanical airway obstruction and feeding difficulties in the neonate.

**CASE REPORT**

A 19-year-old African-American primigravida underwent uncomplicated vaginal delivery of a term female infant who was noted to have a large, disfiguring oral lesion (Fig. 1). There were multiple pedunculated soft-tissue masses that interfered with the neonate's ability to feed. Prompt surgical repair under general anesthesia on the second day of life led to a complete recovery (Fig. 2). Pathological evaluation revealed benign granular histiocytoid cells consistent with congenital epulis, and tumor-marker immunohistochemistry was negative.

**DISCUSSION**

When a neonatal oral lesion is encountered, special

attention should be paid to the neonate's respiratory status and ability to feed. The differential diagnosis of congenital epulis includes teratoma, hemangioma, lymphangioma, epignathus, ranula, and rhabdomyosarcoma. As congenital epulis is uniformly benign, simple surgical resection is sufficient for correction of the lesion (2,3,5). When airway obstruction is suspected on antenatal ultrasound, ex utero intrapartum (EXIT) procedures have been successfully used to create a secure airway prior to delivery (5).

**REFERENCES**

1. Neumann E. Ein Fall von congenitaler Epulis. Arch Heilk 1871;12:189-94
2. Lack EE, et al. Gingival granular cell tumors of the newborn (congenital "epulis"). Am J Surg Pathol 1981;5:37-46
3. Childers ELB, Fanburg-Smith JC. Congenital epulis of the newborn: 10 new cases of a rare oral tumor. Ann Diagn Pathol 2011;15:157-61
4. Eghbalian F, Monsef A. Congenital epulis in the newborn, review of the literature and a case report. J Pediatr Hematol Oncol 2009;31:198-9
5. Kumar P, et al. Obstructive congenital epulis: prenatal diagnosis and perinatal management. Laryngoscope 2002;112:1935-9

**Figure 1.**



**Figure 2.**



**Case Report: Peripherally Inserted Central Catheter (PICC) Line and Dialysis Catheter**

Ramin Nazari, MD, Shonola Da-Silva, MD  
 St. Christopher's Hospital for Children: Department of Pediatrics, Section of Critical Care Medicine

**CASE REPORT**

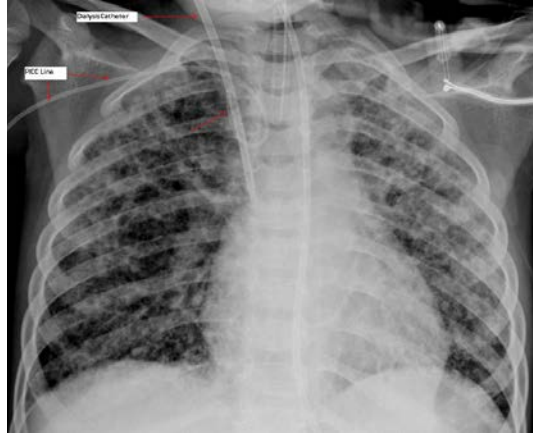
A 6 year old male patient with working diagnosis of Stevens' Johnson Syndrome versus Drug Reaction (or Rash) with Eosinophilia and Systemic Symptoms (DRESS Syndrome) who was intubated because of respiratory failure and had hepatic failure and renal failure was decided to start continuous venovenous hemofiltration (CVVH). For the purpose of CVVH a 7 French dialysis catheter was inserted in Superior Vena Cava (SVC) through right internal jugular vein on the second day of admission (Figure 1). He had also had a Peripherally Inserted ventral

Catheter (PICC) line in place for other medicine infusion and Total Parental Nutrition (TPN) before that. Eleven days later the nurse complained of difficulty in blood draw and flashing through the PICC line, so TPA ordered for the line but wasn't effective. The next day, routine morning CXR (Figure 2) showed the tip of PICC line being sucked to one of the side holes of the dialysis catheter. The PICC line was replaced by new catheter through the left side PICC line.

**Figure 1. Before replacing the PICC line**



**Figure 2. PICC line in side hole of the dialysis catheter**



-----

### **Case Report: Prolonged Third Remission with Recovery of Donor Engraftment following Treatment of Post-transplant Relapse with Bortezomib in a 9 year old male with Precursor B-Cell Acute Lymphoblastic Leukemia**

Sameer Sait, MD, Stanley Calderwood, MD, Saurabh Patel, MD, Ionela Iacobas, MD, Nibal Zaghoul, MD  
Saint Peter's University Hospital: Department of Pediatrics

#### **INTRODUCTION**

Options for treating acute lymphoblastic leukemia (ALL) relapsing after allogeneic bone marrow transplant (alloBMT) are limited (1). Bortezomib, a novel proteasome inhibitor with activity in vitro and in vivo against ALL, appears to be synergistic with conventional chemotherapy (2-4).

#### **CASE REPORT**

A 6 year old Hispanic male with high risk precursor B-cell ALL experienced a relapse after 14 months of standard conventional chemotherapy. The patient underwent an alloBMT from a fully matched female sibling after achieving a second complete remission. Unfortunately, a second relapse occurred 9 months post-transplant. The patient then received 3 cycles of salvage chemotherapy (cycle 1: vincristine, dexamethasone, asparaginase, and doxorubicin, cycle 2: etoposide and cyclophosphamide, cycle 3: high dose cytarabine and asparaginase ) given concurrently with Bortezomib 1.3 mg /m<sup>2</sup>/dose on day 19, 22, 25 and 28 of cycle 1 and day 1, 4 and 8 of cycle 2. Bone marrow aspiration obtained 6 weeks after start of Cycle 3 confirmed complete remission, with conversion to full donor chimerism (100% 46XX) without additional stem cell infusion. Therapy was complicated by prolonged marrow suppression accompanied by an episode of gram negative sepsis responding to antibiotics, but was otherwise

well tolerated. The patient remains in complete remission with a normal quality of life more than 1 year post treatment.

#### **DISCUSSION**

This case report suggests that Bortezomib is well tolerated and may be efficacious, even in heavily pre-treated patients with multiply relapsed ALL and suggests that further studies of the incorporation of bortezomib into salvage and frontline therapy of childhood ALL are warranted.

#### **REFERENCES**

1. Arellano ML, et al. Treatment of relapsed acute leukemia after allogeneic transplantation: a single center experience. *Biol Blood Marrow Transplant.* 2007;13(1):116-123
2. Ko RH, et al. Outcome of patients treated for relapsed or refractory acute lymphoblastic leukemia: a Therapeutic Advances in Childhood Leukemia Consortium study. *Journal of Clinical Oncology.* 2010;28(4):648-654
3. Gaynon PS. Childhood acute lymphoblastic leukaemia and relapse. *British Journal of Haematology.* 2005;131(5):579-587
4. Brown RE, Bostrom B, Zhang PL. Morphoproteomics and bortezomib/dexamethasone-induced response in relapsed acute lymphoblastic leukemia. *Annals of Clinical and Laboratory Science.* 2004;34(2):203-205

-----

### **Case Report: Small Bowel Ileus: An Uncommon Complication of Colonoscopy**

Shelini Sooklal, MD, Amit Sohagia, MD  
Easton Hospital: Department of Medicine

#### **CASE REPORT**

An 82-year-old female with a history of numerous prior

intra-abdominal surgeries reported a three-week history of dull, lower abdominal pain and watery diarrhea. Self-

treatment with loperamide was ineffective. During a subsequent colonoscopy, a significant amount of air was insufflated into the bowel for adequately visualization. Unfortunately, the procedure was abandoned due to poor bowel preparation. Two hours later, she experienced worsening generalized abdominal pain, nausea and vomiting. The abdomen was visibly distended, and bowel sounds were distinctly hypoactive. Electrolytes were normal. A non-contrast CT scan of the abdomen and pelvis demonstrated markedly dilated small bowel loops and mild large bowel dilatation. There was no free air or identifiable transition point. She was treated with nasogastric suction, intravenous fluids and bowel rest. Symptoms resolved within 24 hours. Complete colonoscopy and sigmoid polypectomy were performed two months later. The 4mm polyp was a tubular adenoma. No gross abnormality was identified which could have caused bowel dilatation.

**DISCUSSION**

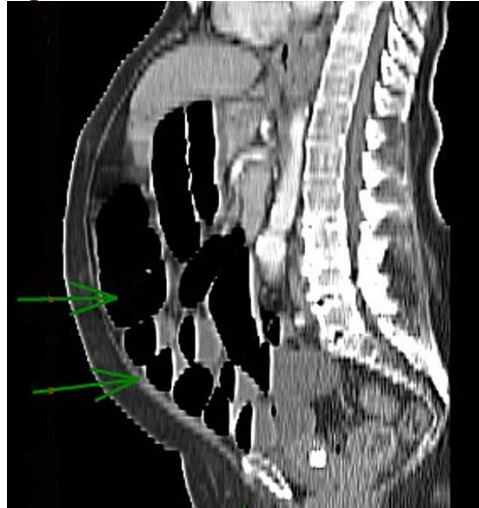
Narcotic medications prior to colonoscopy, excessive air sufflation, and prior abdominal surgery with resulting adhesions are predisposing factors for post-colonoscopy ileus. Loperamide, an opioid-receptor agonist, as well as sympathetic overactivation of the bowel caused by high

pressures of air required to distend the bowel wall likely caused adynamic ileus in this patient. The mild abdominal pain as well as the lack of an identifiable transition point on CT scan is consistent with ileus. Physicians caring for post-colonoscopy patients with the above predisposing factors should be on high alert for possible ileus or bowel obstruction.

**REFERENCES**

1. Zanati SA, Fu A, Kortan P. Routine colonoscopy complicated by small-bowel obstruction. *Gastrointest Endosc.* 2005;61(6):781
2. Wallner M, et al. Small-bowel ileus after diagnostic colonoscopy. *Endoscopy.* 1994;26(3):329
3. Raghavendran K, Novak JM, Amodeo JL, Kulaylat MN. Mechanical small bowel obstruction precipitated by colonoscopy. *Surg Endosc.* 2003;17(9):1496
4. Longacre AV, Aslanian H. Acute colonic pseudo-obstruction after colonoscopy in a young woman on narcotics. *J Clin Gastroenterol.* 2006;40(3):225
5. Bernasconi D, Gehring, Mark; Roy, Praveen K. Small bowel ileus following colonoscopy. *Am J Gastroenterol.* 2002;97(9):199

**Figure 1. Abd distension with air-filled bowel loops**



**Table 1. Clin features of pts with SB ileus after colonoscopy**

Reference	Year of publication	Journal name	Age/Gender	History	Findings post-colonoscopy
Present case			82/F	Loperamide use, multiple prior abd surgeries	Abdominal distention, vomiting in 2 hours
Ko et al.	2009	Can J Gastroenterol	60/F	Iron deficiency anemia	Hyperamylasemia, acute pancreatitis and ileus
Longacre et al.	2006	J Clin Gastroenterol	40/F	Iron-deficiency anemia. Oxycodone use. Meperidine and fentanyl given during colonoscopy.	Severe abdominal pain, inability to pass flatus, fever in 3 hours
Gonzalez Ramirez et al.	2003	Endoscopy	62/F	Prior hysterectomy & change in bowel habits	Abdominal distension in 4 hours, perforation
Bernasconi et al.	2002	Am J Gastroenterol	61/M	Heme (+) stools	Vomiting in 2 hours
Wallner et al.	1994	Endoscopy	52/F	Irregular bowel movements	Right lower quadrant pain in 2 hours
Sterner and Levy	1990	Am J Gastroenterol	72/M	Hemi-colectomy for cancer	Abdominal pain and vomiting in 3 hours
Ramakrishnan	1979	Southern Medical Journal	50/M	Mucorrhoea	Abdominal distention within 2 hours

**Case Report: Stenotrophomonas maltophilia Pneumonia found in Inhalation Injury Burn Patient**

Shahruq Sarela, MD  
Allegheny General Hospital: Department of Medicine

**CASE REPORT**

A 27 y/o male with PMH of autism and epilepsy was trapped in a house fire requiring intubation for airway protection. Chest x-ray showed proper ET tube positioning and no active lung disease. However, the patient continued to spike fevers and remained tachycardic. Blood cultures remained negative, but on bronchoscopy with BAL cultures grew *Stenotrophomonas* (*Xanthomonas*) *maltophilia* sensitive to Bactrim. After initiation of antibiotics the clinical status improved and he was extubated on day 8.

**DISCUSSION**

*Stenotrophomonas maltophilia* is an aerobic, non-fermenting, gram-negative bacillus closely related to the *Pseudomonas* species (1). This was first isolated in 1943 (2). Reported incidence of infection ranges from 7.1 to 37.7 cases per 10,000 discharges and is associated with significant mortality from 21 to 69 percent (2). It is frequently isolated from soil, water, animals, plant matter, and hospital equipment. It has the ability to adhere to foreign materials and form a biofilm, rendering protection from antimicrobial agents (3). This bacteria also has

intrinsic or acquired resistance mechanisms to multiple antibiotic classes: beta-lactams, aminoglycosides, carbapenems, and fluoroquinolones (4). Risk factors include admission to an intensive care unit, HIV infection, malignancy, cystic fibrosis, neutropenia, mechanical ventilation, central venous catheters, recent surgery, trauma, and previous therapy with broad-spectrum antibiotics (2). In regards to treatment TMP-SMX is the favored choice with 94% susceptibility. Of note, it is 71% susceptible to ticarcillin/clavulanic acid, 56% susceptible to ciprofloxacin and 49% susceptible to ceftazidime. Potentiation was observed with the combination of TMP-SMX and ticarcillin/clavulanic acid (5).

**REFERENCES**

1. Paez JI, et al. Factors associated with mortality in

patients with bloodstream infections and pneumonia due to *Stenotrophomonas Maltophilia*. *Eur J Clin Microbiol Infect Dis*. 2008;27(10):901

2. Denton M, Kerr KG. Microbiological and clinical aspects of infection associated with *Stenotrophomonas Maltophilia*. *Clin Microbiol Rev*. 1998;11(1):57

3. Looney WJ, Narita M, Muhlemann K. *Stenotrophomonas Maltophilia*: an emerging opportunist human pathogen. *Lancet Infect Dis* 2009;(9):312

4. Falagas ME, et al. Attributable mortality of *Stenotrophomonas Maltophilia* infections: a systematic review of the literature. *Future Microbiol*. 2009;4(9):1103

5. Smit WJ, et al. The antibiotic susceptibilities of *Xanthomonas Maltophilia* and their relation to clinical management. *Pathology*. 1994;26(3):321

**Case Report: Subclavian/Coronary Steal Treated with Hybrid Bypass Surgery and Carotid Stenting**

Christopher Seaman, MD, Gary Ledley, MD

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

**CASE REPORT**

A 61 year-old female with coronary artery disease, status-post three-vessel coronary artery bypass grafting (CABG), presented with one month of progressive angina and chest pain on the day of admission. Cardiac catheterization showed retrograde filling of her left internal mammary artery (LIMA) to left anterior descending (LAD) graft and a completely occluded left subclavian artery at its origin with evidence of coronary-subclavian steal. CT angiography showed left common carotid artery stenosis in addition to the subclavian artery occlusion (Figure 1). However, carotid ultrasound showed normal flow in the bilateral carotid arteries and the patient underwent left carotid to subclavian bypass surgery.

Post-operatively, the patient’s left radial pulse was diminished and she had claudication in the left arm. A carotid angiogram revealed critical stenosis of the left common carotid artery proximal to the patent left carotid artery to subclavian artery bypass graft (Figure 2). Left carotid artery stenting was performed on a subsequent admission without complications. Her arm claudication

and angina symptoms resolved.

**DISCUSSION**

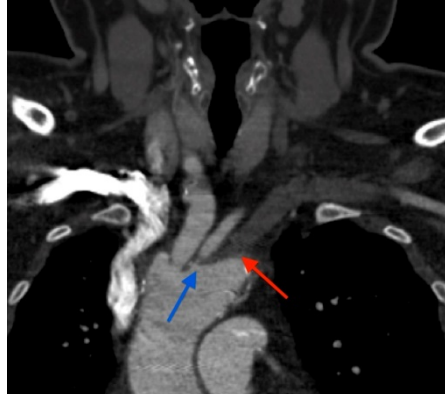
Subclavian steal is a syndrome in which subclavian artery stenosis leads to filling of the subclavian artery via retrograde flow through the ipsilateral vertebral artery. Patients with prior LIMA bypass surgery can also develop a coronary-subclavian steal syndrome, with flow from the LAD to the left subclavian artery through retrograde flow of the LIMA. In addition to neurological symptoms, patients may experience typical angina. If carotid to subclavian bypass surgery is performed, undiagnosed carotid artery stenosis can lead to ongoing symptoms, including arm claudication.

**REFERENCES**

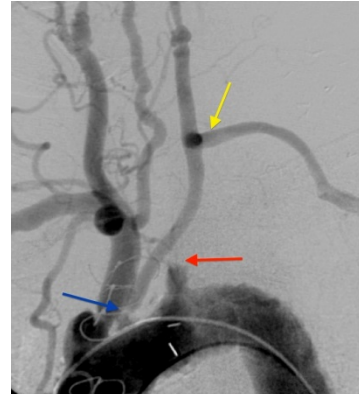
1. Hwang HY, et al. Left subclavian artery stenosis in coronary artery bypass: prevalence and revascularization strategies. *Ann Thorac Surg* 2010;89:1146

2. Rogers JH, Calhoun RF 2nd. Diagnosis and management of subclavian artery stenosis prior to coronary artery bypass grafting in the current era. *J Card Surg* 2007;22:20

**Figure 1. CT angiogram with L subclavian artery occlusion (red arrow) and L carotid artery stenosis (blue arrow)**



**Figure 2. Angiogram - L subclavian artery occlusion (red arrow), critical ostial carotid artery stenosis (blue)**



## Case Report: Successful early Carotid Endarterectomy for Critical Carotid Artery Stenosis following Thrombolysis in Acute Ischemic Stroke

Nagakrishnal Nachimuthu, MD\*, Michael Chan, MD\*, Matthew Davis, MD\*, Neil Holland, MD\*, Alfonso Ciervo, MD\*\*

\*Monmouth Medical Center: Department of Medicine

\*\*Monmouth Medical Center: Department of Surgery

### CASE REPORT

A 43 year old male presented to our Emergency Room after he was found unable to express himself and noted to have a right sided facial droop. He did not have any focal weakness. CT head revealed no hemorrhage. NIH stroke scale was 5 with aphasia, disorientation, and right-sided facial droop. On re-evaluation NIH score improved to 2 and within couple of minutes deteriorated to a score of 6. TPA was administered within the time frame. An hour later, patient developed weakness of right upper and lower extremities. His aphasia and facial droop persisted. CT angiogram revealed nearly occlusive thrombus in the left internal carotid artery approximately 2.7 cm distal to the left common carotid bifurcation. An intraluminal thrombus was suspected in the distal left middle cerebral artery segment. Patient underwent carotid endarterectomy within 22 hours of administration of tPA. At the time of discharge he had improvement in symptoms and no motor deficits.

### DISCUSSION

Timing of carotid endarterectomy following acute ischemic stroke and administration of tPA has been of debate. In selected candidates with no significant co-morbidities carotid endarterectomy can be done within a 48 hour period with no major complications. Use of peri-operative CT scan will help to select appropriate candidates for early carotid endarterectomy.

### REFERENCES

1. Crozier JEM, et al. Early carotid endarterectomy following thrombolysis in the hyperacute treatment of stroke. *BJS*. 2011;98(2):235–238
2. McPherson CM, et al. Early Carotid Endarterectomy for Critical Carotid Artery Stenosis After Thrombolysis Therapy in Acute Ischemic Stroke in the Middle Cerebral Artery Stroke. *Stroke*. 2001;32:2075-2080

Figure 1. Comparison of CT scans on admission and after CEA

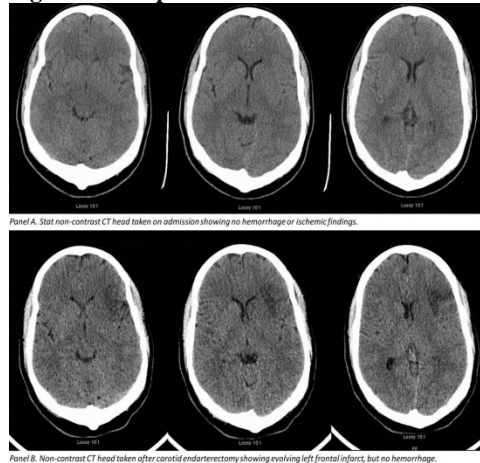
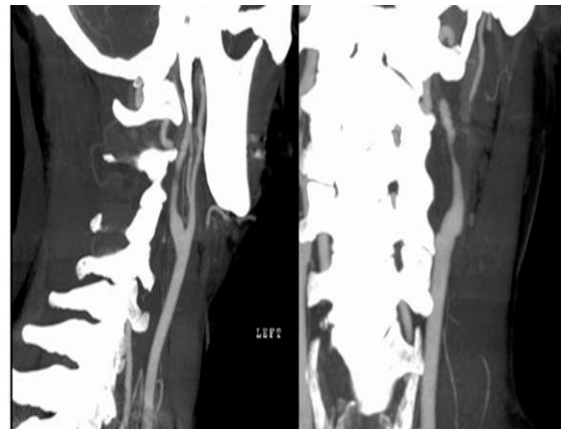


Figure 2. Critical carotid artery stenosis



## Case Report: There is More to Swallowing than just the Esophagus

Haseeba Shahzad, MD, Shelini Sooklal, MD, Rashid Makhdomi, MD  
Easton Hospital: Department of Medicine

### CASE REPORT

An 84-year-old Caucasian female with a history of myasthenia gravis presented with a three week history of worsening dysphagia. She was diagnosed with seronegative myasthenia gravis five years ago. She had responded poorly to standard treatment modalities including intravenous immunoglobulin therapy and plasmapheresis in the past. Dysphagia was neither worse with solids nor liquids. She had resorted to a diet of thickened protein drinks. A modified barium swallow evaluation confirmed a normal swallowing mechanism, however impacted food

was noted in the distal esophagus. An esophagogastroduodenoscopy revealed an empty, non-dilated esophagus with a partial ring at the gastroesophageal junction which was successfully dilated with a 48-French Maloney bougie. The patient reported no relief of dysphagia. A CT scan of the chest reported a large pericardial effusion. A transthoracic echocardiogram confirmed a posteriorly located, moderately large pericardial effusion. Under fluoroscopic guidance, pericardiocentesis was performed and 600ml of serosanguinous pericardial fluid was removed. Pathological



analysis was negative for malignant cells. The patient reported an almost immediate improvement in dysphagia, and soon tolerated a regular diet.

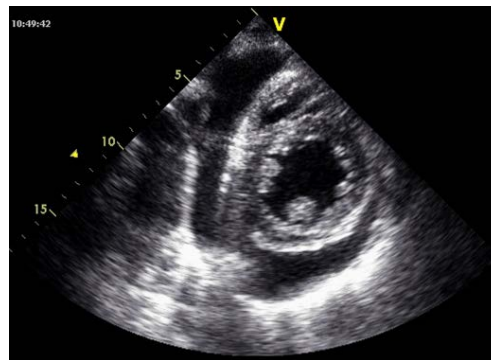
#### DISCUSSION

Myasthenia gravis is a relatively uncommon neuromuscular disorder with an annual incidence of approximately 10 new cases per million. About 15 percent of such patients have complaints of dysphagia, attributed to oropharyngeal muscle weakness. A pericardial effusion causing dysphagia in myasthenia gravis due to extrinsic compression is unusual, and a review of the literature reveals few documented cases. This case emphasizes the importance of considering non-gastrointestinal causes of a typical gastrointestinal complaint.

**Figure 1. CT showing pericardial effusion**



**Figure 2. Echocardiogram showing effusion**



#### REFERENCES

1. M Llabrés, F J Molina-Martinez, F Miralles. Dysphagia as the sole manifestation of myasthenia gravis. *J Neurol Neurosurg Psychiatry* 2005;76:1297-1300
2. Ertekin C, Yuceyar N, Aydogdu I. Clinical and electrophysiological evaluation of dysphagia in myasthenia gravis. *J Neurol Neurosurg Psychiatry* 1998;65:848-56
3. Theron BT, Pearson L, Gillson J. An odd cause of dysphagia. *BMJ*. 2011 May 10;342:d73
4. Vats HS, Richardson SK, Pulukurthy S, Olshansky B. Pericarditis in myasthenia gravis. *Cardiol Rev*. 2004;12(3):134-7
5. Rathore S, Masani ND, Callaghan PO. Clozapine-induced effuso-constrictive pericarditis. Case report and review of the literature. *Cardiology*. 2007;108:183-5

---

### Case Report: Unusual Case of Apical Hypertrophic Cardiomyopathy and Narrow Complex Tachycardia

Eduard Koman, MD\*, Obiora Anusionwu, MD\*\*, Eugene Khait, MD\*\*\*

\*Drexel University College of Medicine: Department of Medicine

\*\*Drexel University College of Medicine: Department of Medicine, Division of Cardiovascular Disease

\*\*\*State University of New York at Downstate Medical Center: Department of Medicine, Division of Cardiovascular Disease

#### INTRODUCTION

Apical Hypertrophy Cardiomyopathy (AHC) is a rare disease resulting from predominant thickening of the apical portion of the left ventricle. Its prevalence is estimated to be around 3% of all hypertrophic cardiomyopathies (1-3).

#### CASE REPORT

A 47 year-old African American Male with a history of an “abnormal heart beat” diagnosed 10 years prior presented to the emergency department with a chief complaint of palpitations and dizziness. Initially found to have an irregular heart rate ranging between 70-130 bpm. An electrocardiogram revealed a narrow complex tachycardia with an R-P interval that progressively prolongs. This decremental conduction or retrograde Wenckebach resulted in a complete block after one of the QRS complexes followed by resumption of sinus rhythm. Giant symmetric T-wave inversions in leads V3-V6, and LVH were found as well (Fig 1). A left ventriculogram demonstrated a “spade like” configuration of the left ventricle with no evidence of

apical aneurysm (Fig 2).

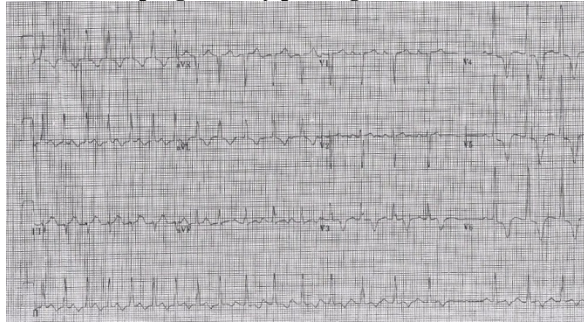
#### DISCUSSION

This case illustrates the classical clinical findings of AHC and the different type of arrhythmia that have never been documented in the patient’s history. This should be considered as potential etiologies for patients with AHC who present with palpitations.

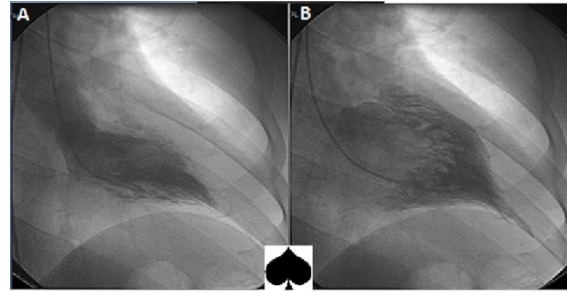
#### REFERENCES

1. Sakamoto T, et al. Giant T wave inversion as a manifestation of asymmetrical apical hypertrophy (AAH) of the left ventricle: Echocardiographic and ultrasonocardiographic study. *Jpn Heart J*. 1976;17:611-629
2. Kitaoka H, et al. Comparison of prevalence of apical hypertrophic cardiomyopathy in Japan and the United States. *Am J Cardiol*. 2003;92:1183-1186
3. Eriksson MJ, et al. Long-term outcome in patients with apical hypertrophic cardiomyopathy. *J Am Coll Cardiol*. 2002;39:638-645

**Figure 1. ECG: narrow complex tachycardia and R-P' interval that progressively prolongs**



**Figure 2. Cardiac ventriculogram: “spade-like” left ventricle cavity. Systole (A) & Diastole (B)**



### Case Report: Use of Atherectomy for Severe Peripheral Vascular Disease

Michael Macciocca, MD, Rehan Ali, MD, Daniel Ratliff, DO, Gary Ledley, MD  
Drexel University College of Medicine: Department of Medicine, Division of Cardiology

#### CASE REPORT

A 64 year-old male with a past medical history of hypertension, hypercholesterolemia and tobacco abuse presented with complaints of claudication for the past 6 months. His symptoms were worse in his left leg and occurred after walking 2 blocks. The pain had failed to improve despite medical management and physical therapy. Physical exam revealed diminished pedal pulses bilaterally. Ankle brachial index as well as lower extremity arterial duplex was abnormal, and the patient was referred for lower extremity angiography. Angiography revealed heavily calcified vessels and multiple blockages. Most significantly, there was a 90% stenosis in the left common femoral artery extending into the superficial femoral artery. He underwent revascularization of the left lower extremity with rotational atherectomy utilizing a Jetstream device, after which balloons were able to be advanced through the vessel and angioplasty was performed. Subsequent angiography confirmed improvement in stenosis and flow. On follow up the patient reported decreased symptoms and improved exercise tolerance.

#### DISCUSSION

Peripheral arterial disease (PVD) is defined as atherosclerosis causing peripheral artery obstruction leading to symptoms of reduced blood flow. PVD is associated with a significantly elevated risk of cardiovascular disease morbidity and mortality, and affects

more than 5 million adults in the US alone (1). Risk factors for PVD include hypertension, hyperlipidemia, and smoking, as seen in our patient (2). There are many treatment options for PVD including medicine, physical therapy, peripheral intervention and/or surgical intervention (3-5). We present a case using rotational atherectomy with balloon angioplasty as a means of revascularization.

#### REFERENCES

1. Selvin et al. Prevalence of and Risk Factors for Peripheral Arterial Disease in the United States: Results From the National Health and Nutrition Examination Survey 1999–2000. *Circulation*. 2004;110:738-743
2. Shamma. Epidemiology, classification, and modifiable risk factors of peripheral arterial disease. *Vasc Health Risk Manag*. 2007;3(2):229–234
3. Wolf et al. Surgery or balloon angioplasty for peripheral vascular disease: a randomized clinical trial. Principal investigators and their Associates of Veterans Administration Cooperative Study Number 199. *J Vasc Interv Radiol*. 1993;4(5):639
4. Zeller et al. Long-term results after directional atherectomy of femoro-popliteal lesions. *J Am Coll Cardiol*. 2006;48(8):1573
5. Sixt et al. The 1-year clinical impact of rotational aspiration atherectomy of infrainguinal lesions. *Angiology*. 2011;62(8):645-56

**Figure 1. Angiography before revascularization**



**Figure 2. Angiography after revascularization**



---

## Case Report: Zinc Phosphide Rodenticide Ingestion in a Toddler

Jolene Okaneku, MD, David Vearrier, MD  
Drexel University College of Medicine: Department of Emergency Medicine

### CASE REPORT

A 14 month-old female presented to our emergency department shortly after an ingestion of 6 to 7 pellets of Erazo AG Pelleted Bait (Manufacturer: Motomco; zinc phosphide 2%). The patient had multiple episodes of non-bloody emesis. Physical examination was normal as was a complete blood count and a basic metabolic panel. The patient was observed in the emergency department for a total of 10 hours with resolution of her gastrointestinal symptoms. On a follow-up telephone call, the patient remained asymptomatic at 17 hours post-ingestion.

### DISCUSSION

Rodenticides containing zinc phosphide are highly toxic via the oral route. Phosphide reacts with water or acid in the stomach to generate phosphine gas. Suggested mechanisms of toxicity include inhibition of cytochrome C oxidase, formation of highly reactive hydroxyl radicals, inhibition of cholinesterase, and corrosive action. Early manifestations include nausea, vomiting, epigastric pain, dyspnea, and a garlic odor on the breath. Rapid onset of systemic toxicity

may ensue with profound circulatory collapse, pulmonary edema, hepatic failure, pancreatitis, and severe metabolic acidosis. Treatment is limited to supportive measures. Gastric lavage using 3-5% sodium bicarbonate has been recommended, however, evidence supporting various decontamination strategies, antidotal therapy, and enhanced elimination are lacking.

### CONCLUSION

Zinc phosphide is an uncommon ingestion but may occur with pediatric exploratory ingestions or in a suicide attempt. It is important to understand and recognize the toxicity of rodenticides containing zinc phosphide because of the high mortality risk.

### REFERENCES

- 1.Proudfoot AT. Aluminium and zinc phosphide poisoning. *Clinical Toxicology*. 2009;47(2):89-100
- 2.Sogut O, Baysal Z, Ozdemir B. Acute pulmonary edema and cardiac failure due to zinc phosphide ingestion. *The Journal of Emergency Medicine*. 2011;40(6):e117-e8



---

## Article: A Rare Case of Hepatic Flexure Diverticulitis after Pelvic Laparoscopy and Review of Literature for Management

Abdul Shakoor Badr, MD\*, Aniket Sakharpe, MD\*, Jakub Wilhelm, MD\*, Leopoldo Baccaro, MD\*, Nida Mumtaz, MD\*\*, Robert Bloch, MD\*

\*Easton Hospital: Department of Surgery

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

### ABSTRACT

Transverse colon diverticulitis is a rare cause of acute abdomen in the aging population. We present a case of perforated right-sided and transverse colon diverticulitis requiring partial colectomy in a 57-year-old female with no prior history of diverticulosis. Our case highlights the importance of prompt and thorough surgical intervention in the successful treatment of this rare condition.

### INTRODUCTION

Diverticulosis commonly affects the geriatric patients, 10-15% of whom ultimately develop diverticulitis. Diverticulitis has many known complications, such as the formation of phlegmon, fistulas, bowel obstruction, bleeding, perforation and colonic abscess (6). Diverticulitis in the Western world most commonly affects the sigmoid colon and presents as “left-sided appendicitis” in that location. A perforated sigmoid diverticulum is often recognized preoperatively. Diverticulosis involving the transverse colon, however, is a rare finding and a perforated diverticulum of the transverse colon is seldom considered in the differential diagnosis of acute abdomen. Transverse colon diverticulitis lacks the more specific signs and symptoms of sigmoid diverticulitis and is therefore a more difficult diagnosis based on clinical exam alone (8). We present a rare case of perforated right-sided and transverse colon diverticulitis in a 57-year-old female who presented with free air in the abdomen.

### CASE REPORT

A 57 year-old female presented with a seven day history of acute non-radiating right upper quadrant pain which worsened with motion. The patient complained of anorexia without any nausea, vomiting, fevers, chills or constipation. She was having regular bowel movements. Her past medical history was significant for hypertension, gastroesophageal reflux disease, and asthma. Her past surgical history included hysterectomy, appendectomy, and a diagnostic laparoscopy done 5 days before for an ovarian cyst that was abandoned due to multiple intra-abdominal adhesions. The patient denied smoking, drugs, or alcohol.

Vital signs were noted as temperature 99F, pulse 106 bpm, respiratory rate 18, and blood pressure 119/67 mmHg. On physical exam, the abdomen was soft, distended and slightly guarded with rebound tenderness in the right upper quadrant and positive bowel sounds. Laboratory studies were within normal limits except for an elevated white blood cell count of 15,000/ mL with a pronounced left shift with 53% bands as well as decreased albumin level at 2.4 g/dl. Liver function tests were also within normal limits and lactic acid was normal at 0.9 mmol/L. Noncontrast CT of the abdomen and pelvis revealed the possibility of interloop bowel abscess with a lot of free air and thickening of the proximal transverse colon. The patient was immediately taken to the operating room after getting informed consent for exploratory laparotomy.

The postoperative diagnosis of right-sided ascending colon and transverse colon diverticulosis with perforated diverticular abscess was made based on surgical findings. The patient was found to have a diverticular abscess due to perforated diverticula in the hepatic flexure as well as a second diverticulum involving a short segment of the proximal transverse colon. A partial transverse colectomy with end colostomy and distal mucus fistula was performed. The postoperative course was complicated by an intra-abdominal abscess, which was treated with intravenous antibiotics and drain placement. Pathological examination of the resected colon revealed acute inflammation and crypt abscess formation indicative of a perforated diverticulum. The patient returned two months later for reversal of the colostomy with a colo-colonic anastomosis. She had uneventful course and was discharged five days later.

### DISCUSSION

Acute perforated diverticulitis, a common cause of acute abdomen in Western countries, is often an indication for surgery. Diverticulitis frequently involves the sigmoid colon in Western populations and the right-sided colon in

---

Asian populations. Typical symptoms of acute sigmoid diverticulitis include: left lower quadrant pain, nausea, vomiting, diarrhea, constipation, flatulence, and fever (6). The diagnosis can now be made using ultrasonography and CT (7). Transverse colon diverticulitis is even more rare. Extensive literature search indicates that 80% of patients with diverticulosis had diverticula in the descending and sigmoid colon, 10% in the transverse colon, 4% in the ascending and 2% in the cecum (1). It is important to note that although diverticulosis of the transverse colon may be more common than that of the right colon, acute diverticulitis of the right colon may be more common than that of the transverse colon (1). Thus, the transverse colon diverticulitis presented in this case is indeed a rare occurrence.

Overall, patients with diverticulitis of the transverse colon are 15-20 years younger with a mean age of 52 and predominantly female in comparison to those with perforations of the sigmoid colon (3). Often confused with appendicitis, the differential diagnosis for transverse colon diverticulitis includes perforated colon cancer, ischemic colitis, Crohn's disease, and adjacent organ inflammation (3). It is often quite difficult to make a correct diagnosis due to the variable location of the pain and tenderness since the transverse colon is mobile on its mesentery and can present in any quadrant of the abdomen (8). Barium enema has proved to be useful in this diagnosis in the past but is contraindicated in the acute abdomen due to the risk of perforation. CT scan findings in diverticulitis can reflect both acute and chronic inflammation. Key findings in acute diverticulitis include stranding within adjacent mesenteric fat as well as the presence of extraluminal gas or fluid (3). Chronic pathological changes include wall thickening of more than 5mm in the distended colon. Any localized area of inflammation is suspicious for a perforated diverticulum. Unusual secondary manifestations of transverse colon diverticulitis can include the formation of a gastrocolic fistula, colocutaneous fistula, and subcutaneous emphysema of the lower extremities (9). Definitive diagnosis can only be made with certainty during surgery.

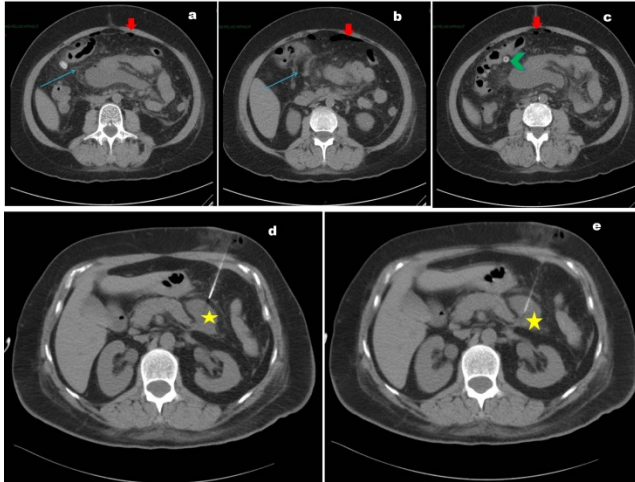
Transverse colon diverticulitis can be managed with both medical and surgical interventions. It is recommended that patients with uncomplicated diverticulitis be treated conservatively with bowel rest and broad-spectrum antibiotics (5). On the other hand, those with complicated diverticulitis, including but not limited to abscess, peritonitis, fistulas, and stenosis, require surgery. The surgical options for complicated diverticulitis include: 1) three-stage colostomy, resection, and anastomosis, 2) two-stage Hartmann's procedure, and 3) one-stage resection and primary anastomosis (4). Recent studies indicate that laparoscopic surgery can be performed safely and effectively even for patients with complicated diverticular disease and results in a significant decrease in overall complications, wound infections, and hospital stay, despite the longer operation time, when compared to open surgery (4). Early recognition, early surgical consultation, and timely initiative treatment are necessary for the treatment of acute complicated diverticulitis.

In conclusion transverse colon diverticulitis is a rare cause of acute abdomen and needs to be included in the differential diagnosis of our aging population.

#### REFERENCES

1. Greenwald M, Nussbaum T. Right colon, sigmoid colon, and transverse colon diverticulitis in the same patient: report of a case. *Dis Colon Rectum* 2005;48:162-6
2. Griffith PS, et al. An exploratory analysis of the epidemiology and surgical management of perforated diverticular disease over a two-year period at a referral centre in the Caribbean. *West Indian Med J* 2009;58(6):561
3. Jasper DR, et al. Transverse colon diverticulitis: successful nonoperative management in four patients. *Dis Colon Rectum* 1999;42(7):955-8
4. Katsuno G, Fukunaga M, Nagakari K, Yoshikawa S. Laparoscopic one-stage resection of right and left colon complicated diverticulitis equivalent to Hinchey stage I-II. *Surg Today* 2011;41:647-654
5. Kwon JW, et al. Surgical treatment of complicated right colonic diverticulitis: laparoscopic versus open surgery. *Surg Endosc* 2012;26:2926-2930
6. Little A, Culver A. Right-sided sigmoid diverticular perforation. *West J Emerg Med* 2012; 13(1):103-5
7. Matsushima K. Management of right-sided diverticulitis: a retrospective review from a hospital in Japan. *Surg Today* 2010;40:321-325
8. Peck MD, Villar HV. Perforated diverticulitis of the transverse colon. *West J Med* 1987;147:81-84
9. Yamamoto M, et al. Perforated diverticulum of the transverse colon. *Am J Gastroenterol* 1997; 92 (9): 1568-9

**Figure 1. CT scan findings reflect acute inflammation. Key findings in acute diverticulitis include stranding within adjacent mesenteric fat**



**Article: Evaluation of Patients seen in the Emergency Department during two Philadelphia Marathons**

Nicholas Bertoni, MD, Edward Ramoska, MD  
Drexel University College of Medicine: Department of Emergency Medicine

**ABSTRACT**

Objectives: We aimed to identify commonalities of illness or injury in patients who were seen in a large urban emergency department (ED) after participating in the Philadelphia Marathon. This information could help EDs prepare for marathons.

Design: Retrospective observation study using chart review.

Setting: Tertiary care urban university hospital.

Participants: Seventeen patients who were evaluated in the ED after being identified as participating in two Philadelphia Marathons.

Interventions: There were no interventions in this study.

Main Outcome Measures: The main outcome measures were the medical illnesses and injuries seen in the ED in marathon participants.

Results: Seventeen patients were seen at an urban ED following the 2011 and 2012 races. Two patients were brought to the ED for cardiac arrest; 12 of the remaining 15 presented with either syncope or near-syncope. The other three patients had musculoskeletal injuries. In the patients with syncope or near-syncope, seven had a final diagnosis that included dehydration, four had acute kidney injury, three had hypoglycemia, two had heat exhaustion, and one had rhabdomyolysis.

Conclusions: The majority of marathon participants who were brought to the ED were diagnosed with syncope or near-syncope. These data show that an ED should be prepared to rapidly assess and treat marathon participants with dehydration, metabolic derangements, and heat exhaustion. Furthermore, emergency medical personnel need to be prepared for the possibility of cardiac arrest in these patients. Following a marathon, emergency departments should be prepared to treat patients with dehydration, metabolic derangements, heat exhaustion, and cardiac arrest.

---

## INTRODUCTION

Long-distance running events including marathons, half-marathons, 10K, and 5K races have become increasingly popular in the United States in recent years. In 2011, a record high 518,000 people finished marathons, compared with 353,000 in 2000 and 224,000 in 1990 (1). In 2011, approximately 523,000 individuals participated in 564 timed marathons around the United States. In 2011 and 2012, 10,267 and 11,635 people, respectively, finished the Philadelphia Marathon. This makes it one of the 10 largest marathons in the United States (1). This increased number of participants indicates that medical personnel need to be well prepared for illnesses and injuries that can occur during and after the races. Much of the recent medical and media attention concerning marathon-associated illness has focused on cardiac arrest. Recent studies have identified 59 cases of cardiac arrest with 42 deaths in US marathons and half-marathons between 2000 and 2010 (2) Calculations from the same study estimated this to translate into prevalence rates of cardiac arrest and sudden death of 1 per 184,000 and 1 per 259,000 participants, respectively. However, data are scarcer on the prevalence of other more common illnesses and injuries associated with long distance running. We aimed to evaluate any commonalities of illness and injury and to compare their prevalence among patients seen in the emergency department after participating in the Philadelphia Marathon. This information could help EDs determine strategies for preparing for a marathon.

## METHODS AND MATERIALS

This was a retrospective observational study. Medical staff compiled a list of patients seen in the ED on November 20, 2011 who participated in the 2011 Philadelphia Marathon and Half-Marathon. A similar list was obtained for patients seen in our ED who participated in the 2012 races on November 18, 2012. This list included patients who identified themselves as having participated in the race and were either transported from the marathon via emergency medical services (EMS) or presented to the ED. We collected data through a retrospective chart review of the selected patients. We used identifiers to collect these charts, but we did not include identifying data such as name, date of birth, or medical record number. Data obtained included age, sex, race, presenting vital signs, blood work, and any treatments or interventions. We also reviewed the presenting “chief complaint” for each patient, as well as the final diagnosis, which was determined by the patient’s medical provider. All patients included in this study were evaluated by an attending emergency physician, resident physician, or registered nurse practitioner. The City of Philadelphia Medical Examiner’s office made the autopsy reports of two patients available to our study group. We reviewed the probable cause of death from these reports after the autopsy had been completed. We created data tables to analyze the 17 patients seen in the ED. These tables included information pertaining to chief complaint/diagnosis, initial vital signs, laboratory studies, and treatment interventions. We also included in our data any prehospital interventions or interventions performed by EMS that were evident on the medical chart. Treatment interventions during the resuscitation for the two patients who experienced cardiac arrest were reviewed but were not included in our data. We also reviewed statistics 109 and information from the Philadelphia Marathon, including the number of participants in the race and the finishing times of the patients seen in our ED. Ethical considerations Study approval was obtained from the Drexel University College of Medicine Institutional Review Board. Informed consent to perform chart reviews was waived.

## RESULTS

We identified 17 patients (10 men and seven women) who were treated in our ED following the 2011 and 2012 races (14 from the 2011 race and three from 2012). Their ages ranged from 19 to 50 years old. Table 1 shows demographics, chief complaint, and final diagnosis for all 17 patients. Two patients were brought to the ED via EMS for cardiac arrest from the 2011 marathon, both of whom underwent resuscitation in the ED via the Advanced Cardiovascular Life Support protocol. From the autopsy reports, the cause of death for patient #1 was “unspecified cardiomyopathy” and for patient #2 was “hypertrophic cardiomyopathy.” Of the remaining 15 patients, 12 presented to the ED with a chief complaint of either feeling lightheaded or experiencing near-syncope or syncope. The other three patients presented to the ED with a musculoskeletal or fall injury. Diagnostic groups included cardiac arrest (12%), syncope or near-syncope (70%), and musculoskeletal injury (18%). In the group with lightheadedness, near-syncope, or syncope, seven patients had a final diagnosis that included dehydration. Three patients were diagnosed with hypoglycemia, and four were diagnosed with acute kidney injury. Two patients had heat exhaustion, and two patients were diagnosed with rhabdomyolysis. One patient (patient #12) was subsequently admitted to the medical intensive care unit. Initial vital signs recorded in the ED are presented in Table 2. For the two patients who experienced cardiac arrest, vital signs were not recorded. Any point-of-care blood glucose testing by medical staff was also recorded in our data. One patient (#16) had a blood glucose value that was recorded as “normal” in the medical chart. One patient (#7) was hypotensive systolic blood pressure <90 mm Hg), while the rest were relatively normotensive. Four patients were tachycardic (heart rate >100 beats/min), and two patients were febrile

---

(temperature >38°C). Among the 11 patients who had a point-of-care blood glucose evaluation, two were hypoglycemic (blood sugar <60 mg/dL). Prehospital vital signs and point-of-care glucose values for these patients were not available, so they were not included in our data analysis.

Table 3 shows initial laboratory studies performed in the ED. Ten of the 17 patients had some form of blood test, including basic metabolic panel, complete blood count, and/or cardiac enzyme measurement. Of these 10 patients, all had at minimum a basic metabolic panel analyzed; six had troponin, creatine (CK), and CK-MB analyzed; and seven had a complete blood count performed. The two cardiac arrest patients both demonstrated electrolyte abnormalities, with patient #1 having hyponatremia and hyperkalemia and patient #2 having hyperkalemia. Blood samples were drawn and sent after cardiopulmonary resuscitation had been initiated for cardiac arrest. For the remaining eight patients who had blood work, five demonstrated hypomagnesemia (Mg <1.8 mEq/L). In all eight of these patients, sodium and potassium levels were within normal range. Using normal range for blood urea nitrogen (5–25 mg/dL) and creatinine (0.80–1.40 mg/dL), five patients had a laboratory abnormality demonstrating acute kidney injury. Three patients exhibited abnormalities in cardiac enzymes, with all three having elevated CK (>140 IU/L), two with elevated CK-MB (>10 ng/mL), and one with an elevated troponin (>0.04 ng/mL).

Table 4 lists any treatment which the patients received in the ED or prehospital via EMS. Drugs, medications, and intravenous fluids administered to the two cardiac arrest patients were not included in our data analysis. Of the remaining 15 patients, 10 received intravenous fluids (normal saline) and two received oral fluids for hydration. Three patients were treated with intravenous dextrose by EMS prior to arrival at the hospital. Miscellaneous medications were sorted into an “other” category, which included one patient who received aspirin (162 mg), one patient who received acetaminophen (650 mg), and two patients who received intravenous ondansetron.

## DISCUSSION

The majority of patients who were evaluated and treated in the ED after two Philadelphia marathons had a final diagnosis of either syncope or near-syncope. Dehydration and hypoglycemia were presumed to be the major precipitants of these diagnoses; seven patients had dehydration included in their discharge diagnosis and three patients had hypoglycemia. For the 12 patients who were diagnosed with syncope or near-syncope, all received hydration with either intravenous or oral fluids. The choice of intravenous versus oral was at the discretion of the physician evaluating the patient, based on the clinical appearance of the patient. Of the 15 non-cardiac arrest patients, only one patient was admitted to the hospital, with the admitting diagnoses of heat stroke, acute kidney injury, and rhabdomyolysis. This decision was based on the clinical appearance of the patient and lack of improvement following ED treatment interventions. Pertaining to the laboratory studies, the basic metabolic panel was probably the most clinically relevant blood test, showing that at least four patients had an acute kidney injury. These laboratory data could help medical providers with their treatment and disposition plans for patients presenting during or following a marathon. The basic metabolic panel also helps to identify serious electrolyte abnormalities that sometimes present in marathon runners, such as hyponatremia and hyperkalemia. One study from the 2002 Boston Marathon stated that 13% of their sample population of runners demonstrated hyponatremia (<135 mmol/L) and three runners (0.6%) had severe hyponatremia (<130 mmol/L) (3). There is one documented case of hyponatremia listed as the cause of death for a marathon runner between 2000 and 2010 (2). One of the non-cardiac arrest patients had a quantitative troponin test, and the result was slightly above the normal (<0.04 ng/mL) range at 0.09 ng/mL. A study from 2010 demonstrated a pooled incidence of postmarathon troponin elevation in 51% of participants from various races (4). However, our study did not show any clinical correlation between elevated troponin levels and marathon participation. This study provides several insights into injuries and illness associated with long distance running requiring medical attention. If a marathon participant experiences syncope, or feels like he or she is going to “pass out,” transport by EMS personnel to the ED for further evaluation may be indicated. However, without the on-site EMS medical data, we do not know whether every patient who experienced a syncopal event in the Philadelphia races was brought to an ED for further evaluation. We also do not know how many patients who had these symptoms were evaluated and treated by the on-site medical staff without being sent to the ED. Our literature search found one paper specifically evaluating all medical encounters for individuals participating in long-distance marathon running. The study summarized data from the Twin Cities Marathon from 1983–1994 and found that only 30 individuals were transferred to a hospital emergency facility over the 12-year period, with 25 of these 30 being classified as having “exercise-associated collapse.” This was also the most common medical illness seen in their on-site medical tent, accounting for 59.4% of injured runners (5). These findings are similar to ours. The majority of patients in the two studies showed substantial improvement with simple fluid hydration and supplemental glucose as warranted.

Limitations to our study include the small sample size available for our data collection. Having data for all patients who were evaluated by the on-site medical personnel would be of great utility for future studies. We do not know whether any marathon participants went to different hospital emergency facilities besides our hospital. Another limitation when relying on medical charts is the possibility that not all treatment interventions were documented. In conclusion, review of the patients evaluated in a Philadelphia ED from the 2011 and 2012 Philadelphia Marathons indicates that the vast majority of patients were diagnosed with syncope or a near-syncope event. These patients improved with fluid hydration and supplemental glucose, with only one patient requiring hospital admission. When preparing for a long-distance running event, EMS personnel should be ready to rapidly assess and treat patients who may be dehydrated, have electrolyte derangements, or irregularities in body temperature. Although the focus of this study was not cardiac arrest, our research does emphasize the importance of medical staff being prepared for marathon participants suffering cardiac arrest.

## REFERENCES

1. Lammpa R. Running USA's Annual Marathon Report. [RunningUSA web site]. March 13, 2013. <http://www.runningusa.org/index.cfm?fuseaction=news.details&ArticleId=332>. Accessed July 28, 2013.
2. Kim J, et al. Race Associated Cardiac Arrest Event Registry (RACER) Study Group. Cardiac arrest during long-distance running races. *N Engl J Med.* 2012;366:130-140
3. Almond C, et al. Hyponatremia among runners in the Boston marathon. *N Engl J Med.* 2005;352:1550-1556
4. Regwan S, et al. Marathon running as a cause of troponin elevation: a systematic review and meta-analysis. *J Interv Cardiol.* 2010;23:443-450
5. Roberts W. A 12-yr profile of medical injury and illness for the Twin Cities Marathon. *Med Sci Sports Exerc.* 2000;3209:1549-1555

**Table 1. Demographics/diagnoses for patients seen in the ED after the 2011/ 2012 Philadelphia Marathons**

Patient	Age(y)	Sex	Race	Chief Complaint	Disposition/Diagnosis
1	40	M	Caucasian	Cardiac Arrest	Deceased; PEA arrest
2	21	M	Asian	Cardiac Arrest	Deceased; PEA arrest
3	24	M	Caucasian	Lightheaded	Discharged; Dehydration
4	39	M	Caucasian	Lightheaded	Discharged; Near syncope, dehydration, acute kidney injury
5	29	F	Caucasian	Syncope/hypoglycemia	Discharged; syncope, hypoglycemia
6	23	F	Caucasian	Syncope/hypoglycemia	Discharged; syncope, hypoglycemia
7	51	M	Caucasian	Syncope	AMA; syncope, acute kidney injury, rhabdomyolysis
8	22	M	Latino	Syncope	Discharged; syncope, heat exhaustion, dehydration
9	34	F	Caucasian	Dehydration	Discharged; dehydration, heat exhaustion
10	19	F	Caucasian	Syncope/dehydration	Discharged; syncope, dehydration
11	50	M	Black	Syncope	Discharged; syncope, dehydration
12	33	M	Black	Syncope/altered mental status	Admit; heat stroke, acute kidney injury, rhabdomyolysis
13	50	M	Caucasian	Knee pain	Discharged; acute myofascial strain
14	36	F	Caucasian	Knee pain	AMA; (no diagnosis)
15	21	M	Caucasian	Near syncope/hypoglycemia	Discharged; near syncope, dehydration, hypoglycemia
16	24	F	Caucasian	Syncope	AMA; syncope, acute kidney injury
17	44	F	Caucasian	Fall injury	Discharged; fall, multiple abrasions, contusions

AMA; against medical advice, PEA; pulseless electrical activity

**Table 2. Initial vital signs of patients seen in the ED after the 2011/2012 Philadelphia Marathons**

Patient	BP(mmHg)	Heart Rate (beats/min)	Temperature (°C)	Resp Rate (breaths/min)	O <sub>2</sub> sat (%)	PoC Glucose (mg/dL)	Body Mass Index
1	None	None	None	None	None	55	UTA
2	None	None	None	None	92%	None	UTA
3	120/57	96	36.4	20	97%	77	21.41
4	103/44	66	36.6	16	100%	None	21.43
5	118/86	85	36.6	17	96%	72	22.14
6	104/70	91	36.8	19	100%	111	18.25
7	98/53	68	36.3	20	95%	None	22.96
8	75/43	114	38.2	20	97%	47	23.69
9	123/67	74	36.7	18	99%	121	18.85
10	117/57	113	36.9	14	99%	128	22.11
11	96/61	72	36.6	14	98%	None	27.87
12	125/67	125	39.5	26	90%	131	31.78
13	136/66	72	37	16	100%	None	22.87
14	120/75	59	37.1	16	99%	None	21.77
15	125/74	111	36.7	16	100%	140	24.2
16	122/74	88	36.8	16	100%	Normal	23.0
17	126/80	93	36.7	16	100%	185	20.2

UTA; unable to assess

**Table 3. Lab studies for patients seen in the ED after the 2011/2012 Philadelphia Marathons**

Patient	Basic Metabolic Panel	Renal Function	Complete Blood Cell Count	Cardiac Markers
1	Na-166, K-6.6, Cl-106, CO2-31, Mg-1.8, Phos-5.2, Gluc-377	BUN-19, Creat-1.29	WBC-19.8, Hgb-14.5, Hct-43.0, Plt-UTA	CK-170, CKMB-5.0, Trop-0.11
2	Na-145, K-6.4, Cl-106, CO2-7, Mg-1.7, Phos-6.3, Gluc-184	BUN-19, Creat-1.41	WBC-16.3, Hgb-14.3, Hct-42.0, Plt-UTA	CK-309, CKMB-4.6, Trop-0.13
3	None	None	None	None
4	Na-142, K-4.1, Cl-104, CO2-24, Mg-1.7, Gluc-84	BUN-26, Creat-1.50	None	None
5	None	None	None	None
6	None	None	None	None
7	Na-140, K-3.9, Cl-104, CO2-24, Mg-1.5, Phos-None, Gluc-146	BUN-24, Creat-2.08	WBC-16.1, Hgb-13.6, Hct-38.8, Plt-194	CK-300, CKMB- 14.9, Trop-0.09
8	Na-146, K-3.9, Cl-111, CO2-23, Mg-1.7, Phos-None, Gluc-66	BUN-24, Creat-1.43	WBC-24.5, Hgb-16.4, Hcy-45.8, Plt-202	CK-246
9	Na-142, K-3.8, Cl-109, CO2-25, Gluc-122	BUN-21, Creat-1.08	None	CK-138
10	Na-144, K-4.6, Cl-115, CO2-22, Mg-1.6, Gluc-107	BUN-19, Creat-1.30	WBC-20.2, Hgb-12.9, Hct-37.5, Plt-315	None
11	Na-139, K-4.1, Cl-102, CO2-29, Mg-1.7, Gluc-111	BUN-18, Creat-1.15	WBC-15.7, Hgb-14.0, Hct-39.9, Plt-244	None
12	Na-145, K-4.6, Cl-109, CO2-22, Gluc-118, Mg-1.8	BUN-22, Creat-2.00	WBC-8.9, HGB-15.6, HCT-45.6, PLT-284	CK-1644, CKMB-12.1
13	None	None	None	None
14	None	None	None	None
15	None	None	None	None
16	Na-141, K-4.1, Cl-106, CO2-23, Gluc-107, Mg-1.6	BUN-31, Creat-1.53	None	None
17	None	None	None	None

**Table 4. Treatment interventions for patients seen in the ED after the 2011/2012 Philadelphia Marathons**

Patient	IVF Hydration	PO Hydration	IV dextrose	Other
1	N/A (deceased)	N/A (deceased)	N/A (deceased)	
2	N/A (deceased)	N/A (deceased)	N/A (deceased)	
3	1 liter NS	None	None	
4	4 liter NS	None	None	
5	None	PO fluids	1 amp D50W (pre-hospital)	
6	None	PO fluids	1 amp D50W (pre-hospital)	
7	2 liter NS	None	None	ASA 162 mg PO
8	6 liter NS	None	None	
9	2 liter NS (1 liter pre-hospital)	None	None	
10	2 liter NS	None	None	Zofran 8mg IV, Benadryl 50 mg IV
11	2 liter NS	None	None	
12	4 liter NS, Ativan (pre-hospital)	None	None	
13	None	None	None	
14	None	None	None	
15	1 liter NS	None	1 amp D50W (pre-hospital)	Zofran 4 mg IV
16	1 liter NS	None	None	
17	None	None	None	Tylenol 650 mg PO

D50W, dextrose in water; IV, intravenous; PO, oral  
1 amp= 25 grams

### Article: Is Obesity a Risk Factor for Iron Deficiency Anemia?

Nay Tun, MD, Mariette Austin, MD  
Easton Hospital: Department of Medicine

#### ABSTRACT

**Objective:** Iron deficiency is thought to be more common in patients who have poor nutrition and low iron intake. However, there have been observations of an inverse relationship between body weight and iron saturation. Therefore, we are assessing whether Body Mass Index (BMI) can affect serum iron levels.

**Methods:** This is a retrospective case control study where 78 adult patients from age 18-98 years with iron deficiency anemia from Eaton Hospital in-patients as well as a community care clinic in Easton with regard to their body weight (i.e. BMI). Hemoglobin, serum iron, ferritin, iron binding capacity and iron saturation were measured and correlated with patients' BMI. Patients with any ongoing blood loss such as hematuria, severe menorrhagia, hematochezia or history of gastrointestinal bleeding including peptic ulcer disease, variceal bleeding, hemorrhoidal bleeding, diverticular bleeding, arteriovenous malformation were excluded. Patients who had inflammatory bowel disease, celiac disease, post-surgical malabsorption problems, gastric bypass surgery, gastrointestinal tract malignancy, chronic kidney disease, repeated blood donations, as well as pregnant patients were also excluded from the study.

**Results:** 67 female patients and 11 male patients aged 18-98 years with iron deficiency anemia were evaluated for BMI. 40 patients had high BMI (BMI =30) and 38 patients had low BMI (BMI<30). The median age was 55. The mean hemoglobin of patients in this study was 10.8g/dL. The mean iron level in the high BMI group was 40.6, versus 57.92 µg/dL in the low BMI group (p value=0.08). In addition, the mean ferritin level in the high BMI group was 76.92 versus 198.8 ng/ml in the low BMI group (p value=0.09), using the Welch two sample t-test. The mean TIBC was slightly higher at 352.8 µg/dL in obese patients whereas patients with a low BMI had a lower mean TIBC



---

at 312.72  $\mu\text{g}/\text{dL}$  (p value 0.06). Patients with a high BMI had a mean iron saturation of 11.25%, compared to a mean iron saturation of 18.71% in the low BMI group (p value 0.007).

**Conclusion:** In our study, obese patients (BMI=30) had a higher prevalence of iron deficiency anemia in comparison to patients with BMI<30, after excluding patients with potential blood loss or iron malabsorption. Therefore, BMI is a significant predictor of iron saturation.

## INTRODUCTION

Iron deficiency anemia is the most common anemia worldwide. Interestingly, overweight and obese children and adolescents are found to have a higher incidence of iron deficiency anemia (1-4). Overweight and obese children and adolescents have been shown to have higher hepcidin levels, and inadequate responses to oral iron therapy (5). Hepcidin produced from hepatocytes is one of the key regulators of iron hemostasis. Hepcidin inhibits expression of iron transporter, ferroportin, in enterocytes, macrophages and hepatocytes (6). Inhibition of ferroportin action results in iron sequestration in the enterocytes with diminished release of iron into the circulation, thereby decreasing iron absorption (7). Hepcidin levels are upregulated by inflammation and iron storage (8) but downregulated by anemia (9). Obesity triggers inflammatory response with increased release of cytokines and acute phase reactants in multiple organs (10). Obese patients are found to express higher levels of hepcidin (11). Therefore, we are assessing whether adult patients with high BMI (BMI=30) are more prone to develop iron deficiency anemia.

## METHODS

This is a retrospective study where 78 patients diagnosed with iron deficiency anemia either in inpatient or outpatient settings from August 2010 to November 2013 were chosen after excluding potential sources of bleeding or malabsorption. These patients' hemoglobin, iron, ferritin, iron saturation and total iron binding capacity were noted, in association with body mass index. Exclusion criteria included patients with chronic kidney disease, pregnancy, gastric bypass surgery, history of repeated blood donations, upper or lower gastrointestinal tract bleeding, inflammatory bowel disease, gastrointestinal cancer, colon cancer, hematuria, menorrhagia from gynecological problems, post-surgical malabsorption, celiac disease, and hemoptysis.

## RESULTS

A total of 78 patients (11 males and 67 females) aged 18-98 years were included in the study. 40 patients had a high BMI (BMI=30) while 38 patients represented the control group with a lower BMI (BMI<30). The median age was 55. Half of the = 55 years group were overweight (BMI 29.9) whereas the majority of adults in the <55 years group were obese (BMI 32.17), p = 0.24. Using the Welch two sample T test, the parameters for iron saturation were assessed along with the respective BMI or age group. The average iron level in age 18-54 years was 43.7 $\mu\text{g}/\text{dL}$ , whereas in 55 years or older patients, the mean iron level was 54.3 $\mu\text{g}/\text{dL}$  (p = 0.29). The mean ferritin level was higher in the older group at 225.88 ng/ml, and in younger patients it was significantly lower at 51.9 ng/ml (p = 0.01). The overall average iron saturation in age 18-54 years was 12.38% versus 17.18% in the older group (p = 0.07). TIBC was 363.4 $\mu\text{g}/\text{dL}$  in the <55 years group and 304.2  $\mu\text{g}/\text{dL}$  in the older group (p = 0.005). Although the average iron level in the high BMI group was 40.6  $\mu\text{g}/\text{dL}$  compared to the mean iron level in the lower BMI group of 57.9  $\mu\text{g}/\text{dL}$ , it was not significant (p = 0.08). In addition, although the ferritin levels were found to be higher in the low BMI group at 198.8 versus 76.92ng/ml in the high BMI group, this was also not a significant difference (p = 0.09). The average iron saturation was statistically significantly lower in the high BMI group versus the low BMI group. The latter had a mean iron saturation of 18.71% and the former had a mean iron saturation of 11.25% (p = 0.007). The mean TIBC in the high BMI group was 352.87 $\mu\text{g}/\text{dL}$  in comparison to 312.72  $\mu\text{g}/\text{dL}$  in patients with a low BMI group (p = 0.06). Using the regression model, we compared patient's age, sex and BMI to predict iron saturation. Controlling age and sex, BMI was a significant predictor of iron saturation (p = 0.006).

## DISCUSSION

Iron deficiency anemia is the most common anemia worldwide. The prevalence of iron deficiency anemia is estimated to be 2 percent in adult men, 9 to 12 percent in non-Hispanic white women, and nearly 20 percent in black and Mexican-American women in the United States (12). The etiology of iron deficiency anemia varies from inadequate iron intake to impaired iron absorption, to blood loss from the gastrointestinal tract. The majority of the causes of iron deficiency anemia are successfully treated with iron supplements and correcting the underlying causes of blood loss. However, in certain situations, iron deficiency anemia persists despite aggressive supplementation by oral or intravenous routes. Investigations of iron refractory iron deficiency anemia have been conducted (13). Problems with eradication of iron deficiency anemia (IDA) in the community despite readily available iron tests and

---

ease of iron supplementation have prompted investigation of other potential causes of iron deficiency anemia. Interestingly, there have been recent reports that obese children and adolescents with a high BMI (BMI 85-95% percentile) have a higher risk of developing iron deficiency anemia in comparison to children and adolescents with a normal BMI (14). This sparked our interest to look for whether any relationship exists between iron deficiency anemia and body mass index in adults. Using the Welch two sample t-test, our study indicated that mean iron saturation was approximately 7.5% lower in the high BMI group (BMI=30) compared to the low BMI group (BMI<30) with a  $p = <0.05$ . TIBC was higher in obese patients ( $p = 0.06$ ) although it was not statistically significant. Iron and ferritin levels were not significantly lower in obese patients both in inpatient and outpatient settings ( $p = 0.08$  and  $0.09$ ) respectively. In contrast, on controlling age and gender, BMI was found to have a significant impact on iron saturation ( $p = <0.05$ ) in the regression model. There are several hypotheses suggesting that obesity induces an inflammatory state, causing release of multiple inflammation markers including hepcidin. Hepcidin causes impaired iron absorption as it induces degradation of ferroportin and in turn, it decreases iron release from the enterocytes available to be absorbed in the body. Hepcidin is found to be expressed in liver and adipose tissue with high demand in an obesity-induced metabolic inflammatory state. In Sanad et al, obese children were found to have high serum hepcidin levels with inadequate response to iron therapy. In our study, 50% of the anemic patients were iron deficient with a mean hemoglobin of 10.8 g/dL despite being on iron supplements. It could be due to poor oral iron intake through the diet, noncompliance, need for more iron requirements due to high body mass index (15). This could also be due to a diminished response to iron supplements as a result of obesity-induced up-regulation of hepcidin, as a result of obesity-induced inflammatory responses.

#### CONCLUSION

Our findings in the study suggest that obesity can affect iron saturation. It is important to note that iron deficiency anemia in obese patients may be attributed to high body mass index, in addition to other common causes of iron deficiency anemia. It is therefore prudent to recommend weight loss in iron-deficient obese patients in the absence of other underlying causes of iron deficiency anemia.

#### REFERENCES

1. Pinhas-Hamiel O, et al. Greater Prevalence of Iron Deficiency in Overweight and Obese Children and Adolescents. *International Journal of Obesity* 2003;27:416-418
2. Wenzel BJ, Stults HB, Mayer J. Hypoferraemia in obese adolescents. *Lancet* 1962; 2:327-28
3. Seltzer CC, Mayer J. Serum iron and iron-binding capacity in adolescents: Comparison of obese and non-obese subjects. *Am J Clin Nutr* 1963;13:354-61
4. Nead KG, Halterman JS, Kaczorowski JM, Auinger P, Weitzman M: Overweight children and adolescents: a risk group for iron deficiency. *Pediatrics* 2004;114:104-8
5. Sanad M, Osman M, Gharib A. Obesity Modulate Serum Hepcidin and Treatment Outcome of Iron Deficiency Anemia in Children: A Case Control Study. *Italian Journal of Pediatrics* 2011;37:34
6. Kwapisz J, Slomka A, Zekanowska E. Hepcidin and its Role in Iron Hemostasis. *The Journal of the International federation of Clinical Chemistry and Laboratory Medicine*
7. Rossi E. Hepcidin-the Iron Regulatory Hormone. *Clin Biochem Rev* Aug 2005;26(3):47-49
8. Pigeon C, et al. A new mouse liver-specific gene, encoding a protein homologous to human antimicrobial peptide hepcidin, is overexpressed during iron overload. *J Biol Chem* 2001;276:7811-19
9. Nicolas G, et al. Severe iron deficiency anemia in transgenic mice expressing liver hepcidin. *Proc Natl Acad Sci USA* 2002;99:4596-601
10. Spencer M, et al. Adipose tissue macrophages in insulin-resistant subjects are associated with collagen VI and fibrosis and demonstrate alternative activation. *Am J Physiol Endocrinol Metab.* 2010;299(6):E1016-E1027
11. Bekri S, et al. Increased adipose tissue expression of hepcidin in severe obesity is independent from diabetes and NASH. *Gastroenterology* 2006;131:788-96
12. Killip S, Bennett J, Chambers M. Iron Deficiency Anemia. *Am Fam Physician* . 2007;75(5):671-678
13. Hershko C. Camaschella C. How I Treat Unexplained Refractory Iron Deficiency Anemia. *Blood.* 2014;123(3): 326-333
14. Nead KG, Halterman JS, Kaczorowski JM, Auinger P, Weitzman M. Overweight children and adolescents: a risk group for iron deficiency. *Pediatrics.* 2004;114:104-8
15. Cepeda-Lopez AC, Aeberli I, Zimmermann MB. Does obesity increase risk for iron deficiency? A review of the literature and the potential mechanisms. *Int J Vitam Nutr Res.* 2010;80(4-5):263-70

---

## Article: Posterior Scalp Melanoma: a Rare Location for a Common Skin Cancer

Aniket Sakharpe, MD\*, Pamela Chia\*\*, Leopoldo Baccaro, MD\*, Manthan Makadia, MD\*, Manny Iyer, MD\*, Jakub Wilhelm\*

\*Easton Hospital: Department of Surgery

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

### ABSTRACT

**Introduction:** The incidence of cutaneous melanoma is on the rise and now accounts for 77% of all skin cancer deaths. While 25% of cutaneous melanomas are found in the head and neck, only 3.6% are found in the scalp region. Because of this, few studies have looked specifically at melanoma of the scalp, often grouping scalp melanomas together with head and neck melanomas. Head and neck melanomas in general are associated with a poorer prognosis than melanomas of other areas of the body, and scalp melanomas specifically have been noted to have a lower 5 year survival than other areas of the head and neck. Neck dissection has been shown to control disease and improve the prognosis in some patients.

**Methods:** We present a case of scalp melanoma in a 70 year old male with a posterior scalp lesion who required a posterior neck dissection.

**Results:** The patient underwent a wide local excision of the defect that was closed with pinwheel local rotational skin flaps. He later went in for a posterior neck dissection that involved preservation of the spinal accessory nerve and has been disease free since the surgery.

**Conclusion:** This case underlines the usefulness of a selective posterior neck dissection as an appropriate measure to help control the spread of scalp melanoma.

### INTRODUCTION

The incidence of cutaneous melanoma is increasing exponentially (1). Melanoma is most commonly seen in Caucasians ages 30 to 60. UV radiation from sunlight and heredity are two important risk factors for the development of melanoma (2). Among all the cutaneous melanomas, 25% occur in the head and neck region, of which only 3.6% occur in scalp area. These are associated with a very high mortality rate (2,3). The 5 year survival for scalp melanoma has been observed to be 66.7%. In comparison, the face and neck is 81.8% (4). Most of the melanomas in the head and neck occur outside the scalp region, but patients with primary scalp melanoma have a mortality rate that is 44% higher than in patients with primaries on the face (2,5). We report a rare case of scalp melanoma in a patient who required a posterior neck lymph node dissection.

### CASE REPORT

A 70 year old Caucasian male presented with a lesion on his scalp in the occipital area. A punch biopsy at the dermatology office determined that the lesion was consistent for melanoma. The melanoma was Breslow stage II with a thickness of 1.03 mm and lymphovascular invasion. The margins were positive so a re-excision was recommended. His past medical history is significant for congenital heart disease, bladder carcinoma, prostate carcinoma, and diverticulitis. The patient underwent a wide local excision, with the defect measuring 4.0 X 3.5cm. The primary defect was closed with pinwheel local rotational skin flaps. A cervical sentinel node was biopsied from the left occipital area and stat imprint staining was negative. Pathological examination of the specimen failed to reveal residual melanoma, though scarring was found within 1.3cm from the margins of the resection. The sentinel lymph node, however, revealed a microscopic metastasis measuring 0.6mm on a routine section. Lymphangiography and a PET-CT showed uptake in the posterior scalp region (Figure 1a/b). The patient was then brought back for posterior neck dissection (Figure 1c). He underwent dissection in levels 2, 3, 4, and 5, including the sentinel biopsy site. The dissection started in level 5 of the posterior neck where the accessory nerve was identified and preserved (Figure 1d). The dissection continued to level 4 and the lymphatic tissues were dissected beneath the inferior aspect of the sternocleidomastoid. The anterior jugular vein and the carotid were then identified to dissect the lymphatics in the carotid sheath and over the internal jugular vein (Figure 1d). The dissection ended with levels 2, 3 and the sentinel node. The fourteen lymph nodes sampled failed to identify any malignant cells on routine sampling. Postoperatively the patient was discharged 1 day after surgery. The patient has been free of disease for more than 15 months as evidenced by PET-CT and clinical examination.

---

## DISCUSSION

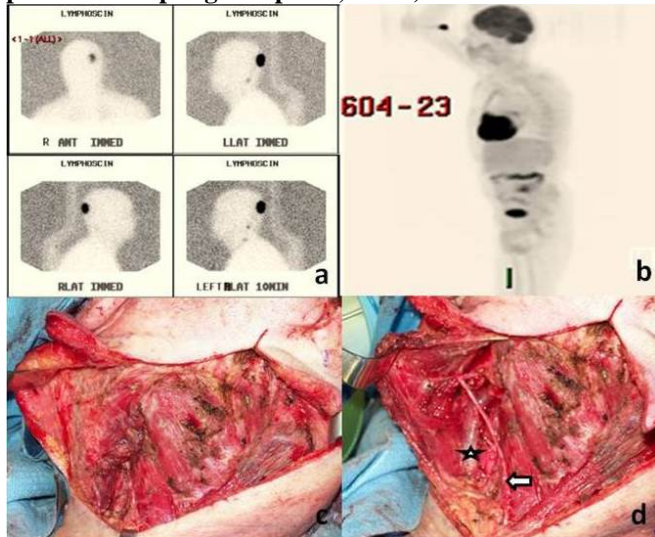
Cutaneous melanoma of the head and neck account for 12 to 25% of all cutaneous melanomas, yet this region only represents 9% of the total body surface (6). Few studies have examined the specific areas of melanoma in the head and neck region, making it difficult to appreciate the incidence of scalp melanoma. Though one study mentions the incidence to be 3.6% of all melanomas, the incidence of scalp and neck melanoma was twice as high in males as in females (6). Specifically for scalp melanomas, the incidence in males was 20 fold higher than in women (6,7). On all sites of the face except the ears, women were diagnosed with melanoma at a younger age. The median age of diagnoses in women was 49 years old. The diagnoses of scalp and neck lesions in men were about 12 years later (8). For the ears and the adjacent scalp and neck areas, there was a steady increase in melanoma occurrence in men compared to women. It seems that while scalp melanomas are rare, males over the age of 50 are at a higher risk of developing scalp melanoma. However, more studies are needed to elucidate the incidence of melanoma specifically in the scalp. It is widely accepted that UV exposure is linked to melanoma and correlations between the distribution of cutaneous melanoma and patterns of sun exposure suggest that melanoma is associated with areas of maximal sun exposure such as the ear and adjacent scalp and neck areas (8,9). A study by Lesage et al (2013) not only attempted to break down the prevalence of cutaneous melanoma in specific locations of the head and neck, but also tried to assess any differences in the distribution of cutaneous melanoma between men and women. Their study separated the head and neck into two areas: peripheral and central. The peripheral area contained the scalp, forehead, temple, ears and neck while the central area contained the eyelids, nose, cheeks, and area around the mouth and chin. Their study found that 56.7% of head and neck melanomas were located in the peripheral area in men and 79.3% in the central area in women. Additionally, of the head and neck melanomas found peripherally, 57.6% were on the left side of men and 73.1% were on the right side of women. Malignant melanoma of the head and neck has a poor prognosis, but neck dissection has been shown to improve survival in some patients (3,5). While prognosis is determined by Clark's level of invasion and Breslow's index for tumor thickness, surgical treatment is based on the location of the primary melanoma and the stage of the tumor. Posterior neck dissections, first described by Rochlin in 1962, were performed to resect lesions in the posterior scalp (10). Because the primary efferent lymphatics of the posterior scalp go to the posterior neck, it is possible to only need a posterior dissection if there is no metastasis to the anterior neck. A study by Sutton et al (2012) showed that primaries of the posterior neck and scalp metastasize to the occipital lymph nodes (levels 2-5) as well as to the postauricular and nuchal lymphatics in 2 of 6 patients. More extensive procedures such as radical neck dissection have been performed in the past, but they carry significant morbidity and complications such as injury to the facial and spinal accessory nerves (1). Selective dissections are considered more appropriate and now the standard of care. In conclusion, scalp melanomas are generally rare and their outcome is often poor. This case underlines the appropriate management of locally advanced posterior scalp melanoma and the usefulness of selective posterior neck dissection to help control the spread of disease in the patient.

## REFERENCES

1. Leong S. Role of selective sentinel lymph node dissection in head and neck melanoma. *Journal of Surgical Oncology*. 2011;104:361-368
2. Lind DS, Ahmed MI, DeGara C, Warneke J. Surgical oncology: malignant diseases of the skin and soft tissue. In: Lawrence PF (ed). *Essentials of General Surgery*. 5th ed. Philadelphia. Lippincott Williams & Wilkins;2013:505-530
3. Sutton P, Luksic D, Muller D, Virag M. Lymphatic drainage patterns of head and neck cutaneous melanoma: does primary melanoma site correlate with anatomic distribution of pathologically involved lymph nodes? *Int. J. Oral Maxillofac. Surg*. 2012;41:413-420
4. De Giorgi V, et al. The prognostic impact of the anatomical sites in the 'head and neck melanoma': scalp versus face and neck. *Melanoma Res*. 2012;22:402-405
5. Fisher SR. Elective, therapeutic, and delayed lymph node dissection for malignant melanoma of the head and neck: analysis of 1444 patients from 1970 to 1998. *The Laryngoscope*. 2002;112:99-110
6. Lesage C, et al. Sex-related location of head and neck melanoma strongly argues for a major role of sun exposure in cars and photoprotection by hair. *Journal of Investigative Dermatology*. 2013;133:1205-1211
7. Green AC, Kimlin M, Siskind V, Whiteman DC. Hypothesis: hair cover can protect against invasive melanoma on the head and neck (Australia). *Cancer Causes Control*. 2006;17:1263-1266
8. Bulliard JL. Site-specific risk of cutaneous malignant melanoma and pattern of sun exposure in New Zealand. *Int. J. Cancer*. 2000;85:627-632
9. Elwood JM, Gallagher RP. Body site distribution of cutaneous malignant melanoma in relationship to patterns of sun exposure. *Int. J. Cancer*. 1998;78:276-280

10. Fisher SR, Cole TB, Seigler HF. Application of posterior neck dissection in treating malignant melanoma of the posterior scalp. Laryngoscope. 1983;93:760-765

**Figure 1. a) Lymphangiography showing contrast uptake in the scalp and posterior neck, b) PET-CT showing posterior scalp region uptake, c & d) Posterior neck dissection and identified carotid and jugular**



---

### Article: Splenic Artery Embolization for Post Gastric Bypass Marginal Ulcer

Aniket Sakharpe, MD\*, Jakub Wilhelm, MD\*, Omkar Baxi\*\*, George Ibrahim, MD\*, Leo Baccaro, MD\*, Manzur Haque, MD\*, Artun Aksade, MD\*

\*Easton Hospital: Department of Surgery

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

#### ABSTRACT

The popular treatment for morbid obesity, the roux-en-y gastric bypass, is safe and effective but can be complicated by the development of marginal ulcers at the anastomotic sites. Typically, these ulcers can be managed medically though rarely, these ulcers may erode into underlying vessels and lead to significant gastrointestinal bleeding. The bleeding is managed by endoscopic intervention or surgical exploration depending on severity. This report describes a unique case of short gastric artery bleeding with failure of endoscopic management. Interventional radiology guided arterial embolization was used to control the bleeding providing a valuable alternative to surgery in bleeding marginal ulcers

#### INTRODUCTION

The frequency of bariatric operations is increasing due to the epidemiology of obesity and the wider indications for the procedures. One of the most effective and common bariatric operations is laparoscopic roux-en-y gastric bypass (RYGB). While this operation is generally safe and effective, one of its most common complications is marginal ulceration at the gastro-jejunal anastomosis which affects 0.6 to 16% of patients (1). Marginal ulcers are usually treated medically with proton pump inhibitors and sucralfate. However, an untreated ulcer can eventually perforate into the underlying vessel and lead to a severe gastrointestinal (GI) bleed. GI bleeding represents a therapeutic challenge in the RYGB patient, but treatments include endoscopic intervention and surgical exploration based on patient presentation. The utility of interventional radiology (IR) in this treatment ladder has been suggested, but to our knowledge, has not been investigated (2). We describe the case of short gastric arterial erosion by marginal ulcers in RYGB successfully managed by IR embolization after failure of endoclipping.

#### CASE REPORT

A 62 year old Caucasian woman, six months post roux-en-y gastric bypass at an outside facility, was admitted to the ICU for severe upper GI bleeding. She presented with a one day history of hematemesis and melena. Her medical

---

history included hypertension, morbid obesity, cholecystectomy and roux-en-y gastric bypass. On admission, the patient denied any abdominal pain, shortness of breath, or chest pain but admitted to some lightheadedness and dizziness. She also reported chronic NSAID and aspirin use discontinued one week previously. On examination, she was hypotensive without orthostatic changes. She had dry mucosal membranes and mild pallor but the physical exam was otherwise unremarkable. The blood work revealed severe anemia with hemoglobin of 7.5mg/dl (baseline of 10-12). She was admitted to the medical ICU for severe upper gastrointestinal bleeding secondary to suspected ulceration and resuscitated with 2 units of RBC and 2L of IV fluids. A bedside EGD identified a 2cm ulcer at the gastro-jejunal anastomotic site with a briskly bleeding perforated vessel (Figure 1A). Four clips were applied and 10ml of epinephrine were injected into the bleeding vessel to control the bleeding (Figure 1B). Despite immediate hemostasis as observed on the EGD, the patient developed recurrent severe bleeding a few hours after the procedure and required 3 units of RBC for stabilization. The decision was made to achieve control of bleeding through IR guided interventions. Emergency angiography revealed prominent extravasation from the short gastric artery branches into the roux limb of the jejunum (Figure 1C). At this point, the patient became unstable and the systolic blood pressure dropped to 47mmHg. She was aggressively resuscitated with fluids, four units of RBC and 4 units of FFP while an operating room was kept on standby for emergency surgery if required. The splenic artery was entered using a Simmons One catheter directed toward the celiac bifurcation. A 018 glidewire and 3-French micro catheter was used to access the extravasating upper pole vessels from the splenic artery. Placement of two 5mm embolization coils just proximal to the endo-clips on the splenic artery demonstrated a cessation of bleeding (Figure 1D/E) and resulted in an immediate rise of systolic blood pressure from 47mmHg to 90mmHg. Post-procedure, the patient had one episode of melena but no further hematemesis. An EGD performed a day after embolization showed a stable clot without any active bleeding (Figure 1F). Serial exam and hemoglobin monitoring showed that the patient had stabilized and she was discharged four days after embolization on routine ulcer treatment. Follow-up EGD at 1 month showed that the ulcer was healing well, reduced to 5mm without any acute bleeding.

## DISCUSSION

GI bleeding is an uncommon but feared complication of RYGB. Early bleeding, defined as bleeds within 30 days of surgery, is typically due to leakage from anastomotic sites. Late bleeding, which occurs after 30 days, is most commonly due to bleeding marginal ulcers (4). These ulcers frequently occur at the anastomotic sites with a prevalence of 0.6 to 16% in RYGB patients. The exact pathophysiology leading to the ulcers remains unclear but several factors including *H. pylori*, smoking, and diabetes have been implicated (3,4). The role of NSAIDs as a risk factor for marginal ulcers has not been definitively proven; however, in the case presented above, NSAID use is likely to have contributed to the severity of the ulcer and GI bleed (2,3). One of the leading theories argues that the lack of Brunner's glands in the jejunum makes its mucosa susceptible to damage from the acidic stomach contents. This theory is supported not only by anatomic evidence, but also the correlation of increased acid load and ulcer prevalence – gastro-gastric fistulas which presumably increase acid content are associated with increased marginal ulcers (3). This theory has largely guided the treatment of marginal ulcers, which are managed similarly to peptic ulcer disease. Standard therapy includes proton-pump inhibitors and sucralfate to promote healing of the mucosa. The major health risk arising from marginal ulcers is the possibility of erosion into the underlying artery and development of severe, life threatening GI bleeds, as seen in this patient. Typically, the left gastric artery is involved in ulcer erosion, but our case indicates that in some cases, the short gastric branches may also be eroded if they are preserved in surgery. The location of ulceration and bleeding can be approximated based on history: gastro-jejunosomy ulcers typically present with hematemesis and melena, jejunojejunosomy ulcers present with hematochezia, and gastric remnant ulcers may present with melena (4). Anemia on blood work should not immediately guide treatment since bariatric patients are frequently chronically anemic. However, patients with symptomatic bleeds should undergo endoscopic evaluation to identify the source of bleeding and guide therapy. The remnant stomach and biliary-pancreatic limb should be suspected when an obvious source of bleeding cannot be seen (8). While the ulcers and small bleeds may be managed conservatively with transfusions, severe GI bleeds are best managed through surgical approaches (4). EGD offers the ability to evaluate the bleed and also undertake corrective measures such as endoclipping, electrocautery, and epinephrine injection.

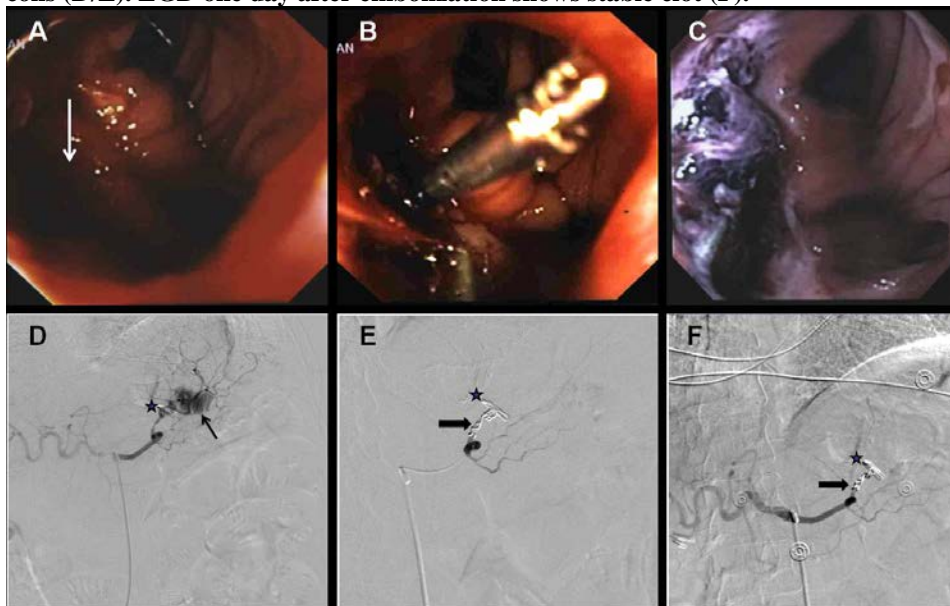
Unfortunately, the severity of some cases leads to failure of EGD interventions, as seen in the reported case. Typically, the failure of the endoscopic approach leads to surgical exploration, either through laparoscopic or open techniques (2,4). If the bleeding cannot be controlled by routine surgical means, alternatives include resection of the ulcer, revision of the anastomosis, or even reversal of the bypass (8). While these interventions are definitive, they are much more invasive, carry risks that may not be appropriate for the critically ill bleeding patient. In addition, the surgical corrections compromise the efficacy of the original RYGB. While that is a clearly acceptable sacrifice in

light of severe hemorrhage, an intervention that corrects bleeding and also spares the RYGB would be advantageous. Recently, IR techniques have increasingly been suggested to fill the gap between endoscopic and surgical indications for GI bleeds in peptic ulcer disease (7). IR embolization of the feeding artery can immediately decrease blood flow and lead to rapid patient stabilization. These techniques have been reported to have outcomes similar to surgery with lower complication rates (5-7). The primary ulcer can then be managed by medical and endoscopic techniques to prevent further bleeding. While arterial embolization has been accepted for treatment in peptic ulcer bleeding, its use has not been investigated in post-bariatric patients. This disparity may be due to the complicated nature of bariatric patients, both in clinical severity and altered anatomy. However, the case above shows that IR embolization is a viable therapeutic option for GI bleeding in patients with RYGB and should be considered as an alternative to surgery after failure of endoscopic interventions.

#### REFERENCES

1. Azagury DE, Dayyeh BK, Greenwat IT, Thompson CC. Marginal ulceration after roux-en-y gastric bypass surgery: characteristics, risk factors, treatment, and outcomes. *Endoscopy*. 2011;43:950-954
2. Heneghan H, et al. Incidence and management of bleeding complications after gastric bypass surgery in the morbidly obese. *Surgery for Obesity and Related Diseases*. 2012;8:729-735
3. Rasmussen J, Fuller W, Ali M. Marginal ulceration after laparoscopic gastric bypass: an analysis of predisposing factors in 260 patients. *Surgical Endoscopy*. 2007;21:1090-94
4. Rabl C, et al. Early and late abdominal bleeding after roux-en-y gastric bypass: sources and tailored therapeutic strategies. *Obesity Surgery*. 2011;21:413-20
5. Katano T, et al. The efficacy of transcatheter arterial embolization as the first-choice treatment after failure of endoscopic hemostasis and endoscopic treatment resistance factors. *Digestive Endoscopy*. 2012;24:364-9
6. Wong T, et al. A comparison of angiographic embolization with surgery after failed endoscopic hemostasis to bleeding peptic ulcers. *Gastrointestinal Endoscopy*. 2011;73:900-8
7. Barkun A, Bardou M, Kuipers E. International consensus recommendations on the management of patients with nonvariceal upper gastrointestinal bleeding. *Annals of Internal Medicine*. 2010;152:101-13
8. Hamdan K, Somers S, Chand M. Management of late postoperative complications of bariatric surgery. *British Journal of Surgery*. 2011;98:1345-55

**Figure 1. Evaluation and treatment of severe upper GI bleed from a perforated ulcer. A bedside EGD revealed bleeding at the gastrojejunostomy (A) that was clipped and injected (B). Emergency angiography revealed extravasation from short gastric artery (C). Cessation of bleeding after placement of embolization coils (D/E). EGD one day after embolization shows stable clot (F).**





---

## **Article: A Preliminary Retrospective Study of the Epidemiologic Characteristics of Pediatric Iron Deficiency Anemia in a Large Well Child Clinic in New Brunswick, New Jersey, USA**

Jaishree Ramachandran, MD, Maheswari Arumugam, MD, Kamaldeep Grewal, MD, Erika Mehta, The Tiong, MD  
Saint Peter's University Hospital: Department of Pediatrics

### **ABSTRACT**

**Objective:** To assess the epidemiological features of children who are most vulnerable to the adverse neuro-cognitive effect of iron deficiency/ anemia in a large urban well child clinic in central New Jersey.

**Method:** Retrospective review of 50 charts of patients, less than 4 years of age with iron deficiency anemia.

**Results:** The mean age of diagnosis is 21 months (i.e. < 2 year), with a slight (3:2) male predominance. The majority are Hispanic Christians residing in New Brunswick. Fifty-eight percent were omnivore and 66% were already taking a multivitamin supplement. Patients with IDA secondary to excessive consumption of non-formulary cow's milk drank twice the amount of milk as compared to patients with IDA not caused by high milk ingestion (78 ml/kg/day vs 36 ml/kg/day, t-test, t=5.6, df=20, p<0.0001). Ninety-four percent of the patients were asymptomatic at the time of diagnosis. Eighty-five percent of the diagnosis was made presumptively solely based upon the complete blood count indices alone without iron studies. In our data, both wasting and adiposity was observed to be a risk factor for Iron deficiency anemia.

**Conclusions:** Iron deficiency anemia is grossly under-reported. There appears to be an increased need for iron supplementation at 18-25 months of age due to excessive milk intake. An efficient diagnostic algorithm for diagnosing and treating iron deficiency in the clinic is identified. Patients at the 85th centile weight for height are found to have the highest hemoglobin concentration.

### **INTRODUCTION**

In United States, about 9 percent of toddlers are estimated to have iron deficiency (ID), with 2 to 3 percent having iron deficiency anemia (IDA) (1,2). Having ID in this early age negatively affects the pre-school age child's psychomotor, cognitive and socio-emotional development with persistent delays, some of which may be irreversible (3,4). Because of this, United States Department of Health and Human Services has set a target of reducing iron deficiency by 10 percent by 2020. Reaching this goal requires knowledge of the local communities' at risk populations, diagnostic and treatment practices. The investigators hereby present their preliminary findings in the New Brunswick area in Central New Jersey.

### **METHODS**

After obtaining Institutional Review Board approval (St. Peter's University Hospital and Health System CPHSR Study # 13:20), the billing database was queried for pediatric patients, age 4 or less, in the past 7 years (2005-2012), who were diagnosed with the ICD-9 CM codes 280.1 (IDA due to inadequate dietary iron intake) and 280.9 (IDA, unspecified) during their routine well child visit at the outpatient clinic. Charts were reviewed to identify patient's age, sex, ethnicity, religion, ZIP code, dietary history, anthropometry measurements (height, weight, head circumference), laboratory parameters (Hemoglobin {Hb}/ Hematocrit{Hct}, Mean Corpuscular Volume {MCV}, Red cell Distribution Width {RDW}, Mean Corpuscular Hemoglobin Concentration {MCHC}, Serum Iron {Fe}, Serum Ferritin, Percentage Saturation of Iron, Total Iron Binding Capacity), diagnostic strategy and treatment. The data were then analyzed using Stata version 12.

### **RESULTS**

A total of 50 IDA patient charts were available for review.

**Demographics:** Patients ranged in age from 2 – 40 months with a mean age of 21 months with a slight (3:2) male predominance. Ninety-five percent of the patients were between the ages of 18-25 months. Ninety-two percent were Hispanics. Eighty-four percent were Christians. Sixty-two percent resided in the same zip code 08901 as the clinic. This is likely representative of the population in our catchment area. Eleven (22%) were ex-premies, but their age at time of diagnosis of IDA is not significantly different from non-premies (22.5 vs. 19.8 months, t=0.954).

**Anthropometric parameters:** The weight for age, height for age, and head circumference for age percentiles clustered closely around the 50th percentile. The ex-premies in the group had a tendency for lower weight for age

---

(z-score wt/age = -0.64 vs. 0.17,  $t = -1.5$ ,  $df = 35$ ,  $p < 0.08$ ).

**Dietary patterns:** Fifty-eight percent of the patients were omnivore with only six percent being vegan. Sixty-six percent were already taking a multivitamin supplement at time of diagnosis. Seventy-eight percent of patients were consuming non-formulary cow's milk with an average consumption of 55 ml/kg/day. But, those diagnosed with IDA due to excessive consumption of milk took twice the amount of milk as compared to patients with IDA not caused by high milk ingestion (78 vs 36 ml/kg/day,  $t = 5.6$ ,  $df = 20$ ,  $p < 0.0001$ ).

**Laboratory parameters:** Ninety-four percent of the patients were asymptomatic at the time of diagnosis. Eighty-five percent of the diagnoses were made presumptively solely based upon the complete blood count indices alone, using a diagnostic algorithm as shown in Figure 1. No iron studies were done in these cases, and IDA was confirmed by an improvement in complete blood count indices after iron therapy. In the diagnostic algorithm shown in Figure 1, the high variability in hemoglobin (6 – 13 g/dL), MCV (51-75 fL), RDW (15-30%), and Mentzer Index (9-23) were all used to differentiate IDA from other cause of anemia. The MCHC had too low a variability to be useful as a good differentiator for IDA. No patient had a high lead level.

**Correlations of hematological to anthropometric parameters:** Due to the non-Gaussian distribution of the weight for age (waus), weight for height (whus), height for age (haus) anthropometric parameters, these were converted to z-scores of the standardized 2000 CDC growth charts using the Stata commands contained in zanthro(package dm0004\_1 from <http://www.stata-journal.com/software/sj13-2>).

(a) Multiple linear regression analyses showed that the Hemoglobin concentration was highly statistically significantly correlated with both the MCV and the z-scores of the wt/ht ( $Hb = 0.13 \text{ MCV} + 0.37 \text{ zwhus} + 1$ ,  $n = 41$ ,  $r\text{-squared} = 0.42$ ,  $p < 0.0001$ ). The positive coefficients of the multi-regression equation showed the multiplication factor that, each of the independent co-variants (MCV or zwhus) increased the Hb as it increased, while the other co-variant is held constant. Figure 2 illustrated that as the patient's wt/ht levels is held fixed at -3, 0, 3 z-scores, Hb is positively correlated to the MCV. Thus, at each level of wt/ht, as the MCV goes up so does the Hb; and more importantly as the MCV goes down, so does the Hb, i.e. the IDA worsen. Furthermore, as the MCV is held fixed, the Hb decreased as the wt/ht is decreased.

(b) The result in (a) would seem to contradict the statistically significant negative correlation between MCV and z-scores of the wt for height ( $MCV = 64.8 - 1.6 * \text{zwhus}$ ,  $n = 41$ ,  $R\text{-squared} = 0.13$ ,  $p < 0.02$ ), shown in Figure 3.

(c) There is a negative quadratic relationship between hemoglobin concentration and the z-scores for weight for height ( $Hb = 9.49 - 0.143 \text{ zwhus}^2$ ,  $n = 41$ ,  $p < 0.03$ ) shown in Figure 4. The hemoglobin concentration peaked at one (1) z-score of weight for height above zero (i.e.: ~ 84th percentile wt/ht). As the weight for height drops below 84th percentile and the child get leaner and wasted, the Hemoglobin concentration drops, thus explaining relationship in Figure 2. At the other extreme, as the weight for height increased beyond the 85th percentile, and the child gets fatter and obese, the MCV and Hemoglobin concentration also drops explaining the relationship shown in Figure 3. MCV in IDA is low at lower weight for height. MCV increases with increase in weight for height. But in our study population we observed that beyond the 84th percentile for wt/ht, MCV showed a drop with increase in weight for height, implying a worsening of the IDA in overweight and obese children as their adiposity increased. ID worsen in both extremes of weight for height.

**Treatment:** All patients were treated with oral iron supplementation. Ninety-six percent received additional multivitamin supplements. Majority of those with IDA due to excessive milk consumption received instructions to reduce milk consumption. Only eight percent were transfused with packed red blood cells; all had other major comorbidities such as pneumonia, septic shock etc.

## DISCUSSION

Despite the small number of study patients, the study does identify certain unique characteristics of the vulnerable population living in the area. The characteristics of the vulnerable population attending the clinic are 1] Hispanic, 2] Christians, 3] between 18-25 months of age, 4] Male > female, 5] living in the zip code 08901 (New Brunswick), 6] taking a large amount of non-formulary milk, 7] ex-premies, and 8] at extremes of the weight for height percentiles (either wasted or obese). Our data suggested that in term of anthropometric measurements, the hemoglobin concentration distribution is slightly skewed to the left, with a peak on the 85th centile weight for height and then a gradual drop off at either ends of the weight for height distribution curve. More interestingly, our study showed that being asymptomatic, being in the 50th percentile weight for height, being an omnivore, and taking multivitamins is not a deterrent from being iron deficient. Our data suggests that though 66% of our population was taking

multivitamins that meets the minimum daily requirements of iron, the 18-25 month age group has an increased requirement for iron supplementation, perhaps due to excessive cow milk consumption. The dosage of multivitamins routinely given may be appropriate and protective when these children were infants, but as they get older, they need increased dosage, on a body weight basis, of iron supplementation in their multivitamins. Perhaps this may be the explanation why the ex-premies became anemic at a slightly older age (22.5 vs. 19.8 months), since extensive statistical analysis of the data showed that the only difference the ex-premies vs. non-premies, at this age group, is that the premies have a lower weight for age. The diagnostic algorithm employed by the clinician to identify and treat IDA appears to be cost effective. This study was undertaken in a large urban outpatient clinic in the central New Jersey area served by the St. Peter's University Health System. This clinic sees approximately 32,000 patient visits per year. The fact that our billing database identified only 50 patients with IDA suggests gross under-reporting. The authors performed a post-study random sampling of 200 patients attending the clinic and using the diagnostic algorithm shown in Figure 1 have identified the prevalence of IDA to be of about 10% in the clinic. This figure approximates the data given by the Department of Health and Human Services nationally (1,2).

The American Academy of Pediatrics currently suggests universal laboratory screening for ID at approximately one year of age (5). This is particularly important in populations with increased risks for ID, including communities with low-income levels (like those who receive support from the Women, Infants and Children [WIC] program), immigrants, infants with inadequate nutrition, ex preterm/ low birth weight, children with special health needs (chronic infection, inflammatory disorders, chronic gastrointestinal dysfunction, restricted diets). Given the large amount of non-formulary cow's milk consumption in our population, a focused dietary history of milk consumption may be one of the important screening tools.

IDA is a common pediatric problem with potential for long lasting complications that can lead to significant morbidity and accrued health care cost. Given the fact that our vulnerable population is in the 18 – 25 months age group, it illustrates the importance of primary care provider's role in appropriately screening children for ID/IDA at 12 months of age as recommended by American Academy of Pediatrics and treating them appropriately to prevent the detrimental neuro-developmental outcomes.

## REFERENCES

- Centers for Disease Control and Prevention, National Center for Health Statistics. National Health and Nutrition Examination Survey. Available at: [www.cdc.gov/nchs/nhanes.htm](http://www.cdc.gov/nchs/nhanes.htm). Accessed September 29, 2008
- Cusick SE, et al. Unexplained decline in the prevalence of anemia among US children and women between 1988–1994 and 1999–2002. *Am J Clin Nutr.* 2008;88:1611–7
- Lozoff B, Jimenez E, Smith JB. Double burden of iron deficiency in infancy and low socioeconomic status: a longitudinal analysis of cognitive test scores to age 19 years. *Arch Pediatr Adolesc Med.* 2006;160:1108–13
- Bruner AB, Joffe A, Duggan AK, Casella JF, Brandt J. Randomized study of cognitive effects of iron supplementation in nonanemic iron-deficient adolescent girls. *Lancet.* 1996;348:992–6
- Baker RD, Greer FR, Committee on Nutrition American Academy of Pediatrics. Diagnosis and prevention of iron deficiency and iron-deficiency anemia in infants and young children (0-3 years of age). *Pediatrics* 2010;126:1040-50

Figure 1.

Figure 1: Diagnostic Algorithm

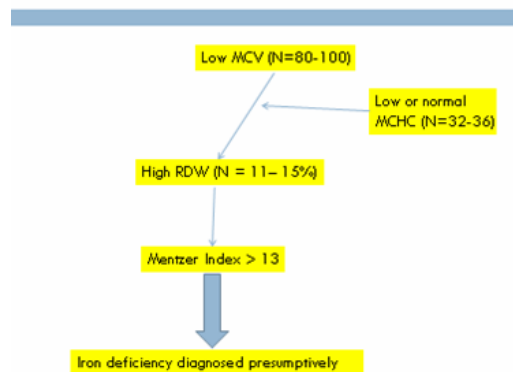
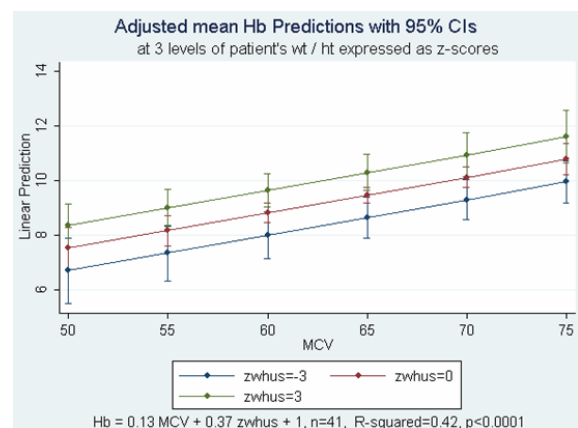
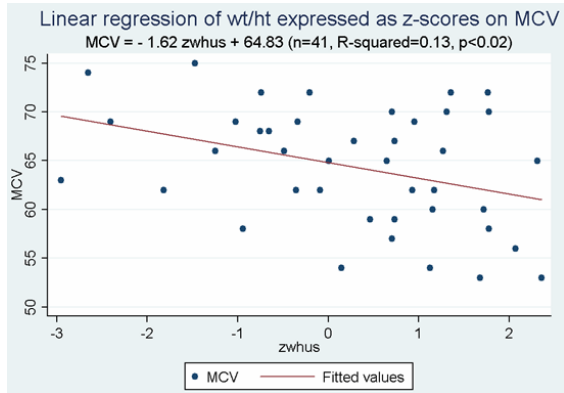


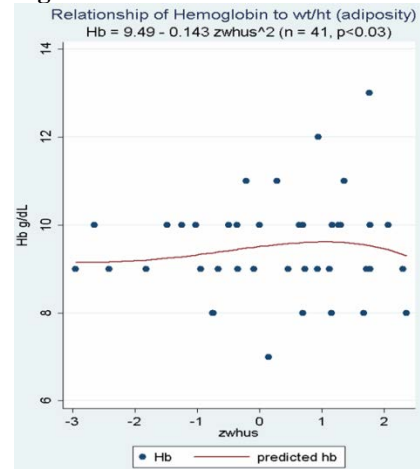
Figure 2.



**Figure 3.**



**Figure 4.**



---

## Medical Essay: An Essay on the PPACA

Sameul Hanif, MD

Drexel University College of Medicine: Department of Radiology

After years of well publicized quarrel in Washington DC, HR 3590 was passed as the Patient Protection and Affordable Care Act (PPACA), colloquially known as “Obamacare.” The bill was met with a general sense of hesitant optimism. It is generally agreed that the existing system was inadequate and sweeping changes were necessary – but no one was certain how to proceed. The bill was primarily sponsored by Representative Charles Rangel from New York and was well publicized (and criticized) for its mandates on individual citizens. Opponents of the law fired from a long list arguing points and insisted that the law encroached on the constitutional freedoms of each individual (an accusation that was overruled by the Supreme Court). Every medical student, resident, and physician should be well educated in the business and structure of healthcare, if not for the simple reason that it is the basis of their career and livelihood. This article seeks to clarify some important points of the PPACA.

The status quo of healthcare in America prior to the PPACA was that it was a troubled business, fraught with problems of poor revenue, over-spending, unregulated practice, and disheartening stories from Americans who suffered from the consequences. “Bodies were saved but lives were lost” was the common saying among doctors who would work tirelessly to save patients from near-death, only to watch them suffer tremendous financial burdens. Ethically, the services offered by doctors and nurses are not withheld simply because a person can’t pay, unlike, for example, the sale of car at an auto dealership. Those who couldn’t pay, or approximately 47 million Americans, were left without healthcare coverage entirely and relied primarily upon ER’s, carefirst clinics, mental health hospitals, and street medicine for their healthcare. Their medical problems were paid for by a hodgepodge system of local, state, and federal grants along with non-profit organizations and pro bono work from physicians. Those that could afford insurance also faced the expensive and confusing dilemma of dealing with their insurance companies. Private insurance companies frequently contested reimbursements to doctors and patients, penalized the sick by denying coverage, and limited amounts of lifetime reimbursement. Until the passage of Obamacare, these companies were uncontested in these practices. The only system of healthcare which, ironically, was applauded as efficient and least problematic was Medicaid and Medicare, the government-run healthcare programs for the eligible poor and elderly Americans.

Today, the healthcare industry has been restructured by the new law, and will be reorganized in stages as if a consulting firm were hired to audit and rearrange the practice. Changes will be made to how an individual gets insurance, visits a physician, receives care, and pays for it. It will also adjust how insurance firms handle their side of the practice, from how they will pick an individual to insure and how they will pay these individuals and doctors/hospitals for services rendered. Finally, the actual practitioners (doctors) will also be directly affected, as they will be monitored and scored with quality assurance measures, or report card, for patients to see so they may act as a proper consumer. This model is otherwise known as PQRS, or Physician Quality Reporting Service, and contains payment incentives for better performance.

An important term to understand in the healthcare process is the Accountable Care Organization, or ACO. This entity is assigned a group of about five thousand Medicare patients, and is responsible for managing their costs related to healthcare. If there is an opportunity for profit, the ACO may capitalize accordingly. These organizations have begun to function under “fee for service” payments. This model pays each study and treatment as a fixed cost, as if it was a menu at a restaurant (albeit with several caveats). This process rewards quantity over quality, although there are measures in place to ensure that over-testing is not performed. One of the measures includes the creation of the Center for Medicare and Medicaid Innovation which has funded research studies to ensure ethical and appropriate use of resources. There is also a trend towards the “bundled payment” model, which pays hospitals and doctors a fixed amount for treatment of a specific “event” or cause for a hospital stay. This method rewards judicious use of healthcare testing and a low complication and readmission rate. This seems logical, but medical students and young physicians should understand the implications of this structured plan: if patient John Doe is hospitalized for a complaint of pneumonia, their total reimbursement will be bundled as X amount to the hospital and all of those who provided care (X amount was pre-determined through research cost analysis, which assigned an average dollar amount for treatment, with consideration of cost domestically and abroad). Now, if during the hospital stay John Doe mentions a complaint of knee pain, unrelated to his reason for admission, and receives expensive diagnostic tests for the complaint, they (the insurance company) will not reimburse for this unrelated,

---

non-emergent issue. Take this in comparison to the traditional Managed Care Organization, created in 1973 (another form of health care management, which encompasses several different forms of healthcare delivery), which pays according to a process called capitation. This model takes a group of patients and pays a fixed amount to the healthcare providers per patient, per unit of time, regardless of whether they received care or not. This model fails to address the discrepancy of patients whose care costs nothing (healthy population) or those patients whose care costs astronomically more (chronically sick, usually underprivileged).

An exhaustive review of the PPACA is beyond the scope of this article. It is important for medical students and young physicians to understand certain terms, processes, and acronyms as they relate to the dynamics of healthcare and to know the key points of disparity between proponents and opponents of the plan. The existing program was tremendously disjointed and did not demonstrate efficient workflow for the patient, doctor, or insurer. The PPACA is not perfect, but will hopefully alleviate some of these deficiencies.

---

## **Review Article: A Unique Case of Vaginal Foreign Body Leading to Rectovaginal Fistula in an Adolescent Female - A Case Report and Review of Literature**

Jasmine Gujral, MD, Susan Brill, MD  
Saint Peter's University Hospital: Department of Pediatrics

### **CASE REPORT**

A 14 year old girl presented to well child clinic with a 5 month history of multiple complaints. She reported fatigue, intermittent fevers, loss of appetite, 50 lb weight loss, lower abdominal pain, foul smelling vaginal discharge (for which she had been using sanitary napkins everyday), intermittent dysuria and occasional blood in her stool. She had regular menstrual cycles. The patient also complained of feeling anxious and depressed for the past few months and difficulty falling asleep at night with early morning awakenings. She had been seen at two local emergency rooms and was diagnosed with urinary tract infections and yeast vaginitis. She was treated with oral antibiotics one month prior to the current visit.

Social history was significant for some 'stress' in the family a few months ago; she had recently moved into the area. She reported feeling safe at home and school, had a 'normal' relationship with her mother and mother's partner who lived with the family. The patient was in 9th grade in school and was doing 'okay' and had a few friends. She denied any smoking, alcohol or drug abuse. She also denied any sexual activity or inappropriate touch when asked alone.

On exam, patient had stable vitals but appeared anxious. There was some pallor and eczematous lichenified patches noted on skin. Her physical exam was otherwise normal. On genital exam, there was yellow, blood stained, foul smelling vaginal discharge on the sanitary pad. When the interior vagina was inspected with labial traction there was a plastic foreign body noted about 2 cm interior to the introitus. It was a firm plastic curved object. She had marked discomfort when the examiner tried to remove it. On repeated questioning, the patient denied any sexual activity, rape, trauma or any introduction of a foreign body. She could not explain how the object could have been there. Lab work showed normal complete blood counts and complete metabolic profile. The erythrocyte sedimentation rate was 34mm/hr and C-reactive protein was <5 mg/L. Urinalysis was positive for leukocyte esterase. The urine culture was positive for E.coli, 50-100,000 cfu/ml. HIV antibody screen, rapid plasma reagin, Gonorrhea and Chlamydia transcription mediated amplification (TMA) RNA tests were negative. MRI of the pelvis showed presence of a hollow cylindrical foreign body within the vagina with lobulated soft tissue protruding into the lumen of the foreign body and hypertrophied and inflamed vaginal mucosa (Figure 1).

The patient was taken to the operating room and examined under anesthesia. The foreign body was seen and found to be embedded in the vaginal tissue with extensive tissue surrounding it and was incised and evacuated using ring forceps. It was a plastic cup/cap with three cuts in the wall, measuring 4.5 cm in length and 4 cm in diameter. There was also a discovery of 3 cm, midline, recto-vaginal fistula and a primary repair was done. The pathology of the excised vaginal wall tissue had evidence of chronic inflammation and granulation tissue; the rectal mucosa also showed inflammation and reactive fibrosis which confirmed the diagnosis of a recto-vaginal fistula. The patient was treated postoperatively with analgesia and antibiotics; her course was uneventful. Social services and child protection services were consulted and the Division of Child Protection and Permanency (DCPP), New Jersey was contacted because of strong suspicion of abuse. The case is under DCPP investigation at present.

### **DISCUSSION AND REVIEW OF THE LITERATURE**

Symptoms secondary to a vaginal foreign body are responsible for approximately 4% of pediatric gynecologic outpatient visits. The majority of foreign bodies are found in girls between 3 and 9 years of age. The most common foreign bodies are small wads of toilet paper. Other common foreign objects in the younger age group include small, hard objects such as hairpins, parts of a toy, tips of plastic markers, crayons, and sand or gravel (1). Commonly found foreign objects among adolescents are tampons, sex toys, condoms and bottle caps. Because of the low density of nerve endings in the upper two thirds of the vagina, females are sometimes unable to determine the presence of a foreign body in this area. This explains how a "forgotten tampon" may remain unnoticed for several days in the upper vagina until its presence results in a symptomatic discharge, abnormal bleeding, or odor (1).

In the younger age group, foreign bodies may be inserted because the genital area is pruritic or as a result of curiosity and exploration. Children may also have accidental insertion due to vigorous wiping with toilet paper (1).



---

In adolescents, a foreign body may be used for menstrual purposes (tampons), sexual gratification or abuse by an assailant. Girls with vaginal foreign bodies should be evaluated for possible sexual abuse (2).

The vaginal foreign body can present with diverse symptoms depending on the age of patient, nature of foreign body, mode of insertion and length of retention. The classic symptom is a foul, bloody or non- bloody vaginal discharge. The most frequent other symptoms in these and other reported cases are: pain in the lower abdomen and supra-pubic region, increased frequency of urination, dysuria and dyspareunia (in sexually active adolescents) (3). The natural history reflects the object initially causing irritation, creating local inflammation and then purulent discharge. As the object embeds itself into the vaginal epithelium, bleeding and spotting may occur. There is often a lag between insertion of the object and vaginal bleeding. Over time, the foreign body may become partially “buried” or embedded within the vaginal wall. These embedded objects are often difficult to remove without discomfort and may require a brief anesthesia (1).

Reports of recto-vaginal fistula are an extremely rare occurrence (4) which was seen with our patient. Depending on the size and location of the fistula, the patient may be almost asymptomatic or complain of a small amount of flatus passing into her vagina with a low small fistula. With a large fistula, she may have formed stool coming through the vagina with every bowel movement, causing significant distress and hygiene problems (1).

In this case, the plastic cap must have slowly led to the development of a recto-vaginal fistula by pressure necrosis and subsequent granulation tissue. It was not clear whether it was inserted into the vagina or introduced into the anus initially.

Reports have also confirmed rare development of vesico-vaginal fistulas in these patients (5,6). Table 1 shows the few reports in literature for foreign body in the vagina leading to formation of intra-pelvic fistulas (7). Long standing foreign bodies can sometimes also lead to ulceration and perforation (8). There have been occasional reports of retroperitoneal or intraperitoneal perforation (9,10).

Although vaginal examination (labial separation approach, supine labial traction method, or a prone knee-chest position) generally reveals the presence of a foreign body, imaging techniques like plain radiography of the pelvis, ultrasound or vaginography can be used for localizing the foreign body. MRI is recommended as the best imaging tool for ruling out vaginal foreign bodies (11,12). Continuous flow vaginoscopy can also be used to detect an intra-vaginal foreign body, which may then be removed successfully by hysteroscopy (12,13).

The essential treatment is removal of the foreign object. If the object has been present for some time, there may be associated bacterial or fungal infection. This should be treated with appropriate antimicrobials e.g., metronidazole (weight adjusted dose) twice daily for a week for bacterial infection, fluconazole (weight adjusted dose) single oral dose for candidal vaginitis (14). If an object is seen on exam, the clinician may be able, in a cooperative child, to either grasp the object with a forceps or wash the object out by irrigation (1). Examination under sedation and/or anesthesia may be necessary for extraction of larger foreign bodies and those that cannot be removed with irrigation such as ones that are embedded in the tissue (15).

Current methods used to remove vaginal foreign bodies include hysteroscopy and colposcopy. If there are other complications, such as fistula or perforation, they need to be repaired surgically. Following foreign body removal, the vaginal discharge and odor should disappear after a few days without further intervention (16). Following treatment, social and psychological support and counseling might also be considered.

## **CONCLUSION**

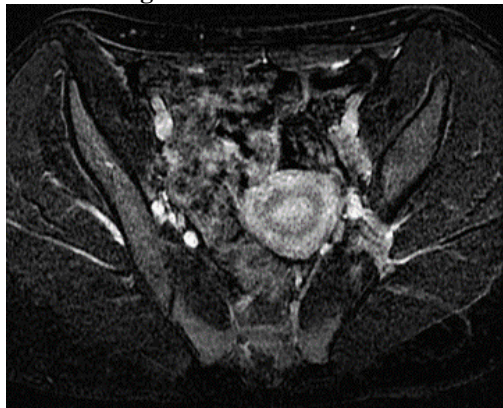
This case report clearly brings to our attention the need for a high index of suspicion for foreign body in the vagina. It should be considered for every pediatric patient with complaints of recurrent or persistent vaginal or rectal discharge with or without bleeding. It is crucial to have a thorough history and genital examination in order to rule out foreign body and therefore avoid potentially serious lifelong complications that can be associated with it. The unique point in our case is that the long duration of retention of foreign object lead to embedding into the vaginal tissue and subsequent formation of a rectovaginal fistula.

Acknowledgements : Authors are thankful to the Medical Library at Saint Peter’s University Hospital for the intensive literature search and the Department of Obstetrics and Gynecology department for their cooperation.

**REFERENCES**

1. Lentz Comprehensive Gynaecology , 6th edition : Chapter 12,Pediatric and Adolescent Gynecology
2. Herman-Giddens ME. Vaginal foreign bodies and child sexual abuse. Arch Pediatr Adolesc Med. 1994;148(2): 195-200
3. Dahiya P, Sangwan K, Khosla A, Seth N. Foreign body in vagina: An uncommon cause of vaginitis in children. Ind J Paediatr. 1999;66:466–7
4. Anderson PG, Anderson M. An unusual cause of rectovaginal fistula. Australia and New Zealand Journal of Surgery. 1993;63:148–149
5. Bhandari M, Kalla VK, Rao KLN. Transvaginal inversion of urinary bladder after concealment of box in vagina. Urology. 1983;21:508–509
6. Binstock MA, et al. Combined vesicovaginal-ureterovaginal fistulas associated with a vaginal foreign body. Obstetrics and Gynecology 1990;76:918–921
7. Shiryazdi SM, et al. J.Pediatr Adolesc Gynecol (2013) e73-e75
8. Ogbonmwan et al. 2005
9. O’Hanlon KA, Westphal LM. First report of a vaginal foreign body perforation into the retroperitoneum. Am. J. Obstet. Gynaecol., 1995;173,962–4
10. Knobel J, Maescotti G. Injuries of the vagina. S. Afr. Med. J. 1973;47:1675
11. Van Eyk N, et al. Pediatric vulvovaginal disorders: a diagnostic approach and review of the literature. J Obstet Gynaecol Can. 2009;31:850
12. Kihara M, et al. Magnetic resonance imaging in the evaluation of vaginal foreign bodies in a young girl. Arch Gynecol Obstet. 2001;265:221–2
13. Smith YR, Berman DR, Quint EH: Premenarchal vaginal discharge, finding of procedures to rule out foreign bodies. J Pediatr Adolesc Gynecol 2002;15:227
14. Golan A, et al: Continuous-flow vaginoscopy in children and adolescents. J Am Assoc Gynecol Laparosc 2000; 7:526
15. Marx: Rosen's Emergency Medicine - Concepts and Clinical Practice, 8th ed. Chapter 60 : Foreign Bodies
16. Tintinalli JE, Reize E, Krom RL. Vaginal foreign bodies. Emergency Medicine, Comprehensive Study Guide. USA, McGraw-Hill, 1996, p. 563

**Figure 1. MRI pelvis showing circular foreign body (Bottle cap) on the left side with hypertrophied and inflamed vaginal mucosa around it.**



**Table 1. Review of reports about Intra-pelvic Fistula in Pediatric Age group Due to Vaginal Foreign Bodies**

First Author	Journal	Year Published	Foreign Body	Age	Fistula	Surgical Method
Esmaeli	Iran Journal Pediatrics	2008	Cap of eyebrow pencil	7	Rectovaginal	Vaginal
Hirai	Hinyokika Kiyo	2005	Hair spray cap	14	Vesicovaginal	Abdominovaginal
Fourie	Int J Obstet Gynecol	2001	Aerosol cap	16	Vesicovaginal	Abdominal
Arikan N	Br J Urol	2000	Aerosol cap	18	Vesicovaginal	Abdominal
O’Hanlan	Am J Obstet Gynecol	1995	Bottle cap	19	Retroperitoneum	Abdominal
Dalela	Br J urol	1994	Cylindrical tin counter	13	Vesicovaginal	Abdominovaginal
Unda Urzaiz M	Arch Esp Urol	1989	Child’s toy	8	Vesicovaginal	Abdominal
Methfessel H	Z Urol Nephrol	1987	Plastic splinter	18	Vesicovaginal	Vaginal

---

## **Review Article: Evidence Based Review on Impact of Modern Day Technology and Mobile Health on Doctor-Patient Communication**

Reem Sheikh, DPM\*, Anita Gupta, DO\*\*

\*Drexel University College of Medicine: Podiatric Medicine and Surgery

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

### **INTRODUCTION**

With constant transformations in healthcare delivery due to the Health Information Technology for Economic and Clinical Health Act of 2009 and the Affordable Care Act of 2010, physicians have to adapt to these changes rapidly. In order to be efficient and provide a high level of care, the use of digital technology in medicine has grown dramatically. New platforms for integrating medical care and digital technology continue to enhance doctor-patient communication (4,8,15). Digital technology encompasses a broad range of tools such as smartphone applications, e-mail, electronic health records (EHR), patient portals, telemedicine, and more.

### **EVIDENCE-BASED REVIEW**

#### Mobile Health: Smartphone Applications and Technology

In a comScore 2013 report, 149.2 million of the U.S population was reported to own smartphones, with a 4.1 percent increase within the year (2). Data recently published by the Pew Research Center's Internet & American Life Project noted that 52% of smartphone users reported researching health information on their phones prior to visiting their doctor and that every 1 in 5 smartphone owner has a health app (12). Similarly, nearly 9/10 healthcare providers utilize either smartphones or tablets in a professional capacity (3).

Mosa et al, discuss medical applications and their positive impact on patient care. The mVisum app, for instance, is designed for cardiologists to review monitor data, alarms, ECGs, and lab results. Leading apps for patients include Diabeco, to help manage diabetes as patients can keep blood glucose logs and use the readings to calculate bolus insulin (10). Apps that allow doctors to transmit voice recordings have also been found beneficial to ensure patients receive particular directions (1,15).

San Mateo Medical Center designed an app that allowed 50 asthmatic pediatric patients to keep daily medication and diary logs for 8 months. The app also allowed caregivers to provide real-time feedback, reminders and quick intervention as needed. Over 8 months, there was a significant decline in ED visits, costs, missed school days and improved medication compliance was noted. Patients also enjoyed using the app as it was easy to use (14).

#### Health Information Technology (HIT)

The U.S Department of Health and Human Services defines HIT as an electronic exchange of health information to improve the quality of health care, prevent medical errors, reduce costs, and increase efficacy while ensuring patient privacy and security. When EHR was first introduced, patients demonstrated mixed responses. However as doctors become more confident and efficient, patients' attitudes are changing. Satisfaction among patients has increased as they feel the physicians are more familiar with their conditions, have details on hand, communicate better and allow patients to participate in the medical decision-making process (5). Randomized- controlled trials showed a 40% positive effect of HIT on patient satisfaction while 50% elicited no change (13).

Montague et al, observed doctor-patient interactions with EHR and identified three distinctive styles in which doctors communicate. Doctors were categorized as technology-centered, human-centered, or those that had a good balance between both as mixed. Physicians that were technology-centered had the lowest patient trust and satisfaction ratings. Those in the human-centered group had high satisfaction rating, however, patients felt they had very little trust with physicians' capabilities of using EHR. Physicians who used a mixed style shifted their attention and body language between their patients and the computers throughout the visit, achieving the highest rating in all categories, patient trust in physician, in EHR use and patient satisfaction of physicians' EHR use. Although no particular style is better than the other, there is a need for better training to identify effective strategies to maximize communication with patients while integrating EHR into daily practice (9).

#### E-mail

E-mail has shown great potential to improve patient-doctor communication allowing a more thorough exchange of information (6,7). In 2005, a pilot study by Leong et al investigated patient and physician satisfaction after 6 months

---

of communication via email messages. Surveys revealed that patient satisfaction was much higher in the group of patients that communicated via email, as they felt it was convenient and efficient. Patients were more satisfied as they also enjoyed quick updates on their conditions. Only 2/172 participants reported minimal concerns over privacy. Similarly, physicians reported convenience and related to minimal change time spent communicating with patients (6). Common practice to utilize email remains relatively common and high among physicians. In 2008, an increase was also reported between individuals at hospitals and pharmaceutical companies as well (7). However, the need to encourage e-mail use, with proper establishments to ensure patient-privacy still persists among health care providers.

## DISCUSSION

Literature reviewed clearly demonstrates a rapid influx of modern day technology and its impact on medicine. With increasing use of modern day technology and mobile health, physicians are trying to strike a balance to satisfy new legal regulations and maintain patient satisfaction. Most importantly, doctor-patient communication remains a priority for better disease management, treatment and overall outcomes (8, 14). On the contrary, it may be argued that mobile health compromises the traditional in-person interaction, eliminates eye contact and body language. However, we must realize that medicine and the traditional face-to-face patient-doctor interaction is changing as communication, interaction, and information flow becomes technology dependent. As doctors and patients both adapt to EHR and HIT, special considerations such as clinical setting and examination room setup should be considered to allow more eye-to-eye contact during an office visit. Also, a possibility may be to share screens with patients so they can provide active feedback as physicians are typing or updating records.

## CONCLUSION

One can only imagine the possibilities and their impact on patient care via modern day technology. As changes are implemented and opportunities develop to improve the quality of care, the need for research to evaluate patients' responses and satisfaction also increases. Nonetheless, doctor-patient communication will always remain an essential aspect of medical care. In conclusion, as trends and practices consistently change, physicians of the modern era will be expected to evolve and comply accordingly.

## REFERENCES

1. Boulos M, Wheeler S, Tavares C, Jones R. How smartphones are changing the face of mobile and participatory healthcare: an overview, with example from eCAALYX?. *Biomedical Engineering Online*. 2011;10:24
2. comScore Reports. U.S. Mobile Subscriber Market Share. December 2013. Accessed online at [http://www.comscore.com/Insights/Press\\_Releases/2013/12/comScore\\_Reports\\_October\\_2013\\_US\\_Smartphone\\_Subscriber\\_Market\\_Share](http://www.comscore.com/Insights/Press_Releases/2013/12/comScore_Reports_October_2013_US_Smartphone_Subscriber_Market_Share)
3. Epocrates Inc. 2013 Mobile Trends Report. Maximizing Multi-Screen Engagement Among Clinicians. 2013. Accessed online at [http://www.epocrates.com/oldsite/statistics/2013%20Epocrates%20Mobile%20Trends%20Report\\_FINAL.pdf](http://www.epocrates.com/oldsite/statistics/2013%20Epocrates%20Mobile%20Trends%20Report_FINAL.pdf)
4. Hesse B, et al. Trust and sources of health information: the impact of the Internet and its implications for health care providers: findings from the first Health Information National Trends Survey. *Archives of Internal Medicine*. 2005;165(22):2618-24
5. Hsu, J, et al. Health Information Technology and Physician-Patient Interactions: Impact of Computers on Communication during Outpatient Primary Care Visits. *J Am Med Inform Assoc*. 2005;12 (4):474-80
6. Leong S, Gingrich D, Lewis P, Mauger D, Georde J. Enhancing Doctor-Patient Communication Using Email: A Pilot Study. *Journal of American Board of Family Medicine*. 2005;18(3):180-188
7. Menachemi N, Prickett C, Brooks R. The Use of Physician-Patient Email: A Follow-up Examination of Adoption and Best-Practice Adherence 2005-2008. *Journal of Medical Internet Research*. 2011;13(1):e23
8. Meryn S. Improving doctor-patient communication. Not an option, but a necessity. *British Medical Journal*. 1998;316:1922
9. Montague E, Asan O. Physician Interactions with Electronic Health Records in Primary Care. *Health System(Basingstoke)*. 2012;1(2):96-103
10. Mosa A, Yoo I, Sheets L. A Systemic Review of Healthcare Application for Smartphones. *BMC Medical Informatics and Decision Making*. 2012;12:67
11. Ong L, De Haes M, Hoos A, Lammes F. Doctor-Patient Communication: A Review of the Literature. *Social Sciences Medical*. 1995;(7):903-918
12. Pew Internet and American Life Project. Mobile Health 2012. 2012. Accessed online at [http://www.pewinternet.org/~media/Files/Reports/2012/PIP\\_MobileHealth2012\\_FINAL.pdf](http://www.pewinternet.org/~media/Files/Reports/2012/PIP_MobileHealth2012_FINAL.pdf)

- 
13. Rozenblum R, et al. The impact of medical informatics on patient satisfaction: a USA-based literature review. *International Journal of Medical Informatics*. 2013;82(3):141-58
  14. U.S Department of Human and Health Services. Daily Patient-Provider Communication and Data Transfer Using Mobile Phones Improves Outcomes and Reduces Costs for Teens With Chronic Asthma. 2008. Accessed online at <http://innovations.ahrq.gov/content.aspx?id=1690>
  15. Weiner J. Doctor-Patient Communication in The E-health Era. *Isr J of Health Policy Res*. 2012;1:33

-----

## **Review Article: Ovarian Macrocyst - Case Report with Review of the Literature**

Nima Patel, MD, Carl Della Badia, DO

Drexel University College of Medicine: Department of Obstetrics and Gynecology

### **INTRODUCTION**

Pelvic masses most commonly arise from the uterus or ovaries although they can originate from any of the reproductive organs (e.g., uterus, cervix, ovaries, and fallopian tubes) or from the surrounding structures. The majority of large masses in the female pelvis represent such commonly encountered diagnoses as uterine fibroid tumor, ovarian cyst, and ovarian cancer. Benign ovarian cysts occur commonly in women of reproductive age. With the advent of pelvic ultrasonography, ovarian neoplasms are diagnosed and treated in an early stage. Occasionally, cysts can reach immense proportions before the patient seeks medical attention (1).

### **CASE REPORT**

The patient is a 53-year-old nulliparous postmenopausal female who presented to the emergency department with increasing abdominal girth over the prior 8 months. The swelling was accompanied by abdominal and pelvic pain that had increased over the past few weeks prior to her presentation. The increased girth was now associated with an inability to bend forward at the waist. She also noted early satiety and some occasional constipation but denied any history of vomiting or urinary symptoms. She has no medical or surgical history and she has had no medical care for 10 years. She has been postmenopausal for the past 2 years. She is not sexually active. Family history is not significant. Abdominal examination showed a markedly distended abdomen with a firm mass palpable from the pubic symphysis to the xyphoid process. Serum lab tests, including complete blood count, liver function and renal function, were normal. CA125 of 156 and CA19-9 of 75 were both elevated. Abdominal Xray showed possible abdominal ascites versus mass (Fig 1). Abdominopelvic CT scan showed a large predominantly cystic mass in the abdomen and pelvis measuring 21.5 x 28.7 x 31.7 cm that compressed both ureters resulting in mild hydronephrosis of both kidneys (Fig 2).

Due to the patient's age, menopausal status and elevated tumor markers, the decision was made to perform a laparotomy. There was concern about spillage of the fluid and the possibility of upstaging if a malignant neoplasm was present. The patient underwent a laparotomy through a large vertical midline incision, extending up to the xyphoid. Upon entry into the abdominal cavity, a large tense, smooth surfaced cystic mass was noted (Fig 3). The cyst measured 40 cm, extended from the pelvic floor up to the diaphragm, and was noted to be arising from the right adnexal region. Pelvic washings were obtained. As the fallopian tube was seen to be adherent to the mass, a right salpingo-oophorectomy was performed in the standard fashion. The mass, ovary, and fallopian tube were removed en bloc. Once the specimen was removed, an evaluation of the abdomen and pelvis showed no evidence of seeding. The omentum was inflamed and, therefore, a partial omentectomy was performed. Frozen pathology showed a benign mucinous cystic tumor of the ovary (Fig 4). The postoperative course was uneventful and the patient was discharged on postoperative day #3. The patient was seen 2 weeks post-operatively in the office for a visit and was recovering well. Final pathology showed pelvic washings and omentum negative for malignancy. The right adnexal mass measured 40 x 30 x 20 cm, weighed 12.3 kilograms, and contained 5 liters of serous fluid. It was found to be a benign mucinous cystadenoma.

### **DISCUSSION**

Giant ovarian tumors are uncommon as many ovarian masses can be identified early. In those patients that do not receive regular medical care or seek prompt medical attention for occurrence of symptoms, ovarian cysts can progress to macrocysts. Ovarian masses can be divided according to cell types into 3 main groups: epithelial, stromal, and germ cell, with epithelial tumors comprising 2/3 of all ovarian neoplasms (2). The most common types

---

of epithelial tumors encountered are benign cystadenomas, of which 75% are serous and 25% are mucinous. Mucinous cystadenomas of the ovary are known for their potential to grow to massive proportions. They are typically benign tumors accounting for 15% of ovarian tumors and up to 80% of all mucinous tumors (3). Ovarian mucinous cystadenomas are characteristically unilateral, with only 5-10% presenting bilaterally. The peak incidence occurs among reproductive aged women, between 30 and 50 years of age, and are extremely rare prior to menarche or after menopause (4).

There are three histopathological groups of mucinous tumors: benign mucinous cystadenoma, mucinous tumor of uncertain malignant potential (borderline tumor), and mucinous carcinoma. 75% of mucinous tumors are benign, 10% borderline, and 15% carcinomas (5). These tumors usually present as a large cystic mass, can be uni- or multi-loculate, and contain sticky gelatinous fluid, mucin. These masses may simulate diffuse abdominal ascites due to their enormous size. Microscopically, the tumor consists of multiple cystic spaces lined by tall columnar epithelium with mucinous differentiation (6,7). In general, ovarian mucinous cystadenomas tend to present with initial symptoms of abdominal distention, increased girth and pelvic pressure. Possible complications of mucinous cystadenoma are perforation and rupture, which can lead to the deposit and growth of mucin-secreting epithelium in the peritoneal cavity known as pseudomyxoma peritonei.

### **TREATMENT**

The extremely large ovarian cyst presents a major challenge for the gynecological surgeon. Management of ovarian cysts depends on the patient's age, the size of the cyst, menopausal status, and the potential for malignancy. Factors that may complicate surgery for such cysts may include surgeon skill in laparoscopic surgery and technical problems related to the removal of such cysts. The large size of the cyst can impact cardiac and respiratory function potentially increasing anesthesia risks (8). Surgical management of cysts is by cyst excision or oophorectomy. As in our case, very large ovarian cysts have conventionally been treated by laparotomy. For women with low suspicion of malignant potential, advances in laparoscopic surgical techniques have offered new alternatives for management of such large ovarian cysts. Recent studies have shown successful management of macrocysts through minimally invasive surgery in the way of cyst aspiration to decompress the cyst followed by ovarian cystectomy or oophorectomy (4,9,10). Risk of spillage of cyst contents and cyst recurrence has been shown to be low with laparoscopic approaches (11).

### **CONCLUSION**

Although large mucinous cystadenomas are an uncommon occurrence due to the availability of pelvic sonography, they can be seen in women that have limited medical care. The majority of these tumors are benign and, in most cases, can be managed conservatively via minimally invasive surgery with the possibility of ovarian conservation. The patient's age, tumor marker levels, size of the cyst, and surgeon skill should be taken in consideration when formulating a management plan for these macrocysts. For those macrocysts in a postmenopausal female with elevated tumor markers, a laparotomy is a reasonable approach.

### **REFERENCES**

1. Moslemia MK, Yasdanib Z. A Huge Ovarian Cyst in a Middle-Aged Iranian Female. *Case Rep Oncol.* 2010;3(2):165–170
2. Lentz G, Lobo R, Gershenson D, Katz V. *Comprehensive Gynecology*, 6th edition (2012). Elsevier Health Sciences
3. Aslam MF, Bedford NA, Sissons MC, Sooltan AR, Duthie SJ. Halving of body weight: a case of an ovarian mucinous cystadenoma. *Eur J Gynaecol Oncol.* 2006;27(1):88-9
4. Mittal S, Gupta N, Sharma AK, Dadhwal V. Laparoscopic management of a large recurrent benign mucinous cystadenoma of the ovary. *Arch Gynecol Obstet* 2008;277:379-80
5. Rodriguez IM, Part J. Mucinous tumors of the ovary. A clinicopathologic analysis of 75 borderline tumors (of intestinal type) and carcinomas. *Am J Surg Pathol.* 2002;26:139
6. Kemp WL, Burns DK, Brown TG. *Pathology: The Big Picture.* (2008). McGraw Hill Companies
7. Sri Paran T, Mortell A, Devaney D. Mucinous cystadenoma of the ovary in perimenarchal girls. *Pediatr Surg Int* 2006;22:224
8. Sagiv R, Golan A, Glezerman M. Laparoscopic management of extremely large ovarian cysts. *Obstet Gynecol.* 2005;105:1319–1322
9. Alobaid A, Memon A, Alobaid S, Aldakhil L. Laparoscopic management of huge ovarian cysts. *Obstet Gynecol Int.* 2013:380854



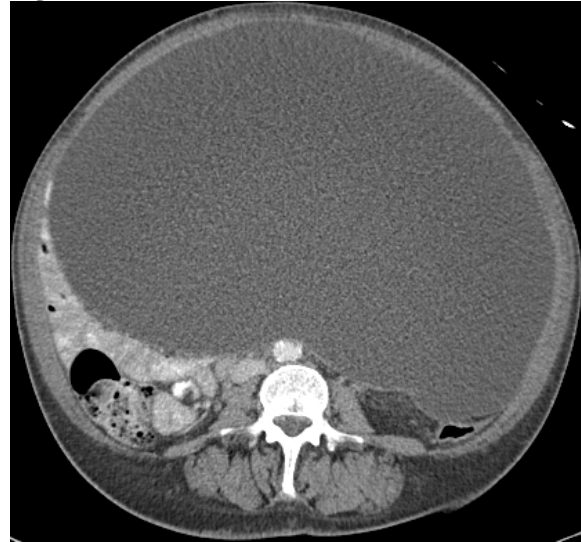
10. Turkyilmaz E, et al. Recurrent mucinous cystadenoma: a laparoscopic approach. Arch Gynecol Obstet 2009;279:387-9

11. Ben-Ami I, et al. Does intraoperative spillage of benign ovarian mucinous cystadenoma increase its recurrence rate? Am J Obstet Gynecol 2010;202:142.e1-5

**Figure 1. Abdominal Xray**



**Figure 2. CT scan of abdomen**



**Figure 3. Intraoperative view**



**Figure 4. Gross Pathology**



---

## **Review Article: Pituitary Apoplexy: A Rare Cause of Third Nerve Palsy and Central Diabetes Insipidus**

Meghan Berkenstock, MD  
Drexel University College of Medicine: Department of Ophthalmology

### **INTRODUCTION**

Pituitary apoplexy with hemorrhage is a potentially life-threatening condition, and a rare cause of third nerve palsies. The range of vision loss and ophthalmoplegia seen in cases of apoplexy reflects the variability of cranial structures compressed by mass effect. The pathophysiology of extraocular muscle restriction and facial parasthesia occurs with compression of the cavernous sinus, which contains cranial nerves three, four, six, and the ophthalmic



---

branch of five. Blood supply to adjacent structures may be also be compromised, causing additional loss of function. This case report of a patient with diabetes insipidus and a third nerve palsy illustrates the anatomic basis of the presenting signs of pituitary apoplexy, and the necessity for prompt neuroimaging if it is suspected.

### **CASE REPORT**

A 50 year-old African American male with a history of hypertension presented with a four day history of progressive, painful vision loss in the right eye. The vision loss was described by the patient as “closing in superiorly and inferiorly” and progressed to no light perception in the right eye. The patient also noticed a droopy right eyelid and an outward drift of the right eye. The corresponding vision in the left eye had also become blurry with loss of temporal visual fields. Systemically, the patient complained of a right-sided headache, nausea, vomiting, extreme thirst, and polyuria. His wife described a personality change over the preceding week. The patient denied any recent trauma or previous episodes of vision loss. On initial exam, visual acuity was no light perception in the right eye and 20/200 in the left eye. Both pupils were equally round and reactive and an afferent pupillary defect in the right eye was noted. External exam showed a ptosis and exotropia of the right eye. Confrontational visual field testing of the left eye showed complete temporal hemianopsia. The remainder of the ophthalmic exam was within normal limits. Specifically, optic nerve examination showed healthy nerves bilaterally without pallor or papilledema.

The constellation of symptoms was suspicious for an intracranial process, and an MRI was ordered. Imaging showed a reduced ventricular size and a 2.7 x 1.7 x 1.5 centimeter pituitary adenoma displacing the optic chiasm superiorly on the right with partial extension to the left side. An MRA was performed to further characterize the lesion prior to neurosurgical intervention, and showed a left side deviation of the pituitary stalk with apoplexy and hemorrhage measuring 1.9 x 1.9 x 1.2 centimeters. The MRA also revealed fifty percent compression of the internal carotid artery due to mass effect, and compression of the cavernous sinus. Initially, the patient was managed with Decadron 4mg every 6 hours for intracranial swelling and acute adrenal crisis. Further endocrinologic work-up was consistent with the diagnosis diabetes insipidus. After electrolyte correction, the patient underwent neurosurgical intervention via a transphenoidal approach to decompress of the adenoma. Pathology revealed fragments of necrotic tissue with inflammation suggestive of a pituitary tumor, although no viable tissue was obtained for definitive diagnosis. Subsequent follow-up confirmed complete resolution of the cranial nerve palsies, although visual field defects persisted. The patient is doing well clinically and is currently managed with hormone therapy for panhypopituitarism.

### **DISCUSSION**

Pituitary apoplexy with hemorrhage is a potentially life-threatening condition, and a rare cause of third nerve palsies (1). The range of vision loss and ophthalmoplegia seen in cases of apoplexy reflects the variability of cranial structures compressed by mass effect. The pathophysiology of extraocular muscle restriction and facial parasthesia is due to a compressive effect within the cavernous sinus, which contains cranial nerves three, four, six, and the ophthalmic branch of five (1). Superior impingement of the optic chiasm leads to ipsilateral afferent pupillary defects and visual field loss (1). Apoplexy can be caused by diverse entities including adenomas, Rathke cysts, CNS lymphoma, hypertension, postpartum, postoperatively, post intrathecal anesthetic, or after bromocriptine treatment. In case reports of apoplexy occurring without a mass lesion, such as after cardiac surgery and post-partum, offer several pathophysiologic mechanisms of action including hypotension with hemorrhage after infarction or microemboli (5,8). Several proposed etiologies for the cause of the cranial nerve palsies exist including direct tumor expansion into the cavernous sinus, impingement of the nerves through compression of the cavernous sinus wall by a mass or edema, erosion of the posterior clinoid process with compression at the oculomotor trigone, and vascular occlusion of the nerves (2). While most commonly causing unilateral findings, cases of pituitary apoplexy caused by bilateral cavernous sinus compression have been reported (3).

Clinically, most patients present with headache emanating from behind the forehead and orbit (1). This is secondary to hemorrhage extending into the dura surrounding the pituitary, causing meningeal irritation and distention (4,6). Less common presenting symptoms include restricted visual fields, nausea, vomiting, ophthalmoplegia, decreased visual acuity, altered mental status, and hemiplegia (6). Medical treatment involves observation of neurologic status along with intravenous steroids and hormone replacement. Surgical decompression is warranted if visual acuity and fields are compromised or are rapidly diminished or if there is altered mental status (1,6). Most commonly, the mass is removed using a transphenoidal approach (1,6).

It is estimated that 60 to 80 percent of pituitary apoplexy cases occur subclinically, which illustrates the atypical and

---

fulminant presentation in this case (1). Symptomatic apoplexy in pituitary adenomas has been estimated between 0.6–9.1% (9). Given the rarity, it reinforces that a high level of suspicion and emergent neuroimaging are critical to make the diagnosis. The key to a good clinical outcome in cases of pituitary apoplexy is timely intervention to correct the life-threatening Addisonian crisis and prevent further visual compromise.

#### REFERENCES

1. Murad-Kejbou S, Eggenberger E. Pituitary apoplexy: evaluation, management, and prognosis. *Curr Opin Ophthalmol.* 2009;20(6):456–461
2. Kobayashi H, et al. A possible mechanism of isolated oculomotor palsy by apoplexy of a pituitary adenoma without cavernous sinus invasion: a report of two cases. *Acta Neurochir.* 2011;153:2453–6
3. Komurcu HF, et al. Pituitary adenoma apoplexy presenting with bilateral third nerve palsy and bilateral proptosis: a case report. *Med Princ Pract.* 2012;21:285–287
4. Kashkouli MB, et al. Pituitary apoplexy presenting as acute painful isolated unilateral third cranial nerve palsy. *Arch Iranian Med.* 2008;11(4):466–468
5. Chen Z, et al. Pituitary apoplexy presenting as unilateral third cranial nerve palsy after coronary artery bypass surgery. *Anesth Analg.* 2004;98:46–8
6. Verrees M, et al. Pituitary tumor apoplexy: characteristics, treatment, and outcomes. *Neurosurg. Focus.* 2004;16
7. González-Tortosa J, et al. Pituitary adenoma apoplexy after spinal anaesthesia. Report of two cases and review of the literature. *Neurocirugia Astur.* 2009;20(5):484–93
8. Quintero Wolfe S, et al. Primary central nervous system lymphoma mimicking pituitary apoplexy: case report. *Pituitary.* 2009;12(1):76–9
9. Randeve HS, et al. Classical pituitary apoplexy: clinical features, management and outcome. *Clinical Endocrinology.* 1999;51(2):181–188

---

#### Review Article: Pulseless Electrical Activity

Farley Neasman, MD

Drexel University College of Medicine: Department of Medicine, Division of Internal Medicine

#### INTRODUCTION

Despite years of research, pulseless electrical activity (PEA) remains a dynamic entity – not only has it been re-defined with improved imaging, but survival rates have changed, and with continued research, further improvements can be expected in treatment and outcomes. Currently defined as an organized rhythm without a palpable pulse (1), PEA had previously been referred to as electromechanical dissociation (EMD), under the assumption of “organized electrical depolarization of the heart without synchronous myocardial fiber shortening and, therefore...without cardiac output” (2), or excitation-contraction uncoupling. In a small study, Bocka et al. demonstrated synchronous myocardial wall motion in 86% and valvular motion in 88% of patients with organized electrical activity and no pulse (2). The following year Stueven et al. organized EMD on the basis of ECG morphology, showing decreasing survival as normal QRS complexes with isoelectric ST segments and normal T waves degraded into monophasic RST complexes (3). This led Mehta and Brady to define PEA as a “true uncoupling of cardiac mechanical activity from the cardiac rhythm”, and pseudo-PEA as “cardiogenic shock...inadequate to maintain perfusion pressure” (4). This last designation includes systemic hypotension, mechanical impedance of cardiac output, and differentiates them from a true dissociation of excitation and contraction. Notably, the designation of a state as pulseless is fraught with error – first responders are relatively inaccurate in the determination of a pulse (19), likely designating the majority of pulseless electrical activity as pseudo-PEA.

#### PATHOPHYSIOLOGY

The question of etiology, thus remains – historically, the potentially reversible H’s (hypovolemia, hyperkalemia, hypothermia, hypoxia, hydrogen ion) and T’s (tamponade, tension pneumothorax, thrombosis coronary / pulmonary, toxins) (5,6) - some of which may mechanically impede palpation of a pulse - have been the focus of therapeutic efforts in PEA arrests. There remains, however, evidence that molecular factors may contribute to the electromechanical uncoupling in already diseased myocardium. High energy phosphate metabolism (and its surrogate, the ratio of phosphocreatine to  $\beta$ -ATP), has been shown to be reduced in patients with coronary artery disease (7), hypertension (8), diabetes (9) and hypercholesterolemia (10), leading Klug et al to show a linear risk

---

between high-energy phosphate metabolism and cardiac risk (11). Neumar et al. had previously shown a linear correlation between high-energy phosphate depletion and likelihood of ventricular fibrillation with total circulatory arrest (VF-TCA) in an animal model (12). Given the statistical link between ventricular fibrillation and PEA (6, 13), it can be inferred that there exists a relationship between high energy phosphate metabolism and PEA. Geddes et al. demonstrated a link between PEA and the duration of Vfib, arterial potassium concentration, and arterial PCO<sub>2</sub> (13), and Niemann and Cairns (14) hypothesized that hyperkalemia and ionized hypocalcemia during resuscitation may lead to post-countershock arrhythmias. Martin theorized that calcium channel blockers may have a role in preserving myocardial function in the setting of reperfusion injury (15), and Atar, Dong, and Marban demonstrated diminishing myocardial contractility as intracellular calcium accumulated due to ischemia (16). They went on to separate the dysfunction of acutely stunned myocardium, which may be due to protease-induced reperfusion injury, from that of long-standing pump failure, characterized by altered gene expression resulting in myofilament isomer switching and altered handling of calcium in the sarcoplasmic reticulum. Thus, hypoxia/myocardial ischemia appear to be a final common pathway for many of the recognized causes of PEA and, if not causative, is at least implicated. Mechanical causes (hypovolemia, tamponade, tension pneumothorax, pulmonary emboli and coronary thromboses) can directly inhibit the ability of the myocardium to self-oxygenate, and altered high-energy phosphate metabolism and calcium handling as well as ventricular fibrillation are associated with long-standing myocardial ischemia. Thus, there may be a link between the acute and chronic changes that occur in hypoxic myocardium and the development of true PEA.

**Causes of Death:** Though the etiological questions persist, the causes of death remain overwhelmingly cardiac in origin; in one retrospective review of 50 autopsies of patients with PEA, Pirolo et al showed 44% of cases of EMD to be due to myocardial ischemia, 24% to systemic shock, 20% to pulmonary vascular compromise, and 12% unknown (17). Virkkunen et al. demonstrated an overestimation of myocardial infarction and underestimation of pulmonary embolism in cases of unsuccessful PEA without autopsy, therefore arguing for more definitive diagnoses regarding PEA (18).

**Survival Rates:** Though PEA wasn't exclusively identified in their data, Thomas et al demonstrated a 5.3% – 10.8% survival rate for all rhythms in out of hospital cardiac arrest (20). Varynen et al studied survival rates in cases of out-of-hospital cardiac arrests, with PEA being the presenting rhythm in 30% of cases (21). Understandably, a quick return of spontaneous circulation (less than 19 minutes) and lower total doses of epinephrine were associated with improved outcomes. Importantly, any use of epinephrine was associated with worse outcomes. Nevertheless, survival for PEA has been reported to be around 6.9% (22). In a study of hospitalized patients suffering cardiac arrest, initial survival of those with PEA was 33%, though survival to discharge had dropped to 11.2% (23); when bedside echocardiography was used to identify potentially reversible causes that figure rose to 14.3% (24).

## **TREATMENT**

The current treatment for PEA has remained relatively unchanged over the years, and after initiation of ACLS protocol, is concerned primarily with the rapid identification and treatment of reversible causes. A brief physical exam and review of vital signs will reveal clues to possible causes - hypotension may indicate hypovolemia requiring fluids, or, when coupled with muffled heart sounds and distended neck veins, indicate cardiac tamponade, necessitating pericardiocentesis. Hypoxia may indicate pulmonary embolism, or a host of other pulmonary causes, and should be supplemented with 100% O<sub>2</sub> and advanced airway. Unequal breath sounds may indicate tension pneumothorax requiring needle decompression, and assessment of temperature will reveal hypothermia, mandating warming. EKG will point towards myocardial infarction, and critical care labs will also reveal reversible potential causes - acidosis requiring bicarbonate and possibly renal replacement therapy; hyperkalemia requiring calcium gluconate, insulin, D50, kayexalate, and possibly renal replacement therapy; and hypokalemia, requiring potassium replacement (1,5). Finally, one must consider toxins and various drug ingestion. When PEA occurs in the inpatient setting, the most common causes are hypovolemia and hypoxia, whereas outpatient causes of PEA are most commonly hypothermia and myocardial infarction (5).

## **CURRENT AND FUTURE RESEARCH**

PEA remains a dismal diagnosis, with survival ranging from 6.9% to 33% across various studies (22,23), however, recent research may contribute to improving outcomes. While a significant proportion of cardiac arrests and PEA are due to pulmonary emboli and myocardial infarction, Böttinger et al demonstrated a lack of improved outcomes with the administration of thrombolysis (25). From a mechanical standpoint, though the AHA and European Council recommend two minute cycles of CPR in between pulse checks, Nordseth et al sought to evaluate the rate of rhythm

---

conversion with different cycle lengths (25). By using data from AEDs, they showed a 50% conversion of PEA to some other rhythm, 75% by 6 minutes, and 90% conversion rate with 10 minute cycles of compressions. Thus, they recommend not pausing for a pulse check until 4-6 minutes have passed, in order to maximize the likelihood of an alteration of rhythm(26). As earlier stated, Cimpoesu et al demonstrated improved outcomes when echocardiography was used to rapidly identify potential reversible causes of PEA (24), and Feinleib et al showed that outcomes may be improved with something as simple as using handheld dopplers to assess pulselessness in PEA arrest. While small improvements have been made in the treatment of PEA, as with cardiovascular health in general, larger gains can be expected with a greater focus on prevention.

## REFERENCES

1. Neumar RW, et al. Part 8: Adult Advanced Cardiovascular Life Support 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2010;122(18) suppl 3:S729-S767
2. Bocka JJ, Overton DT, Hauser A. Electromechanical dissociation in human beings: an echocardiographic evaluation. *Ann Emerg Med* 1988;17(5):450-452
3. Stueven HA, et al. Defining electromechanical dissociation: morphologic presentation. *Resuscitation* 1989;17(2): 195-203
4. Mehta C, Brady W. Pulseless electrical activity in cardiac arrest: electrocardiographic presentations and management considerations based on the electrocardiogram. *Am J Emerg Med.* 2012;30(1):236-239
5. Principles of critical care. New York: McGraw-Hill, Medical Pub. Division, 2005
6. Vincent JL, et al. Clinical and experimental studies on electromechanical dissociation. *Circulation* 1981;64(1): 18-27
7. Weiss RG, et al. Regional myocardial metabolism of high-energy phosphates during isometric exercise in patients with coronary artery disease. *N Engl J Med.* 1990;323(23):1593-1600
8. Okada M, et al. Influence of aging or left ventricular hypertrophy on the human heart: contents of phosphorus metabolites measured by <sup>31</sup>P MRS. *Magnet Reson Med.* 1998;39(5):772-782
9. Metzler B, et al. Decreased high-energy phosphate ratios in the myocardium of men with diabetes mellitus type I. *Journal of Cardiovascular Magnetic Resonance* 2002;4(4):493-502
10. Schocke MFH, et al. 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors improve myocardial high-energy phosphate metabolism in men. *Journal of Cardiovascular Magnetic Resonance* 2003;5(4):595-602
11. Klug G, et al. Correlation of cardiovascular risk scores with myocardial high-energy phosphate metabolism. *International journal of cardiology* 2011;150(2):208-210
12. Neumar RW, et al. Estimation of myocardial ischemic injury during ventricular fibrillation with total circulatory arrest using high-energy phosphates and lactate as metabolic markers. *Ann Emerg Med* 1991;20(3): 222-229
13. Geddes LA, et al. The natural biochemical changes during ventricular fibrillation with cardiopulmonary resuscitation and the onset of postdefibrillation pulseless electrical activity. *The American journal of emergency medicine* 2006;24(5):577-581
14. Niemann JT, Cairns CB. Hyperkalemia and ionized hypocalcemia during cardiac arrest and resuscitation: possible culprits for postcountershock arrhythmias? *Ann Emerg Med* 1999;34(1):1-7
15. Martin GB. Use of calcium blockers in electromechanical dissociation. *Ann Emerg Med* 1984;13(9):846-848
16. Atar D, Gao WD, Marban E. Alterations of excitation—contraction coupling in stunned myocardium and in failing myocardium. *Journal of molecular and cellular cardiology* 1995;27(2):783-791
17. Pirolo JS, Hutchins GM, Moore GW. Electromechanical dissociation: pathologic explanations in 50 patients. *Human pathology* 1985;16(5):485-487
18. Virkkunen I, et al. Pulseless electrical activity and unsuccessful out-of-hospital resuscitation: What is the cause of death?. *Resuscitation* 2008;77(2):207-210
19. Dick, WF, et al. The carotid pulse check revisited: what if there is no pulse?. *Crit Care Med* 2000;28(11):N183-5
20. Rea TD, et al. Incidence of EMS-treated out-of-hospital cardiac arrest in the United States. *Resuscitation* 2004;63(1):17-24
21. Väyrynen T, et al. Who survives from out-of-hospital pulseless electrical activity?. *Resuscitation* 2008;76(2): 207-213
22. Pepe PE, et al. Cardiac arrest presenting with rhythms other than ventricular fibrillation: contribution of resuscitative efforts toward total survivorship. *Critical care medicine* 1993;21(12):1838-1843
23. Montse TJ, Fontanals E, Carrero G, Sánchez-Etayo F.J, Tercero RA. Survival from pulseless electrical activity after cardiopulmonary resuscitation in-hospitalized patients. *Resuscitation* 2006;70(2):318
24. Cimpoesu D, Tiron AA, Petris AO. Echocardiography during cardiopulmonary resuscitation-not only FEER.

---

Resuscitation 2010;81(2):S17

25. Nordseth T, et al. Optimal CPR loop duration for asystole and pulseless electrical activity during in-hospital cardiac arrest. Resuscitation 2010;81(2):S17

26. Bottiger BW, et al. Thrombolysis during resuscitation for out-of-hospital cardiac arrest. New England Journal of Medicine 2008;359(25):2651

27. Feinleib MD, Gong Z, Honiden S. Handheld Doppler to Improve Pulse Checks during Resuscitation of Putative Pulseless Electrical Activity Arrest. Anesthesiology 2014;120(4)