Wednesday, April 30, 2008
University of Arizona College of Medicine Phoenix
Virginia G. Piper Auditorium
600 E Van Buren St
Phoenix, Arizona 85004

7:15 a.m. - 3:55 p.m.
Poster Exhibition
Oral Presentations

12:10 p.m. - 1:10 p.m.
Dean M. Wingerchuk, MD, MSc, FRCP(C)
Mayo Clinic Arizona

4:30 p.m. - 5:00 p.m.
Awards Presentation

Presented by:
TWELFTH ANNUAL
ACADEMIC EXCELLENCE DAY
WEDNESDAY, APRIL 30, 2008

The Arizona Medical Education Consortium (AzMEC) is pleased to present Academic Excellence Day as an educational program in joint sponsorship with Banner Good Samaritan Medical Center, Maricopa Integrated Health System, Mayo Clinic Arizona, Phoenix Baptist Hospital, Phoenix Children’s Hospital, St. Joseph’s Hospital & Medical Center and Scottsdale Healthcare.

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Submitted Abstracts Page 19
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Hospital Residency/Fellowship Programs Page 203

ACADEMIC EXCELLENCE DAY COMMITTEE MEMBERS:

Arizona Medical Education Consortium
Karen Archibald
Michael Grossman, MD, MACP
Brian Johnson

Banner Good Samaritan Medical Center
Richard Gerkin, MD, MS
Heidi Vega

Maricopa Integrated Health System
David Drachman, PhD
Michael Grossman, MD, MACP
Nancy Partington
Phyllis Thackrah, MS

Mayo Clinic Arizona
Joseph Drazkowski, MD
Connie Erickson
Tamara Kary Erickson
Linda McCleve

Phoenix Baptist Hospital
Martin Krepcho, PhD
Wendy Orm, MD

Phoenix Children’s Hospital
Sandra Barker
Grace Caputo, MD, MPH
Debi Hamersly
Stephanie Putman

St. Joseph’s Hospital and Medical Center
Charles Daschbach, MD, MPH
Burt Feuerstein, MD, PhD
Linda Larson Carr, PhD
Sallie Weems, RN

Scottsdale Healthcare
Suzanne Anderson
Robert Marlow, MD
TWELFTH ANNUAL
ACADEMIC EXCELLENCE DAY
WEDNESDAY, APRIL 30, 2008

UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE PHOENIX
ORAL PRESENTATIONS - VIRGINIA G. PIPER AUDITORIUM ROOM 2210
POSTER PRESENTATIONS - VIRGINIA G. PIPER AUDITORIUM
FIRST FLOOR CORRIDOR & CLASSROOMS 2206 & 2208

SCHEDULE OF EVENTS

7:15 a.m. – 7:25 a.m. Welcome
Michael Grossman, MD, MACP

Moderators
Michael Grossman, MD, MACP
Associate Dean for GME
University of Arizona College of Medicine Phoenix
Executive Director
Arizona Medical Education Consortium (AzMEC)

Joseph Drazkowski, MD
Program Director Epilepsy Fellowship
Co-Director of Comprehensive Epilepsy Center
Mayo Clinic Arizona

7:25 a.m. – 12:10 p.m. Oral Presentations
Auditorium Room 2210

9:40 a.m. – 9:55 a.m. Mid-Morning Break
Auditorium Classroom 2206
/ Refreshments

12:10 p.m. – 1:10 p.m.
"Neuromyelitis Optica: From the Patient to the Lab, and Back Again"
Dean M. Wingerchuk, MD, MSc, FRCP(C)
Associate Professor of Neurology, Mayo Clinic College of Medicine
Vice-Chair for Clinical Research, Mayo Clinic Arizona
Co-Director, Multiple Sclerosis Center, Mayo Clinic Arizona
Co-Director, MERIT Center, Mayo Clinic Arizona

1:10 p.m. – 3:55 p.m. Oral Presentations
Auditorium Room 2210

2:25 p.m. – 2:40 p.m. Mid-Afternoon Break
Auditorium Classroom 2206
/ Refreshments

4:00 p.m. – 4:30 p.m. Dessert Reception
Auditorium Classroom 2206

4:30 p.m. Awards Ceremony
Auditorium Room 2210

The poster exhibition will take place in
Auditorium First Floor Corridor and Classrooms 2206 & 2208.

Academic Excellence Day is an opportunity to focus attention on the magnitude and variety of clinical and bench research being done by residents, fellows, graduate students, clinical allied health staff, and physician staff.
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<tr>
<th><strong>JUDGES</strong></th>
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<tr>
<td><strong>Banner Good Samaritan Medical Center</strong></td>
<td><strong>Phoenix Children’s Hospital/ Maricopa Integrated Health System</strong></td>
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<td>Richard Gerkin, MD</td>
<td>Jeffrey Buchhalter, MD</td>
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<td>John Mattox, MD</td>
<td>Jeff Foti, MD</td>
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<td>Alex McLaren, MD</td>
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<td>Ayrn O’Connor, MD</td>
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<td>Cheryl O’Malley, MD, FAAP, FACP</td>
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<td>Edward Perrin, MD</td>
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<td><strong>Carl T. Hayden VA Medical Center</strong></td>
<td><strong>St. Joseph’s Hospital &amp; Medical Center</strong></td>
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<td>Christopher Reardon, PhD, MD</td>
<td>Charles Alfano, MD</td>
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<td>Paul Duntley, MD, FACP</td>
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<td>Raymond Chung, MD</td>
<td>Carol Hatler, MS, RN, PhD</td>
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<td><strong>Maricopa Integrated Health System</strong></td>
<td>Joan Shapiro, PhD</td>
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<td>Dianna Borowski, PharmD</td>
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<td>David Drachman, PhD</td>
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<td>Eric Katz, MD, FACEP</td>
<td>Robert Marlow, MD, MA</td>
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<td>Karyn Kolman, MD</td>
<td><strong>University of Arizona/ Arizona State University</strong></td>
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<td>Janeth Mattox, MPA</td>
<td>Doug Campos-Outcalt, MD, MPA</td>
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<td>Mary Mulrow, RN</td>
<td>Peter Jurutka, PhD</td>
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<td>Melissa Pressman, PhD</td>
<td>Suwon Kim, PhD</td>
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<td>Gilbert Ramos, MS</td>
<td>Allan Markus, MD, MS, MBA, FACP</td>
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<td>Beverley Rowley, PhD</td>
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<td>Kristy Tran, PharmD</td>
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<td>Michael Cluck, MD, PhD</td>
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<td>Teresa Pipe, PhD</td>
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<td>Donald Miles, MD</td>
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AWARDS

Twenty-eight abstracts were selected for oral presentation. A panel of jurors will judge the presentations and award the prizes. Awards will be presented to a resident and fellow for each of the following placements in each category, except where noted below.

**Oral Presentation:**
- Clinical Research – First Place: $250
- Clinical Research – Second Place: $175
- Clinical Research – Third Place: $125
- *Case Report/Series – First Place: $150
- *Case Report/Series – Second Place $100

**Poster Presentation:**
- Clinical Research – First Place: $175
- Clinical Research – Second Place: $125
- Clinical Research – Third Place: $75
- Case Report/Series – First Place $100
- Case Report/Series - Second Place $50

These prizes will be presented during the Awards Ceremony at 4:30 pm in the Auditorium Room 2210. Primary authors of all submitted abstracts will receive a certificate recognizing their participation in the 2008 Academic Excellence Day program.

Residents and fellows of Banner Good Samaritan Medical Center, Maricopa Integrated Health System, Mayo Clinic Arizona, Phoenix Baptist Hospital, Phoenix Children’s Hospital, St. Joseph’s Hospital & Medical Center and Scottsdale Healthcare were invited to submit abstracts for oral presentations. Abstracts for poster exhibition were accepted from residents, fellows, attending physicians, nurses, nurse practitioners, physician assistants, allied health professionals, and PhDs associated with these affiliated graduate medical education programs or clinical departments.

*Residents only*
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<tr>
<td>7:25 AM</td>
<td>15</td>
<td>The Effect Of Fatigue On Cognitive and Psychomotor Skills Of Trauma Residents and Attending Surgeons</td>
<td>Jodi Gerdes, MD, Banner Good Samaritan Medical Center Surgery</td>
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<td>7:40 AM</td>
<td>42</td>
<td>Verbal Communication Improves Laparoscopic Team Performance</td>
<td>Shiliang Chang, MD, Maricopa Integrated Health System Surgery</td>
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<td>8:10 AM</td>
<td>79</td>
<td>High Resolution Manometry: The Detection Of A Hiatal Hernia In The Setting Of A Giant Paraesophageal Hernia</td>
<td>Scott Swanson, MD, Maricopa Integrated Health System Surgery</td>
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<td>8:25 AM</td>
<td>99</td>
<td>Effect Of Adenovirus-36 In A Localized In Vivo Model Of Neoadipogenesis</td>
<td>Randall Craft, MD, Mayo Clinic Arizona Surgery</td>
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<td>8:40 AM</td>
<td>95</td>
<td>Retrospective Chart Review On The Incidence Of Removal Of The Bravo Capsule At Mayo Clinic Arizona</td>
<td>Angela Bradley, MD, Mayo Clinic Arizona Internal Medicine</td>
</tr>
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<td>8:55 AM</td>
<td>46</td>
<td>Three Dimensional Transthoracic Echocardiogram Detects Pulsatile Left Atrial Abscess Cavity</td>
<td>April Ferguson, MD, Maricopa Integrated Health System Internal Medicine</td>
</tr>
<tr>
<td>9:10 AM</td>
<td>16</td>
<td>A Very Important Precipitant Of Chronic Diarrhea</td>
<td>Scott Goodwin, MD, Banner Good Samaritan Medical Center Internal Medicine</td>
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<tr>
<td>9:25 AM</td>
<td>23</td>
<td>Influence Of Ethnicity and BMI On The Diagnostic Value Of ECG Criteria For Detecting Left Ventricular Hypertrophy</td>
<td>Angelica Motta, MD, Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>9:40 AM</td>
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<td>BREAK</td>
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<td>9:55 AM</td>
<td>133</td>
<td>A Deadly Game of Truth or Consequences: A Tragic Case of Cocaine and Alcohol Associated Ischemic Stroke</td>
<td>Timothy Owolabi, MD, Phoenix Baptist Hospital Family Medicine</td>
</tr>
<tr>
<td>10:10 AM</td>
<td>157</td>
<td>Pericardial Effusion Secondary to Primary Hypothyroidism in a 53 Year-Old Female</td>
<td>Hector Lopez, MD, Scottsdale Healthcare Family Medicine</td>
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<td>10:25 AM</td>
<td>64</td>
<td>“County” EM Residents Treat Less Ami Patients With PCI Than “Community” Hospital Based EM Residents</td>
<td>Craig Mangum, MD, Maricopa Integrated Health System Emergency Medicine</td>
</tr>
<tr>
<td>10:40 AM</td>
<td>153</td>
<td>The Relationship Between Mode Of Ventilation And Development Of Periventricular Leukomalacia In The Newborn: A Cohort Study</td>
<td>Mary Bull, MD, **MIHS/SJH PIROG Obstetrics and Gynecology</td>
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<td>10:55 AM</td>
<td>10</td>
<td>The Effect Of Fatigue and Sleep Deprivation On Psychomotor And Cognitive Skills Of Surgical Residents</td>
<td>Marcy Deka, MD, Banner Good Samaritan Medical Center Obstetrics and Gynecology</td>
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**The Phoenix Integrated Residency in Obstetrics and Gynecology (PIROG) program is located at Maricopa Integrated Health System and St. Joseph’s Hospital and Medical Center.**
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<tr>
<td>11:10 AM</td>
<td>151</td>
<td>Primary Amebic Meningoencephalitis: A Silent Killer</td>
<td>Kristina Wilson, MD Phoenix Children's Hospital / Maricopa Integrated Health System Pediatrics</td>
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<tr>
<td>11:25 AM</td>
<td>35</td>
<td>Safety, Feasibility and Clinical Outcomes Using Cryoaeblation For Atrial Fibrillation</td>
<td>Kahn Yarkoni, MD Banner Good Samaritan Medical Center Cardiology</td>
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<td>11:40 AM</td>
<td>83</td>
<td>Effect Of Single Vs. Multiple Antipsychotic Medication Regimens On Hospital Recidivism: A One Year Retrospective Study</td>
<td>Alfredo Velez, MD Maricopa Integrated Health System Psychiatry</td>
</tr>
<tr>
<td>11:55 AM</td>
<td>84</td>
<td>Level Of Clinical Acuity Of Not Competent Not Restorable Defendants Referred By Court For Civil Commitment</td>
<td>Illa Vora, MD Maricopa Integrated Health System Psychiatry</td>
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<tr>
<td>12:10 PM</td>
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<td><strong>LUNCH – KEYNOTE SPEAKER</strong></td>
<td>Dean Wingerchuk, MD, MSc, FRCP(C)</td>
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<tr>
<td>1:10 PM</td>
<td>100</td>
<td>Intra-Operative Radiation Therapy For Early-Stage Breast Cancer: Mammographic Changes Closely Approximate Those Of Conventional Whole Breast Irradiation</td>
<td>Caroline M. Cranford, MD Mayo Clinic Arizona Advanced Radiology</td>
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<td>1:25 PM</td>
<td>166</td>
<td>Defining MRI Microvascular Surrogate Markers for Non-Invasive Diagnosis of Glioma Recurrence and Post-Treatment Radiation Effect</td>
<td>Leland Hu, MD St. Joseph's Hospital and Medical Center Neuroradiology</td>
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<td>1:40 PM</td>
<td>167</td>
<td>Subacute Sclerosing Panencephalitis - A Videographic Report of a Rare Clinical Entity</td>
<td>Stanley Iyadurai, MD St. Joseph's Hospital and Medical Center Neurology</td>
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<td>1:55 PM</td>
<td>110</td>
<td>The Spectrum of Neurological Disorders Associated with GAD65 Autoimmunity</td>
<td>Matthew Hoerth, MD Mayo Clinic Arizona Neurology</td>
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<tr>
<td>2:10 PM</td>
<td>163</td>
<td>SOX2 Expression in Glial and Neuronal Neoplasms: Immunohistochemistry and Gene Expression Analysis</td>
<td>Jennifer Eschbacher, MD St. Joseph's Hospital and Medical Center Neuropath</td>
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<td>2:40 PM</td>
<td>26</td>
<td>The Effect Of Coccidioidal Prophylaxis In Liver Transplant Patients In Endemic Areas</td>
<td>Nayan Patel, DO Banner Good Samaritan Medical Center Hepatology</td>
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<td>2:55 PM</td>
<td>121</td>
<td>Screening For Esophageal Varices In End Stage Liver Disease: Utility Of Esophageal Capsule Endoscopy</td>
<td>Ayodele Osowo, MD Mayo Clinic Arizona Hepatology/Liver Transplant</td>
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<td>3:10 PM</td>
<td>111</td>
<td>Role Of Magnetic Resonance Elastography In Assessing Hepatic Fibrosis</td>
<td>Mashal Jatoi, MD Mayo Clinic Arizona Hepatology/Liver Transplant</td>
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<td>3:25 PM</td>
<td>113</td>
<td>Endosonographic Evaluation Improves Survival In Patients With Pancreatic Cancer</td>
<td>Feng Li, MD Mayo Clinic Arizona Division of GI and Hepatology</td>
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<td>3:40 PM</td>
<td>32</td>
<td>Does Tandem Colonoscopy Affect The Adenoma Detection Rate Described With Narrow Band Imaging</td>
<td>Sally Stipho, MD Banner Good Samaritan Medical Center Gastroenterology</td>
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<td>1</td>
<td>A Rare Presentation Of Hepatocellular Carcinoma</td>
<td>Lydia Aye, DO Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>2</td>
<td>A Rare Cause Of Multiple Pulmonary Nodules: Benign Metastasizing Leiomyoma</td>
<td>Elise Barney, DO Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>Large Cell Transformation of Mycosis Fungoides After Puva Treatment</td>
<td>Ramona Behshad, MD Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>4</td>
<td>The Electrocardiographic Brugada Pattern Is Rarely Associated With The Brugadsa Syndrome and Is Commonly Associated With The Acute Coronary Syndrome</td>
<td>Kathleen Benson, DO Banner Good Samaritan Medical Center Cardiology</td>
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<td>5</td>
<td>Coronary-Cameral Fistula As Etiology Of Unstable Angina</td>
<td>David Biglari, DO Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>6</td>
<td>A Case Of Lithium-Induced Thyroiditis Precipitating Thyroid Storm</td>
<td>Alexis Bogorad, MD Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>7</td>
<td>Why Do Patients Call Their Doctor?</td>
<td>Susanne Burkett, MD Banner Good Samaritan Medical Center Family Medicine</td>
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<td>8</td>
<td>Motor Vehicle Accident Resulting In Prolonged Cerebral Salt Wasting</td>
<td>Jamie Capasso, DO Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>9</td>
<td>A Comparison Of Glargine and NPH Insulin On Maternal and Fetal Outcomes In Women With Diabetes During Pregnancy</td>
<td>Jin Chang, DO Banner Good Samaritan Medical Center OB/GYN</td>
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<td>The Effect Of Fatigue and Sleep Deprivation On Psychomotor And Cognitive Skills Of Surgical Residents</td>
<td>Marcy Deka, MD Banner Good Samaritan Medical Center OB/GYN</td>
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<td>11</td>
<td>Antibiotic Distribution Is Equivalent Between Surgeon-Mixed and Commercially Premixed Antibiotic Loaded Bone Cement</td>
<td>Kostas Economopoulos, MD Banner Good Samaritan Medical Center Orthopaedics</td>
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<td>12</td>
<td>Pulmonary Plombage: Tuberculosis Treatment Prior To The Advent Of Effective Antimicrobial Therapy - A Case Report</td>
<td>Siavash Farshidpanah, MD Banner Good Samaritan Medical Center Internal Medicine</td>
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<td>13</td>
<td>Factors Associated With Early Discontinuation Of Chronic Hepatitis C Virus Treatment Using Pegylated Interferon and Ribavirin: A Four-Year Experience</td>
<td>Edward Friedman, MD Banner Good Samaritan Medical Center Gastroenterology</td>
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**The Phoenix Integrated Residency in Obstetrics and Gynecology (PIROG) program is located at Maricopa Integrated Health System and St. Joseph’s Hospital and Medical Center.**
A RARE PRESENTATION OF HEPATOCELLULAR CARCINOMA

Lydia Aye, DO; Ester Little, MD; Ann Moore, NP; Geetha Kolli, MD; Alberto Ramos, MD; Mark Wong, MD; Kaya Fox, PA; Richard Manch, MD
Banner Liver Disease Center, Phoenix, Arizona

Introduction: Hepatocellular carcinoma (HCC) is a well known complication of hereditary hemochromatosis (HH), and it accounts for 30% of all deaths in these patients. However, the vast majority of patients with HH who develop HCC have underlying cirrhosis. This is a rare case of a non-cirrhotic patient with HH, who developed HCC.

Case report: This is a 62 year old male, diagnosed with HH at age 42. Patient was evaluated after his mother and twin brother were diagnosed with HH. Over the following 20 years, the patient underwent weekly phlebotomies, with the ferritin kept below 50 ng/mL. The patient developed diabetes, hypertension, severe osteoarthritis requiring multiple joint replacements and atrial fibrillation. Later, he tested positive for homozygous presence of the C282Y mutation. A recent abdominal CT, ordered to evaluate hematuria, demonstrated a 9 cm liver mass. There were no other clinical, biochemical, or imaging tests consistent with cirrhosis. AFP was 3 ng/mL. Liver biopsy showed a well differentiated HCC, and a biopsy of the adjacent liver tissue was normal. Other possible causes of chronic liver disease were excluded. Because of the biliobular involvement of the liver tumor, the patient was not considered a surgical candidate and was treated with Ytrium-90 glass microspheres.

Discussion: Like most patients with HH and cirrhosis who develop HCC, this patient is male and older than 50. However, he does not have cirrhosis. There are 14 cases of HCC in HH without evidence of cirrhosis cited in the literature. These cases support the theory that iron is carcinogenic to the liver, even in the absence of cirrhosis. There has been growing evidence that the C282Y mutation increases the risk of HCC. However, since multiple proteins are involved in iron homeostasis, further research is needed to discern which of these are involved in this genetic predisposition. Although the incidence of HCC in non-cirrhotic patients with HH is low, there are many questions as to what the appropriate HCC screening is for this population. With increased awareness of this complication of HH, perhaps HCC could be diagnosed at an earlier stage, when liver transplantation, the only curative treatment for HCC, may be an option.
A RARE CAUSE OF MULTIPLE PULMONARY NODULES:  
BENIGN METASTASIZING LEIOMYOMA

Elise Barney, D.O.

Introduction: The differential for multiple pulmonary nodules is extensive and often history and physical exam will lead to the diagnosis. Metastatic solid organ malignancies represent the most common etiology, accounting for 80 percent of cases. The following is a case of an incidental finding of multiple pulmonary nodules leading to an unusual diagnosis.

Case Presentation: A 39 year-old Jamaican woman, with history significant only for uterine fibroids, post-myomectomy 10 years prior, presented to the emergency department with complaint of neck pain. Plain films of the cervical spine showed nodules in the lungs and chest x-ray was performed, showing diffuse pulmonary nodules, favoring metastatic disease. The patient was a never-smoker with a negative family history for malignancy. Physical exam was unremarkable. Laboratory studies revealed a iron-deficiency anemia with a hemoglobin of 9.1, which decreased to 7.3 on day two of hospital admission. CT of the chest showed numerous bilateral, non-calcified, solid pulmonary nodules with a dominant nodule near the right azygos esophageal recess, measuring 4 cm in diameter. CT of the abdomen and pelvis showed a large fibroid uterus. Pelvic ultrasound showed too numerous too count fibroids. Biopsy of the dominant nodule was performed and pathology showed fascicles of eosinophilic spindle cells with morphological features consistent with smooth muscle differentiation. There was no atypia or necrosis. Immunohistochemistry stains were positive for desmin and smooth muscle actin and tissue was estrogen and progesterone receptor-positive. The patient was thus diagnosed with benign metastasizing leiomyoma.

Discussion: Benign metastasizing leiomyoma (BML) is a rare disease entity found exclusively in women with a history of uterine leiomyoma. BML is characterized by the presence of extra-uterine benign smooth muscle proliferations consistent with leiomyoma. The most common site is the lungs but it has been reported in the lymph nodes. BML is hypothesized to be a lymphatic or vascular dissemination of a benign uterine leiomyoma post-hysterectomy or myomectomy secondary to mechanical instrumentation. However, there have been case reports of BML with no history of any procedures. Since there are only approximately 100 reported cases in the literature, management remains controversial. Treatment may not be necessary but usually based on hormonal manipulation with progesterone and/or surgical resection of lesions. Hysterectomy and bilateral oophorectomy are controversial. Prognosis is generally good.
Abstract 3
Banner Good Samaritan Medical Center
Internal Medicine

LARGE CELL TRANSFORMATION OF MYCOSIS FUNGOIDES AFTER PUVA TREATMENT

Ramona Behshad, Ora Fried, Carl T Hayden VA Medical Center, Banner Good Samaritan Medical Center, Phoenix AZ

Introduction: Mycosis fungoides (MF) is a cutaneous non-Hodgkin's lymphoma characterized by the proliferation of helper T cells. Transformation of MF to large cell lymphoma is a well-described phenomenon and has a very poor prognosis. Psoralen plus ultraviolet A (PUVA) photochemotherapy is widely used for the therapy of MF and its acute side effects, including erythema, pruritus and nausea, are generally self-limited. Chronic complications, however, include secondary cutaneous malignancies, which demonstrate its carcinogenic potential.

Case Report: A 59 year old male with a four year history of patch/plaque stage MF returned to the dermatology clinic as his scaly, erythematous patches had recurred over significant portions of his trunk, face, neck, and proximal extremities despite topical steroids. Vital signs, general physical exam, and laboratory tests were unremarkable. Two skin biopsies from the right posterior shoulder confirmed the diagnosis of MF and PUVA therapy was started (3 J/ cm²). The day following treatment, despite avoidance of sunlight, he developed diffuse erythema with swelling of eyelids and hands. The lesions became increasingly confluent and pigmented. Shortly following his second ultraviolet A treatment (4 J/cm²), despite taking diphenhydramine and holding psoralen, his legs and arms swelled bilaterally, his lesions become increasing violaceous and tumor-like, and open sores developed on his legs and feet. This was accompanied by diffuse erythema and scaling that required inpatient care. On admission, laboratory tests were significant for a WBC 14.7 (G72.5%, L12%, M14.9%, E0.1%, B0.5) without Sezary cells. CT scan showed prominent somewhat enhancing bilateral axillary lymph nodes. Lymph node biopsy with immunohistochemistry and flow analysis revealed findings diagnostic of MF with large cell transformation. Staging workup revealed IVB disease and standard CHOP therapy was prescribed. After the first round of chemotherapy, the patient had a good response with partial shrinking and flattening of lesions. However, one week after chemotherapy, the patient became neutropenic and febrile with staphylococcal and pseudomonal bacteremia. He went into septic shock with cardiopulmonary arrest and multiorgan failure. He passed away five days after transition to palliative care.

Discussion: The sequence of events suggests a PUVA-mediated step in the patient’s development of large cell transformation. While PUVA is an effective therapy in early MF, this case underscores PUVA’s well known ability to modify DNA and cause genetic mutations. Therefore, when acute worsening of MF occurs after PUVA treatment, it is important to consider large cell transformation, so that PUVA treatment can be withdrawn and another treatment can be started. While combination chemotherapy initially appeared promising in this patient, the final outcome was poor. This suggests that newer immunomodulatory regimens should be used in patients with extensive skin lesions to reduce the need for cytotoxic therapies, as the risk of infection should be balanced against the effectiveness of the drug.
THE ELECTROCARDIOGRAPHIC BRUGADA PATTERN IS RARELY ASSOCIATED WITH THE BRUGADA SYNDROME AND IS COMMONLY ASSOCIATED WITH THE ACUTE CORONARY SYNDROME

K.M. Benson, N. Farraj, K.B. Desser, N. Laufer, M. Burns
Cardiology Fellowship Program, Banner Good Samaritan/Veterans Affairs Medical Center, Phoenix, Arizona

Introduction: Previously designated incomplete or complete right bundle branch block with early or high J point/ST segment take-off, this electrocardiographic (ECG) configuration is now interpreted as “Brugada pattern” by many cardiologists. The purpose of this study was to determine the incidence and clinical significance of this ECG finding.

Methods: Over a 2 year period, 67,233 consecutive ECGs were prospectively studied for the presence of the Brugada pattern at an ECG work station of a large teaching hospital. Clinical correlation was then determined by patient data extraction.

Results: One hundred fifty-eight patients (0.24%) manifested the Brugada pattern with the following Arrhythmia Working Group distribution: type 1 (prominent coved ST segment elevation) = 3, type 2 (saddleback configuration above baseline) = 98, type 3(saddleback, coved or both < 1mm above baseline) = 57. Only 4/158 (2.5%) had pre-syncope, syncope and/or polymorphic ventricular tachycardia (3, type 1, 1 type 2). Of the other 154 subjects, 64 (42%) had cardiovascular diagnoses with 50 acute coronary syndromes and 14 cases of suspect or diagnosed pericarditis. Forty-one of fifty (82%) with acute coronary syndrome were troponin positive. The Brugada saddleback pattern in 2/3 adjacent leads (V1, V2, V3) did not resolve after therapy and no subject received thrombolytics. Ninety subjects had a variety of non-cardiovascular medical and surgical diagnoses.

Conclusions: Only a small minority of patients with the Brugada ECG pattern has findings which satisfy Brugada Syndrome criteria and this finding is encountered in subjects with ischemic heart disease. Whether the latter association is incidental remains to be determined.
CORONARY-CAMERAL FISTULA AS ETIOLOGY OF UNSTABLE ANGINA

David Biglari, DO, Nahel Farraj, DO, Kenneth Desser, MD

Introduction: Coronary-cameral fistula is a rare finding and may not be familiar to the internist. A coronary-cameral fistula is an unexpected termination of a coronary artery, usually the right coronary, into a cardiac chamber, by and large the right ventricle. First described by Krause et al. in 1865, in fact it is the most common of the hemodynamically significant coronary variants and comprises nearly half of all coronary artery anomalies. The most common presentation is asymptomatic. Coronary-cameral fistulas are usually congenital anomalies but can also be acquired as an uncommon result of trauma (accidental or iatrogenic). We present a case of an unusual form of this vascular anomaly in which three coronary arteries terminated into the left ventricle.

Case Report: A 59 year-old man with multiple comorbidities but no known coronary artery disease, trauma or prior invasive intra-thoracic procedures presented to emergency department for evaluation of chest pain. The patient reported intermittent chest pain for the past 3 years but stated the episodes had recently increased in frequency and were now occurring on a daily basis. A typical episode started with numbness and tingling of left hand followed by severe sharp “gripping” substernal chest pain. The episodes are associated with shortness of breath and anxiety. The pain occurred mostly at rest, often within minutes of waking up, and resolved with sublingual nitroglycerin. On admission, vital signs, physical examination and laboratory evaluation were unremarkable. The patient was ruled out for myocardial infarction, with normal electrocardiogram and cardiac biomarkers. He underwent an exercise technetium stress test. He achieved 88% of the predicted maximal heart rate and a double product of 28,542. The nuclear images revealed an ejection fraction of 48% as well as a small partially reversible apical defect. Left heart catheterization was performed and revealed a coronary-cameral fistula emptying into the left ventricle that was supplied by the distal posterior descending, diagonal and obtuse marginal arteries. There was no evidence of significant stenosis in the coronary arteries, and the left ventricle had normal function with ejection fraction of 55%. Based on the findings, the patient was referred to cardiothoracic surgery for possible intervention.

Discussion: As more invasive cardiothoracic procedures are performed, once uncommonly seen anomalies are being discovered more frequently. We find this case unique for its unusual termination site. The majority of coronary fistulas terminate in the right ventricle, right atrium or pulmonary vasculature. In this case, the fistula involved three coronary vessels and the left ventricle, giving rise to anginal symptoms. Therefore, we recommend including coronary-cameral fistulas in the differential diagnosis for episodic angina, especially in patients with a history of trauma or invasive intra-thoracic procedures.
A CASE OF LITHIUM-INDUCED THYROIDITIS PRECIPITATING THYROID STORM

Alex Bogorad

Introduction: Thyroid storm is a rare but potentially fatal condition that is most frequently associated with Graves' disease. It is sometimes associated with toxic adenoma and toxic multinodular goiter, and almost never with thyroiditis. We present a case of an elderly male with lithium-induced thyroiditis causing a thyroid storm.

Case Presentation: A 67-year-old male with no personal or family history of autoimmune disease on chronic lithium therapy for bipolar disorder was admitted for lithium toxicity. He has taken extra lithium pills, and has developed visual hallucinations, mood swings, increasing tremulousness, and thirst. His past medical history was significant for chronic kidney disease, stage 3, alcohol abuse, and schitzoaffective disorder. While he was hydrated with intravenous fluids, he developed new onset atrial fibrillation with rapid ventricular rate, fever, psychosis, nausea and vomiting, and thyroid function abnormalities meeting criteria for thyroid storm. He was transferred to intensive care unit and treated with propylthiouracil, metoprolol, potassium iodide and hydrocortisone. His free T4 and free T3 became subnormal on day 8 of hospitalization, prompting discontinuation of propylthiouracil. Cultures and radiography of head and chest did not find evidence of infection. History did not support recent surgery, iodine therapy or iodinated contrast dyes or amiodarone use. The patient was diagnosed with lithium-induced thyroiditis based on the absence of classical ocular, dermatological, thyroidal signs of Grave's disease, lack of thyroid stimulating immunoglobulins, and lack of enhanced vascularity and nodule size on ultrasound examination. Chronic lymphocytic thyroiditis was less likely in the absence of diffusely enlarged gland and antithyroid peroxidase antibodies. We were unable to confirm the diagnosis with radioactive iodine uptake study secondary to potassium iodide treatment of thyroid storm. He was discharged on day 33 without any thyroid medication. Our diagnosis was supported by the course of patient's thyroid function panel which was typical for thyroiditis: by day 44 post hospitalization the patient was hypothyroid and by day 55, he became euthyroid.

Discussion: To our knowledge, this is a third reported case of thyroiditis causing thyroid storm, and a first reported case of lithium-induced thyroiditis precipitating a thyroid storm. Lithium inhibits hormone release from the thyroid gland, and is used to treat severe thyrotoxocosis, especially in patients who have experienced severe thionamide side effects. Thus lithium inducing thyroid storm through thyroiditis is unusual. This case illustrates the necessity to include thyroiditis in the differential diagnosis of severe thyrotoxicosis and thyroid storm. The etiology of thyrotoxicosis determines its therapy, and should be pursued concurrently with treatment of thyroid storm. Antithyroid drugs are indicated in Grave's disease, but not in thyroiditis, as in the latter thyroidal hormone synthesis is not increased.
WHY DO PATIENTS CALL THEIR DOCTOR?

Susanne Burkett, MD, Steven Brown, MD

Purpose: Patient telephone calls to physicians constitute a significant time requirement for both staff and the physicians. The quantification and categorization of these calls may be useful to reduce call volume through specific interventions. The aim is to quantify all patient telephone calls coming in within the period of one month and then organize them into categories with the final goal of designing specific interventions through which to reduce unnecessary telephone calls.

Methods: Data from incoming patient telephone calls were collected during the period of October 1, 2007 to October 31, 2007 by using paper message slips. Those were then counted and separated into appropriate categories. The setting is the Family Medicine Residency Program at BGSMC.

Results: The total number of patient telephone calls during the month of October 2007 was 921. The specific breakdown was as follows:

- **Medication Request for Existing Rx**: 237 (25.7%)
- **New Medication Request**: 8 (0.86%)
- **Medical Question**: 281 (30.5%)
- **Pharmacy Calls**: 49 (5.3%)
- **Lab calls**: 3 (0.32%)
- **Medical Record Requests**: 7 (0.76%)
- **Paperwork Request**: 24 (2.6%)
- **Radiology Request**: 17 (1.8%)
- **Lab Request**: 9 (0.98%)
- **Result Request Radiology**: 36 (3.9%)
- **Result Request Lab**: 41 (4.5%)
- **Equipment request**: 9 (0.98%)
- **Referral Request**: 52 (5.6%)
- **FYI**: 59 (6.4%)
- **Returning Your Call**: 26 (2.8%)
- **Other/Multiple**: 63 (6.8%)

Conclusion: Patient telephone calls are an important aspect in practice management considering that a call volume of 921 calls a month with an estimated three minutes per call demands a full time position dedicated only to telephone call management. Reducing the call volume in certain categories such as result requests or refill requests through better patient education or more efficient telephone call triage could have a significant impact on cost containment and improve office efficiency as well as patient satisfaction.
MOTOR VEHICLE ACCIDENT RESULTING IN PROLONGED CEREBRAL SALT WASTING

Jamie Capasso, DO, Associate, and Kelly McDonnell, DO

**Introduction:** Cerebral salt wasting is a difficult and controversial diagnosis but is important to consider in patients with polyuria and hypotension.

**Case Discussion:** The patient is a 67 year old Navajo man that was admitted for further evaluation of bradycardia and orthostasis after a syncopal episode. His history was significant for a motor vehicle accident (MVA) four months prior with resultant unspecified head injury without intervention. The family noted a subsequent 40 pound weight loss. The patient reported increased urination and symptoms of orthostasis. The patient was noted on initial examination to be a very thin male. His mucous membranes were dry. His heart rate was bradycardic and regular. His skin demonstrated significant tenting. His vitals on admit were blood pressure (BP) 82/48 and heart rate (HR) 59 while supine and BP 70/53 and HR 82 when standing. His labs were significant for a sodium of 132 that corrected with IV fluids. Despite fluid resuscitation the patient continued to have orthostasis and polyuria with a maximum of 9L output in 24 hours. A twelve hour fluid restriction was done to evaluate diabetes insipidus with resultant urine osmolarity equaling 561. Additional labs included a random cortisol of 16.9. A 24 hour direct analysis of sodium intake documented a 42.5meq sodium intake and associated 24 hour urine documented 209 meq sodium excretion, resulting in a negative sodium balance of 166.5 meq daily. The accumulative water balance was also calculated to be negative 16802 mL throughout the admission. The diagnosis of cerebral salt wasting was made and the patient was started on midodrine, flornief, sodium tabs and IV fluids. During the following two weeks his orthostasis improved and he was weaned from IV fluids and will continue long term sodium replacement.

**Discussion:** The differential diagnosis of orthostasis and hyponatremia includes diarrhea, diabetes insipidus, adrenal insufficiency, SIADH, neuropathies and cerebral salt wasting (CSW). CSW is often considered controversial due to the difficulty of separating multiple common contributors and is often considered in the spectrum of SIADH. It can be differentiated based on serum sodium response to fluids, persistent low volume status, weight loss, negative water balance, and a negative sodium balance. CSW is most often documented in traumatic brain injury and cerebral hemorrhage and is related to natriuretic factors; our patient had prolonged salt wasting secondary to an MVA. After correction of his sodium balance and restoration of his fluid balance, the patient returned to his normal premorbid activities.
A COMPARISON OF GLARGINE AND NPH INSULIN ON MATERNAL AND FETAL OUTCOMES IN WOMEN WITH DIABETES DURING PREGNANCY

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Purpose: To compare the maternal and fetal outcomes for diabetic women on a traditional insulin regimen (NPH/regular or humalog) vs. insulin glargine.

Methods: This investigation was a case-control study, using medical and delivery records of women with diabetes requiring insulin treatment during pregnancy for the years 2005-2006. Where appropriate, descriptive statistics, chi squared tests and regression techniques will be used. A two tailed p<0.05 will be considered significant.

Results: A total of 20 patients on insulin glargine in pregnancy were identified during the time period. The small number of cases resulted in a lack of power to note significant differences. There was no difference in fasting or postprandial glucose levels, hemoglobin A1C or delivery route. There was however, a significant difference (p=0.01) in the incidence of maternal hypoglycemia (blood glucose < 60) in the insulin glargine group compared to the control group. Of the insulin glargine group, 54.6% (6/11) had at least one recorded hypoglycemic event. In the control group, 12.5% (3/24) experienced maternal hypoglycemia. There was no difference in fetal outcomes including birth weight, cord gas pH, episodes of respiratory distress, jaundice or neonatal hypoglycemia. Though not significantly different, the control group’s neonatal mean hematocrit was 48.5%, while insulin glargine group’s was 53.3%.

Conclusions: The use of insulin glargine appears to be as effective as more traditional regimens for glycemic control in pregnancy. Although there was a statistically significant increased rate of maternal hypoglycemia in the insulin glargine group, this could very well be due to the inherent selection bias. A large portion of the insulin glargine participants started off with the more traditional insulin regimens, but due to poor and difficult control were eventually converted to insulin glargine later in their pregnancy. This also implies that patients, as well as physicians, need to be better educated in recognizing insulin glargine candidates and possible initiating therapy sooner.
THE EFFECT OF FATIGUE AND SLEEP DEPRIVATION ON PSYCHOMOTOR AND COGNITIVE SKILLS OF SURGICAL RESIDENTS

Mary Deka MD, Mario Leyba MD, Kanav Kahol PhD, Marshall Smith MD. PhD, John Mattox MD, Ann Woodward MD

Purpose: Study was designed to determine the effects of a call period on psychomotor and cognitive skills in a laparoscopic simulated environment using haptic feedback.

Methods: Thirty-two obstetrical and surgical residents at Banner Good Samaritan Hospital were recruited for the study. Subjects were requested to perform a ring transfer task while wearing CyberTouch Datagloves and Polhemus Tracker for measuring hand movements. The task was created using Sensable Joystick that allows visio-haptic feedback to the user. A surgical probe was attached to the joystick to simulate realistic psychomotor requirements. This task is designed to develop and test basic psychomotor skill. We extended the task to test and train cognitive skills including (1) attention, (2) memory, (3) working memory and (4) intermodal transfer and coordination. The study involved subjects answering questionnaires assessing fatigue levels and performing predefined order of tasks before and after call.

Results: Statistically significant change was identified in the smoothness of hand movements and time taken to complete the tasks in the precall and postcall groups. Drastic drop in measured cognitive skills was noticed in the postcall condition.

Conclusion: The results suggest that call-associated fatigue and sleep deprivation are associated with increased technical errors in both the psychomotor and cognitive skills. However, more serious drop in cognitive skills is observed. These results need to be accounted for in the design of resident curriculum and call schedule.
ANTIBIOTIC DISTRIBUTION IS EQUIVALENT BETWEEN SURGEON-MIXED AND COMERCIALLY PREMIXED ANTIBIOTIC LOADED BONE CEMENT

Kostas Economopoulos, MD, Himanshu Kaul, PhD, Ryan Miller, BS, Alex McLaren, MD

Purpose: Antibiotic loaded polymethylmethacrylate (AL-PMMA) has been proven to be an effective treatment for orthopaedic infections.Commercially available AL-PMMA restricts the surgeon’s choice of antibiotic and has a higher cost than surgeon-mixed AL-PMMA. The difference of antibiotic delivery between commercially pre-mixed and surgeon-mixed AL-PMMA is not known. We question the value of commercially available premixed AL-PMMA over surgeon-mixed AL-PMMA. Our hypothesis is that gentamicin release from surgeon-mixed AL-PMMA is similar to gentamicin released from commercially premixed AL-PMMA. The purpose was to measure the release of gentamicin from beads made from AL-PMMA made using five different mixing techniques, one commercial premix and four surgeon-mixed.

Methods: Commercially premixed gentamicin loaded bone cement, Cobal-G (Biomet) and the corresponding cement without premixed gentamicin, Cobal, were used for the experiment. One gm of gentamicin mixed into the PMMA was compared using five different methods: commercially pre-mixed (1), suspension in the monomer (2), no mixing (3), hand stirred in the PMMA polymer powder (4) and stirred in the PMMA polymer powder using a commercial mixing bowl (5). Ten samples of each mixing style were eluted in deionized water. Disk inhibition bio-assay (Kirby Bauer) was used to measure the concentration of gentimicin in the eluant at regular intervals over 30 days to quantify release of antibiotic from each sample. The total retrieved gentamicin and the range of gentamicin release for individual beads in each mix was compared between the five different mixing techniques.

Results: Released gentamicin was similar amongst mixing techniques with the range of gentamicin eluted from individual beads in a group large for all groups and overlapping between groups. The ‘suspension in monomer’ mix had the smallest range in released gentamicin and the ‘no mix’ group had the greatest range in release amongst the individual beads in any group.

Discussion: Each bead is a specimen from a different location in each PMMA mix. The gentamicin recovered from individual beads therefore represents gentamicin recovered from various areas in each PMMA mix and therefore the homogeneity of the mix. The total antibiotic recovered from all the beads is the total that would be delivered to the wound and is similar in all mixing groups. The range of recovered gentamicin from the beads in each mixing group shows that if the surgeon mixes the antibiotic powder in either the liquid monomer or the powder polymer before the two components are combined it will lead to a release of the antibiotic similar to the commercial premixed AL-PMMA.

Conclusion: The minor difference in the release of gentamicin from surgeon-mixed AL-PMMA compared to commercially premixed AL-PMMA is not enough to warrant the cost of purchasing pre-mixed AL-PMMA.
Introduction: Pulmonary plombage, or collapse therapy, was one treatment for cavitary tuberculosis before effective antimicrobials became available. Plombage therapy involved filling parts of the lung with oil, paraffin, or Lucite spheres to selectively collapse the diseased portions of the lung. This procedure proved effective, but had complications including infection and migration of the foreign objects, sometimes resulting in death. Eventually, this idea was mostly abandoned with the advent of effective antimicrobial therapy. With the recently increasing incidence of multidrug-resistant and extensively drug-resistant tuberculosis, this concept may have renewed utility.

Case Report: Our patient is a 73 year old Native American male with a past medical history significant for hypertension and benign prostatic hyperplasia who presented with fatigue, weight loss and general deconditioning. During the course of his diagnostic workup, a large right upper lobe lesion was noted on CT scan of his chest. Upon review of his medical history, he had plombage therapy in the 1950s for tuberculosis. The patient was initially placed in isolation for suspected reactivation of tuberculosis; however, active infection was diagnostically ruled out suggesting continued efficacy of the original plombage. The patient continued to improve without further intervention and returned to his functional baseline upon discharge; the etiology of his presentation remained uncertain.

Discussion: Pulmonary plombage, which originated in the 1950’s, was for the most part a highly effective method for the treatment of cavitary tuberculosis, providing a functional cure in up to 75% of patients. Unfortunately, this procedure had common complications including secondary infection, vessel erosion, and later migration of foreign material within the body. With the emergence of new antimycobacterials in the 1960’s, pulmonary plombage fell out of favor as it was less effective and had a higher risk of complication.

As a result of inadequately treated cases of mycobacterial infections and the natural resilience of this organism, multidrug and extensively drug-resistant tuberculosis has become a real threat worldwide. According to a recent report by the CDC, in industrialized nations alone, 32.9% of all reported cases fit the definition of multidrug-resistance and of those, 6.5% are considered extensively drug-resistant. As these patients no longer benefit from antimycobacterial agents, adjunctive therapies need to be investigated.

Given the high incidence of complications, plombage as previously performed in the 1950’s is obviously inappropriate, but the concept of extrapleural pneumolysis appears to have merit. Recent studies examining this concept have yielded encouraging results with the use of inflatable silicone tissue expanders. These devices have the benefits of less interaction with tissues, prevention of migration, and better fit in the geometry of the extrapleural cavity. Antimycobacterials remain first line therapy, but in the subset of extensively drug-resistant tuberculosis, this revised plombage offers an additional tool and warrants further investigation.
FACTORS ASSOCIATED WITH EARLY DISCONTINUATION OF CHRONIC HEPATITIS C VIRUS TREATMENT USING PEGYLATED INTERFERON AND RIBAVIRIN: A FOUR-YEAR EXPERIENCE

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Purpose: Maximizing adherence to hepatitis C (HCV) therapy impacts the rates of sustained virologic response (SVR). We analyzed variables in patients undergoing HCV therapy which may be associated with early treatment discontinuation.

Methods: Cohort of patients, who initiated HCV treatment between April 2002 and April 2006, was evaluated for twenty seven factors that may negatively influence treatment completion. Inclusion criteria: a) patients who completed HCV treatment b) Patients who discontinued HCV treatment. Exclusion criteria: Patients requiring early treatment withdrawal due to non-response.

Results: 218 patients were included in the study with mean age of 51.0 +/- 6.8 yrs and median viral load of 2,030,000 c/ml. Eighty nine percent were Caucasian. Genotype 1 was present in 58.5%, genotype 2 in 26.7%, and genotype 3 in 14.7%. Pegylated interferon alpha-2a was used in 41.3% and pegylated interferon alpha-2b in 58.7%. Multiple logistic regression analysis identified 8 factors significantly associated with early treatment discontinuation (table 1). Variables predicting early treatment discontinuation were concomitant co-morbidities (HTN, DM, CAD and COPD) and pre-treatment cytopenias. Figure 1 illustrates the sensitivity and specificity of the logistic regression analysis used for our study.

Conclusion: Pre-treatment medical co-morbidities and cytopenias are predictors of pre-mature discontinuation of HCV treatment. This might represent decreased treatment tolerance in this patient population. Symptoms while on treatment and genotype 2 and 3 that appear to be associated with decreased rate of treatment discontinuation likely represent the duration of therapy in these patients. In our study, mandatory pre-treatment alcohol cessation could have contributed towards decreased treatment discontinuation, probably reflective of patient’s level of commitment.
AN ACROMEGALIC WITH PITUITARY APOPLEXY PRESENTING WITH ASEPTIC MENINGITIS

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Introduction: Pituitary apoplexy most often presents as an acute life threatening emergency, but it is always important to include in your differential diagnosis for headache presenting with unexplained endocrine syndromes.

Case Presentation: AA is a previously healthy 27 year old male who presented to an outside hospital with a severe headache and neck stiffness that progressed over a period of two weeks, culminating in unbearable panencephalic pain. A CT was obtained which showed a large pituitary mass, and the patient was transferred to our institution for neurosurgical evaluation. Our initial physical exam revealed a well developed male with large hands and exaggerated facial features. The patient notes that his appearance has been changing over the past “few years.” He first began to notice that his shoes no longer fit him, and he later became cognizant of a change in facial features after looking at older pictures of himself. A diagnostic lumbar puncture was significant for grossly xanthochromic CSF with an elevated protein and white cell count. Further analysis included a somatomedin C level which was elevated at 533 Units/mL. Standard microbiologic workup including gram stain and culture was negative. At this point we began to consider viral etiologies, such as West Nile Virus and herpes simplex. MRI showed a large sellar and suprasellar lesion compressing the optic chiasm consistent with a pituitary macroadenoma. The MRI findings, together with the somatomedin C level, confirmed the diagnosis of pituitary adenoma resulting in the patients acromegaly. The patient promptly underwent successful resection of the pituitary gland, which was shown to contain infarcted macroadenoma tissue. Infarction of this large mass is the underlying etiology of the patient’s severe headache and meningeal signs. AA was discharged from the hospital on post operative day #3 with panhypopituitarism. He will require lifelong replacement of thyroid hormone and androgens.

Discussion: Pituitary adenomas are usually benign tumors that primarily exert their effects either by compression of surrounding structures or altered production of pituitary hormones. Common sequelae include bilateral bitemporal hemianopsia or ophthalmoplegia secondary to compression of the optic chiasm or cavernous sinus, respectively. Hormonal manifestations such as hyperprolactinemia, thyrotoxicosis, acromegaly and Cushing’s Syndrome may be present according to the functionality of the tumor. A tumor can cause over or under expression of any or all pituitary hormones. This patient presented with signs of acromegaly without any compressive features. Patients with pituitary tumors generally have a favorable outcome after resection. However, an often fatal pre-operative complication is apoplexy, or infarction of the enlarged gland. Factors contributing to apoplexy include outgrowth of the gland’s blood supply, as well as the anterior pituitary’s unique perfusion by its portal vein. Usually, apoplexy presents as a sudden onset severe headache. Rarely, as in our case, pituitary apoplexy can have an indolent course resembling aseptic meningitis.
THE EFFECT OF FATIGUE ON COGNITIVE AND PSYCHOMOTOR SKILLS OF TRAUMA RESIDENTS AND ATTENDING SURGEONS

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Methods: To quantify the effect of fatigue on psychomotor and cognitive skills of surgical residents and attending surgeons taking in-hospital trauma call, simulations were created using a visio-haptic joystick attached to a surgical probe that allows realistic interactions. Before each study session, subjects were given a warm-up period. Then, for psychomotor skill evaluation, subjects were tasked with grasping a series of “virtual” rings and placing each on randomly highlighted pegs on a board. This task was modified to evaluate cognitive skill (e.g. attention, memory, orientation) in addition to psychomotor skill, providing realistic surgical conditions that combine psychomotor and cognitive skills. Before and after taking call, the senior surgical residents (n=5) and attending surgeons (n=9) performed a predefined order of ring transfer tasks while wearing datagloves to measure hand movements. Surgical proficiency was established using five metrics per session (minimum of three call sessions per subject): hand movement smoothness; tool movement smoothness; time of completion; gesture level proficiency; cognitive errors.

Results: Both groups showed a significant (ANOVA, 95% power with a two-tailed alpha of 0.05) decrement in proficiency measures postcall barring time required to complete the task. When tasks are separated based on psychomotor- vs cognitive-dominated skills, attending surgeons made 25% fewer (p<0.05) cognitive errors than residents postcall. Psychomotor skills were equally affected in both groups.

Conclusion: Call-associated fatigue is associated with increased error rates in the cognitive skill domain, though less so in attending surgeons compared to their resident counterparts.
A VERY IMPORTANT PRECIPITANT OF CHRONIC DIARRHEA

Scott Goodwin, MD; Brenda Shinar, MD

Introduction: Chronic diarrhea can be a common presenting symptom with a multitude of causes. This case describes a rare cause for this illness.

Case Report: A 76 year-old man presented with 8 weeks of chronic watery diarrhea, failure to thrive, and increasing confusion. His stools were tea-colored, non-bloody, and occurred day and night. He had nausea, decreased appetite and an 18-kg weight loss but denied fevers or abdominal pain.

Physical examination revealed an afebrile, thin man with orthostasis and typical sings of dehydration. He was alert, but confused with poor recall ability. Thyroid, heart and lung examination were normal. Abdominal exam was significant only for hyperactive bowel sounds, without masses. Digital rectal exam revealed tan, hemoccult negative liquid stool. He had no focal neurological abnormalities, peripheral edema, or lymphadenopathy.

Laboratory revealed a serum bicarbonate of 15 mmol/L, creatinine of 2.4 mg/dL, and corrected serum calcium of 14.8 mg/dL. Parathyroid hormone level was inappropriately elevated at 44 mg/dL. Serum and urine protein electrophoresis were normal. A parathyroid sestamibi scan revealed a parathyroid adenoma. Stool electrolytes revealed a low stool osmolal gap. CT of his chest, abdomen and pelvis revealed multiple hepatic masses consistent with metastatic disease. Fine needle aspiration of the hepatic lesions revealed metastatic small cell carcinoma. Neuroendocrine tumor markers were normal, except for vasoactive intestinal peptide (VIP), which was extremely elevated. MRI of the pituitary was normal. PET scan revealed the numerous known hepatic lesions and a 3.5 cm destructive lesion to the head of the left humerus.

Initial treatment included aggressive intravenous fluids, an intravenous bisphosphonate, and anti-diarrheal medications including octreotide. He underwent hepatic transarterial chemoembolization with drug eluting microspheres (TACE) for palliative treatment of his multiple hepatic lesions. Within 48 hours post-procedure his diarrhea ceased and his creatinine normalized.

Discussion: Multiple Endocrine Neoplasia type 1 (MEN1) is defined as the presence of two of three major tumor types: parathyroid, pancreatic endocrine, and/or anterior pituitary. It is a rare heritable syndrome with prevalence of only 2 per 100,000. Primary hyperparathyroidism is the most common component of MEN1 and hypercalcemia is the initial manifestation in most patients. Vasoactive intestinal peptide secreting adenomas (VIPomas) are an even rarer clinical entity that is detected in only 1 in 10 million people per year. Most VIPomas arise within the pancreas, however there are case reports describing primary VIP-secreting hepatomas. Most adults with VIPomas are diagnosed between the ages of 30 and 50 years of age. It is almost unprecedented to find a VIPoma in a patient near their eighth decade of life. Somatostatin analogs have long been the treatment of choice for controlling the symptoms due to VIPomas. But, hepatic artery embolization offers a revolutionary and novel approach for treatment of symptomatic hepatic metastases.
GOT MILK?: SEVERE IATROGENIC MILK-ALKALI SYNDROME WITH MINIMAL SYMPTOMS

Christina Judd, D.O.

Introduction: Presenting symptoms in hypercalcemia typically correlate with calcium levels, with levels above 14mg/dl causing a near comatose state. Milk-alkali syndrome is the third most common causes of hypercalcemia in people with normal kidney function. We present a case of extreme hypercalcemia from iatrogenic milk-alkali syndrome with relatively few symptoms.

Case: A 59-year old male presented to his primary care physician with progressive weakness and lethargy. His wife noticed that over the prior 2 weeks he had had progressive fatigue to the point that he slept all day. He was too weak to feed himself and stopped communicating. He also had mild abdominal pain and very infrequent muscle twitches throughout his body. He had undergone complete laryngectomy with a total reconstruction and tracheoesophageal prosthesis one month prior to presentation for stage IV laryngeal cancer. The surgery included removal of all four parathyroid glands and post-operative hypocalcemia resolved with supplementation. He had recovered from surgery well and 2 weeks ago had been administering his nutrition via PEG tube and even exercising. His medications included levothyroxine, calcium carbonate, vitamin D. Examination revealed the patient to be alert, but minimally communicative; he was confused with 4/5 weakness in all four extremities. The remainder of the neurologic exam was normal. He grimaced slightly to abdominal palpation. Initial laboratory studies showed a calcium of 20.2mg/dL, potassium of 2.6mg/dL, bicarbonate of 36mg/dL, BUN 36mg/dL, creatinine of 5.1mg/dL, and pH of 7.69. EKG demonstrated U waves, but no changes in the QT-interval. He was admitted to the Intensive Care Unit and treated with intravenous normal saline, furosemide, pamidronate, and methylprednisolone. PTH and PTHRP levels were both low. His electrolytes and renal failure gradually improved over several days, as did his mental status, without the need for dialysis. Further history revealed that his wife was administering at least 4 grams of elemental calcium via Tums and over 1 microgram of calcitriol daily on the advice of his outpatient physicians who attributed his weakness to hypocalcemia.

Discussion: Most causes of hypercalcemia are either from hyperparathyroidism or solid malignancy, but milk-alkali syndrome is still more common than multiple myeloma as a cause of hypercalcemia requiring hospitalization. Calcium has a narrow therapeutic window when given with carbonate for hypoparathyroidism, as in this case, or for osteoporosis. This case illustrates the need for a high suspicion of hypercalcemia during calcium supplementations and that high levels of calcium need not be associated with coma.
Abstract 18
Banner Good Samaritan Medical Center
Internal Medicine

64-SLICE CARDIAC CT DEMONSTRATING ANOMALOUS RIGHT CORONARY ARTERY ARISING FROM THE PULMONARY ARTERY WITH A LEFT TO RIGHT CORONARY SHUNT

Jason D. Klein, MD (Associate), Aki Loli, MD, Peter Maki, MD

Introduction: Anomalous right coronary artery arising from the pulmonary artery (ARCAPA) is a rare congenital anomaly accounting for 0.12% of coronary artery anomalies. A clinical review found MI or sudden death in up to 30% of patients with ARCAPA. A detailed review of the medical literature cited 70 case reports of ARCAPA since 1885 when it was first noted on autopsy. Over half of the cases (57.1%) were described in children (<18), with the most frequent presentation a murmur. Interestingly, 19 of the 30 cases seen in adults (63.33%) presented with symptoms of myocardial ischemia.

Case History: A 69-year old African American female with hypertension and obstructive sleep apnea presented with one year of shortness of breath and fatigue. Physical exam revealed obesity and mild hypertension. A Q wave was seen in lead II of her ECG. Echocardiogram and dobutamine stress test were nondiagnostic. SPECT imaging showed a mildly reversible anterior wall defect. A 64-slice ECG–gated CT angiogram (CTA) was done, which showed the right coronary artery (RCA) arising from the main pulmonary artery (PA). The vessel was massively dilated and folding upon itself in a serpiginous fashion. The posterior descending artery (PDA) was large in size and appeared to communicate with the large tortuous LAD through a web of vessels. Cardiac catheterization showed the large RCA arising from the PA and filling from left coronary contrast injection. Pulmonary angiography revealed brief competitive filling highlighting the anomalous origin of the RCA. Room air oximetry during catheterization showed a left-to-right shunt of 1.4 at the level of the pulmonary artery with step-up in O2 saturations from 64% in the right ventricle to 74% in the PA.

Discussion: ARCAPA is tolerated in fetal circulation because high pulmonary vascular resistance allows blood to flow from the PA to the RCA. As pulmonary vascular resistance falls over the first few days of infancy, blood flows less briskly from the PA to the anomalous RCA. This places the myocardium at risk for ischemia unless collateralization rapidly develops from the left coronary system. This compensatory mechanism may lead to ischemia via a coronary steal phenomenon. Currently there is no consensus on treatment of ARCAPA. Surgical treatments include ligation of the RCA or transplantation of the RCA into the aorta. Conservative observation has also been suggested in asymptomatic patients. As more cases of ARCAPA are identified on noninvasive imaging, the need for clear treatment guidelines will become necessary. CTA is an excellent non-invasive tool for imaging cardiac anomalies and their spatial relationship to surrounding structures. Images obtained will undoubtedly be useful in estimating ischemic risk and aid in surgical planning.
YTTRIUM-90 MICROSPHERES FOR THE TREATMENT OF HEPATOCELLULAR CARCINOMA IN PATIENTS NOT ELIGIBLE FOR LIVER TRANSPLANTATION

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Department of Hepatology, Department of Radiology

Purpose: To evaluate the survival of patients with Hepatocellular carcinoma (HCC) not eligible for liver transplantation, after treatment with Yttrium-90 glass microspheres.

Methods: Twelve patients seen between August of 2001 and May of 2007 were included in this retrospective analysis. All patients were diagnosed with HCC either by biopsy or the combination of characteristic imaging tests and elevated Alpha fetoprotein (AFP). Patients were treated with Yttrium - 90 glass microspheres (TheraSphere MDS Nordion, Ottawa, Ontario) injected into the hepatic artery via a percutaneous femoral catheter radiologically guided into the liver. The median survival was calculated using lifetables.

Results: Of the 12 pts included, 8 were male and 4 female, mean age of 55.4 +/- 12.5 (27 to 76). All but one patient had cirrhosis. The diagnosis of cirrhosis was made by biopsy in 6 of the patients, and combination of clinical, biochemical and image studies in the remaining 5. The etiology of the liver disease was HCV in 6 pts, ETOH in 2, NAFLD in 1 and cryptogenic in 2. The remaining patient developed hepatocellular carcinoma but had no liver disease. All but one pt had tumor burden exceeding Milan criteria, and were not eligible for liver transplantation. One pt had 3 tumors all less than 3 cm, but because of other comorbidities he was not eligible for transplant. Three of the 12 patients are currently alive and 9 are deceased. The median survival was 510 days. Side effects of treatment were mild to moderate in severity, not requiring hospital admission, and consisted of nausea, vomiting, abdominal pain, myalgia and low-grade fever, resolving within two weeks of treatment.

Conclusions: Yttrium-90 glass spheres are a well tolerated treatment modality for pts with HCC not eligible for liver transplant. The median survival post Yttrium - 90 glass microspheres treatment in this group of patients was 510 days, which is higher than the previously described 8 month median survival.
EVALUATION OF COGNITIVE AND PSYCHOMOTOR SKILLS OF SURGICAL RESIDENTS 
AT VARIOUS STAGES IN RESIDENCY

Stephanie Mayes, MD, Vikram Deka, MD, Kanav Kahol, PhD, Marshall Smith, MD, PhD, John Mattox, MD, Ann Woodward, MD

Purpose: To evaluate the difference in cognitive and psychomotor skills between different years of surgical residents using laparoscopic simulation with haptic feedback.

Methods: Banner Good Samaritan surgical residents were recruited to participate, resulting in enrollment of sixteen 1st years, six 2nd years and eight 3rd years. Subjects filled out a questionnaire assessing their previous experience prior to performing the assigned task. The task was created using Sensable Joystick that allows visio-haptic feedback to the user. A surgical probe was attached to the joystick to stimulate realistic psychomotor requirements. The default ring transfer task involved residents grasping a ring and placing it on a peg on the peg board. This task is designed to develop and test basic psychomotor skills such as grasping and tool manipulation. We extended the task to test and train cognitive skills including attention, memory, working memory and intermodal transfer and coordination. The data capture setup and its validity were established in earlier studies.

Results: Statistically significant difference was identified in the smoothness of hand movements and time taken to complete the tasks between years. Measured cognitive skills also demonstrated significant differences.

Conclusions: The results suggest that experience and training leads to reduced technical errors in both psychomotor and cognitive skills. Ultimately, an integrated curriculum of simulation training would benefit residents in surgical teaching and learning.
Abstract 21
Banner Good Samaritan Medical Center
Internal Medicine

UTILITY OF HOLTER MONITORS IN THE ANALYSIS OF SYNCOPE, NEAR SYNCOPE, DIZZINESS AND PALPITATIONS

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Purpose: To determine the diagnostic yield of 24-hour Holter analysis in patients evaluated for syncope, near syncope, dizziness, and palpitations.

Methods: At Carl T. Hayden VA Medical Center (CTHVAMC) in a retrospective single-center study was performed to evaluate the diagnostic yield and outcomes of patients with class I symptoms being evaluated with Holter monitors. A review of adult patients with Holter analysis from January 1, 2005 – December 31, 2005 was performed after IRB approval. Inclusion criteria were age greater than 18 with a symptom of syncope, near syncope, episodic dizziness or unexplained recurrent palpitations. Exclusion criteria were patients with other known medical cause of symptoms, history of documented arrhythmias, or history of or current use of anti-arrhythmics. Outcomes included a diagnostic Holter monitor recording, treatment received, and long term outcome defined as resolution of symptoms, cardiac complications, other cause identified, or continuation. Independent variables included demographics, history of presenting illness, past medical history, family history, and Holter findings. Descriptive statistics were used.

Results: Three hundred and seventy charts were reviewed with 161 patients meeting inclusion criteria. Seventeen percent of patients had a history of structural heart disease (defined as systolic dysfunction, diastolic dysfunction, valvular disease, dilated cardiomyopathy, or hypertrophic cardiac disease). Twenty-nine percent of patients had a history of coronary artery disease. Results demonstrate 71 patients being evaluated for palpitations, 40 for dizziness, 34 for syncope, and 16 for near syncope. In those 161 patients, 11 (6.83%) had diagnostic studies. Further analysis revealed no significant difference in diagnostic yield based on presence of absence of cardiac disease (2.48% vs 4.35%). Diagnostic yields were slightly higher in low risk patients, those without known cardiac disease, and when they were evaluated for palpitations and dizziness. Diagnostic tests only occurred in patient with known cardiac disease when evaluated for near syncope and syncope.

Conclusions: Our data suggests overutilization of Holter monitors for the evaluation of syncope, near syncope, palpitations, and dizziness. Despite the known utility of Holters to identify potential cardiac arrhythmias responsible for the above symptoms, the ease of use by practitioners and the low risk to patients has likely led to increased utilization. Holters are considered most useful in patients with unexplained symptoms and a high probability of an arrhythmia. When studies focused on high risk patients, diagnostic yields reached 48%. Our study demonstrates low diagnostic yields, suggesting that when an open-use policy is used the utility is greatly diminished. Physician may increase yields by applying more stringent criteria to patients they evaluation with a Holter. This would include a history of cardiac disease or high likelihood of cardiac cause.
WHEN DIURESIS ISN'T A GOOD IDEA: DYSPNEA ON EXERTION, HYPOXIA, ORTHOPNEA, ELEVATED JUGULAR VENOUS PRESSURE AND PITTING LOWER EXTREMITY EDEMA DOESN'T ALWAYS MEAN LASIX

Tony Merrill, DO

Introduction: A 54 year old Caucasian gentleman presents reporting shortness of breath, lower extremity swelling and orthopnea. The shortness of breath has been present over the last few years, worsening over the last six months. He is unable to lay down flat, and has slept upright for the last six months. Prior to three years ago, he denied any shortness of breath, chest pain, productive cough or purulent sputum. He reports swelling in both his neck and bilateral axilla that has waxed and waned over the last three years. He admits to night sweats over the last few years. His family and social history is non-contributory.

Case Report: Upon admission, his vitals were unremarkable, except for O2 saturation of 92% on 2 Liters of nasal cannula oxygen. Physical exam revealed a sick appearing gentleman. Lungs exhibited diffuse ronchi, persistent upper-airway sounds and tachypnea. Cardiac exam was essentially normal; except for tachycardia. Abdomen was obese, no tenderness to palpation, and bowel sounds were present. Spleen and liver margins were difficult to palpate secondary to body habitus. Lower extremities exhibited 2+ edema bilaterally. His lymphatic exam revealed diffuse bilateral supraclavicular and axillary lymphadenopathy. The largest nodes appeared to be 5-6 cm in diameter. Chest x-ray indicated mediastinal adenopathy with right upper and left lower lobe infiltrates. The comprehensive metabolic panel indicated hyperkalemia of 5.6. His complete blood count indicated a leukocytosis of 241,000 with a predominance of lymphocytes, normocytic anemia of 8.8 and thrombocytopenia of 110. A contrasted CT scan of the chest, abdomen and pelvis indicated splenomegaly and massive diffuse lymphadenopathy throughout the entire body, with predominance in the supraclavicular and axillary regions.

Discussion: After the presumptive diagnosis of Chronic Lymphocytic Lymphoma was made, there was continued concern for his worsening shortness of breath with the constellation of symptoms suggesting congestive heart failure. Lasix was considered as a treatment modality. After further investigation, however, diuresis was not prescribed, and the reasoning behind that is the subject of this discussion. The patient’s lower extremity swelling was not secondary to CHF, but rather lymphatic obstruction from overwhelming tumor burden in his lower extremities and abdomen. His effective circulating volume was significantly decreased, and additional diuresis would have only further compromised his volume status. His shortness of breath was not secondary to pulmonary edema, but rather bronchial obstruction from tumor load in his chest, worsened by a supine position. Likewise, his hyperkalemia was not secondary to renal dysfunction but rather a background baseline tumor lysis syndrome, which required additional intravenous fluids and would have been exacerbated with diuresis. This case effectively reminded the medicine team that lasix isn’t always the default treatment in a patient with signs and symptoms of CHF.
INFLUENCE OF ETHNICITY AND BMI ON THE DIAGNOSTIC VALUE OF ECG CRITERIA FOR DETECTING LEFT VENTRICULAR HYPERTROPHY

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Objective: The presence of left ventricular hypertrophy (LVH) diagnosed by electrocardiographic (ECG) criteria is a strong predictor of cardiovascular morbidity and mortality. ECG criteria for LVH have almost been exclusively evaluated in the Caucasian population, and the applicability of these criteria to the Hispanic population remains to be demonstrated. The purpose of this study is to investigate the differences in ECG parameters and the prevalence of LVH between different ethnic groups, with emphasis in the Hispanic population. Additionally, we investigated the impact of Body Mass Index (BMI) on ECG LVH criteria in the Hispanic population.

Methods: This is a retrospective cohort study involving patients having echocardiography at Banner Good Samaritan Medical Center (BGSMC). A list of patients having echocardiograms performed within the dates of January 1, 2007 to December 31, 2007 was obtained from the echocardiography laboratory. From this list, the first 800 echocardiograms were analyzed. Only adults who were older than 18 years of age, and who had echocardiograms and ECG within 1 month of each other were included in the study. The diagnosis of LVH was made if M-mode recordings showed an increased end-diastolic wall thickness of more than 1.1 cm for either the LV posterior wall or the intraventricular septum (IVS). An alternative rule for diagnosis of LVH was if LV Mass Index (LVMI) was greater than 104 g/m² in women and 116 g/m² in men. Once LVH was established by echocardiogram, medical records were obtained and ECG’s were checked. For the present study, three ECG criteria for LVH were chosen. The criteria consist of Sokolow-Lyon (SL) voltage, Cornell voltage, as well as Romhilt-Estes (RE) Point score system. Other data collected included age, LV ejection fraction (EF), and BMI.

Results: Among the 800 patients included in the study, 51 were excluded due to the presence of a pacemaker or left bundle branch block in the ECG. A total of 749 patients were analyzed in the study, in which 421 were Caucasians, 258 Hispanics, and 70 non-Caucasians (Native Americans, Asian-Americans, African-Americans). The prevalence of LVH by race was 44.7% in Caucasians, 82.2% Hispanics, and 34.3% Non-Caucasians. Among Hispanics, the SL voltage criteria reached the highest specificity 100%, whereas Cornell voltage criteria reach the highest sensitivity 71.5%. RE Point score criteria had a sensitivity of 70.7 % and a specificity of 99.7%. Additionally it was observed, that race had no significant influence on detecting LVH by any of the ECG criteria studied. Using LVMI as the gold standard, independent predictors of LVH were IVS wall thickness, EF, SL voltage, BMI and ethnicity.

Conclusions: Although the gold standard for detecting LVH is by echocardiographic measurements, SL voltage, RE point score, and Cornell voltage criteria have high levels of specificity. Furthermore, when using LVMI for diagnosis of LVH, BMI, ethnicity and SL voltage provide additional information.
Abstract 24  
Banner Good Samaritan Medical Center  
Orthopaedics

IMMERSION CYBERGLOVES USED TO DETERMINE A DIFFERENCE BETWEEN EXPERTS AND NOVICES FOR DRILLING SKILLS

Nugent, Matthew; Kanov, Kavol; McLaren, Alex; Kennedy, Sarah

Purpose: The use of virtual reality simulation has received increasing amounts of attention as a tool for use in physician training. Specialties such as General Surgery, Obstetrics and Gynecology, and Anesthesia have been using various simulation type systems in their training programs. Orthopaedically, virtual reality simulation has been used mostly in arthroscopic surgery training. A literature search revealed no study that identified whether or not Immersion Cybergloves could be used to determine precision of drilling movements. The study is intended to demonstrate that use of the haptic gloves can show a difference between those who are experts and those that are novices at the drilling technique.

Methods: Three groups of six participants were divided based on their experience with handling the drilling, tapping, and screwing mechanisms. The first group was novices, with no prior experience handling a drill or tap. The second group was made up of participants with some experience with the above processes. The final group was made up of orthopaedic experts finished with residency who use these techniques on a regular basis. Each participant was asked to drill a hole, tap threads in the hole and place a screw in the hole 10 times. Each participant did so while using the Immersion Cybergloves that traced each movement of the hands. A previously determined algorithm was used to determine which group had the most efficient and proficient movements.

Results: The Hidden Markov model was used to analyze the data generated by measuring hand movements using the Immersion Cybergloves. The analysis was able to discriminate between the three groups Novice, Intermediate and Expert. As the participants in the novice and intermediate groups performed an increasing number of drill, tap, screw tasks they progressively improved their performance toward the performance characteristics of experts indicating motor skills learning.

Conclusions: This study suggests that the use of Immersion Cybergloves can be used to determine a difference in skill level with the drilling, tapping and screwing mechanisms.
THE INTRA AND INTER OBSERVER VARIABILITY OF NARROW BAND IMAGING TO DIFFERENTIATE HYPERPLASTIC VERSUS ADENOMATOUS POLYPS

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Purpose: Narrow band imaging (NBI), a novel endoscopic technology uses optical filters for red-green-blue sequential illumination and narrows the bandwidth of spectral transmittance highlighting superficial mucosal capillaries and improving contrast for adenomas. This study evaluated the intra and inter observer agreement of endoscopists to differentiate hyperplastic polyps (HPP) and tubular adenomatous polyps (TAP) using conventional white light and NBI.

Methods: Photographs of 24 polyps (12 HPP and 12 TAP) from 14 patients were randomly displayed to 5 experienced endoscopists in white light and NBI. Before displaying the photographs, endoscopists were familiarized with pit patterns of HPP and TAP as described by Kudo et al. For analyses, Chi square and kappa testing were used.

Results: using white light, hyperplastic polyps were indentified correctly 70% (42/60) of the time. Adenomatous polyps were correctly identified 80% (48/60) of the time (p = 0.292). Using narrow band imaging, hyperplastic polyps were correctly identified 50% (30/60) of the time, while adenomatous polyps were correctly identified 80% (48/60) of the time (p < 0.001). Under white light imaging, there was good inter observer agreement (Kappa=0.65). Under NBI, there was moderate inter observer agreement (Kappa = 0.44). Seven times a polyp was called TAP when viewed under white light and subsequently called HP when seen using NBI. Twenty-one times a polyp was called HPP when viewed under white light and subsequently called TAP when seen using NBI. The kappa for intra observer agreement (between methods) was 0.52.

Conclusions: Using white light, endoscopist accuracy was similar for detection of HPP and TAP. However, using NBI, the accuracy to detect HPP was decreased. More polyps were called TAP when seen in NBI than in white light. Among experienced endoscopists, there was good agreement when using white light and moderate agreement when using NBI.
THE EFFECT OF COCCIDIOIDAL PROPHYLAXIS IN LIVER TRANSPLANT PATIENTS IN ENDEMIC AREAS

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Background: Coccidioidal infection is endemic in the southwestern region of the United States. Immunocompromised patients, and more specifically patients who receive solid organ transplants, are at risk for more severe and disseminated infections than immunocompetent people. As residents of an endemic area, all patients who receive a liver transplant at Banner Good Samaritan Transplant Program are placed on coccidioidal prophylaxis. The aim of the study was to evaluate whether the current prophylaxis regimen is effective in preventing coccidioidal infection in this patient population.

Methods: Charts of all patients who underwent liver transplantation between January 1st 2001 and October 31st 2006, at BGSMC, were retrospectively reviewed. Patients were treated with fluconazole for coccidioidal infection prophylaxis. Patients were followed for an average of 3 years. The risk of infection, with a 95% confidence interval was calculated.

Results: One hundred and thirty patients were identified, 80 males and 50 females, average age was 49.9 years. The most common indications for liver transplant were HCV (16%), followed by HCV and hepatocellular carcinoma (12%), alcohol alone (11%) and HCV and alcohol (9%). Five patients had a history of coccidioidal infection, confirmed by serological tests, and were placed on fluconazole prophylaxis for life. The remaining 125 patients were treated with fluconazole 100 mg daily, for the first six months following liver transplant. Eleven patients (8%) had an episode of acute rejection and were treated with fluconazole 100mg for prophylaxis during the treatment of rejection. None of the 125 patients developed coccidioidal infection, 0%, with a 95% CI of 0 to 2.8%.

Conclusion: Given the endemicity of coccidioidal infection in some areas of the USA, we believe that preemptive prophylaxis is important in these areas. In 125 post liver transplant patients at our program treated with 100mg of fluconazole daily for 6 months, there were no cases of coccidioidal infection, during an average follow up of 3 years.
WHO IS MY DOCTOR?: THE USE OF BUSINESS CARDS ON AN INTERNAL MEDICINE TEACHING SERVICE TO IMPROVE PATIENT IDENTIFICATION OF THEIR HOSPITAL PHYSICIANS AND PATIENT SATISFACTION

M.R. Paulson, DO, C.W. O’Malley, MD, S. Cherukuri, DO, O. Fried, MD, N.R. Paulson, MA.

Purpose: Patients cared for in the hospital today meet numerous new physicians including hospitalists, housestaff, and consultants. The relationship of each provider to the care of the patient is often confusing. Previous studies have proven that 77% of patients were unable to correctly identify one inpatient physician on their team¹ and that placement of photographs of physicians in hospital rooms improves patients' satisfaction with their medical care.² We proposed that the distribution of personalized business cards with the physician name, title with description, central contact number and a photo to patients at the time of first meeting would improve the identification of the physicians by the patient and their satisfaction.

Methods: Patients meeting study criteria admitted to the academic hospitalist teaching service over a 2 month period in 2007 were eligible. During half of each month, patients received photo business cards from each of the members of their primary team. The backside of business cards contained a definition of intern, resident or attending. Study patients were contacted to complete a telephone survey using questions from the Hospital Consumer Assessment of Providers and Systems (HCAHPS) within 2 weeks of discharge.

Results: During the 2 month study period, 126 patients met eligibility criteria and 74 agreed to participate. Thirty surveys were completed with 9 in the control group and 21 in the business card study group. Patients were satisfied with receiving the cards and 85.7% felt that they were helpful in knowing who was taking care of them. In the evaluation of their doctors overall, 86% of patients who received cards answered that doctors always treated them with respect, and 14% of patients answered usually, compared with 67% and 33% in the control group respectively (p=0.23). Secondly, the cards resulted in a trend toward improved ability for patients to name their main physician with 71.4% of the experimental group compared to 55% of the control group. Finally, patients given business cards felt that their main doctor explained things in a way they could understand 71% of the time as opposed to 33% in the control group, significant at the .05 level (p=0.036). 95.3% of doctors agreed or strongly agreed that patients seemed to like getting business cards. 80% felt the addition of the photo was helpful and 88.4% would continue to give out this type of card if they were provided. The correlation between these 2 variables is 0.634, significant at all alpha levels.

Conclusions: Patients hospitalized on an academic hospitalist teaching service found it useful to receive business cards with their physician's photo, title, description, and contact information. The cards impacted patient's perception of the ability of their main physician to explain things clearly. There were trends toward improvement in other important variables but small sample size limited attainment of statistical significance. Doctors enjoyed this type of card and would continue to use them. Given the relatively small expense and observable benefits in patient satisfaction, this simple intervention is an important tool for hospitalists and academic teaching services.
IMPROVING CROFAB® RECONSTITUTION TIMES

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#Banner Good Samaritan Medical Center, Department of Medical Toxicology, Phoenix, AZ
*Maricopa Medical Center, Department of Pharmacy, Phoenix, AZ

Purpose: To determine whether filling CroFab® vials to the top (25 cc) and hand rolling decreases the amount of time required to completely reconstitute CroFab.

Methods: The package insert of CroFab® recommends dilution with 10 mL of sterile water for injection (SWI), followed by gentle rolling. Three sets of five vials each were reconstituted with 10 mL SWI and compared to three sets of 5 vials each that were reconstituted with 25 mL of SWI. Each set of five vials was then either left undisturbed, agitated with the Baxter agitator, or rolled by hand. All activities were performed at room temperature utilizing a standard timer. The time to complete dissolution of each of the vials was recorded. Groups were compared using a Mann-Whitney U test, with a two-tailed p < 0.05 chosen to represent statistical significance.

Results: Reconstitution with 10 mL of SWI undisturbed at room temperature dissolved in an average of 33.6 minutes (range 27 to 57 minutes) compared to reconstitution with 25 mL of SWI undisturbed at room temperature dissolving in average of 17.2 minutes (range 5.8 to 26 minutes) [p < 0.008]. Reconstitution with 10 mL SWI, gently agitated by Baxter agitator, required an average of 26.4 minutes (range 13.5 to 43 minutes) compared to 11.6 minutes (range 8.2 to 13.2 minutes) for CroFab® reconstituted with 25 ml SWI that was gently agitated on the Baxter agitator [p < 0.008]. Reconstitution with 10 mL SWI, gently hand-rolled dissolved at an average of 4.5 minutes (range 3 to 6.8 minutes) compared to reconstitution with 25ml SWI hand-rolled that dissolved in an average of 1.1 minutes (range 0.92 to 1.3 minutes) [p < 0.008]. Less foaming was observed in vials reconstituted with 25 mL SWI regardless of agitation technique.

Conclusion: In this study of CroFab® dissolution, the method with the shortest dissolution time consisted of adding 25 mL SWI and hand-rolling the vial. Addition of 25 mL SWI consistently decreased dissolution time compared with its 10 mL counterpart.
POLYP AND ADENOMA DETECTION RATES DO INCREASE WITH THE USE OF HIGH DEFINITION, WIDE-ANGLE COLONOSCOPES

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Purpose: Quality assurance is area of endoscopy with ever increasing interest. Increasing quality in colonoscopy can occur through improvement in colonoscopy technique and through improved technology. The most recent generation of colonoscopes adds high definition and a wider angle to those of the past. However, there is a paucity of data about how these advances add to a higher quality exam. The aim of this study is to compare the polyp and adenoma detection rates between the newer 180 series colonoscopes and the 160 series scope.

Methods: Consecutive screening exam were reviewed starting from July 2007 and working back in time until 100 exams with a 180 series Olympus colonoscope and 100 exams with a 160 series colonoscope were encountered. Demographic information including age, sex, and presence of diabetes mellitus was recorded. Number of polyps, number of adenomas, presence of advanced neoplasia, total exam time, time to cecum, quality of preparation and fellow involvement was recorded. A Mann-Whitney U test was used to examine continuous variables and Chi square was used to analyze categorical data.

Results: A significantly higher number of polyps (1.14 vs 1.86, p=0.004) and adenomas (0.62 vs 0.99, p=0.002) was found with the 180 series endoscope. Exam time was longer with the 180 series scope (19.6 vs 22.8 minutes p<0.001). Multivariate analysis found that longer exam time (p<0.001) and shorter time to cecum (p<0.001) were predictive of finding more polyps. Cecal time was predicted by both the involvement of a fellow (<0.001) and endoscope used (0.028). Involvement of a fellow added 3.17 minutes to the cecal time. Using a 180 series scope added 1.31 minutes to the cecal time. Five factors were predictive of exam time: Cecal time, presence of advanced neoplasia (p=0.001), number of polyps (p<0.001), fellow involvement (p<0.001), and quality of preparation (0.001). Most notably, each polyp found added 1.73 minutes to the exam, fellow involvement added 2.2 minutes, and finding advanced neoplasia added 6.35 minutes to the exam. Finally, finding advanced neoplasia was predicted by exam time only with an odds ration of 1.13 (p<0.001). For each one minute of exam duration, the odds of advanced neoplasia increased by 13%.

Conclusions: Screening colonoscopy done with a 180 series Olympus colonoscope was associated with a higher number of polyps found, higher number of adenomas found, and longer exam and cecal times. The wide angle and high definition associated with these scopes does seem to lead to detection of more pathology and a higher quality exam.
COLONOSCOPIC WITHDRAWAL TIMES AND POLYP REMOVAL ARE PREDICTED BY TOTAL POLYP NUMBER AND METHOD OF POLYP REMOVAL (SNARE VS BX FORCEPS)

Deepta K. Shah, MD, Francisco C. Ramirez, MD, Richard Gerkin, MD, Felix F. Leung, MD, Carl T. Hayden VA Medical Center, Banner Good Samaritan Medical Center, Phoenix, AZ.

Purpose: To determine if there is a correlation between the number of polyps removed during colonoscopy and withdrawal time along with type of polypectomy (snare vs. bx forceps) and withdrawal time.

Methods: A review of the endoscopic database at a VA medical center was performed from August 2007 to November 2007. Sixteen endoscopists (fellows and attendings) performed two hundred and ninety eight colonoscopies with seven hundred and eighty three polyps removed. The patient’s age, endoscopists, indication (screening vs. other), preparation (excellent to poor), and terminal ileum intubation were reviewed. The total time, cecal time, and withdrawal times were recorded. Total number of polyps and type of polyp removal (snare vs. bx forceps) for each polyp were reviewed. The student’s t-test was used to compare means. Linear regression was utilized to determine predictors of withdrawal time.

Results: There were 298 subjects, mean age 62.5 ± 9.8. The total number of polyps detected per procedure was 2.64 ± 2.2. The average withdrawal time was 22.2 ± 10.8 minutes. The percentage of procedures performed by fellows was 49.2%. Screening colonoscopies comprised 44.1% of procedures. The terminal ileum was intubated in 4.4% of cases. Prep quality ranged from excellent 15.8% to good 60.3% to fair, adequate 20.9% to fair, compromised 2% to poor 1%. Withdrawal time was longer for fellows than attendings, 25.3 (±11.3) vs. 23.8 (±9.4) minutes (p < 0.001), and was longer for other indications than for screening, 23.8 (±11.9) vs 20.2 (±8.9) minutes (p = 0.005).

Withdrawal time is independently predicted by:

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<th>Beta</th>
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<tr>
<td>Fellow</td>
<td>6.2</td>
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<tr>
<td>Indication(other)</td>
<td>2.3</td>
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<tr>
<td>Total polyps</td>
<td>1.8</td>
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For 187 who had all biopsies (no snare removals): Withdrawal time increased by 1.58 minutes/polyp. For 38 who had all snare removals: Withdrawal time increased by 4.45 minutes/polyp.

Conclusion: Colonoscopic withdrawal times for all subjects in this study are statistically significantly lengthened by the presence of a GI fellow (6 minutes), non screening colonoscopy (2.3 minutes), increased number of total polyps (1.8 minutes/polyp), biopsy removal (1.58 minutes/polyp) and snare removal (4.45 minutes/polyp). Perhaps endoscopists can utilize this data to predict appropriate time duration of colonoscopy.
Abstract 31
Banner Good Samaritan Medical Center
Internal Medicine

STEVENS-JOHNSON SYNDROME:
DEADLY SIDE EFFECT OF AN EVERYDAY DRUG

Bridget Bonsall Stiegler, D.O.

Introduction: More than 1.5 billion prescriptions for 60,000 drug products, including over 2,000 different active agents are dispensed each year in the United States. Stevens-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) are potentially the most important severe cutaneous reactions to drug administration. Among pharmacologic agents, sulfonamide antibiotics, allopurinol, amine antiepileptic drugs, lamotrigine and non-steroidal anti-inflammatory drugs pose the highest risk for development of SJS/TEN. SJS and TEN describe a gradient of the same drug-induced disorder, in which blisters and epidermal detachment result from epidermal necrosis in the absence of substantial dermal inflammation. Patients present with malaise and high fever, followed by the appearance of painful skin and mucosal lesions. Although incidence is recorded as only 2 cases per million per year, the inferred mortality rate of up to 30% and association of this entity with ubiquitous drugs warrants placement of SJS/TEN near the top of our differential for “fever and rash”.

Case Report: Mrs. H. is an 88 year old female with medical history of hypertension and osteoporosis who presented with a two day history of fevers and fatigue. The patient had a superficial left arm skin infection that had been treated with Trimethoprim/Sulfamethoxazole (Bactrim) since seven days prior to admission. She was feeling well until forty-eight hours prior to admission, when she began to spike fevers to 102 degrees Fahrenheit. At the time of admission the patient denied any symptoms of localizing infection. Measures to identify a source of infection, including physical examination, chest x-ray, urinalysis and extensive lab work were unrevealing. The evening of hospital day one the patient developed a maculo-papular rash involving her chest and the palms and soles of her feet, but remained non-toxic appearing. This rash was initially attributed to viral exanthem, and the patient was treated supportively with Tylenol and IV fluids. By the morning of day two of admission the rash was severe and diffuse, affecting much of the surface area of the body including eyelids, oral mucosa, perineum, trunk and limbs. The patient was clearly toxic with rising heart rate and temperature and hypotension. She was transferred urgently to the county burn unit for further management of Stevens-Johnson Syndrome.

Discussion: SJS is not an entity that offers much time for diagnostic consideration. Patients may transition from non-toxic to frank hemodynamic compromise with the equivalent of a full body burn in hours. Although many treatments are advocated, none have been proven efficacious in controlled trials. Best outcomes are reached by early diagnosis, immediate discontinuation of any suspected drug, and transfer to a burn unit for specialized care. Understanding the natural history of the disorder allows practitioners to maintain a high index of suspicion for Stevens-Johnson Syndrome and to react accordingly.
DOES TANDEM COLONOSCOPY AFFECT THE ADENOMA DETECTION RATE DESCRIBED WITH NARROW BAND IMAGING?

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Narrow band imaging (NBI) is a novel endoscopic optical technique that enhances tissue details by narrowing bandwidth of transmitted light using optical filters. We previously demonstrated that using high definition endoscopes, NBI with magnification allowed for a higher adenoma detection rate compared to white light.

Aim: To determine whether the tandem nature of colonoscopy alone in our prior study contributed to the improved detection rate seen with NBI.

Methods: Patients referred for average risk CRC screening from 09/2006 to 06/2007 were studied. Olympus H180 scope series were used. All procedures were performed by 2 experienced gastroenterologists and a third year fellow. Patients underwent tandem colonoscopy following cecal intubation. Initial evaluation utilized the NBI mode and was then followed by re-evaluation using white light, performed segmentally every 15cm. Cecal and withdrawal times were recorded. Detection of polyps by either WL or NBI as well as their histology, size and anatomical location were recorded and compared. Student’s t test and Fishers exact test were used for statistical purposes.

Results: A total of 146 patients were evaluated, 100 patients in the NBI/HDM group and 46 patients in the WL/tandem group. All were men with mean ages of 62.2 and 60.4 respectively (p=NS). A total of 22/74 (29.7%) additional polyps were detected by WL/tandem compared with 31/214 (14%) in the NBI/HDM group (p=0.005). Of the polyps "gained", 13/22 (59.1%) were confirmed tubular adenomas in the WL/tandem group versus 11/31 (35%) in the NBI/HDM group (p=NS). The majority of TAs detected in the WL/tandem group were 1-3mm in size (8/13, 62%) and 4-6mm in size (4/13, 31%). 69% were located more proximally. The WL/tandem group was associated with shorter withdrawal times (15.8mins vs 18.9mins, p = 0.003), longer cecal intubation times (6.9mins vs 4.9mins, p<0.005) with similar total times (22.7mins vs 23.8mins, p=NS). These differences may be explained by the addition of a fellow in the initial part of the procedures, with the tandem portions completed by the same 2 experienced gastroenterologists.

Conclusion: 1) The WL/tandem group detected significantly more polyps than the NBI/HDM group. 2) Although the tubular adenoma detection rate was also higher in the WL/tandem group, the difference was not statistically different. 3) This suggests that the tandem nature of the procedure by itself, may be a significant contributing factor for the increased polyp detection rate (irrespective of using WL or NBI).
SEIZURE, SYNCOPE, NEUROCYSTICERCOSIS?

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Introduction: Neurocysticercosis is an infection of the CNS by the porcine tapeworm *Taenia solium*. There are fewer than 1000 cases reported annually in the United States and therefore it is usually low on the differential in cases of new onset adult seizure. However, with increased numbers of immigrants from Latin American countries where this infection sometimes represents over 50% of adult onset seizures, infections caused by *Taenia solium* may warrant greater consideration now and in the future.

Case Report: A 41 year old Honduran male presented to the ED with a chief complaint of “runny nose, cough and cold, headache, and passing out this morning.” The patient was awakened by the headache and passed out when walking to the bathroom. The patient’s wife noted that the patient appeared to be shaking his arms on the ground for 2-3 minutes and then appeared confused. Additional history revealed that he had come to the United States from Honduras 7 years earlier. In the days preceding admission, the patient felt well other than some rhinorrhea, occasional blurred vision, and mild fevers. Physical exam was only remarkable for a 2 x 2cm nontender, freely mobile, subcutaneous nodule located in the left upper quadrant. There were no focal neurologic deficits noted, and fundoscopic exam was also normal. Due to the added history from the patient’s wife, CT of the head was done and revealed 10 coarse scattered intracranial calcifications. MRI revealed multiple hypointensities with associated vasogenic edema and mild peripheral enhancement. Together, CT and MRI findings were compatible with neurocysticercosis and the edema and enhancement were concerning for active lesions. Stool ova and parasite tests were negative and antihelminthic therapy was not initiated. The patient in this case was treated with antiepileptic medications and a short course of steroids. During the four day hospitalization, the patient remained afebrile, hemodynamically stable, and did not have any further seizure activity while hospitalized.

Discussion: This case illustrates the importance of neuroimaging in patients with questionable new onset seizure and also raises questions as to the appropriateness of antihelminthic treatment in patients with low probability of active cysticercosis disease. With the patient’s cold symptoms, it could have been easy to dismiss this case for a diagnosis of dehydration induced vaso-vagal syncope. A complete history, physical, and seizure workup, proved to be essential and diagnostic in this case. In cysticercosis, the eggs of this tapeworm are released in the stool of the carrier; therefore, recognition and treatment of this infectious process is essential in preventing continued spread of the disease and increased incidence of infection in the United States.
INCOMPLETE COLONOSCOPIES: RATE AND ASSOCIATED FACTORS AT A VETERANS AFFAIRS MEDICAL CENTER ENDOSCOPY UNIT

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Purpose: To determine the rate for incomplete colonoscopy in a Gastroenterology Unit at a Veteran Affairs Medical Center and the factors associated with such incompletion.

Methods: This is a retrospective study of all incomplete colonoscopies reported at our Endoscopy Unit from July 1, 2002 to June 30, 2007. Variable thought to be associated with colonoscopy incompletion (patient demographics, patient age, procedure time, prior abdominal and pelvic surgery, body mass index, and the training level of the operator) were recorded and analyzed.

Results: Of 12,798 colonoscopies (4278 for screening) and excluding those due to poor colonic prep, there were 483 (3.8%) that were incomplete; 137 of which were for screening (3.2%). There were 64 colonoscopies where active colitis (15), obstructing tumors (43) and strictures (6) prevented colonoscopic completion. Trainees were involved in 35% (169 colonoscopies) of all incomplete colonoscopies. Individual attending’s incompletion rates ranged from 1.7% to 7.3%. In average the duration of the incomplete procedures was 27 minutes (3-90). The mean body mass index of patients with incomplete colonoscopy was 28.9. Diverticulosis was found in 220 (45.5%) of procedures and 21% of patients had prior abdominal/pelvic surgery. Discomfort and/or intolerance were reported as the cause of incompletion in 134 colonoscopies (27.7%) and were significantly more common in younger patients and associated with shorter total colonoscopy time than those with reason(s) other than intolerance/discomfort. There were 140 colonoscopies that either had prior and/or subsequent attempts, representing 28.7% of incomplete colonoscopies. Of these, 36 (25.7%) were attempted by the same endoscopist and in 26/36 (72.2%) were successful. Likewise, 110 of the 140 repeated attempts (78.6%) had a complete previous and/or subsequent repeat examination.

Conclusions: At our Endoscopy Unit the completion rates for all (and screening) colonoscopies was above 96%. Trainees were involved in 1/3 of incomplete procedures. Almost 30% of incomplete procedures had a repeated attempt at a prior or subsequent date, and the completion rate in these repeated attempts was 78.6%, suggesting that a repeat attempt by the same or another experienced endoscopist may improve the completion rates even further.
SAFETY, FEASIBILITY AND CLINICAL OUTCOMES USING CRYOABLATION FOR ATRIAL FIBRILLATION

Banner Good Samaritan/Veterans Affairs Medical Center Cardiology Fellowship Program

PURPOSE: Current percutaneous catheter ablative therapy for atrial fibrillation (AF) is associated with significant complications. Cryoablation (CRYO) has been employed as a relatively safe method for the treatment of supraventricular tachycardia. The feasibility, safety, and efficacy of CRYO for AF by means of pulmonary vein isolation (PVI) has not been established.

METHODS: A prospective study of 55 consecutive patients who underwent CRYO with circumferential PVI for medically unresponsive AF was undertaken. All procedures were performed under conscious sedation using the Freezor® MAX ablation catheter (CryoCath Tech, Inc.). The distribution of AF by type was: paroxysmal (PAF), 28/55 (51%); persistent, 21/55 (38%); and long standing persistent (LS-pers), 6/55 (11%). Mean left atrial (LA) dimensions (in cm) were: PAF=5.9, persistent=6.0, LS-pers=6.3. 51 subjects (93%) also underwent CRYO for typical or atypical inducible atrial flutter. All patients underwent post-procedure follow-up at 2 weeks, 6 weeks, and every 3 months thereafter.

RESULTS: The average procedure time was 4.83 hours, including 21.4 minutes of fluoroscopy and 138 minutes of CRYO. Acute procedural success rates for PVI was 100%, confirmed by Lasso and pacing techniques. The percentage of patients remaining in sinus rhythm (SR) was 69% (82% PAF, 62% persistent, 33% LS-persistent) on 2-week, 86% (92% PAF, 80% persistent, 67% LS-persistent) on 6-week and 78% (92% PAF, 63% persistent, 50% LS-persistent) on 3-month follow-up. No patients experienced procedure related chest pain or complications. Antiarrhythmic medications decreased from 44 to 36 (P<0.05) and anticoagulation use decreased from 36 to 31 of patients at 3 months (P<0.05). LA size > 5.5cm (RR 2.6; 95% CI 1.3-5.5) and LA pressure > 20mmHg (RR 4.9; 95% CI 2.4-11.2) were the strongest independent predictors of AF at 3 months.

CONCLUSIONS: Catheter based CRYO for AF is a safe and effective procedure with a high mid-term follow-up success rate of 78% maintenance of SR at 3 months. Ongoing follow-up and further randomized controlled trials are needed to establish the long term impact of CRYO for the treatment of AF.
OBSTRUCTIVE SMALL BOWEL SEROSAL INJURY IN A CHILD FOLLOWING BLUNT
TRAUMA

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Introduction: Although small bowel represents a proportionally significant portion of intra-abdominal tissue-mass, small bowel injuries translate to less than 1% of injuries secondary to blunt abdominal trauma in the pediatric population. The presentation of the small bowel injury from lap belt use varies substantially: from gross hemodynamic instability to insidious deterioration to simple failure of improvement. Rarely does small bowel injury manifest as obstruction. This presentation will discuss one such occurrence, with the added complexity of herniation of intact mucosa/submucosa through a serosal tear in a neurologically compromised pediatric patient.

Case Report: A 4-year-old male passenger restrained by an adult lap belt presented to our level 1 trauma center after involvement in an MVC. The patient had lost consciousness and had vomited several times after reviving. He was hemodynamically normal en route with a GCS of 15. Positive physical findings included an abdominal seatbelt sign and thoracic spine tenderness without gross deformity. He had decreased sensation in bilateral lower extremities, with decreased spontaneous and coerced movements but normal rectal tone. Full CT work-up was remarkable only for a sub-grade 1 splenic laceration. MRI of the spine showed spinal cord contusion with dural hematoma at T4. Secondary to continued nausea/vomiting and subsequent CT evidence of obstruction, he was taken to the OR HD#4 for exploration. Relevant operative findings included a 4 cm serosal disruption with herniated but intact mucosal and submucosal layers of small bowel. The area was excised and primarily re-anastomosed. The patient did well post-operatively and was discharged to a rehabilitation facility.

Discussion: The use of seatbelts has reduced the overall mortality associated with motor vehicle collisions. So diverse are the abdominal injuries associated with lap belt use, however, they have been referred to collectively as “the seatbelt syndrome.” A seatbelt sign, i.e., bruising along the path of the belt, has been shown to correlate strongly with surgically-relevant intra-abdominal injury. Automotive child restraint laws vary from state to state, but the medical community’s opinion on this topic does not. This patient was not appropriately restrained according to current Arizona state law ($50 fine) or the current recommendations from the American Academy of Pediatrics. The fluid seen by CT in our patient’s abdomen was believed to be blood from a splenic laceration. This finds consonance with both mechanism of injury and initial physical examination finding of lower rib tenderness. Operative evaluation of the spleen proved this to be untrue. Had there been no evidence of splenic injury, this patient would have gone to the operating room shortly after arrival. The literature shows that surgically-relevant hollow viscous injury may occur following blunt trauma without evidence of solid organ injury. However, this tendency is not easily applied to the pediatric population where surgically-relevant findings drop considerably even in the presence of free intra-abdominal fluid. Had this patient gone for exploration immediately, it is possible that the serosal injuries would have been addressed by enterorrhaphy or enterectomy, but closure of serosal injuries teleologically has more to do with avoiding perforation through a weakened wall than preventing obstruction. Bowel obstruction is an uncommon consequence of blunt abdominal trauma. Early, it is most often secondary to hematoma with compression of the lumen. Later, bowel stricture may develop secondary to ischemia. In our patient’s case, the injured bowel appeared hyperemic with significant narrowing at the margin of the torn serosa. Histologic evaluation describes ulcerative mucosal necrosis. Had this process continued, perforation would have resulted. Serosal injury as a nidus of the obstructive herniation of intact mucosa/submucosa without perforation is a rare finding. Indeed, we have yet to come across another reported instance.
Abstract 37
Maricopa Integrated Health System
Internal Medicine

**IMMUNE THROMBOCYTOPENIA PURPURA AS AN EXTRAINTESTINAL MANIFESTATION OF ULCERATIVE COLITIS**

Swati Andhavarapu MD, Billy Bravo MD, Ravinder Chawla MD and Jyotsna Ravi MD

**Introduction:** Ulcerative Colitis (UC) is an idiopathic, chronic inflammation of the colon that may present with a range of mild to severe symptoms. Immune thrombocytopenia purpura (ITP) is an auto-antibody mediated thrombocytopenic disorder in which impairment of production and accelerated destruction of the platelets by antibodies occur. ITP is treated with steroids, concurrent intravenous immunoglobulin (IVIG), and platelet transfusion. Treatment of UC is directed towards inducing and maintaining remission of symptoms and mucosal inflammation. There are few reports to support the less common relationship between UC and ITP, but this is the first case to be reported in an elderly population.

**Case Report:** A 77-year-old male with no known past medical history presented with intermittent abdominal cramping and bloody diarrhea over the last 2-3 weeks. He had a similar episode three years ago. The patient also noticed some bleeding from his gums. Complete blood count was normal, except for the platelet count of 10,000. Physical examination revealed diffuse tenderness in the pelvic area. Radiologic studies were unremarkable. A presumptive diagnosis of ITP was made and the patient was treated with prednisone, IVIG and platelet transfusion. After he was started with prednisone, the patient's gastrointestinal symptoms improved. He was subsequently diagnosed with UC based on clinical symptoms and colonoscopic and sigmoidal biopsy results. The patient's platelet count increased with therapy. He was discharged home with tapered prednisone and oral mesalamine. Upon follow-up after four days, the patient was readmitted for thrombocytopenia (platelet count of 4,000), with no symptoms of UC. He was treated with prednisone, IVIG and platelet transfusion. Mesalamine was decreased and with the changes in regimen, the patient's platelet count increased (93,000).

**Discussion:** Our patient had two thrombocytopenic episodes. The first presentation was an extraintestinal manifestation of UC that responded very well to steroid treatment. The second was most likely induced by mesalamine treatment and resolved with the decrease in mesalamine dose. However, a relapse of ITP could not be ruled out. The exact causes of ITP and UC are still under study; suggestions have been made stating enhanced exposure to luminal antigens, due to increased luminal permeability in UC, could lead to the development of ITP. Evidence also suggests that UC has almost always preceded development of ITP. ITP responds very well to steroid treatment, given along with IVIG and platelet transfusion based on the severity of thrombocytopenia. Patients with mesalamine induced thrombocytopenia respond very well when mesalamine treatment is discontinued.
Abstract 38
Maricopa Integrated Health System
Surgery

**PAINFUL FLATUS IN MY THIGH!**
C Ballecer MD, A O’Connor MD, A Kassir MD

**Introduction:** Subcutaneous emphysema remains a rare but well-reported complication of gastrointestinal tract perforation. A fistulous connection between the site of intestinal perforation and the subcutaneous and deep fascial tissues of the lower extremities may develop in the absence of primary abdominal complaints. This offers a diagnostic dilemma with unfortunately high attendant mortality rates. We report the development of extensive subcutaneous thigh emphysema with involvement of the hip joint to the level of the knee, following low anterior resection for rectal carcinoma.

**Case Report:** This patient is a 62-year-old female with a history of rectal carcinoma who underwent neoadjuvant chemoradiation and low anterior resection. Three months following surgery, she presented to the ED with a three-week history of left thigh swelling associated with pain extending from her left buttock to her left knee, which made it difficult to ambulate. A CT examination revealed extensive gas tracking and associated subcutaneous edema within the left pelvis and anterior compartment thigh musculature to the level of the left knee joint.

The patient was taken to the operating room for left thigh exploration, fasciotomy, and debridement of infected tissue compartments. Operative findings were notable for purulent fluid within the deep muscular compartments of the thigh and buttock without any evidence of myonecrosis. Cultures were obtained revealing a polymicrobial bacterial content of probable enteric origin. The patient then underwent an exploratory laparotomy. Operative findings were significant for a posterior leak adjacent to the site of the low rectal anastomosis. A colonic diversion with end colostomy and Hartmann’s pouch was performed. The left hip and thigh wound was treated with a wound vac, and the patient was discharged to a skilled nursing facility without further septic sequelae.

**Discussion:** Subcutaneous emphysema of the thigh following gastrointestinal perforation is a rare but well-reported clinical phenomenon. The first reported case of emphysema of the hip and thigh complicating a gastrointestinal tract perforation was in 1853. The most common causes of GI tract perforation leading to extremity emphysema are carcinoma of the colon, diverticulitis, and appendicitis. To our knowledge, this is the first case reported in the literature of subcutaneous emphysema involving the articular surface of the hip joint.

The proposed route of extrapelvic spread to the thigh involves the development of a fistulous tract between the site of perforation, i.e., rectal anastomosis, through the greater sciatic foramen via the inferior gluteal artery to the greater trochanter of the femur. Further spread to the distal extremity is facilitated through facial investments of the quadriceps muscle to its sites of insertion on the knee.

This case report illustrates a unique presentation of a perforated viscus as well as the diagnostic dilemma it may pose. While the presence of gas gangrene of the lower extremity is most commonly caused by major trauma or infection by gas-forming organisms, other etiologies of subcutaneous emphysema do exist.

In conclusion, the diagnosis of subcutaneous emphysema resulting from gastrointestinal tract perforation requires maintaining a high index of suspicion for fistulous connections through variable anatomical pathways. In order to avoid unacceptably high mortality rates, as well as significant morbidity, prompt diagnosis and aggressive treatment must be initiated. The principles of treatment involve the administration of broad spectrum antibiotics, aggressive debridement of infected tissue, and colonic diversion to allow for the healing of pelvic sepsis.
Purpose: We hypothesize that more patients are treated at non-“county” hospitals for their chest pain. This results in “county-type” hospitals treating fewer STEMI patients.

Methods: “County-type” hospitals were defined as found in the National Association of Public Hospitals. Rates of compliance with process of care measures for PCI and fibrinolytic therapy, from April 2006 to March 2007, were obtained from www.hospitalcompare.hhs.gov for hospitals in the 25 largest US cites. Compliance with PCI < 90 minutes and fibrinolytic therapy < 30 minutes at “County-type” hospitals were compared to community hospitals. The database was reviewed and data entered by research assistants after a structured training course and practice runs done as a group. For quality assurance, 10% of data was from charts randomly selected by a third investigator for accuracy, and discrepancies were discussed as needed. The data points were entered into a Microsoft Excel™ spreadsheet and analyzed with SPSS Software™.

Results: A total of 254 hospitals were included in the study, 31 being county hospitals. Rates were computed per 1,000 patients per fibrinolytic/PCI therapy. A mean of .089 was reported for “County” hospitals, and a mean of .160 documented for “Community” hospitals (p<.041).

Conclusion: Community-hospital-based emergency rooms treat a significantly higher number of patients for AMI that result in either PCI or administration of fibrinolytics than do “county” hospitals.
DISSEMINATED HISTOPLASMOSIS IN AN HIV POSITIVE PATIENT IN ARIZONA

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Introduction: Disseminated Histoplasmosis (DH) in an HIV-positive patient is a serious and potentially lethal infection. At initial presentation, patients are often asymptomatic and may present with dissemination eight to ten years after visiting an endemic area. Histoplasmosis dissemination is at times referred to as an AIDS-defining disease. This case demonstrates the above-mentioned findings in an inhabitant of a non-endemic area.

Case Report: A 44-year-old Caucasian male with HIV/AIDS for eight years prior to presentation complained chiefly of worsening confusion, intermittent cough, and diarrhea during the previous month. The patient had been non-compliant with his antiretroviral regimen. During initial evaluation, the patient was disoriented. The patient was afebrile and vital signs were stable. The physical exam was remarkable for palpable lymph nodes in the groin and axillary regions. A lumbar puncture illustrated 3 white blood cells in milliliter and 107 red blood cells in milliliter. The Urine Histoplasmosis Antigen was found to be 3.2, a sensitive diagnostic test for DH. Imaging of the Computed Tomography (CT) of the abdomen showed some retroperitoneal lymphadenopathy. Based on the patient’s history of working on a poultry farm, he was at high risk for Mycobacterium avium-intercellulare exposure. Endoscopic evaluation showed an erythematous area in the sigmoid colon. Biopsy demonstrated the presence of histoplasmosis.

The patient was started on Amphotericin B lipid injection and itraconazole for his histoplasmosis infection. A fungal culture and lymph node biopsy confirmed the diagnosis. The patient’s clinical course improved with the initiation of treatment. In addition, the patient was restarted on his antiretroviral regimen for his AIDS, and itraconazole for histoplasmosis. A synergic effect is seen in the treatment of HIV and DH, and this limits the further spread of the histoplasmosis as CD4 count improves.

Discussion: Histoplasmosis usually presents as an interstitial lung disease with extensive lymphadenopathy, bone marrow infiltration, and ulcerated skin lesions. Clinically, the patient had no evidence of skin lesions or radiographic evidence of pulmonary involvement. The occurrence of histoplasmosis and lack of visitation to an endemic area makes this case unique.

Progressive dissemination can occur if there is an underlying latent histoplasmosis infection. Risk for dissemination is particularly increased in the first two months after initiation of antiretroviral treatment. Although this patient was not in his first two months of antiretroviral treatment, his frequent drug holidays exposed him to a higher risk of dissemination. DH commonly involves the colon in 85% of people at time of autopsy; however, colonoscopy is not the diagnostic tool for diagnosing DH, as skin lesions can be used for biopsy. Urine Histoplasmosis Antigen has high specificity for diagnosing DH. For our patient, both colonoscopy and histoplasmosis antigen proved the presence of DH.
CANCER OF UNKNOWN PRIMARY PRESENTING AS SPINAL EPIDURAL MASS
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Introduction: Spinal epidural mass producing spinal cord compression is a relatively common neurologic complication in patients with cancer. However, cases where cancer of unknown primary CUP have presented as epidural cord compression as an initial manifestation of malignancy are infrequent, accounting for fewer than 38% of cases. The clinical features of epidural CUP are similar to the cardinal manifestation of other epidural spinal tumors, yet the diagnostic and therapeutic approach is quite different from epidural tumors of known origin.

Case Report: A 58-year-old African American female presented with left facial paralysis, numbness, ptosis, diminished reflexes, sensory loss of the left lower extremity (with no atrophy), and lower back pain. Past medical and family history was unremarkable. Diagnostic findings showed WBC 18,200/microliter, hemoglobin 9.1gm/dl, hematocrit 27.1%, and MCV 79.6 FL. Electrolytes and liver enzymes were normal. Magnetic Resonance Imaging of the brain showed no evidence of mass or lesion. Computed Tomography (CT) of the chest revealed mediastinal, pretracheal, right axillary, right paratracheal, right subcarinal, and right hilar lymphadenopathies with no mass in the lung parenchyma. In addition, there was a lytic lesion in the left scapula and L5 vertebrae. CT of the abdomen revealed a mildly distended gallbladder, a small left adrenal mass, and multiple retroperitoneal nodes, but the pancreas and spleen were grossly normal. There was a deep vein thrombosis in the left common iliac vein extending to the proximal inferior vena cava. CT and Magnetic Resonance Imaging (MRI) of the lumbar spine showed an epidural mass with destruction and compression deformity of L4 and L5 consistent with neoplastic process. The patient underwent laminectomy and lumbar fusion of the epidural mass. Biopsy of the epidural mass showed a metastatic moderately differentiated adenocarcinoma of unknown primary with necrosis. In addition, immunoperoxidase stains cytokeratin AE1/AE3 and CK7 were positive. CK20, TTF-1, ER and PR were negative. CEA and HMCK were positive as well. Vimentin and Her2Nu were negative. The above findings were non-specific for any primary site, although they favored cholangiocarcinoma/hepatobiliary carcinoma as primary. Biopsy of the right axillary lymph node demonstrated poorly differentiated adenocarcinoma, but the immunohistochemical staining pattern of the lymph node was not helpful in determining the primary site. An endoscopic biopsy of the duodenum was non-specific and benign. A mammography was ordered and a plan of treatment was discussed. The patient refused any further treatment, however, and decided on hospice care.

Discussion: Cancer of unknown primary (CUP) defined as metastatic cancer is a very aggressive tumor with a median survival of approximately 6 to 9 months. The diagnosis of a CUP site is a frequent challenge for an internist. In the United States, incidence of CUP represents 2% to 5% of all newly diagnosed malignancies. The four most common histologic diagnoses of CUP are: adenocarcinoma (70%), poorly differentiated carcinoma (20%), squamous carcinoma (10%), and poorly differentiated neoplasm (5%). Less than 20% of patients with CUP will eventually have the primary site identified ante mortem. Laboratory and clinical investigations, including mainly pathology with immunohistochemical test, radiographs, and endoscopic studies, are key points for diagnosis. However, the cost in terms of time and money, as well as the final benefit in the outcome of these patients, should be taken into consideration. In addition, not all patients are cured with standard therapy and some standard treatments may have more side effects than are desired. Clinical trials for CUP are also ongoing in most parts of the country. For the above reasons, it is important for physicians to understand the disease concept of CUP and to identify favorable subsets for which specific treatment is available.
VERBAL COMMUNICATION IMPROVES LAPAROSCOPIC TEAM PERFORMANCE

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Purpose: Information exchange among team members is normally accomplished through verbal communication, body gestures, and facial expressions. In the operating room, however, nonverbal cues are limited by the restraint of work space and the restrictions of the surgical costume and mask. Thus more importance must be placed on verbal communication in surgery, providing a means for instant guidance, error correction, and performance feedback.

The purpose of this study was to examine the impact of verbal communication on laparoscopic team performance.

Methods: A total of 24 dyad teams, consisting of residents, medical students, and office staff, underwent two team tasks in this study, with the previously validated bench model, Legacy Inanimate System for Endoscopic Team Training (LISETT). Twelve teams (the feedback groups) received instant verbal instruction and feedback on their performance from an instructor, compared to twelve teams (the control groups) that received minimal or no verbal feedback from an instructor. Team performances were both video- and audio-taped for analysis.

Results: Surgical backgrounds were similar between feedback and control groups. In the control group, an average of 20 verbal communication episodes per task was recorded, as compared to 55 communication episodes measured in the feedback group.

Study results revealed that teams with verbal feedback from an instructor achieved significantly higher LISETT scores (p = 0.002), peg transportation scores (p < 0.001), and suture scores (p = 0.040) as compared to scores achieved by teams in the control group. When a complex suturing task was subdivided into aiming and knotting subtasks, the study demonstrated significantly shorter aiming times in the feedback group; however, the study revealed no significant difference in knotting times between control and feedback groups.

Conclusions: This study demonstrated that verbal instruction and feedback from an experienced instructor during simulated laparoscopic procedures improved team efficiency and performance. When tasks require team cooperation, the impact of communication on team performance was significant.

The laparoscopic knotting subtask performance and efficiency, however, appeared to depend upon individual surgical skill rather than instructor feedback. This result implies that different strategies should be implemented to improve different aspects of individual surgical skills during laparoscopic surgery.
Purpose: There are few studies available regarding the clinical course following acute ingestions of oxycodone in toddlers.

Methods: Following a brief training, reviewers blinded to the purpose of the study completed a standardized data collection sheet. Four years of poison center patient encounters were reviewed. Age, outcomes and co-ingestions, vital signs, clinical manifestations, hospital admissions, and mortality were abstracted. Data were analyzed using descriptive statistics.

Results: 62 cases were identified, with a mean age of 16.6 months and a mean presumed ingestion of 15.6 mg. 21 of these were the sustained release product. 2/41 received Naloxone, and one patient was admitted for symptoms consistent with opiate toxicity. All symptoms occurred within 3 hours of ingestion and in the sustained release product. All patients were asymptomatic at 12-hour follow-up. No deaths were recorded. A kappa score for inter-reviewer reliability was kappa score 0.74 95% CI [0.6-0.79].

Limitations: This was a retrospective study that was limited by patient history.

Conclusions: Isolated Oxycodone ingestion in toddlers rarely results in toxicity beyond 12 hours.
MELAS
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Introduction: Neuromuscular disorders are divided mainly into muscular dystrophies, metabolic myopathies, and mitochondrial disorders. Mitochondrial encephalomyopathies are a group of multisystemic disorders characterized by molecular defects in mitochondrial DNA (mtDNA). These disorders can have clinical features of weakness, exercise intolerance, hearing loss, seizures, ataxia, short stature, dementia, neuropathy, or stroke. These disorders are primarily maternally inherited, though some are sporadic. Mitochondrial myopathy, Encephalopathy, Lactic Acidosis, and Stroke-like episodes (MELAS) is a maternally inherited disorder characterized by short stature, recurrent strokes, lactic acidosis, and progressive mental deterioration. Muscle biopsy typically demonstrates ragged red fibers that stain brilliant red, with occasional cytoplasmic bodies with trichrome stain. Distinct mtDNA point mutations (involving nucleotide position A3243G, A3271G, C3256T, A3252G, C3271T or T3291C) are diagnostic of MELAS syndrome.

Case Report: A 24-year-old Hispanic male presented with a 2-year history of seizures, decreased mental function, altered speech, altered gait, a need for assistance for activities of daily living (such as dressing), and progressive weight loss of at least 10% of his body weight. Physical examination revealed ataxic speech, slowness in following even simple commands, and inability to follow any complicated commands. He was cachectic in appearance and areflexic in the upper and lower extremities. His gait was 2+ wide based. Laboratory studies showed elevated lactate levels. An Electroencephalogram revealed frequent primary generalized seizures at 3 Hz frequency. A Computerized Tomography (CT) scan of the brain showed subacute infarctions in the right parietal, sylvian, and left temporal regions; Magnetic Resonance Imaging (MRI) of the brain without gadolinium showed acute ischemic changes along the frontal lobes and left temporal lobe laterally. An Echocardiogram showed no source of emboli, but revealed left ventricular hypertrophy, an abnormally thick left ventricular wall with progressive dilatation, and poor left ventricular function. The Electrocardiogram showed inverted T-waves in leads II, III, aVF, and V5-V6, premature ventricular contractions, and the Wolff-Parkinson-White syndrome.

Discussion: The investigation of mitochondrial diseases requires an integrated approach, incorporating clinical, histochemical, biochemical, and molecular biological investigations. Mitochondrial disease should be considered in any patient with an unexplained progressive multisystem neurological disorder, particularly if there is evidence of other organ dysfunction. The investigation of mitochondrial disease is complex, but a structured approach will result in rapid and efficient diagnosis. Recent advances in automated mtDNA sequencing can confirm the presence or absence of an mtDNA mutation. Although there is no cure for these diseases at present, understanding the pathophysiology of the diseases will hopefully lead to new advances in treatment.
REOCCURRING CUTANEOUS ZYGOMYCOSIS COMPLICATING EXTENSIVE BURN INJURY: A CASE REPORT

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INTRODUCTION: Opportunistic fungal infections, such as those caused by Rhizopus species, often complicate the care of immunocompromised patients. It is widely accepted that burn victims are among those most highly susceptible to opportunistic infection. *Rhizopus microsporus* infection causes Zygomycosis, often incorrectly referred to as Mucormycosis.

Zygomycosis is an opportunistic infection caused by diverse fungal species belonging to the taxonomic class Zygomycetes, which includes Absidia, Apophysomyces, Mucor, Rhizopus, and Rhizomucor. Due to the depressed immune state of the patient, coupled with the reported lack of susceptibility to antifungal therapy, Zygomycosis has a very high mortality rate. Although cases of Zygomycosis have been reported in a patient on dialysis, a diabetic leg infection, a lung infection in a leukemic patient, and in a patient with heat stroke, this study documents the first known case of *Rhizopus microsporus* variant *microsporus* causing Zycomycosis in a burn patient.

CASE REPORT: A 48-year-old Caucasian male was discovered outdoors by emergency medical service personnel next to a pad-mounted electrical cabinet containing 7,200 volts. The patient was attempting to steal copper wiring when the flash-flame explosion occurred. The patient sustained full thickness burns to 60% of his body surface area, including his abdomen, torso, back, face, and bilateral upper extremities. He was immediately transported to the regional burn center where he underwent aggressive resuscitation, including intubation, chest shield escharotomy, bilateral upper extremity fasciotomies, and finger escharotomies. During the patient’s hospital course, he underwent multiple tangential excisions of his burn wounds. On post-burn day 6, the patient became febrile and demonstrated a leukocytosis. Blood, urine, and bronchoalveolar lavage cultures were obtained and he was started on empiric piperacillin-tazobactam and linezolid. On post-burn day 10, a black pigment, suspicious for fungus, was noted on the patient’s anterior thorax extending down to muscle. Multiple biopsies were taken and tangential excision and debridement was performed. His wounds were dressed with a series of topical therapies, including dakin’s solution. On post-burn day 11, his back and bilateral flanks were covered with the same black pigment, and infectious disease consultation was obtained. Suspecting Aspergillus and Candida infection, voriconazole was immediately implemented. On post-burn day 14, the initial fungal cultures identified a Rhizopus species. Excision of infected and suspicious tissue continued at least every other day. After failing to see any clinical improvement, voriconazole was stopped and posaconazole was started. On post-burn day 23, the patient became acutely hypotensive and hypoxemic requiring vasopressors. The following day, it was noted that the previously excised fungal infection had recurred. Upon speaking with patient’s family about the lack of success in controlling the patient’s overwhelming fungal infection despite systemic medical therapy, topical agents, and surgical excision, the family decided to withdraw support and the patient subsequently expired.

SUMMARY: Zygomycosis, in this case caused by the fungus *Rhizopus microsporus*, is a rare and highly fatal opportunistic infection. This is the first documented case report of such infection in a critically ill burn patient, and highlights the rapid clinical demise despite multiple systemic and topical antifungal therapies and aggressive surgical excisions.
THREE DIMENSIONAL TRANSTHORACIC ECHOCARDIOGRAM DETECTS PULSATILE LEFT ATRIAL ABSCESS CAVITY.

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Introduction: We present a case that demonstrates the use of three-dimensional transthoracic echocardiogram as a diagnostic tool for identifying cardiac abscesses.

Case Report: A 54-year-old male with a past medical history of intravenous drug use, infective endocarditis with prosthetic, and mechanical replacement of the aortic and mitral valve, respectively, presented to Maricopa Medical Center with a three-day history of productive cough, pleuritic chest pain, fevers, and mild hypoxia. A harsh IV/VI systolic murmur heard loudest at the mid-left sternal border was appreciated. Despite negative blood and urine cultures, the patient was suspected to have a recurrence of bacterial endocarditis. A three-dimensional transthoracic echocardiogram (3D TTE) revealed an abscess formation at the anterior aortic root and a hyperlipomatous intra-atrial septum with a pulsatile left atrial abscess cavity. A transesophageal echocardiogram (TEE) was then performed for confirmation of the TTE findings. TEE revealed an abscess of the prosthetic aortic valve, sized 3 x 2.5 cm at the anterior aortic root with a fistulosity connection from the aortic root above the prosthetic ring to the left atrium.

Discussion: Various anatomical imaging techniques have been demonstrated as a means for diagnosing aortic root abscess, such as transesophageal echocardiography, magnetic resonance imaging, two-dimensional echocardiography, computed tomography, and angiography. An Ovid literature search, however, revealed no prior publications utilizing three-dimensional transthoracic echocardiography as the primary imaging tool in the diagnosis of aortic root abscess. 3D TTE can be used in both the diagnosis and approximation of the vegetation placement prior to cardiac surgery. 3D TTE is non-invasive, less expensive, and has substantially fewer potential complications for the patient than TEE. Cardiac abscess formation in the setting of infectious endocarditis is relatively common, in the range of 30 to 40 percent of cases. Some patients are not stable enough to undergo a TEE or have financial limitations of their care, and a non-invasive, less expensive diagnostic tool could change the clinical course of patients who are most at risk. 3D TTE has significant benefits to TEE, and can be used as the primary imaging tool in the diagnosis of cardiac abscesses.
DIFFUSE ST ELEVATIONS, INCREASED TROPONIN, AND PLEURITIC CHEST PAIN:
DON'T FORGET MYOPERICARDITIS IN CROHN'S DISEASE
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Introduction: Myocarditis is an extremely rare cardiac manifestation of inflammatory bowel disease (IBD). If left untreated, myopericarditis carries significant morbidity and mortality from tamponade or constrictive pericarditis. Extra-intestinal manifestations occur in approximately 36% of patients. In a population-based study, age-adjusted prevalence ratios for pericarditis were 3.07 in Crohn’s disease and 3.33 in ulcerative colitis, respectively, although the numbers were small. There is no similar data on the incidence of myopericarditis. We present a 48-year-old African American male admitted with an active flare-up of Crohn’s disease that developed a rare cardiac complication 72 hours after hospitalization.

Case Report: A 48-year-old African American male with long-standing Crohn’s disease presented with hematochezia, hematemesis, abdominal pain, weight loss, and dyspnea for one week. Abdominal pain was severe and cramping in nature and was relieved after defecation. The patient had been taking azathioprine, mesalamine, folic acid, and a tapering dose of prednisone. On physical examination, vitals signs were stable, but the patient was in apparent discomfort and had diffuse abdominal tenderness and a mildly distended abdomen. Admission labs revealed leukocytosis (15.9 x 103/liter), but negative blood, urine, and sputum cultures. Hemoglobin and hematocrit were 15.9 g/dl and 47.7%, respectively. Tests performed upon admission included an electrocardiogram (ECG), which showed normal sinus rhythm; creatine kinase (CK) and troponin were normal on three separate occasions. On the third hospital day, the patient developed pleuritic chest pain exacerbated by movement and inspiration, and increasing dyspnea. Another ECG revealed tachycardia (100 beats per minute), widespread ST elevation, and the troponin had increased to 2.629 g/ml, while creatine kinase-myocardial band isoenzyme (CKMB) was within normal limits. The patient had no signs of chronic or acute infections and was negative for tuberculosis and hepatitis.

Discussion: Cardiac manifestation of inflammatory bowel disease is an uncommon occurrence. Myopericarditis is a rarer manifestation and is infrequently documented and inadequately characterized. Myopericarditis involves both the myocardium and pericardium, giving rise to elevated cardiac enzymes or showing focal or diffuse depressed left ventricular function by imaging study. Although mesalamine has been reported to be associated with myopericarditis, our patient had not taken it for three days prior to the manifestation of myopericarditis. Since the half-life elimination of mesalamine is 0.5-5 hours, we inferred it was unlikely to be the etiology of his myopericarditis. As non-steroidal anti-inflammatory agents were contraindicated, colchicine and methylprednisolone were started; the patient began having resolution of symptoms, while ECG and troponin levels normalized.

It is important to maintain a high index of suspicion for myopericarditis when evaluating a Crohn’s patient with chest pain, since, left untreated, it is associated with significant morbidity and mortality.
POST-TRAUMATIC SPLENIC PSEUDOANEURYSM: A FAILURE OF NON-OPERATIVE MANAGEMENT? A CASE REPORT OF A RARE COMPLICATION IN A CHILD

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Introduction: Non-operative management (NOM) of splenic injuries in hemodynamically stable blunt trauma patients yields a high rate of splenic salvage. The major concern, however, is the potential for delayed hemorrhage with potentially serious consequences. Spiral computed tomography (CT) imaging has been used to identify injury characteristics that may predict successful NOM. More recently, serial CT studies during initial admission have been used to identify splenic pseudoaneurysms not apparent on admission imaging studies. This study, however, was limited only to adult patients. Our institutional practice is to perform follow-up CT scans 48 to 72 hours post-splenic injury. Utilizing this approach, we identified a child with a splenic pseudoaneurysm. Early identification of this potentially life-threatening condition allowed early angiographic intervention to preserve successful NOM.

Case report: A 6-year-old female involved in a high-speed motor vehicle crash (MVC) was initially transported to a local hospital. An initial CT scan showed a grade III splenic laceration with active extravasation of contrast material. Despite this, the patient was hemodynamically stable and was subsequently transported to our Level I Adult and Pediatric Trauma Center. After initial trauma bay evaluation and demonstrated hemodynamic stability, a repeat CT scan confirmed the grade III splenic laceration but failed to identify active extravasation of contrast material. The patient was admitted to the Pediatric Intensive Care Unit with non-invasive hemodynamic monitoring, bed and bowel rest, serial hematocrit studies, and abdominal examinations. On the third hospital day, a routine repeat CT scan of the abdomen and pelvis revealed a 1-centimeter (cm) pseudoaneurysm in the parenchyma of the healing splenic fracture site. Following informed consent, the patient went to interventional radiology for subsequent embolization of this pseudoaneurysm and multiple smaller pseudoaneurysms not identified on the CT scan. The patient tolerated the procedure without complication and was discharged two days later. Six-week follow-up has shown no complications of the procedure and continued compliance with limited activity level.

Discussion: NOM of traumatic splenic injuries in hemodynamically stable patients is now a well accepted practice, yet emerging evidence suggests longitudinal surveillance is required. It is now our routine practice to repeat CT imaging 48 to 72 hours post-injury to identify conditions in need of proactive interventions. Despite splenic pseudoaneurysms being a rare complication in children, subsequent development may lead to rupture and death if the patient is not diagnosed promptly. Previously, the youngest patient we have identified to undergo successful angio-embolization of a post-traumatic splenic artery pseudoaneurysm was 10 years old. Our case represents the feasibility of angiographic embolization in younger pediatric trauma patients to ensure successful NOM of the splenic injury.
MINIMAL CHANGE DISEASE IN AN ARMENIAN MALE

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Introduction: Minimal Change Disease is a subset of nephrotic syndrome and is diagnosed by histopathology. The predominant clinical feature of the disease is edema; laboratory features include heavy proteinuria, low serum albumin, and elevated serum cholesterol. Even though it accounts for the majority of cases of nephrotic syndrome in children, it only represents 10-15% of cases of primary nephrotic syndrome in adults. We present a patient with symptoms that eventually led to the diagnosis of Minimal Change Disease.

Case: A 28-year-old Armenian male was referred from jail for evaluation of a pleural effusion confirmed on chest radiograph. The patient had been complaining of shortness of breath, along with generalized swelling of his body, for the past two to three months. Swelling was first noticed in his legs and arms, followed by weeping of serous fluid from his edematous extremities. He denied taking NSAIDs, but took trimethoprim-sulfamethoxazole for presumed cellulitis. The patient was mildly hypertensive. Pertinent exam findings included mild periorbital swelling, decreased breath sounds on the right, and bilateral non-pitting edema on lower extremities without evidence of cellulitis. Blood work revealed normal renal and liver function tests. His albumin level was 1.2 grams/deciliter and total protein was 3.4 grams/deciliter; brain natriuretic peptide was 11. Urinalysis revealed protein > 600 grams/deciliter with a urine protein to creatinine ratio of 9. Hepatitis panel, anti-dsDNA, anti-nuclear antibody, human immunodeficiency virus, lactate dehydrogenase, complement 3, and complement 4 were all normal. A renal biopsy showed normal light microscopic findings. The patient was diagnosed with idiopathic Minimal Change Disease and was started on prednisone with plans to follow up in renal clinic.

Discussion: The mechanism for developing Minimal Change Disease is poorly understood, but it has been proposed that T cells release cytokines that injure glomerular epithelial cells. Epithelial damage may cause proteinuria by decreasing poly-anions such as heparin sulfate that make up the normal charge barrier of the glomerulus. The diagnosis is made by renal biopsy. Minimal Change Disease is defined on light microscopy by lack of definitive alteration in the glomerular structure. Serum complement levels are normal, and anti-nuclear antibodies and cryoglobulins are absent.

Glucocorticoids have reduced the morbidity rates associated with Minimal Change Disease. Approximately 5% of children continue to have steroid-responsive relapses when older than 18 years. Adults have a similarly good prognosis. Chronic renal failure is extremely rare in patients who are steroid-responsive. If chronic renal failure occurs, the possibility that the pathologic lesion is different or has evolved must be considered. Adults are considered steroid-resistant if there is no reduction in proteinuria by 12-16 weeks of steroid therapy. The most common cause of this is misdiagnosis.
EMPIRIC, BROAD-SPECTRUM ANTIBIOTIC THERAPY WITH DE-ESCALATION FOR VENTILATOR-ASSOCIATED PNEUMONIA DOES NOT INDUCE GRAM-NEGATIVE PATHOGEN RESISTANCE
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Purpose: The American Thoracic Society guideline for ventilator-associated pneumonia (VAP) stresses early, empiric, broad-spectrum antibiotics followed by de-escalation to pathogen-specific therapy when culture results are final. Although no national empiric antibiotic regimen has emerged, it has been the practice of our adult Surgical Intensive Care Unit (SICU) since 2004 to use imipenem/cilastatin (I/C) in combination with tobramycin (TOB) or levofloxacin (LEV) until quantitative bronchoalveolar lavage results are finalized. With this practice, however, alterations in antimicrobial resistance remain a concern. We hypothesized that early, empiric, broad-spectrum antibiotic use, followed by de-escalation therapy, does not alter antimicrobial susceptibility profiles for common gram-negative (Gm-) VAP pathogens. Additionally, we sought to assess our compliance in the use of empiric therapies and subsequent de-escalation.

Methods: After Institutional Review Board (IRB) approval, SICU antibiograms from 2004-2006 were compared for I/C, TOB, and LEV sensitivities to common Gm- VAP pathogens. Time periods were defined as early empiric use (01/04-06/04) versus late (07/06-12/06). Chart review of empiric and de-escalation antibiotic usage was obtained. Data were collated and statistical significance assigned with $X^2$ using the on-line tool SISA (simple interactive statistical analysis).

Results: During the study period, I/C was used 198 times for empiric VAP coverage (811 patient-days of exposure) while TOB and LEV were dosed a total of 149 (564 patient-days) and 61 times (320 patient-days), respectively. Collectively, the susceptibility of Gm- organisms to I/C did not change (early: 91.4% vs. late: 97%; $p=0.33$). Individually, non-significant trends in improved sensitivity to I/C were noted for both *Pseudomonas aeruginosa* (early: 85.7% vs. late: 90.9%; $p=0.73$) and *Acinetobacter baumannii* (early: 80% vs. late: 100%; $p=0.13$). Further, both TOB (early: 77.1% vs. late: 70.0%; $p=0.49$) and LEV (early: 74.3% vs. late: 70.0%; $p=0.67$) were found to maintain their susceptibility profiles. Our de-escalation compliance (by 96 hrs) was 78% for I/C, 77.2% for TOB, and 59% for LEV. When the bacteria that required I/C as the subsequent therapeutic agent was taken into account, de-escalation compliance was shown to have improved (I/C: 92%).

Conclusion: In our SICU, empiric VAP therapy with I/C and TOB or LEV followed by de-escalation therapy did not lead to increased antimicrobial resistance of common Gm- VAP pathogens. Further, our compliance with de-escalation therapy was above previously published rates.
CLIVUS FRACTURE IN A 25-YEAR-OLD MALE FROM A GROUND LEVEL FALL:
A CASE REPORT

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Introduction: Fractures of the clivus are associated with severe head trauma. It is a rare fracture of the skull base with a reported incidence of \( \sim 0.5\% \) in the literature. The associated injury to brain parenchyma and vascular structures reflects the high energy necessary to cause the fracture initially. Morbidity, including cranial nerve deficits and persistent vegetative states, and mortality of patients with this specific fracture are both very high. Previously, it has been difficult to diagnose secondary to the dense petrous temporal bones, but more recently, high resolution fine-cut computed tomography (CT) scans have made the diagnosis more straightforward.

Case Report: We report on a 25-year-old male who suffered a ground-level fall while wrestling with a family member on New Years day. He presented to Maricopa Medical Center as a level I red trauma, and he was Glasgow Coma Scale (GCS) 4 on presentation with briskly reactive pupils. He was intubated immediately, mannitol was initiated, and he was taken to the CT scanner to determine the etiology of his coma. CT scan revealed an epidural hematoma with no shift, an infratentorial subdural hematoma, and clivus fracture. Neurosurgical examination at that point showed a GCS of 11T. The patient was sent to the Surgical Intensive Care Unit (ICU), where examination of the patient showed a decreasing level of consciousness. A repeat head CT showed increasing parenchymal contusions and intracranial hemorrhage with narrowing of the basilar cisterns and 4th ventricle. Neurosurgery placed a ventriculostomy with an extremely high opening pressure.

The patient was then taken to the operating room (OR) for an emergent occipitotemporal-parietal evacuation of the epidural hematoma. In the OR, it was noted the lateral sinus was disrupted with a venous epidural hematoma. A barbiturate coma, electroencephalography (EEG) monitoring, and 3% saline therapy were initiated upon return to the Surgical ICU. At 1530 of the same day, a neurological check revealed a fixed and dilated left pupil and hypotension necessitating pressor support. A repeat head CT showed no interval change, and neurosurgery, in consultation with the family, took the patient back to the OR for a right suboccipital craniectomy, evacuation of the venous epidural hematoma, and removal of a necrotic right cerebellar hemisphere. After discussion with the family, the patient was changed to “do not resuscitate” status. A brain perfusion scan showed no flow, and the patient was declared dead. Family subsequently donated the patient’s vital organs for transplantation.

Discussion: Clivus fractures are a rare form of basilar skull fracture associated with high morbidity and mortality. This case draws attention to this type of fracture sustained from a ground level fall and resulting in the subsequent death of the patient.
INTRODUCTION: Too little attention has been paid to the differential diagnosis of recurrent oral ulcers, perhaps because these ulcers do not usually cause serious complications. However, a number of patients suffer from continuous oral ulcers which can lead to severe pain with associated failure to thrive. A variety of causes has been suggested, including infection and immunological disorders. We present a case of a 61-year-old Vietnamese male who was admitted to the hospital for evaluation of recurrent oral ulcers.

CASE REPORT: The patient is a 61-year-old Vietnamese male with a 5-month history of recurrent oral ulcers. These were thought initially to be caused by Candida albicans, but did not improve with antifungal therapy. The patient also complained of dysphagia and failure to thrive. Upon admission, his vital signs were stable. Physical examination was remarkable for revealing large white plaques throughout mouth, tongue, and posterior pharynx. He also presented with perirectal ulcers, as well as ulcerations over the proximal interphalangeal joints of the fourth digits bilaterally. Laboratory work-up showed normal electrolytes and complete blood count, antineutrophilic cytoplasmic antibodies, antiphospholipid antibodies, cultures, and hepatitis panel; quantiferon tests were negative.

Punch biopsy of the fourth digits revealed an ulcer with acute and chronic inflammation, granulation tissue, and reactive fibrosis. There was no growth of organism and the smear was negative for acid fast bacilli. Colonoscopy showed scattered ulcers and erosions of the descending and ascending colon, and biopsies showed non specific chronic inflammation with no evidence of colitis or vasculitis.

When other causes of his recurrent ulcers were excluded, Behçet’s Disease (BD) was diagnosed. The patient’s condition fulfilled the criteria set by the International Study Group on Behçet’s Disease. The patient was started on prednisone orally with marked clinical improvement.

DISCUSSION: Behçet’s Disease is a chronic, relapsing-remitting, occlusive vasculitis affecting multiple organ systems in the body. The diagnostic criteria established by the International Study Group for Behçet’s Disease requires the presence of recurrent oral ulceration, in the absence of other clinical explanations, and two of the following: recurrent genital ulceration, eye lesions, skin lesions, and/or a pathergy test.

This disease occurs worldwide but has a higher incidence around the Mediterranean basin, extending through the Middle East and Asia. There is no cure for BD, but treatment typically focuses on reducing discomfort and preventing serious complications. Currently, extensive research is underway to explore possible genetic, bacterial, and viral etiology of BD, as well as to improve therapeutic strategies.
PERFORATED INTESTINAL LYMPHANGIECTASIA IN AN ADULT:  
A RARE SURGICAL EMERGENCY

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Introduction:  
We present a case report of a rare intestinal tumor of the small bowel.

Case Report:  A 47-year-old male suffered from fever, chills, and nausea associated with severe abdominal pain. He had previously reported vague abdominal pain with diarrhea, which aggravated over several weeks. Physical examination revealed diffuse tenderness with guarding and peritonitis. Further investigation showed leukocytosis of 21,000 units, and a CT scan revealed a heterogeneously enhanced mass in the left lower quadrant, encasing distal small bowel, multiple nodular densities in omentum, spleen, liver, and free fluid in the pelvis.

In light of the above findings, an exploratory laparotomy through a midline abdominal incision was performed. The procedure identified a large amount of purulent fluid in the abdomen, a distal jejunal mass measuring 5 x 4 cms, omental nodules, and cystic areas in the liver and spleen. The small bowel was resected with adequate margins, followed by an end-to-end anastomosis. Partial omentectomy was carried out, including the mucinous nodular areas in the omentum and cholecystectomy for hydrops of the gall bladder. The resected bowel had a typical appearance of lymphatic obstruction with histological evidence of lymphangiectasia.

The patient’s post-operative course was uneventful. Upon return of normal bowel function, he was discharged. At the follow-up visit two weeks after surgery, the patient had resumed full activity with no complications.

Discussion: Intestinal lymphangiectasia (IL) is characterized by obstruction of lymph drainage from the small intestine and lacteal dilation that distorts villus architecture. The etiology may be congenital or secondary to a disease that blocks intestinal lymph drainage. Lymphatic blockage may occur at different sites, and the wide spectrum of clinical and laboratory abnormalities are determined by the extent and location of the disease. Intestinal biopsy and CT scan are important diagnostic tools to identify and localize the disease. Increased edema and thickening of the small bowel wall with the evolution of the disease, as seen in our patient, may result in decreased peristalsis of the pathologic segment and present as severe abdominal pain. Medical treatments are reported for IL with diets high in protein, low in fat, and with added medium chain triglycerides. Octreotide may be beneficial in decreasing intestinal protein losses.
TETRALOGY OF FALLOT REPAIR IN A 22-YEAR-OLD MALE DIAGNOSIS FROM A TRANS-ESOPHAGEAL ECHOCARDIOGRAM VS. TRANS-THORACIC ECHOCARDIOGRAM
REAL TIME THREE-DIMENSION ECHOCARDIOGRAPHY

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Introduction: Tetralogy of Fallot, the most common cyanotic congenital heart defect after infancy, is characterized by a large ventricular septal defect (VSD), an aorta that overrides the left and right ventricles, obstruction of the right ventricular outflow tract (obstruction may be subvalvular, valvular, supravalvular, or in the pulmonary arterial branches), and right ventricular hypertrophy. On the basis of mortality and physiological outcomes, the optimal age for elective repair of tetralogy of Fallot is 3 to 11 months of age. Among patients with surgically repaired tetralogy of Fallot, the rate of long-term survival after the postoperative period is excellent but remains lower than that in the general population. The risk of late sudden death is small. In relation to long-term outcome, pulmonary regurgitation in particular has seemed to dominate the outcome of patients having undergone repair of tetralogy of Fallot, as well as cor pulmonale, VSD patch failure, and arrhythmias. Real time three-dimensional echocardiography (3DE) in terms of left ventricle (LV) function can very accurately quantify the ejection fraction and LV volumes. 3DE can provide excellent visualization of various types of VSD’s. From an LV face projection, the position, size, and spatiotemporal resolution of VSD can be accurately determined. Such precise imaging will be beneficial for surgical and catheter-based closure.

Case Report: A 22-year-old Hispanic male with a past medical history of psychosis, chronic headaches, grand mal seizures, and pulmonary insufficiency presented to clinic with headaches. On physical examination, there was no jugular venous distention, and no carotid bruits. Lungs were clear to auscultation. A grade 4/6 pan-systolic murmur was heard loudest at the lower sternal border, and lower apex. S1 and S2 were normal, and no S3 and S4 were heard. No edema was found. In addition, no cyanosis or clubbing could be seen. Trans-thoracic Echocardiography (TTE) findings were consistent with congenital heart disease with a patched VSD repair and residual VSD shunt, and pulmonary valve stenosis. Right atrial and right ventricular enlargement, tricuspid regurgitation, with moderate pulmonary hypertension (peak pulmonary arterial pressure 50 mmHg) were also seen. A trans-esophageal echocardiogram (TEE) showed a small left atrium and a persistent left superior vena cava that feeds into an enlarged coronary sinus. The right atrium was moderately enlarged but normal in function. The right ventricle was moderately to severely enlarged with only mildly impaired function. The pulmonic valve and right ventricle outflow tract appeared normal, but the pulmonary artery appeared narrowed and stenotic above the pulmonic valve. The inferior vena cava and superior vena cava appeared normal. Agitated normal saline-contrast injections showed simultaneous filling of the coronary sinus on the right side, and, when injected from the right, suggestive of the persistent left superior vena cava. An echocardiogram-dense area in the intraventricular septum was consistent with the prior VSD patching and color Doppler revealed residual shunts. 3DE further delineated the residual VSD shunt channels, the muscular ridge of the pulmonary artery stenosis, and the large coronary sinus.

Discussion: Evaluation of congenital heart disease can be effectively read using a 3DE. A TEE may not be necessary to provide the diagnosis. 3DE gives excellent data of various types of ventricular septal defects and atrial septal defects guiding interventional therapy. Furthermore, 3DE can give a better assessment of ventricle functions, structures, and volume. By primarily utilizing 3DE, the risk semi-invasive TEE can be avoided and thus reduce cost. In some aspects, the real time 3DE provides more information to the physician then the trans-esophageal echocardiogram. This is the first description of the advantage in using surface real time 3DE in comparison with 2D TEE.
AN UNUSUAL CAUSE OF PROXIMAL INTESTINAL OBSTRUCTION
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Introduction: Superior mesenteric artery (SMA) syndrome is a rare but well-recognized cause of proximal intestinal obstruction.

Case Report: A 41-year-old male presented with a 1-day history of abdominal pain and hiccups. He was evaluated at an outside hospital and then transferred to our facility. The patient denied any fevers, but admitted to several episodes of nausea with vomiting. He stated that the pain improved when lying in the fetal position. He did report that he had about a 50 lb. weight loss over the last 3 years. Otherwise he had no other medical problems. His surgical history revealed an exploratory laparotomy some 20 years ago through a right paramedian incision. On exam, he was tall and of thin build. His abdomen was distended and minimally tender to palpation diffusely. Laboratory values were all within normal limits. A CT scan (fig 1 and 2) was performed, which demonstrated a large distended stomach and a dilated duodenum with compression by the SMA. The small bowel distal to the SMA was decompressed. After draining approximately 4 liters through the nasogastric tube, an upper GI with small bowel follow-through was performed. This demonstrated a dilated duodenum with a sharp vertical line of obstruction at the level of the SMA with reflux of contrast back through the pylorus (fig 3). The diagnosis of SMA syndrome was made. The patient underwent Roux-en-Y bypass with gastrojejunostomy and feeding jejunostomy without complication (fig 4). At two weeks follow-up, the patient was gaining weight without tube feedings and the j-tube was discontinued.

Discussion: SMA syndrome (also known as Wilkie’s syndrome, arteriomesenteric duodenal compression, and Cast syndrome) is a rare acquired disorder involving obstruction of the third portion of the duodenum secondary to compression by the SMA against the aorta. The SMA – aortic angle, normally about 45° (38-56°), is decreased to less than 25° in SMA syndrome. The aortomesenteric distance, normally 10-20mm, is also shortened (2-8mm). Some other less common etiologies of SMA syndrome are: high insertion of duodenum at the ligament of Treitz, low insertion of SMA, and adhesions from prior surgery. SMA syndrome was originally described as a complication of scoliosis surgery, where elongation of the spine resulted in a decreased SMA–aortic angle. Spine surgery was also involved, and the use of a body cast had resulted in significant post-op weight loss. Other conditions associated with significant weight loss – malabsorption, severe trauma/burns, cancer, anorexia – can also cause a decrease in the SMA–aortic angle. Common presenting symptoms are epigastric pain, nausea with voluminous vomiting of partially digested food, early satiety, postprandial discomfort, belching, pain improved by left lateral decubitus or fetal position, and pain worsened by supine position. The mainstay of treatment is to achieve weight gain, which results in an increase in mesenteric fat leading to a decrease in the SMA–aortic angle. This is usually accomplished with medical therapy involving NG-tube decompression and enteral and/or parenteral feedings. Indications for surgery include failure of medical management or severe duodenal dilatation. Surgery involves bypassing the obstruction, usually with a duodenojejunostomy. Lysis of ligament of Treitz and duodenal mobilization has also been described.
PATIENT CONTROLLED ANALGESIA (PCA) VS INTERMITTENT IV INJECTION OF MORPHINE IN PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT WITH ABDOMINAL PAIN

Jason Knight, MD, Mary Mulrow, RN,MN, Danielle Hatch, Vonnie Fuentes, Steven Baldassare

PURPOSE: Many patients present to emergency departments with complaints of acute abdominal pain. This makes pain management a principal duty of emergency departments. Unfortunately, pain is oftentimes treated inadequately. Patient-controlled analgesia (PCA) has emerged as an effective solution for pain management in post-operative patients. However, based on the lack of literature available on the subject, PCA’s effectiveness for the treatment of acute pain in an emergency department setting has not been thoroughly investigated.

METHODS: This study was conducted to determine if patient-controlled analgesia (PCA) using morphine sulfate would be a more effective pain management strategy than the commonly used intermittent intravenous (IV) injections of morphine sulfate. Adult patients presenting to the emergency department with abdominal pain were randomly assigned to one of two groups. Ten subjects were enrolled. Each group received an IV bolus of morphine based on a verbal pain scale. Subjects were randomized to either morphine sulfate IV via PCA pump or morphine sulfate via intermittent IV boluses. All patients were asked to rate their pain level on verbal and linear scales both at presentation and at 30-minute intervals for the duration of the four-hour study. The amount of morphine sulfate administered to each patient was recorded.

RESULTS: Patients using the PCA pump had a lower average pain rating overall (m = 4.49±2.27) than patients receiving intermittent IV injections (m= 5.05 ± 1.36). Patients using the PCA pump requested less morphine on average (m = 7.50 mg ± 6.16 mg) than patients receiving intermittent IV injections (m = 12.75 mg ± 6.90 mg). Results showed that the average pain ratings of patients using the PCA pump decreased over the time of the study, whereas the average pain ratings of patients receiving intermittent IV injections approached two minimum values over the course of the study, from which time they began increasing again.

CONCLUSIONS: Pain management continues to be a major focus of emergency department care that requires additional study. Further research should include a larger sample size, grouping patients by gender, diagnosis, co-morbid conditions, and use of chronic pain medication at home. Future studies with larger sample size would be useful in clarifying the most effective pain management strategies in the emergency department.
Introduction: Mycobacterium skin infections are rare throughout the world and are usually seen in an immunocompromised host. Because methicillin-resistant Staphylococcus aureus (MRSA) has become such a common cause of outpatient acute-care visits in the U.S., it is often the presumed diagnosis for any skin or soft tissue infection. This overshadowing by MRSA makes a detailed history important in the clinical diagnosis and treatment of skin infections.

Case Report: A 30-year-old woman presented to the urgent care clinic with three large, erythematous skin nodules on the back of her leg. The largest had been growing for two weeks and had begun draining pus. She had also noticed a few smaller nodules over a one-week period developing in various body locations. Accompanying symptoms were fever and malaise for a period of two days. Approximately three weeks prior, the patient had traveled to Colombia and undergone a cosmetic procedure involving lecithin injections for body-curve sculpting. Significant past medical history included breast implants, and a revision one-year prior. She was also still in the surveillance stage, and was followed every three months for Stage 1 cervical cancer that had been treated successfully with a total abdominal hysterectomy about 1-year prior. No family, personal contact, or personal history of skin abscesses was reported. She had a recent negative human immune virus (HIV) test and normal labs including a complete blood count. On physical exam, there were several large, fluctuant, discolored, and reddish-purplish indurated areas on both posterior thighs, each measuring approximately 2-4 cm x 5-9 cm. Two of the abscesses had developed cutaneous fistulas and were oozing purulent, serosanguinous fluid. Initial management with incision and drainage and oral clindamycin and doxycycline improved the existing lesions but failed to prevent development of new ones. On day five, the preliminary culture reported acid-fast bacilli (AFB) resembling *Norcardia* species or *Mycobacterium*. A change from oral clindamycin to oral Bactrim failed to show an improvement in symptoms. On day eight, final cultures were reported as *Mycobacterium chelonae*, sensitive only to clarithromycin (linezolid not tested). After four months of continuous oral clarithromycin monotherapy and several repeat incision and drainage procedures, the patient recovered with only modest scarring.

Discussion: *M. chelonae* is a rare human pathogen. It is recognized for its resistance patterns to most antibiotics, including those commonly used for skin infections. Most case reports in the immunocompetent are found to be a result of improper sterilization technique of surgical equipment or inoculation by other contaminated equipment, such as immunization supplies. Because it is difficult to isolate, *M. chelonae* should be added to the differential in skin infections that have resulted from previous inoculation and fit a clinical pattern not typical for gram-positive bacteria.
TRENDS IN PATIENT PRESENTATION TO EMERGENCY DEPARTMENTS

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Purpose: People present to Emergency Departments (ED) with varying disease processes and by many different modes of transportation. This study aimed to identify trends in pre-existing illness as they present to the ED, along with trends in choice of transportation to an inner-city, tertiary care, and community hospitals.

Methods: Through retrospective chart review, data was collected on patients admitted to the hospital from the ED from July 1 through September 30, 2004. The following data was collected for each patient: age, mode of arrival (private vehicle, ambulance, helicopter, walk-in), advanced versus basic life support services, pre-existing co-morbid conditions [diabetes (DM), hypertension (HTN), chronic obstructive pulmonary disease (COPD), coronary artery disease (CAD), congestive heart failure (CHF), end-stage renal disease (ESRD) and human immunodeficiency virus (HIV)], and vital signs. Patients were excluded from the study if they were younger than 18 years old, if they were transferred from another hospital, if they were direct admits, if no method of arrival could be ascertained, or if they left AMA. Data was analyzed using SPSS software (version 15.0) to observe incidence and trends of co-morbid conditions as they present to the Emergency Department (ED).

Results: There were 2,178 patients admitted to the hospital through the Emergency Department from July 1 through September 30, 2004, 357 of whom did not meet inclusion criteria. Of the 1,821 eligible patients 1,071 did not have any pre-existing conditions. Of the remaining 750 patients, 404 (22%) had one co-morbidity, and 229 (13%) had two co-morbidities. There were 93 (5.1%) patients with three co-morbidities, 18 (1%) with four co-morbidities and six (0.3%) with five co-morbidities. Hypertension was the most common co-morbidity, seen in 496 (66%) cases. There were 343 (46%) cases of DM, 167 (22%) of CAD, 76 (10%) of CHF, 63 (8%) of COPD, 57 (8%) of ESRD and 41 (5%) of HIV. DM and HTN were the two most common pre-existing conditions seen concomitantly with a frequency of 121 (6.6%). This was followed by the combination of DM, HTN, and CAD with a count of 35 (1.9%). HTN and CAD were seen in 33 (1.8%) cases; DM, HTN, and ESRD made up 22 (1.2%) cases, and DM and CAD were seen in 18 (1%) cases.

The majority of the patients (59%) arrived by private vehicle; 32% arrived by ambulance, 8% by air, and 1% were walk-ins. The overall average number of co-morbidities was 0.7. Air-transported patients had significantly fewer co-morbidities than the average (0.2), and walk-ins had significantly more co-morbidities than average (1.6). The two most prevalent co-morbidities for patients transported by private vehicle, air, and ambulance were HTN and DM. The two most prevalent co-morbidities for patients who walked in were CAD and HTN.

Conclusions: Based on the frequency of patients presenting with HTN, DM and CAD, this Emergency Department must be vigilant in assessing for these diseases and consider the possible effects that these conditions may have on the presenting problem. Also, mode of transportation may be misleading when considering the presence of co-morbidities and the degree of illness. Further studies analyzing co-morbidities, mode of transportation, and degree of severity upon arrival are merited with comparison to other similar facilities.
PAPILLARY ADENOCARCINOMA OF THE UTERUS WITH MULTIPLE BRAIN METASTASES

Asha Kurian MD, Karan Bhasin MD, Arinder Tiwana MD, Syma Hamidi MD, Boo Ghee Low MD, Shannon Skinner MD

Introduction: Although endometrial carcinoma is considered the most invasive gynecological tumor, Central Nervous System (CNS) involvement in such cases is rare. One study reported the incidence of CNS involvement with endometrial carcinoma to be 0-5%, with choriocarcinoma being the most common. Endometrial carcinoma follows a path of local extension and pelvic lymph node metastases. When CNS metastasis occurs, there is usually a single CNS lesion. In this case report, the patient presented with multiple metastases to the brain; this presentation makes this case distinct.

Case Report: The patient studied was a 61-year-old morbidly obese Caucasian female with a past medical history of hypertension, diabetes mellitus type 2, and hyperlipidemia who presented with slurred speech occurring over the past month. The patient also had experienced sporadic episodes of right arm weakness. The patient denied weight loss or any change in bowel movements. During initial evaluation, she was afebrile with stable vital signs and was found to have right-sided facial droop with slurred speech; there were no other focal neurological deficits. She had no gait abnormality. Computed tomography (CT) scan of the head demonstrated the presence of greater than fifteen independent lesions that were highly suspicious for metastases. CT of the abdomen revealed sub-centimeter pretracheal lymph nodes and three irregularly shaped hypodense regions in the liver. In addition, the CT revealed a 2.5 x 1.7 cm lesion in the stomach and an 8.5 x 6 cm solid pelvic mass. Endoscopy revealed a benign lipoma in the stomach. Further imaging with positron emission tomography showed increased uptake in the brain, uterine mass, and scattered abdominal and pelvic lymph nodes. Biopsies performed of lymph nodes, uterine mass and brain lesion all confirmed papillary adenocarcinoma. During the patient’s hospital stay, she was started on oral dexamethasone with improvement of her symptoms of facial droop and slurred speech. Discussions regarding further interventions were explored extensively; the patient, however, decided against any further interventions or treatments.

Discussion: Papillary adenocarcinomas of the uterus are highly aggressive tumors. These particular variants of endometrial adenocarcinoma have a clear tendency to spread into the abdomen. Ms. N had no gastrointestinal seeding demonstrated by PET scan or any postmenopausal bleeding, which is common in endometrial carcinomas. Papillary adenocarcinoma presents in only 0.3% of the population with metastases to the brain, a finding evidenced in this particular case. Patients are usually diagnosed with brain metastases on average 1.8 months after the initial diagnosis is made. In this particular case, however, diagnosis of brain metastases was made synchronously. Ms. N’s cancer most likely spread hematogenously as she presented with distant metastases and multiple lymph nodes. Invasive endometrial neoplasms may metastasize early in the course of the disease, before the onset of clinical symptoms related to the primary tumor become apparent; therefore, extensive workup should be pursued.
COPPER THEFT: A PETTY CRIME WITH CATASTROPHIC CONSEQUENCES

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Introduction: The resale value for scrap copper has skyrocketed in Arizona from $0.60/pound in 2003 to its current value of just over $3.00/pound. This price increase has fueled a similar escalation in copper theft. Electric utility providers use large amounts of copper making them attractive but dangerous targets. Thieves risk sustaining life-threatening burn injuries from electrocution when attempting to steal live electrical wiring as scrap. This study reviews three cases occurring over the course of two months within Maricopa County.

Case Report: All three patients were electrocuted while attempting to steal copper from commercial power sources. These sources included a locked switching cabinet carrying 7,200 volts electrical current (n= 2) and a transformer carrying 12,000 volts (n = 1). All three patients sustained electrical burns directly related to current flow and thermal injury from the ignition of clothing. The patients ranged from 39 to 49 years of age. All patients had full-thickness burn injuries with individual Total Body Surface Area (TBSA) involvement of 42%, 61%, and 72%. Complications included compartment syndrome (n = 2), ventilator-associated pneumonia (n = 1), bacteremia (n = 1), perforated ileum (n = 1), and MRSA wound infection (n = 1). Additionally, 2 of the patients developed resistant fungal wound infections (Rhizopus microsporus, Aspergillous flavus) leading to multi-system organ failure and ultimately, death. The length of stay for these two patients was 24 and 44 days. The lone survivor was discharged to an inpatient rehabilitation facility after 62 days of acute care.

Discussion: “Electrical burns are the most devastating of all thermal injuries…”and have a higher morbidity rate than expected based on TBSA alone. These patients utilize enormous healthcare resources as well as cause millions of dollars in damages. Arizona politicians are developing legislation that would impact both ‘supply and demand’ issues associated with copper theft. The proposed bill would make copper theft a Class 4 Felony rather than a petty crime. Nonetheless, the penalties suffered by these three patients are far more severe than a fine or prison sentence. Those who choose the wrong wire to cut or break into a live electrical cabinet are likely to lose their lives in pursuit of a few dollars of quick cash.
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OLIGODENDROGLIOMA MASQUERADING AS A PSYCHIATRIC DISORDER
Na Li, MD, Jihan Jorio, MD, Boo Ghee Low, MD

Introduction: Oligodendrogliomas constitute a large portion of all intracranial tumors. Patients with oligodendroglioma usually present with headache, syncope, seizure, nausea, or vomiting.

In less common situations, patients can present with cognitive changes such as memory loss or mood and personality changes. We present a case of a previously healthy middle-aged male, who demonstrated behavioral changes and was diagnosed with bipolar disorder with psychosis requiring inpatient psychiatric treatment, but was subsequently diagnosed with a brain tumor.

Case report: A 50-year-old Caucasian male with no significant past medical history was initially admitted to a psychiatric unit after petition by his family as a result of mood and personality changes during the previous nine months. The patient was a realtor but he eventually lost his job due to his behavior. He gradually demonstrated speech dysfunction, alexia, and aggressive behaviors such as threatening others, firing guns in the backyard, sexual promiscuity, and altered sleep patterns. He denied other symptoms such as headache, seizure, weakness, or sensory loss. Neurological examination was significant for alexia, finger agnosia, conductive aphasia, and mild expressive aphasia. Laboratory investigations, including complete blood count, complete metabolic panel, and urine drug screen, were noncontributory. The patient was not taking any medication. During his stay at the psychiatric unit, computerized tomography scan with and without contrast and magnetic resonance imaging scan of the head showed a cystic mass within the left parietal and temporal lobes measuring 3.9 x 3.2 x 3.0 cm, with diffuse edema and a midline shift of 4 mm. He was evaluated by a neurosurgeon, and due to evidence of brain edema, dexamethasone was started. The patient was also started on a mood stabilizer, followed by subsequent craniotomy with subtotal resection of the tumor. The biopsy yielded a grade II/III oligodendroglioma with dystrophic calcification. Oncology recommended chemotherapy with temozolomide and radiation therapy.

Discussion: This patient’s symptoms correlated with the involvement of the brain tumor in the cortical lobes. The patient presented with dominant parietal lobe deficits such as alexia and agnosia, part of Gerstmann’s syndrome, which is characterized by damage to the non-dominant side of the parietal lobe. He also demonstrated altered personality, which is the result of temporal lobe dysfunction.

The cognitive changes of oligodendroglioma are usually subtle and can be confused with depression or other psychiatric disorders. Because these symptoms lack specificity, they are often recognized in retrospect by the patient’s family or the treating physician. Thus, a high index of suspicion for a brain tumor should be entertained in a patient with acute mood changes without a prior history of psychiatric disorder or other obvious causes. Such patients should receive neuroimaging to rule out a brain tumor.
Introduction: Decompressive laparotomy for the treatment of abdominal compartment syndrome (ACS) in burn patients often leads to difficulty in management of the open abdomen. Laborious dressing changes are required, and one of many delayed procedures for definitive closure is often necessary, secondary to loss of domain. The most common form of dressing used with the open abdomen is referred to as vacuum-pack, or negative-pressure dressing, has known complications, including enteric fistulas and intra abdominal abscesses. In addition, the burn patient presents a challenge in that the vacuum in the standard vacuum-pack dressing is difficult to maintain, due to inability of adherent occlusive dressing to stick to burned tissues. Given the difficulty in using the vacuum-pack dressing in the burn patient and the possible complications of using this dressing technique, an immediate closure of the decompressive laparotomy with a biologic collagen matrix was performed at our institution.

Case Report: A 16-year-old male suffered an 80% total body surface area (TBSA) mostly full thickness flame burns, including the entire anterior torso. The patient subsequently developed ACS and underwent decompressive laparotomy and immediate closure of the abdomen, with a biologic collagen matrix and human cadaveric allograft to the matrix. At the same time, a fascial excision of the entire anterior torso was performed. We performed twice-daily dressing changes with 5% mafenide acetate soaked gauze overlying the allograft on the biologic matrix. Despite these procedures, small portions of the biologic dried and appeared leather-like. We then, very carefully, tangentially excised the dried out portions of biologic matrix in order to promote granulation tissue formation. After changing the overlying allograft on several occasions, granulation tissue eventually formed overlying the biologic, and cultured epithelial autograft was applied over the biologic. Photographic documentation throughout the course shows the evolution of the wound and the final coverage of the anterior abdomen.

Conclusion: Closure of the abdomen immediately after decompressive laparotomy for ACS with a biologic collagen matrix is not currently a common treatment of ACS. However, this technique allowed for ease of daily dressing changes without the risks of complications known to exist with the standard vacuum-pack dressings, and avoided the complication of an open abdomen in a patient with abdominal burns. One of the difficulties with this technique is keeping the biologic collagen matrix moist and preventing it from drying. Further studies are required to evaluate the optimal surface area of biologic to place, what type of dressing would keep the biologic moist enough to prevent it from dying out, and to compare outcomes to the standard vacuum-pack dressing. However, this case report provides a reasonable option in the treatment of ACS and the open abdomen in the large TBSA burn patient.
AN ATYPIcal PRESENTATION OF PANCREATIC CANCER; LEFT- SIDED PORTAL HYPERTENSION DUE TO CYSTADENOCARCINOMA OF THE PANCREAS

Reza Maleknia, MD; Abdul Nadir, MD

Introduction: Left-sided portal hypertension (LSPH) is a localized form of portal hypertension that usually occurs as a result of an isolated obstruction of the splenic vein. It is a rare syndrome that may lead to bleeding from gastric varices. Pancreatic malignancies and pancreatitis are the most common etiologies of LSPH. We present a patient who had unique presenting symptoms of LSPH and was found to have a rare etiology for his LSPH.

Case report: A 60-year-old Caucasian male was referred for an esophagogastroduodenoscopy (EGD) for evaluation of persistent nausea of four weeks duration. He reported postprandial nausea with occasional bloating, diarrhea, and flatulence, not relieved by oral ranitidine. He denied vomiting, weight loss, jaundice or abdominal pain. He had a history of 20-pack-year smoking and used alcohol in moderate amounts, but quit both 20 years ago.

His EGD revealed moderate gastric varices, supporting the diagnosis of portal hypertension. A computed tomography (CT) scan of the abdomen with intravenous and oral contrast showed two hypodense pancreatic tail masses, gastric varices, splenomegaly and splenic vein thrombosis. A complete blood count, complete metabolic panel, prothrombin time, partial thromboplastin time, stool studies, anti-mitochondrial antibody, serum immunoglobulins, thyroid stimulating hormone, acute hepatitis panel and CA 125 were all within normal limits. CA 19-9 was the only abnormal lab finding with a level of 90 U/ml (normal: 0-37 U/ml). A splenic arteriogram revealed splenic vein thrombosis with presence of collaterals reconstituting the extrahepatic portal vein.

Fine needle aspiration of the fluid from the pancreatic cyst relieved his symptoms and did not contain malignant cells. Four weeks after the aspiration, the patient returned to clinic with recurrence of nausea and abdominal distention. A multiphasic CT scan of the pancreas showed recurrence of two adjacent large cysts on the tail of pancreas. The patient underwent laparoscopic examination of the abdomen with resection of the multiloculated pancreatic cyst, splenectomy, and partial pancreatectomy. Pathological examination of the cyst revealed moderately differentiated pancreatic cystadenocarcinoma with two peripancreatic malignant lymph nodes. Six weeks later, a laparotomy was performed to resect the tumor completely before chemotherapy. Multiple areas of metastasis were found in the mesentery. Despite the poor prognosis, the patient chose to undergo treatment with chemotherapy.

Discussion: Pancreatic cystadenocarcinoma is an uncommon tumor and its preoperative diagnosis may be difficult to ascertain due to the indistinct nature of its clinical features. Left-sided portal hypertension (LSPH) secondary to splenic vein occlusion is an uncommon condition and constitutes only 5% of all extrahepatic portal hypertension cases. Cystadenocarcinoma has not been reported as a cause of LSPH. This case is unique, in that LSPH presented as persistent and recurrent nausea and also because of the rarity of the tumor underlying the cause of LSPH.
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“COUNTY” EMERGENCY MEDICINE RESIDENTS TREAT FEWER AMI PATIENTS WITH PCI THAN “COMMUNITY” HOSPITAL EMERGENCY MEDICINE RESIDENTS

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Purpose: Acute Myocardial Infarction (AMI) remains a leading cause of death in the United States. Emergency Medicine (EM) residents obviously need appropriate training, therefore, on the recognition and medical management of AMI. This study hypothesizes that “county”-based residents treat fewer suspected STEMI type patients requiring Per-cutaneous Coronary Intervention (PCI) than do residents based at “community” type hospitals.

Methods: Investigators for this study utilized the Centers for Medicaid/Medicare Services (CMS) website (www.hospitalcompare.hhs.gov) to acquire process-of-care-measures “heart attack” (PCI) data for the largest 25 U.S. cities between April 2006 and March 2007. Correlating information regarding Emergency Medicine residencies within the same 25 cities was obtained from the www.saem.org website. PCI at “county”-based EM programs was compared to “community” EM program hospitals, on a “per resident” basis. “County” hospitals were described as listed in the National Association of Public Hospitals. Research assistants completed a structured training course and group practice-runs before reviewing and entering data into the database. For quality assurance, a third investigator reviewed 10% of randomly selected charts for accuracy and consultations regarding discrepancies were held as needed. The data points were entered into a Microsoft Excel™ spreadsheet and analyzed with SPSSSoftware™.

Results: Of the 47 hospitals included in the study, the research identified 20 hospitals with “county”-based EM programs as defined above. Calculations determined a mean number of 40 residents at “county” EM programs with an average of 11.0 AMIs, compared to 38.7 residents and 17.2 AMIs at “community”-based programs. A difference in geometric mean AMI per EM resident per year was identified: 0.101 at “county” vs. 0.340 at “community” hospitals (p<.022).

Conclusions: This study therefore confirmed the preliminary hypothesis that residents that participate in Emergency Medicine training at a “county”-type program receive less experience treating patients requiring PCI for STEMI patients than Emergency Medicine residents based at “community” hospitals.
MULTIPLE SACCULAR ANEURYSMS IN THE CORONARY ARTERY CIRCULATIONS

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Introduction: Coronary artery aneurysms are rare. Studies indicate that they are present in approximately 1.5% of autopsy patients and approximately 5% of patients undergoing coronary artery angiography. The majority of cases (50-80%) in the United States are the result of coronary artery atherosclerosis. Coronary artery aneurysms most frequently involve the right coronary artery (RCA) or the left anterior descending (LAD) coronary artery. This case is unusual and therefore notable because of the multiple and large aneurysms present.

Case Report: A 69-year-old hypertensive male smoker, with a history of iliac aneurysms and negative past history of cocaine or Kawasaki’s disease, presented with central chest discomfort, ST elevation in the inferior leads, and elevated cardiac enzymes. Cardiac catheterization revealed a 6 cm aneurysm in the right coronary artery with an occluded lumen and ectatic proximal LAD, as well as inferior wall akinesia. A spiral chest computed tomography revealed a large calcified aneurysm with intraluminal thrombus. The patient underwent an RCA bypass, but unfortunately had suture dehiscence and expired. At autopsy, the LAD had a proximal aneurysm (2.5 cm) and RCA was found to have 6 distinct large aneurysms (6, 2.2, 3, 6, 5 and 3.5 cm). The RCA wall microscopy was suggestive of severe calcific atherosclerosis and a few surgically related acute inflammatory cells.

Discussion: Aneurysm formation of the coronary arteries may result from congenital or acquired conditions. Congenital coronary artery aneurysms are found most commonly in the right coronary artery. Abnormal flow patterns within the aneurysm may lead to thrombus formation with subsequent vessel occlusion, distal thromboembolization, and myocardial infarction. In general, angina pectoris or acute myocardial infarction presenting in patients younger than 20 years of age should prompt suspicion of a congenital coronary artery anomaly or aneurysm. Coronary artery aneurysms, which may be multiple, can be congenital or the result of atherosclerosis, trauma, angioplasty, atherectomy, laser procedures, arteritis (including syphilis), mycotic emboli, mucocutaneous lymph node syndrome, systemic lupus erythematosus, or dissection (spontaneous or secondary). Atherosclerosis-induced aneurysms are thought to result from primary thinning and/or destruction of the media and may represent up to 50 percent of the causes. Angioplasty, atherectomy, vasculitis, and arteritis also may damage the arterial wall (media) and lead to coronary aneurysms. In addition, cocaine use may also predispose to the formation of coronary artery aneurysms, which may in turn be a contributing factor to myocardial infarction. Unfortunately, there are no current guidelines or indications present for screening cardiac aneurysms, and surgery is undertaken only for suitable candidates after thorough review of risks versus benefits.
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TIME TO FIBRINOLYTIC THERAPY IS SHORTER WHEN EM RESIDENTS ARE INVOLVED

Edmund J. Nichter MD, Craig Mangum MD, David Drachman PhD, Frank LoVecchio DO, J Stephan Stapczynski MD

Purpose: CMS collects data on “process of care measures” for “heart attack” for US hospitals. This study compared reported rates of compliance with these measures between Emergency Departments (ED) with Emergency Medicine (EM) residents and those without. We hypothesize that EM resident-staffed EDs will adhere more closely to the “process of care measures” required by CMS.

Methods: Rates of compliance with process of care measures for heart attack (AMI) care from April 06-March 07 was obtained from www.hospitalcompare.hhs.gov for hospitals in the 25 largest US cities. Process of care measures entered into the database included patients receiving; aspirin upon arrival, beta blockers upon arrival, fibrinolytics < 30 minutes, PCI < 90 minutes of arrival and smoking cessation counseling. The www.saem.org website was utilized to obtain EM residency program primary, and any secondary hospital(s). The database was reviewed and entered into a Microsoft Excel spreadsheet by research assistants after providing them with a structured training course. To verify accuracy, 10% of charts were randomly reviewed by a third reviewer. Data was analyzed with SPSS software.

Results: A total of 254 hospitals were included in the study; 47 as primary EM residency sites, 23 as secondary sites, and 184 hospitals without EM residency affiliation. This study revealed no difference between EM and non-EM residency staffed EDs when giving aspirin and/or beta-blockers on arrival, PCI within 90 minutes, or smoking cessation counseling. There was a difference, however, in the average percentage of patients receiving fibrinolytics in < 30 minutes; 62% (n=59) at a primary EM residency site, 58% (n=37) at a secondary EM residency, and 30% (n=349) at a hospital with no EM residency affiliation (p<.001).

Conclusion: This study revealed that EM resident-staffed EDs administer fibrinolytic reperfusion therapy in < 30 minutes more commonly than those EDs without EM residents present. The value of an EM residency in facilitating compliance with other evidence-based guidelines deserves further investigation.
DISSEMINATION OF MALIGNANT CELLS IN A NEEDLE TRACK BIOPSY OF METASTATIC SQUAMOUS CELL CARCINOMA FROM THE FLOOR OF MOUTH: A CASE REPORT

Marc O'CLEIREACHAIN MD, RANDY OPPENHEIMER MD

Introduction: Malignant seeding of a needle track following fine needle aspiration (FNA) of head and neck cancers is rare, with an overall reported incidence of less than 0.09%. Such needle track seeding is more commonly encountered, however, with more invasive biopsy procedures such as wide-bore or open needle biopsy. We report a case of a 63-year-old man whose diagnosis of squamous cell cancer (SCC) of the floor of the mouth was confirmed from an FNA of a large neck mass.

Case Report: The patient is a 63-year-old man who presented to the ENT clinic with a two-month history of a right neck mass. His chief complaint at that time was progressive dysphagia associated with hoarseness for the patient, which was getting worse despite antibiotic therapy for a suspected infection. Examination of the patient revealed a small area of what appeared to be leukoplakia overlying the right submandibular duct without a palpable lesion. There was a large firm mass involving level 1 of the anterior neck. Biopsy of the leukoplakia was done at the initial assessment, which showed high-grade squamous dysplasia. The patient also received a computed tomography (CT) evaluation of his chest and neck, which showed a large heterogeneous mass with central necrosis located at the right-sided floor of the mouth. An FNA of the right-sided neck mass was performed to confirm the diagnosis. The FNA was positive for SCC.

On follow-up with the patient two weeks later, a new growth was noted along the path of the needle track from the FNA. The patient was then returned to the operating room for a more formal biopsy of the floor of the mouth and full endoscopic evaluation as well as complete dental extraction and a gastrostomy tube placement. The patient is currently undergoing chemo-radiation therapy at this time. Surgical options will be reassessed at a later date.

Discussion: It is common practice to perform an FNA of cancers in the head and neck, as there is low incidence of track seeding or other complications and the results are highly diagnostic. Despite the low likelihood of malignant seeding of the biopsy track, this case demonstrates it is still possible. Nonetheless, the morbidity of FNA for head and neck cancers is likely to be much lower than open biopsy and should continue to be used routinely as the risk/benefit ratio favors FNA.
TRAUMATIC RIGHT EPIDURAL HEMATOMA WITH HEMINEGLECT MASQUERADING AS RIGHT MIDDLE CEREBRAL ARTERY INFARCTION
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INTRODUCTION: Epidural hematomas are collections of blood between the inner table of the skull and dura. They are usually associated with a skull fracture over the middle meningeal artery or across a dural sinus, and therefore are commonly located in the temporoparietal region. The classic presentation of an epidural hematoma is trauma followed by a “lucid” interval, and later a declining level of consciousness and hemiation. We report the case of a 57-year-old female with a traumatic right epidural hematoma who presented with near-normal mental status, but flaccid left hemiplegia and hemineglect masquerading as a right middle cerebral artery stroke.

CASE REPORT: A 57-year-old female was knocked over by a slow-moving pickup truck, which resulted in a ground-level fall onto her left side with short loss of consciousness. On scene, she was reportedly alert and oriented, and complained of left knee pain. Her vital signs were normal, with the exception of remarkable hypertension with a blood pressure of 200/140. She was transported by EMS to our facility, a level 1 trauma center, for further evaluation and treatment. On initial evaluation in the trauma bay, the patient had an intact airway, bilateral breath sounds, and pulses. Her blood pressure was 204/117, pulse of 120, respirations of 18, pulse oximetry of 100%, and temperature 36.3 degrees Celsius. Secondary evaluation showed a female lying in spinal precautions. She was alert and oriented to person, but amnestic to the events that brought her to the hospital. She had no dysarthria and was able to relay a cogent medical history, which included only currently untreated hypertension. She had left-sided flaccid hemiplegia and left-sided hemineglect. She had complete left-side sensory loss. Both pupils were 3mm and slightly sluggishly reactive. She would not gaze to her left past the midline with either eye.

The patient was transferred to the CT scanner for scanning of her brain, cervical spine, chest abdomen and pelvis. CT scan of the brain showed a right epidural hematoma measuring 8.3 x 3.7 cm, with buckling of the gray-white junction and 6 mm midline shift with compression of the right lateral ventricle. There was also a left subdural hematoma and subarachnoid hemorrhage, with high density blood in the left sylvian fissure and also in the cortical sulci on the left side. She was taken emergently to the operating room for a right parietofrontal craniotomy with placement of a subgaleal drain. Intraoperatively, the source of bleeding was found to be large venous channels crossing the fractures. The skull was immediately replaced after evacuation of the hematoma and drain placement. She was extubated in the operating room and transferred to the surgical intensive care unit. The patient was hospitalized for a total of 11 days. Throughout her stay she showed remarkable recovery of her left-sided strength. Her hemineglect resolved; she became ambulatory with assistance. She was discharged to an inpatient rehabilitation unit and expected to make a full recovery.

DISCUSSION: The patient’s neurologic syndrome was typical for a right-hand dominant person who had a right middle cerebral artery stroke. On this patient’s initial presentation, it was unclear if a traumatic brain injury was the inciting factor for her neurologic deficits, or if she had had a right middle cerebral artery stroke and her neurologic deficits from that event would have caused her to be struck by the truck. A review of the literature has revealed no previously reported cases of an epidural hematoma associated with hemineglect. The location of this patient’s epidural hematoma does explain her examination, including hemineglect, hemisensory loss, gaze preference, and flaccid hemiplegia.
THE EVOLUTION AND PERIOPERATIVE COURSE OF PATIENTS UNDERGOING RADIOFREQUENCY ABLATION OF LIVER TUMORS BETWEEN 1996 AND 2006


Purpose: Radiofrequency ablation (RFA) is widely touted as a safe and effective means of liver tumor destruction. More data is required before this technique can be accepted as an appropriate part of the standard management algorithm. The purpose of this study is to examine the perioperative course and complications following RFA of liver tumors at a single high-volume institution over a 10-year period.

Methods: Between September 1996 and June 2006, data was collected prospectively on ablations in 192 patients. All procedures were performed under the direction of a single surgeon. Substantial changes occurred in ablation technology during this period, including increases in maximum power generation and alterations in tip design.

Results: Patients included 80 women and 112 men, with an average age of 63 years (SD +/- 23). A total of 464 tumors were ablated, resulting in an average of 2.4 tumor ablations per patient. Mean tumor size was 2.4 cm (SD +/- 1.70, range 0.7 to 13 cm). Laparoscopic ablations were used in 147 patients, 15 patients had open treatments, 26 were computer tomography (CT) guided, and 4 received thoracoscopic (transdiaphragmatic) ablations. Blood loss for all ablations averaged 116 ml, with a mean estimated blood loss (EBL) of 832 ml for the 15 open procedures. The average operative time was 172 minutes.

Major intra-operative complications occurred in seven patients, including one tumor rupture during ablation, one thermal bowel injury, one gallbladder thermal injury, three enterotomies, and one bowel trocar injury. Major post-operative complications occurred in 17 patients and included one cardiac death, six patients with RFA site abscesses, five patients with pulmonary embolism/pneumonia, and five patients had significant hepatic dysfunction. Overall, major complications occurred in 24/192 (12.5%) of patients.

Conclusions: Radiofrequency ablation has rapidly become a popular treatment modality for hepatic tumors, especially in patients who are poor operative candidates. Although overall morbidity is reduced compared to open surgical resection, major complications do occur. We have reviewed our short-term outcomes with the intention of better understanding how to incorporate RFA into our management algorithm.
INTRODUCTION: Nitrous oxide is routinely used in medical or dental settings as an anesthetic. Nitrous oxide also has commercial and industrial uses, such as a propellant in whipped cream canisters. The nitrous oxide from whipped cream canisters is often inhaled as a recreational drug. Referred to as “whippets,” the canister gasses are often inhaled as a recreational drug, inducing euphoria and use as an aphrodisiac. Such excessive use and misuse of nitrous oxide can induce a condition in the central nervous system known as “sub-acute combined degeneration of the spinal cord.” Sub-acute combined degeneration is a condition, such as that occurring in vitamin B12 deficiency, characterized by gliosis with spongiform degeneration of the posterior and lateral columns in the Central Nervous System (CNS).

CASE REPORT: A 25-year-old male presented with ataxia, numbness of the lower extremities, and deficit in positional and vibratory sense at the knees and ankles bilaterally. The patient’s gait was abnormal and not meeting any particular diagnostic criteria of neurological pathology. A provisional diagnosis of Mood Disorder/ R/O malingering was made on the initial evaluation, based on the patient’s history of poly-substance dependence and certain social factors. Furthermore, a differential diagnosis of vitamin B12 deficiency was entertained. However, with his normal serum Vitamin B-12 levels, normochromic RBC’s on peripheral smear, a negative Schillings test, and without the knowledge of the patient’s habit of abusing nitrous oxide, a provisional diagnosis of malingering was made. The patient was subsequently admitted to the psychiatric ward.

After a several days of questioning, the patient admitted that he had been abusing nitrous oxide via the “whippets” canisters. His history of nitrous oxide abuse consisted of 25-30 “whippets” a day over a two-to-three-month period. An MRI of spine T-2 weighed image showed diffuse hyper-intensities in the posterior aspect of cervical and upper thoracic spine. Ultimately, the patient was diagnosed with cervical myeloneuropathy, secondary to nitrous oxide induced sub-acute combined degeneration. Treatment was started with cobalamine IM injections 500 mcg/day for one week, coupled with 3 grams of methionine, which was subsequently changed to SAM 800 mg BID for two weeks. The patient’s ataxic gait improved significantly within two weeks; however, the vibratory sense deficits persisted, with slower improvement over the following three weeks.

DISCUSSION: The increasing tendency of individuals to try new ways of “getting high” can have dire consequences, as exemplified by this patient’s recreational use of the nitrous oxide contained within the “whippets” canisters. A more detailed social history enables physicians to identify the treatable deteriorating effect of nitrous oxide on the nervous system and to better educate the treating personnel to become familiar with etiology and treatment of the neurological sequelae of substance abuse.
TRACHEOESOPHAGEAL FISTULA: A CASE REPORT

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INTRODUCTION: Tracheoesophageal fistula is a congenital defect that is seen on 1/3000 to 1/4500 live births in North America. Among those with this condition, there are some well-described coexisting malformations, most commonly, VACTERL syndrome representing vertebral defects, anorectal malformations, cardiovascular abnormalities, tracheoesophageal defects, renal problems, and limb deformities. This defect is known to originate during a key period of embryologic development at the 3rd to 6th gestational week. It was first discussed anecdotally in the 17th Century. Hirschsprung later described a series of cases in the literature in 1862, but the first successful extraperitoneal single stage repair was not performed until 1941 by Cameron Haight. This approach has been the standard of care for the last six decades. However, with the development of minimally invasive surgery (MIS), this traditional approach is being challenged. Most of the literature in support of thoracoscopic repair may suffer an arguable bias for MIS in that these studies are from centers of excellence in MIS with motivation toward pushing the envelope of current practice.

CASE REPORT: Baby Girl (BG) was born prematurely at 31 weeks gestational age via cesarean section for intrauterine growth retardation, placenta previa, and non-reactive fetal heart tones. BG’s weight measured 1.4 kg. She was reported to have some oral secretions present. Attempts to place a feeding tube failed. Chest roentogram was suggestive of esophageal atresia and tracheoesophageal fistula. On the second day of life, BG was taken to surgery. Rigid bronchoscopy confirmed the diagnosis with visualization of the fistula. Through a right thoracotomy, an extrapleural exposure of the mediastinal structures was obtained. The tracheoesophageal fistula was transected and over-sewn. The chest was filled with warm saline and the anesthesiologist tested the repair with positive pressure. An anastamosis of the esophagus completed the repair. BG experienced an uncomplicated postoperative course and was tolerating full feeds by postoperative day 14.

DISCUSSION: This case illustrates the efficacy of a surgical approach developed over 60 years ago. Recently, innovators in MIS have performed a similar procedure through small thoracostomy ports with similar operative times and outcomes as those with the thoracotomy approach. Some argue that such outcomes therefore favor MIS due to the anecdotal long-term morbidity of a thoracotomy such as chronic pain, winged scapula, and chest disfigurement. However, these outcomes have not been well described in the literature and are not the common experience of all pediatric surgeons. While the scar may potentially be more appealing and argue for MIS, this approach does not allow for an extrapleural approach. A significant problem may be the setting of an anastamotic leak. Such a complication that is not isolated away from the lung may create significant inflammation and compromise the patient’s recovery course.
CHEST PAIN CENTERS (CPC) HAVE BETTER ADHERENCE TO ACUTE MYOCARDIAL INFARCTION PROCESS OF CARE MEASURES THAN NON-CPC HOSPITALS

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Purpose: In 1998, the Society of Chest Pain Centers (CPC) was established with a goal to “improve the treatment of acute coronary syndrome.” In initiating this study, we hypothesized that CPCs would accomplish better compliance with the CMS process of care measures than non-CPC hospitals.

Methods: The CPC website provided statistical data for all CPC accredited hospitals found within the largest 25 US cities. In addition, the Department of Human Health Services and Centers for Medicaid/Medicare Services website www.hospitalcompare.hhs.gov provided process-of-care-measures “heart attack” data. Points evaluated included: number of patients given aspirin therapy, beta blocker therapy, per-cutaneous coronary intervention or fibrinolytics, and smoking cessation counseling. After completing a structured training course and group practice runs, research assistants reviewed and entered the data. For accuracy verification, a third investigator assessed 10% of all charts and discussed discrepancies as needed. The data points were entered into a Microsoft Excel™ spreadsheet and analyzed by means of SPSS Software™.

Results: A total of 254 hospitals were included in the study, 24 of which were accredited CPCs. No statistical significance was noted in facility compliance with aspirin therapy upon arrival, beta-blocker therapy upon arrival, or patients receiving fibrinolytic therapy within 30 minutes of arrival. There was, however, statistical significance in the number of patients at CPCs that received smoking cessation counseling, with a mean of 96.3% as compared to 87.6% at non-CPC hospitals (p<.044). CPC hospitals registered a 61.2 % compliance rate as compared to 55.3 % at non-CPC hospitals [OR=1.272; 95% CI 1.041-1.554] for obtaining a PCI within 90 minutes of arrival.

Conclusion: This study indicates that CPC facilities adhere better to compliance with CMS smoking cessation counseling standards when compared to non-CPC hospitals. CPCs were also more likely than non-CPC hospitals to administer PCI within 90 minutes.
72-YEAR-OLD HISPANIC MALE WITH CARCINOSARCOMA OF THE PROSTATE FIRST PRESENTING AS LIVER METASTASIS

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Introduction: Prostate cancer is the second most common cancer in men after non-melanoma skin cancer. More than 200,000 men are diagnosed with prostate cancer annually, resulting in approximately 27,000 deaths. A great majority of prostate cancer is adenocarcinoma; however, transitional cell carcinoma, basal cell carcinoma, lymphoma, or stromal sarcoma do occur rarely. We present a case of metastatic carcinosarcoma of the prostate, first presenting as liver metastasis in a 72-year-old male.

Case Report: A 72-year-old Hispanic male with past medical history of prostate cancer, status post-prostate surgery three years prior, presented with right upper quadrant pain of a few months duration. The pain was non-radiating, 10/10 in severity, initially intermittent and then progressing to constant and more severe. The patient denied having any urinary problems since surgery, any weight loss, hematuria, or rectal bleeding. On physical examination, abdomen was soft, non-tender, non-distended; caput medusae were noted. On rectal, the prostate felt small, non-tender to palpation but firm. Laboratory examination revealed aspartate aminotransferase of 133 U/L, alanine aminotransferase of 54 U/L, alkaline phosphatase of 254 U/L, total bilirubin 0.2 mg/dl, albumin of 3.9 g/dl, and total protein of 8.1 g/dl. Prothrombin time was 13.8 seconds, international normalized ratio of 1.2, and partial thromboplastin time was 30.8 seconds. Computed tomography scan of the abdomen and pelvis revealed hypodense masses within the liver, with extensive areas of confluence and a prominent prostate. Due to the multiple liver lesions, a colonoscopy was done but did not reveal any evidence of colon cancer. Prostate specific antigen (PSA) was 193.7 ng/ml (<4.0 ng/ml), alpha-fetoprotein was 312.8 ng/ml (0.0 - 8.0 ng/ml), and carcinoembryonic antigen was 0.8 ng/ml (0.0 – 2.5 ng/ml). Liver core biopsy showed necrotic malignant neoplasm infiltrating and trapping benign hepatocytes. Immunoperoxidase stain for cytokeratin AE1/AE3, cytokeratin 7 and anticytokeratin CAM 5.2 were positive. Staining for neuron specific enolase, chromogranin, synaptophysin, CD-99, MSA, desmin, and S-100 were negative. CD-31 and CD-34 stained positive for endothelial cells. These findings were consistent with poorly differentiated carcinoma with sarcomatous changes.

Discussion: Before the advent of PSA, prostate cancer was mostly diagnosed by digital rectal examination or urinary symptoms. Now, however, most prostate cancer is diagnosed by elevation of PSA. When symptoms are present, they are usually characterized by urgency, frequency, nocturia, and hesitancy. Other symptoms that warrant closer investigation include new onset erectile dysfunction, hematuria, or hematospermia. Rarely, prostate cancer can present first as metastasis, causing bone pain or spinal cord compression. Our case is unique in both its initial presentation and its histological type. To our knowledge, there have only been 100 cases reported in the literature of carcinosarcoma of the prostate. It is interesting to note that patients with carcinosarcoma of the prostate often have a history of acinar adenocarcinoma, with a mean of 6.8 years from time of diagnosis. Our patient did, in fact, have a history of prostate cancer, although histological records could not be obtained as surgery was done in Mexico. Although rare, carcinoasarcoma of the prostate should be in the differential diagnosis of an elderly male patient with a newly elevated PSA, especially in those with a history of prostatic acinar adenocarcinoma.
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PERIPARTUM RIGHT CORONARY ARTERY DISSECTION

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Introduction: Spontaneous coronary artery dissection is a rare cause of myocardial infarction. The condition is more prevalent in young women, particularly in the peripartum or early postpartum period. We report a case of a young woman at 39 weeks of noncomplicated pregnancy and no apparent risk factors, presenting with right coronary artery dissection ultimately treated with multiple stents.

Case Report: A 25-year-old Hispanic female, G2P1001, at 39 weeks of an otherwise uncomplicated pregnancy and with no apparent risk factors for coronary artery disease, presented with acute onset substernal chest pressure, diaphoresis, and dyspnea. The patient’s pain had resolved at the time of the initial cardiology evaluation. Her cardiopulmonary physical examination was unremarkable. The 12-lead electrocardiogram revealed antero-lateral T wave inversion. Troponin I was elevated. A spiral chest computed tomography was negative for pulmonary embolism. A bedside echocardiogram revealed normal left ventricular function and wall motion. At this time, spontaneous coronary artery dissection was suspected and the patient was started on intravenous heparin. She underwent emergency caesarean section on the subsequent day and had an uneventful post-operative course. The patient ultimately had a cardiac catheterization that confirmed a large linear dissection of the right coronary artery, and she was successfully treated with multiple stents.

Discussion: Spontaneous coronary artery dissection (SCAD) is a rare yet potentially fatal entity in otherwise healthy individuals. The first case of pregnancy-related dissection was reported in 1931. A review of the medical literature suggests a mean patient age of 33 years, mean parity of 2.7, and mean time span to event of 20 days postpartum. Coronary dissection involves the left anterior descending artery in approximately 80% of cases, and the right coronary artery in most others. Patients with advanced age and multiparity have been reported to be at increased risk. However, etiology of SCAD in gravid patients is still a matter of discussion and appears to be multifactorial. Theories regarding etiology include: pregnancy induced degeneration of collagen in conjunction with the hemodynamic stresses of pregnancy, a primary rupture of the vasa vasorum into the medial wall, or a medial eosinophilic angiitis. The most likely explanation seems to involve induction of morphological changes of the arterial wall by hormonal influences or connective tissue alterations during or shortly after pregnancy. Given its overall mortality of more than 50% at presentation, this diagnosis must be considered when evaluating such patients, especially given the good prognosis in those surviving the acute event. Optimal treatment of SCAD has not yet been defined. However, successful management of this disease has incorporated medical management, percutaneous coronary angioplasty, and intracoronary stent placement, surgical bypass of the affected coronary artery, ventricular assist devices, and even heart transplant in select cases.
Purpose: Several medical specialists are exposed to ionizing radiation. The amount of this exposure is not well described.

Methods: The radiation exposure of these physicians has been studied independently using dosimetry badge data, but the direct comparison of exposure between specialties has not been firmly established. The purpose of this study was to compare radiation exposure of specialties in the Maricopa Medical Center from 1/2003-5/2007.

Results: Cardiologists were found to have the highest exposure (3107.2 mrems/year), more than ten times that of radiologists (310.3 mrems/year), followed by trauma surgeons (240.8 mrems/year), anesthesiologists (201.3 mrems/year), pediatricians (187.8 mrems/year), physiatrists (172.4 mrems/year) and emergency medicine physicians (153.6 mrems/year).

The maximum radiation exposure allowed by regulation authorities in the state of Arizona is 5000 mrems/year. Five of the seven specialties are below five percent of this limit.

Conclusions: In light of these results, researchers should look for ways to promote physician compliance and employ other technological advances to further prevent undue exposure to cardiologists, their personnel, and their patients. The necessity of monitoring badges for specialties that receive consistently low doses of radiation should also be considered.
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POTT’S DISEASE...RARE BUT NOT FORGOTTEN

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Introduction: Bone and joint infections account for 10 to 35 percent of cases of extra-pulmonary tuberculosis and for almost two percent of all cases of tuberculosis overall. The spine is involved in approximately one-half of patients with musculoskeletal tuberculosis. Spinal tuberculosis (Pott’s disease) most often affects the lumbar and lower thoracic regions. Tuberculous abscesses may arise as complications of spinal tuberculosis and are frequently bilateral. We present a case that illustrates this rare complication of tuberculosis.

Case: A 24-year-old Somalian female, who had been living in United States for three years, was admitted with back and right flank pain, with weight loss for two months, and a non-productive cough for two weeks. She was afebrile. There were no signs or symptoms of any neurological deficit on examination. Her white blood cell count was 5.7 x10^3/dL and hemoglobin was 11.8 g/dL. Electrolytes were within normal limits. The chest x-ray showed a right lower lobe infiltrate. Computed tomography scan of the chest/back/spine showed a paraspinal abscess involving T9-T10 and left lung reticulonodular opacities. Magnetic resonance imaging (MRI) of the thoracic spine showed a contiguous abscess between T8 and T10 and T9-10 diskitis. A drain was placed for the paraspinal abscess. Initial stains were negative for acid fast bacilli. The patient was placed in respiratory isolation and pulmonary tuberculosis was ruled out with three negative acid fast bacilli sputum specimens. A human immunodeficiency virus test was negative. Brucella and Histoplasmosis titers and the purified protein derivative [PPD] test were also negative. A bronchoscopy was done, and the washings were negative for acid fast bacilli. Despite the negative results, the patient was started on rifampin, isoniazid, pyrazinamide, ethambutol (RIPE) treatment empirically. Tuberculosis was diagnosed based on the clinical presentation and radiographic evidence. Cultures from the spinal abscess eventually grew out Mycobacterium tuberculosis six weeks later.

Discussion: The treatment of skeletal tuberculosis consists of antituberculous chemotherapy (RIPE) using regimens that are adequate for pulmonary tuberculosis. Traditionally, a 12 to 18 month course of therapy has been advocated for musculoskeletal tuberculosis. However, several studies have advocated shorter courses of treatment and have shown that six- to nine-month regimens containing rifampin are at least as effective as longer courses without rifampin. Surgery is a useful adjunct for selected patients who can benefit from drainage of an abscess, debridement of infected material, and decompression and stabilization of the spinal cord. Combined medical and surgical therapy is recommended for patients with advanced neurological deficits. The response to therapy is monitored by clinical indicators such as pain, constitutional symptoms, mobility, and accompanying neurological signs.
CASTLEMAN’S DISEASE

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Introduction: Castleman’s disease (CD) was first described by Dr. Benjamin Castleman in Boston in 1956. It is also known as giant lymph node hyperplasia and angiofollicular lymph node hyperplasia. Castleman’s disease is not considered a cancer. It is often called a lymphoproliferative disorder – meaning an overgrowth of lymph nodes – similar in many ways to lymphomas. Castleman’s disease can be classified as: unicentric versus multicentric, based on clinical and radiological findings; hyaline vascular versus plasmacytic versus mixed cellularity variety, based on histopathology; and HIV negative versus HIV positive, based on the human immunodeficiency virus (HIV) status of the patient. The pathogenesis of Castleman’s disease is not exactly known but the identification of the Kaposi’s sarcoma-associated herpesvirus (KSHV), also called human herpesvirus 8 (HHV-8) led to the theory that HHV-8 infection may cause abnormal production of interleukin-6 (IL-6) that causes lymphocytes to reproduce excessively. This is a case report of an HIV-positive patient that was found to have HHV-8-associated multicentric Castleman’s disease.

Case Report: A 23-year-old male was admitted with history of fever, shortness of breath and tachycardia. He was recently diagnosed with HIV seven months prior to admission. Physical examination revealed hepatosplenomegaly and generalized lymphadenopathy. Laboratory evaluation revealed pancytopenia. CD4 count was 390 cells/mm3. Sepsis was suspected and he was started on steroids for possible adrenal insufficiency. He continued to be febrile. Chest radiograph showed large bilateral pleural effusion, which was drained. Cervical lymph node biopsy was performed, which showed features consistent with HHV-8-positive plasma cell type Castleman’s disease. Ganciclovir was started. Despite aggressive management, he developed respiratory failure, multiorgan failure with acute tubular necrosis, hepatitis, acute respiratory distress syndrome and disseminated intravascular coagulation. The patient died 20 days after admission. An autopsy confirmed the diagnosis of multicentric Castleman’s disease with generalized lymph node involvement. There was massive splenomegaly with marked acute congestion, extensive extra medullary hematopoiesis, and severe autolysis of splenic parenchyma. Both lungs showed patchy areas of bronchopneumonia. No evidence of opportunistic infection or Kaposi’s sarcoma was identified. The bone marrow was markedly hypercellular with trilineage hematopoiesis, probably reactive. No malignancy was identified.

Discussion: Although several cases of Castleman’s disease have been reported in patients with HIV, it remains a rare disease. The literature for Castleman’s disease consists mainly of single case reports and small case series. Multicentric Castleman’s disease is the least common variant (<10% of about 200 new CD cases per year in the US). Multicentric CD in the HIV-infected patient is often a devastating illness, and treatment is difficult. Surgery does not usually cure the disease because it is too widespread. Therapies that have been reported to have some effect include: single-agent and low-dose etoposide, thalidomide, interferon alfa, retinoids, anti–interleukin-6 antibody, combination chemotherapy, and rituximab. Anti-herpesvirus medications affect HHV-8 only in its lytic phase. The effect of anti-HIV therapy is modest and variable. Even with the poor prognosis and limited success in the treatment of multicentric Castleman’s disease, it is very important to include it in the differential diagnosis of a patient presenting with a lymphoproliferative type disorder.
SEPSIS SECONDARY TO HAFNIA ALVEI IN AN IMMUNOSUPPRESSED PATIENT RECEIVING CHEMOTHERAPY

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Introduction: The genus Hafnia is one of the 40 genera from the family Enterobacteriaceae. Hafnia alvei is a motile, gram-negative, facultatively anaerobic bacillus rarely isolated from humans, but that sometimes can be found as part of the gastrointestinal flora. It has been associated with gastroenteritis, meningitis, bacteremia, pneumonia, nosocomial wound infection, endophthalmitis, and abdominal abscess. We present a 53-year-old Hispanic female with a history of gallbladder adenosquamous carcinoma immunosuppressed secondary to chemotherapy that became septic due to a biloma infected with Hafnia alvei.

Case Report: A 53-year-old Hispanic female with history of adenosquamous carcinoma of the gallbladder was admitted with coagulopathy. The carcinoma was discovered incidentally during open cholecystectomy for a presumptive cholecystitis. Surgical margins were positive and perivascular and perineural invasion was present, and the carcinoma was Stage III (T4 N1 M0). Patient was started on concurrent chemotherapy and radiation postoperatively. Gemcitabine at a dose of 250 mg/m² was begun for three weeks out of every four. After six doses of chemoradiation, patient had begun to have significant nausea and vomiting and increasing abdominal tenderness. A CT of the abdomen and pelvis revealed marked dilatation of the left and right intrahepatic tree, terminating abruptly at the porta hepatis, most likely representing tumor extension. Additionally, a large fluid collection in the gallbladder fossa was evident, most likely representing a biloma. To drain this, interventional radiology consultation was obtained for percutaneous aspiration with a T-Tube. During the procedure, which the patient tolerated well, 1 gram cefazolin IV was infused. Two days after placement of T-Tube, patient became febrile (39.2°C), tachycardic (127 beats per minute), and had leukocytosis (12.6 x10³/liter). Biliary fluid cultures obtained at the time of T-Tube placement showed heavy growth of Hafnia alvei. Blood, sputum cultures, and urine cultures obtained as a part of the sepsis work-up were reported to be negative. Patient was treated in the hospital for three days with cefepime and discharged with ciprofloxacin 500 mg po x 10 days.

Discussion: Hafnia is responsible for infections in adults, especially in hospitalized patients with underlying chronic diseases, subjected to invasive procedures, or even under antibiotic treatment. Risk factors include duration of stay in the intensive care unit, immunosuppression, shock, poor general condition and advanced age. H. alvei is reported to be naturally resistant or of intermediate susceptibility to all tetracyclines, amoxicillin, amoxicillin-clavulanate, ampicillin-sulbactam, narrow-spectrum cephalosporins, azithromycin, and fosfomycin. H. alvei has been considered moderately pathogenic or even non-pathogenic for humans. However, recent descriptions of severe, community or nosocomial infections due to H. alvei have challenged this belief. The actual role of H. alvei in human disease, especially in the immunocompromised population, remains to be defined.
HIGH RESOLUTION MANOMETRY: THE DETECTION OF A HIATAL HERNIA IN THE SETTING OF A GIANT PARAESOPHAGEAL HERNIA
Scott Swanson M.D., Lee L Swanstrom, Christy Dunst

**Purpose:** Although the use of high-resolution manometry for the elucidation of esophageal motility in detecting esophageal dysmotility is well established, it still remains to be determined whether it can be used to reliably detect the presence of a hiatal hernia (HH), and, more specifically, if it can detect giant paraesophageal hernias (PEHs). It is our hypothesis that high-resolution manometry in fact fails to detect the presence of a giant PEH.

**Methods:** Retrospective analysis of 20 consecutive patients, collected from a prospectively maintained database, was reviewed. The database included patients who were found to have giant PEH, as defined by the operative record findings. The criteria for inclusion were based on no prior upper gastrointestinal surgery, evidence of giant hiatal hernia at time of operation, and high-resolution manometry data obtained pre-operatively. As this study was approached from the perspective of a novice to manometry, an on-line tutorial to interpretation of high-resolution manometry from Sierra Scientific Instruments was completed. The targeted database consisted of patients who had undergone repair of a giant PEH from January 2007 to November 2007.

Investigators recalled and reviewed the pre-operative manometric tracings for each of the respective patients. The investigators were blinded as to the size of the actual hiatal hernias found, but knowledge of the presence of a hiatal hernia was predetermined by the design of the study. The manometric tracings were calibrated for the determination of the presence of diaphragm location, for catheter position in relation to diaphragm, lower esophageal sphincter (LES), and for the presence of pressure inversion point (PIP) by tracings. Findings were recorded and entered into a Microsoft Excel™ spreadsheet.

Investigators also reviewed the patient’s medical records to assess the pre-operative esophagastroduodenoscopy (EGD) findings, the subsequent date of operation, and the type of operation performed. This process served as a standard to which a comparison of the pre-operative manometry findings could be compared.

**Results:** The resultant data reflect a well balanced demographic with respect to age and sex, despite a wide range of patient symptoms that prompted consultation and evaluation. The time range for inclusion into the study was January 2007 through November 2007. The data demonstrate that high-resolution manometry was in fact able to detect the presence of a giant HH in only 8/20 patients (40%) by means of subtracting the difference between the LES and the PIP, 5/20 (25%) by subtracting the difference between two separate pressure inversion points, and 6/20 patients when the high-resolution computer calculated the size of the hiatal hernia.

**Conclusion:** The use of high-resolution manometry for the detection of the presence and size of hiatal hernias as described supports our hypothesis that high-resolution manometry fails to detect the presence and/or the true size of the HH. Our data also support the hypothesis that manometry fails to consistently detect the presence, let alone the size, of a large hiatal hernia with any clinical reliability.Clinicians should therefore rely on other methods for detection of the presence of a hiatal hernia when suspected as a cause of patient’s symptoms. It becomes incumbent upon physicians to remain cognizant of the pitfalls or reliance on computer-generated reports for high-resolution manometry, and that even when the results are interpreted properly, the PEH cannot be diagnosed with any clinical reliability based on manometry results alone.
Osteomyelitis Secondary to Providencia Rettgeri in an Immunocompromised Male

Arinder Tiwana MD, Devin Ed Shahverdian MD, Asha Kurian MD, John Carroll MD

Introduction: The genus Providencia is one of the 40 genera from the family Enterobacteriaceae and has been recovered from urine, throat, perineum, axilla, stool, blood, and wound specimens. The species Providencia rettgeri is a gram-negative, rod-shaped, facultative anaerobic bacterium that has rarely been implicated in disease. There have been sporadic reports of nosocomial urinary tract infections and one case of osteomyelitis involving the rib cage in a 6-year-old male secondary to P. rettgeri in Nigeria in 1982. We present a 60-year-old Hispanic male with osteomyelitis due to P. rettgeri.

Case Report: A 60-year-old Hispanic male, with a past medical history of end stage liver disease secondary to hepatitis C and intravenous drug abuse, presented with a two-year history of pain and swelling in the left leg secondary to cellulitis caused by a brown recluse spider bite. Subsequent to the spider bite, he developed increasing edema and erythema of the affected area. The previous cultures from the wound grew Pasteurella multocida, methicillin resistant Staphylococcus aureus, Serratia marcescens, and Klebsiella pneumoniae. He had been treated for these in the past, but the above findings persisted. The patient denied having any constitutional symptoms. On physical exam, the patient had three ulcers in the left leg: one at each malleoli and another at the shin. The ulcer at the lateral malleolus, which had a mixed granular and fibrotic base, was draining purulent non-malodorous discharge. The patient was pancytopenic secondary to end-stage liver disease, erythrocyte sedimentation rate was 62 mm/hr, and C reactive protein was 0.827 mg/L. Radiograph of the left ankle revealed a soft tissue ulcer at the lateral aspect of the distal fibula, and periosteal reaction at the distal fibular shaft indicating osteomyelitis. The patient was started empirically on vancomycin and piperacillin/tazobactam. Cultures from the draining ulcer grew P. rettgeri, Staphylococcus aureus, and Escherichia coli. After checking the sensitivities, antibiotic was switched to trimethoprim/sulfamethoxazole and he was treated for six weeks.

Discussion: Osteomyelitis due to P. rettgeri has been infrequently reported and inadequately characterized. We are aware of only one case of osteomyelitis secondary to P. rettgeri reported in the literature: osteomyelitis of the rib with pathological fracture and sequestrum in a 6-year-old boy in Ibadan, Nigeria in 1982. P. rettgeri was previously known as Proteus rettgeri. In 1978, due to DNA-DNA hybridization Proteus rettgeri was reclassified as Providencia rettgeri. Risk factors that made our patient susceptible to P. rettgeri included pancytopenia secondary to end-stage liver disease, intravenous drug use, and multiple hospitalizations. The only additional data supporting osteomyelitis being caused by P. rettgeri is in the veterinary literature; rattlesnakes having osteomyelitis secondary to P. rettgeri have been reported. However, the significance of P. rettgeri as a pathogen in human disease remains to be defined.
DIFFUSE LARGE B-CELL LYMPHOMA OF THE GASTROINTESTINAL TRACT PRESENTING AS MULTIPLE POLYPOSIS IN A 48 YEAR OLD MALE WITH ACQUIRED IMMUNODEFICIENCY SYNDROME

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Introduction: Patients with human immunodeficiency virus (HIV) are predisposed to different types of malignancies and the appearance of non-Hodgkins lymphoma (NHL) is an acquired immunodeficiency syndrome (AIDS) defining event. NHL of the gastrointestinal tract is uncommon, occurring in less than five percent of all gastrointestinal malignancies. NHL presenting as polyposis is a rare presentation.

Case: A 48-year-old Caucasian male with AIDS with an absolute CD4 count of 123, with undetectable viral load and on antiretroviral therapy, presented with a four-day history of melena, increasing fatigue, and exertional dyspnea. He denied hematemesis, hematochezia, or prior gastrointestinal bleeding. A review of systems revealed chills, night sweats, joint pain, diarrhea and a ten-pound weight loss. The patient's past medical history included chronic active hepatitis B and idiopathic thrombocytopenic purpura. Physical examination revealed a chronically ill-appearing male with a blood pressure of 108/60 mmHg, heart rate of 101 beats per minute, and a temperature of 36.1 degrees centigrade. He had oral thrush, bilateral mandibular tenderness, firm, tender submandibular lymphadenopathy, and bilateral non-tender inguinal lymphadenopathy. The stool was Guaiac positive. Laboratory examinations revealed white cell count of 9.2 x 10³, hemoglobin of 8.3 gm/L, hematocrit of 23.7, mean corpuscular volume of 89.1, platelet count of 15,000/ul, prothrombin time of 11.8 seconds, international normalized ratio of 1.1, and a partial thromboplastin time of 27 seconds. Lactate dehydrogenase was 952; *Clostridium difficile* toxin and stool cultures were negative.

Esophagogastroduodenoscopy was performed, which revealed countless sessile polyps in the stomach and the duodenum. A colonoscopy was performed the next day and revealed the same findings. Multiple biopsies were taken on both occasions. A computed tomography scan of the abdomen and pelvis showed multiple hypodensities in the kidneys, liver, gastrointestinal tract, spleen, and the adrenal glands. Biopsy results of all the representative samples revealed diffuse large B-cell lymphoma. A bone marrow biopsy also revealed extensive lymphoma involvement. The patient received 6 cycles of chemotherapy and is currently in remission.

Discussion: The incidence of NHL is sixty times greater in AIDS patients than in the general population and the incidence has been decreasing since the advent of highly active antiretroviral therapy (HAART). NHL is the second most common malignancy associated with AIDS and is the cause of death in twenty percent of HIV infected patients. The majority presents with stage 3 or 4 disease. The gastrointestinal tract is the most common site of extranodal disease. The most common sites also include the large bowel in 46 percent, ileum in 39 percent, and the stomach in 23 percent. Common presentations include abdominal pain and tenderness in 77 percent and bleeding in 38 percent. Other manifestations include gastric outlet obstruction, ulcerations and perforation. Diagnosis is established with biopsy.
Abstract 82
Maricopa Integrated Health System
Surgery

METASTATIC GOBLET CELL CARCINOID OF THE APPENDIX PRESENTING AS ACUTE APPENDICITIS IN A 21 YEAR OLD

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Introduction: First described in 1974, goblet cell carcinoid (GCC) is a rare neuroendocrine tumor of the appendix comprising 6% of appendiceal carcinoids. GCC has both endocrine and glandular differentiation and appears to combine features of epithelial and carcinoid neoplasms. The number of patients who have been diagnosed with GCC is less than 600 worldwide, and based on the review of 57 publications, the mean age of presentation is 58.9 years; only 1.03% of patients are found to have disseminated disease at diagnosis. This case report describes an instance of widely metastatic appendiceal GCC presenting as acute ruptured appendicitis in a 21-year-old male.

Case Report: A 21-year-old male presented with 4-5 days of right-sided abdominal pain, fever, decreased appetite & nausea/vomiting x4. He was febrile with a white count of 14.8. CT abdomen/pelvis showed intraperitoneal fluid, a fecalith at the base of the appendix, and fat stranding and inflammatory changes in the right lower quadrant. He was given a presumptive diagnosis of acute appendicitis and taken to the OR. During mobilization of the cecum, a mass was noted in the sigmoid. Multiple sub-centimeter lactescent studs were seen in the small bowel mesentery. The sigmoid mass was 10x10 cm, firm, and fungating. The patient underwent partial sigmoidectomy to healthy-appearing bowel, appendectomy, and left colostomy. Pathology confirmed mixed goblet cell carcinoid, immunoperoxidase is identical to appendiceal primary.

Discussion: The case described both typifies current understanding of this disease and provides new insight into presentation and treatment. Like 22.5% of patients diagnosed with GCC of the appendix, this patient presented with signs and symptoms of acute appendicitis. Despite the remarkable amount of fluid in his abdomen and the nearly-obstructing sigmoid lesion, our patient reported symptoms for only 4-5 days duration. These were no doubt secondary to his ruptured appendicitis. This is typical of GCC, where symptoms are normally present for 12 hours to 90 days prior to presentation. Our patient’s carcinoembryonic antigen (CEA) was found to be elevated immediately post-op (3.7 ng/ml, normal 0-3 ng/ml) and normalized to <0.5 ng/ml by POD 3. CEA is one of the markers that is diffusely positive on the plasma membrane of tumor cells in GCC.

This case is remarkable for two reasons: age and treatment. The mean age of presentation of appendiceal GCC is 58.89 years, with a clear tendency for those with metastatic disease to present in their 60s and 70s. The patient described was only 21 years old and was widely metastatic. This finding is extremely rare regardless of age, comprising only 1.03% of patients. Clearly he falls well-outside the normal in this respect and may be the youngest disseminated appendiceal GCC patient known. Attempts for surgical cure in cases with disseminated disease are futile and radical surgery is not recommended because it is doubtful that the course of the disease will be altered. Patients with extensive metastases have not been known to survive past nine months. Six months have passed since this patient’s surgery, and a recent CEA after 8 rounds of FOLFOX-6 treatment was 1.2 ng/ml. While his prognosis is grim, the events of the coming months may afford further insight into a possible role for debulking surgery and aggressive chemotherapy for younger, otherwise healthy patients with metastatic GCC of the appendix.
Abstract 83
Maricopa Integrated Health System
Psychiatry

EFFECT OF SINGLE VS. MULTIPLE ANTIPSYCHOTIC MEDICATION REGIMENS ON HOSPITAL RECIDIVISM: A ONE YEAR RETROSPECTIVE STUDY
Alfredo Velez, MD, John Kingsley, MD, Esad Boskailo, MD, Dan Merrill, MD, Joanna Kowalik, MD, Gilbert Ramos, MA, Kathleen Mathieson, PhD

Purpose: The use of multiple anti-psychotics for stabilization of psychotic patients is a common practice in the community setting. However, published studies have associated this approach with increased risk for adverse reactions, with no commensurate increase in efficacy over single anti-psychotic use. The purpose of this study was to compare post-hospitalization readmission rates for psychiatric inpatients discharged on multiple anti-psychotic medications to those of inpatients discharged on a single medication. Chart data also revealed key characteristics of those receiving multiple anti-psychotic regimens at discharge, and of those experiencing illness relapse post-hospitalization severe enough to require use of emergency psychiatric services.

Methods: Maricopa Integrated Health System (MIHS) discharge records for Desert Vista Hospital and the Psychiatric Annex from January 2003 to December 2004 provided an initial unduplicated pool of 1,912 psychotic disorder inpatient stays for eligibility screening. Screening criteria included a requirement of at least one anti-psychotic medication at discharge, legal status of court-ordered treatment with case management by Value Options (VO), and confirmation of a diagnosis of Schizophrenia, Schizoaffective Disorder, or Psychotic Disorder NOS. Retrospective chart review and data cleaning yielded 1,423 qualified patients for inclusion in the study sample. The sample was then matched to VO clinical case management records for admission history to any of the county’s emergency psychiatric facilities. Any admission within one year from initial MIHS discharge was considered evidence of significant decompensation and recorded as a psychiatric readmission.

Results: Chart review identified 72% of the patient sample as discharged on a single anti-psychotic medication and 28% discharged on a multiple anti-psychotic regimen. Patients discharged on multiple anti-psychotics were slightly younger, on average, than those in the single anti-psychotic group. Race and sex differences were not significant between study groups. Numerous indicators of severity, however, were more prevalent among multiple anti-psychotic patients. Upon release, patients on multiple anti-psychotics more often went to residential placements, step down facilities (CRU), or were institutionalized at the Arizona State Hospital, while discharge to home or self was less prevalent. Multiple-medication patients also had lower average GAF scores and longer average lengths of stay, and were more likely to be on anti-manic and anti-anxiety medications. Primary diagnoses of paranoid schizophrenia and schizoaffective disorder were more prevalent among multiple-medication patients, while psychotic disorder NOS was less prevalent. Finally, multiple-medication patients were more likely to have an Axis II diagnosis of mental retardation, and were less likely to have no (or a deferred) Axis II diagnosis. Rates of re-admission, total re-admissions in one year, and days to re-admission were all similar between study groups.

Conclusion: This study did not reveal any significant difference in the one-year readmission rates of patients on multiple anti-psychotics at time of discharge and those on single anti-psychotics. Without noticeable improvement in readmission outcome for those discharged on multiple anti-psychotic regimens, the benefit over use of single anti-psychotics is questionable. Clinical trials are needed to eliminate illness severity as a cause of the results. These trials should include measures of post-hospitalization medication compliance, quality of life, and costs in order to help clinicians make better decisions regarding medications. Collaboration with case management providers is crucial to conducting such research.
LEVEL OF CLINICAL ACUITY OF NOT COMPETENT NOT RESTORABLE DEFENDENTS REFERRED BY COURT FOR CIVIL COMMITMENT

Illa Vora, MD, Kelly Tyler, MD, Liliane Arenzon, MD, Gwen Levitt, DO, Gilbert Ramos, MA, David Drachman, PhD

Purpose: Inpatients of the MIHS acute psychiatric facilities are typically seriously mentally ill (SMI), and often arrive for civil commitment proceedings due to serious or life-threatening behavior. However, a subgroup of inpatients arrive from criminal court proceedings after a lengthy finding of “not competent not restorable” (NCNR). Incapable of being prosecuted and with the immediacy of their mental health crises typically behind them, this subgroup may differ in essential qualities and outcome from the majority of inpatients. This study sought to compare the admission criteria, hospital course, and civil commitment outcomes of a sample of NCNR patients to those of typical psychiatric admissions.

Methods: NCNR defendants petitioned for court-ordered evaluation (COE) between January 2003 and December 2006 were checked against MIHS psychiatric inpatient records, yielding 293 eligible NCNR admissions. A control group of all other psychiatric admissions was randomly selected and matched using a technique of propensity scoring derived from sex, age, and primary discharge diagnosis. Researchers performed a retrospective chart review, collecting demographic variables, hospital course, admission and discharge data for each group. Patient records were evaluated for meeting ten different admission criteria for acute hospitalization. Incidence of seclusion and restraint (S&R) episodes, number of forced medication (PRN) orders, and outcome of civil commitment proceedings were evaluated. A logistic regression estimated probability of group fit, and corresponding propensity scores were used to sort NCNR and control patients into quintiles. Final comparison groups were comprised of 293 NCNR and 280 control patients.

Results: A majority of the NCNR group did not fulfill a single criterion for admission. Overall, each NCNR admit averaged 0.6 of 10 possible admitting criteria compared to 1.9 average criteria met by each member of the control population, a statistically significant result. NCNRs also received court-ordered treatment (COT) in greater proportion (84%) than the control group (69%). Only 6% of NCNRs receiving COT were found to be a danger to others (DTO), as compared to 31% of the control group. Additionally, 4% of the NCNR group required forced medications compared to double (9%) in the control group. The NCNR group had an average of 1.5 episodes of seclusion & restraint (S&R), for a mean length of 4 hours. The control group required 2.1 S&R episodes for an average of 6 hours. NCNRs also spent on average at least 20 days longer in the hospital awaiting placement.

Conclusion: This study has demonstrated that most defendants found not competent and not restorable do not meet criteria for inpatient psychiatric hospitalization and thus should not have to undergo civil commitment proceedings. They present fewer challenges to the hospital environment, as they are less dangerous and behaviorally more stable than the average psychiatric admission. However, they more often receive COT. These findings may reflect the court's bias against recently incarcerated mentally ill individuals found NCNR when compared to other mentally ill people. The court may view COTs for NCNRs as a type of probation, as a way to further punish them, or perhaps as a way to protect the community. This data may reflect the public myth that psychiatrically ill people are more violent, especially those who have been recently incarcerated.
ELEVATED MDM2 EXPRESSION INDUCES CHROMOSOMAL INSTABILITY AND CONFFERS A SURVIVAL AND GROWTH ADVANTAGE TO B CELLS.

Wang P MD PhD, Raji J MD, Lushnikova T PhD, Greiner TC MD, Jones SN PhD, Eischen CM PhD

**Purpose:** Mdm2 is an essential intermediary in the ARF-p53 tumor suppressor pathway. As an E3 ubiquitin ligase, Mdm2 transfers ubiquitin to p53, targeting it for degradation. Mdm2 can also block the transactivation functions of p53. Mdm2 is regulated, in part, by ARF, which can inhibit Mdm2 from targeting p53. Mdm2 has control over its own expression. As many as half of all human and murine lymphomas overexpress Mdm2 protein, including lymphomas that have inactivated the tumor suppressor p53 or p14/p19ARF. However, the biological consequences of Mdm2 overexpression in lymphocytes and potential roles and mechanisms of elevated expression of Mdm2 in B-cell lymphoma development are not fully resolved.

**Methods:** *In vitro* studies include phenotype analysis by flow cytometry; retrovirus infection, apoptosis, growth viability, and proliferation assay of primary pre-B cells; quantitative real-time PCR, Western and Southern blotting to evaluate the status of ARF, Mdm2, p53 and p21 in DNA, RNA and protein levels; and chromosome stability analysis to evaluate chromosomal instability. *In vitro*, Mdm2 transgenics were mated to Eµ-myc transgenic mice to generate Mdm2/Eµ-myc double transgenic mice. Survival rates and pathological features from different genotyping mice were analyzed as well.

**Results:** Here, we report that increased expression of Mdm2 in B cells augmented proliferation and reduced susceptibility to p53-dependent apoptosis, which was due to inhibition of p53 and suppression of p21 expression. Notably, developing and mature B cells from Mdm2 transgenic mice had an increased frequency of chromosomal/chromatid breaks and/or aneuploidy. This Mdm2-mediated genome instability occurred at a similar frequency as that in B cells overexpressing the oncogene c-Myc, but the chromosomal instability was not further enhanced when Mdm2 and c-Myc were overexpressed together. Elevated Mdm2 expression alone increased the occurrence of B-cell transformation *in vivo* and cooperated with c-Myc overexpression, resulting in an acceleration of B-cell lymphomagenesis. In addition, the frequency of p53 mutations was reduced, but not eliminated, in lymphomas arising in Mdm2/Eµ-myc double transgenic mice. Therefore, increased Mdm2 expression facilitated B-cell lymphomagenesis, in part, through regulation of p53 by altering B-cell proliferation and susceptibility to apoptosis, and by inducing chromosomal instability.

**Conclusion:** Our study focused on the biological processes most closely linked to cellular transformation and how a small increase in Mdm2 protein expression *in vivo* impacted these processes in B cells. Specifically, we showed that elevated levels of Mdm2 accelerated proliferation, conferred resistance to oncogene-initiated p53-dependent apoptosis, and increased the frequency of genomic instability in primary B cells. The growth and survival advantages, in addition to increasing chromosomal instability, make for perfect conditions for B-cell transformation. A lymphocyte that has reduced ability to inhibit cell cycle progression and undergo apoptosis, as well as spontaneously acquiring chromosomal changes, should have an increased potential of developing into a lymphoma, and our data support this concept. This study expands on previous data in limited mouse models on the consequences of Mdm2 overexpression and provides the first *in vivo* evidence of the effects on B cells of elevated Mdm2 levels. Our results also provide a clear rationale for why overexpression is frequently selected for in human and murine B-cell lymphomas. Our results also imply that targeting Mdm2 in lymphomas with increased Mdm2 expression should be a potent therapeutic approach.
Abstract 86
Maricopa Integrated Health System
Emergency Medicine

CMS COMPLIANCE SIMILAR IN COUNTY VS. NON-COUNTY EMERGENCY DEPARTMENTS EXCEPT IN ADMINISTRATION OF FIBRINOLYTICS WITHIN 30 MINUTES

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Purpose: Chest pain is a common presentation in the Emergency Room. Since patients have a choice in hospitals, we hypothesize that more patients elect to be treated at non-“county” type hospitals for their chest pain.

Methods: “County”-type hospitals were defined as found in the National Association of Public Hospitals. Rates of compliance with CMS “process of care measures” for heart attack care for hospitals in the 25 largest US cites between April 2006 to March 2007 were obtained from [www.hospitalcompare.hhs.gov](http://www.hospitalcompare.hhs.gov). The “heart attack” process-of-care-measures obtained from this database indicated the number of patients receiving aspirin, beta blockers, fibrinolytics < 30 minutes, Percutaneous Coronary Intervention (PCI) < 90 minutes of arrival, and smoking cessation counseling. Investigators compared “county” and “community” hospital compliance rates to the above care measures. After completing a structured training course, research assistants were able to review the database appropriately and enter the data into a Microsoft™ Excel spreadsheet. For accuracy, a third reviewer conducted random chart checks on 10% of the data. Data was then analyzed by means of SPSS™ software.

Results: Of a total of 254 hospitals included in the study, 31 facilities were identified as county hospitals. There was no significant difference at these facilities in the administration of aspirin, beta-blocker, or PCI. A statistically significant difference did exist, however, in the administration of fibrinolytic therapy, with more patients being administered fibrinolytic therapy <30 minutes in the county ED (53% vs. 32%; p<.001). Smoking cessation counseling was more commonly offered in the non-county setting than the county setting (94% vs. 87%; p<.001).

Conclusion: Following STEMI, community and county hospitals perform similarly in the administration of most therapies and interventions. County hospitals were more likely, however, to administer fibrinolytics < 30 minutes, and smoking cessation was more commonly offered in community hospitals.
PRENATAL ONSET OF AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE

Michael Yap MD, Deetu Simh MD, Jan Mangalat MD

**Introduction:** The most common inherited renal disease in the world is autosomal dominant polycystic kidney disease (ADPKD), affecting some 1 in 1000 people. It generally manifests later in life with progressive cystic enlargement of the kidneys, and leads to end-stage renal failure within the following decades. 85% of those with ADPKD have a mutation in the \( PKD1 \) gene as the cause of their disease. However, this disease is rarely identified prenatally. In 93% of cases of prenatal ADPKD, the fetal kidneys appear enlarged and hyperechogenic. We present one such case where both mother and fetus are diagnosed with ADPKD simultaneously.

**Case:** A 26-year-old G3P2 female from Mexico was referred to renal clinic for hydronephrosis of pregnancy. A recent ultrasound had shown mild pelvocalyctasis of her right kidney, but also demonstrated multiple cysts in the inferior pole of her left kidney, the largest of these measuring 2.2cm x 2.0cm x 1.5cm. Incidentally, the fetal kidneys were found to be enlarged and echogenic. The patient had normal renal function. Ultrasounds performed during her previous pregnancies were negative for renal abnormalities in both the mother and fetus. She was referred for a level II ultrasound of her fetus that revealed bilateral echogenic kidneys and an enlarged cisterna magnum. Family history revealed that she has an 18-year-old sister with "kidney problems" thought to be secondary to infections, and a 49-year-old mother who may currently have renal disease. It was recommended that she undergo sequence analysis for the \( PKD1 \) mutation as well as amniocentesis to look for evidence of chromosomal abnormality such as Trisomy 13 or 18, which could also be etiologies for her fetus' renal abnormality. She declined amniocentesis. At 37 1/7 weeks, a follow-up ultrasound demonstrated oligohydramnios. She tested negative for Group B Streptococcus, gonorrhea, Chlamydia, HIV, hepatitis B, and syphilis. At 39 weeks, she went into labor and had an uncomplicated vaginal birth. She was lost to follow-up, and the status of both the mother and the baby is unknown.

**Discussion:** Though we were unable to obtain amniocentesis to confirm mutation in \( PKD1 \), the presence of bilateral cysts in the mother combined with enlarged, hyperechogenic fetal kidneys make ADPKD more likely in both the mother and the fetus. The prognosis of children with prenatally diagnosed ADPKD is better than previously thought, with 7.6% of them developing chronic renal insufficiency after 22 years rather than 17% in past studies. Long-term studies on prognosis of these children are few and more would be necessary to aid in genetic counseling for parents with this disease.
MYSTERY IN THE DESERT

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Introduction: *Basidiobolus ranarum* is a fungal organism, predominantly found in subtropical climates, that may be associated with cutaneous disease. We will present an unusual case of a patient who presented with gastrointestinal symptoms.

Case report: 74 yo Caucasian male from Phoenix, Arizona, presented with a chief complaint of abdominal pain, diarrhea and anorexia of one month duration. He had been recently evaluated elsewhere and thought to have a stricture secondary to diverticulitis. Due to persistence of symptoms, he presented to our emergency department for further evaluation. His past medical history was significant for hypertension and diabetes, he was an active smoker and there was no family history of gastrointestinal disease. Upon admission, his vital signs were stable and his only physical exam finding was a palpable abdominal mass. His labs showed anemia, thrombocytosis and hyperglycemia. An abdominal CT revealed an 8cm infiltrating mass in the sigmoid colon. The differential diagnosis included neoplasm, lymphoma or abscess. A colonoscopy was attempted but was unsuccessful secondary to a 5mm stricture in the sigmoid colon. He subsequently underwent an exploratory laparotomy and resection of a lesion adherent to the jejunum, spleen and abdominal side wall. Pathology demonstrated a pattern of palisading histiocytes with a center of hyphal elements surrounded by a ring of immunoglobulins. This pattern is known as the Splendore–Hoeppli phenomenon and is highly suggestive of an infection from *Basidiobolus ranarum*, an environmental saprophyte normally found in subtropical climates. Infections generally manifest as cutaneous disease; visceral involvement is rare. However, there have been 15 cases of gastrointestinal basidiobolus diagnosed in Arizona since 1994. The definitive diagnosis requires culture, however it can be made by serology or histology. Treatment requires surgical resection and prolonged antifungal therapy. This patient required three months of therapy with itraconazole and did well in follow up.

Conclusion: Gastrointestinal basidiobolomycosis is a rare but emerging infectious disease in the Southwestern United States. Nonspecific signs and symptoms can lead to a delay in definitive diagnosis and treatment. It should be suspected if clinical findings are unusual for the working diagnosis, response to therapy is poor, or biopsy shows eosinophilic inflammation.
Abstract 89
Mayo Clinic Arizona
Family Medicine

HIP PAIN AFTER FALL INJURY IN AN ELDERLY PATIENT FROM PSOAS HEMATOMA: A
CASE REPORT

Danielle Armas MD and Jesse Bracamonte DO

Introduction: Hematoma of the iliopsoas muscle is not uncommon in surgical or injured
patients utilizing anticoagulant medications or who have underlying hemophilia, leukemia,
Gaucher’s disease or other propensity to bleeding. The current case involves an elderly male
without underlying bleeding disorder or anticoagulant use who was found to have right hip pain
and inability to bear weight on the leg after a fall. Skeletal injury was ruled out and he was
found to have an iliopsoas hematoma.

Case Report: A seventy-nine year old gentleman fell onto his left side when he slid off of bed
onto the floor. He did not have syncope, stoke symptoms, chest pain, loss of consciousness or
trauma to the head. He presented to the emergency department with paradoxical right hip,
thigh and low back pain with inability to bear weight on right leg. On examination his abdomen
was obese, soft, nontender, with bowel sounds present without ecchymoses to the flanks. He
complained of pain to the right hip, the anterior thigh and the lower back, especially on flexion of
the right hip. He also demonstrated decreased strength upon right hip flexion. X-ray of the right
hip and back showed no fracture or acute injury. CT scan of the abdomen and pelvis revealed
no evidence of acute bone pathology, but the scan did demonstrate findings of stranding of the
right psoas sheath extending into the upper thigh indicative of a psoas hematoma. The patient
had anemia with loss of blood into the evolving hematoma in the ensuing days of
hospitalization. He was hemodynamically stable and not a surgical case for hematoma
evacuation. He was treated with oral pain medication, physical and occupational therapy and
he was eventually discharged to a rehabilitation facility.

Discussion: In cases of hip and or low back pain that may involve weakness or other
neurological symptoms of the femoral nerve distribution, one needs to consider hematoma of
the psoas muscle, especially when skeletal injury is ruled out. As our case demonstrates, this
should be considered even in patients that are not necessarily prone to bleeding. Psoas
hematoma is best ruled out on CT scan and evacuation of the hematoma is considered if
demonstrating neurologic damage. Treatment by arterial embolization or surgery can be
contemplated if active bleeding is occurring.
COMPLICATIONS OF RENAL ARTERY ANGIOPLASTY AND STENTING

Michael H. Arredondo M.D. and Mark Macelwee M.D.

Introduction: Renal artery angioplasty and stenting is a common procedure done to address renovascular hypertension. This case helps reinforce the fact that the complications associated with this procedure are not benign and that the risks need to be well understood.

Case report: The patient is an 84-year-old Asian female who was found to have renovascular hypertension who subsequently underwent angioplasty of the first and third branches of the right renal artery. Chest pain and EKG changes during the procedure necessitated immediate cardiac catheterization where the left main coronary artery was found to be 40% narrowed. However, no hemodynamically significant lesions were found. She recovered from the procedure without further incident and was discharged to home.

Three days later, the patient was brought to the ED by her husband with complaints of weakness, confusion, and difficulty with ambulation. The patient was readmitted, and during the course of her hospitalization a CT of the thorax revealed an iatrogenic Stanford type B aortic dissection. An additional CT without contrast of the head showed evidence of small vessel chronic ischemic changes. Additionally, an MR angio of the head and neck showed punctate foci scattered throughout the cerebellar hemispheres, bilateral posterior temporal and occipital lobes and the left splenium of the corpus callosum that were consistent with recent embolic infarcts.

Discussion: Complications associated with renal artery angioplasty and stenting include problems at the access site, including localized hematoma formation, pseudoaneurysm, retroperitoneal hematoma, A-V fistula formation, infection or arterial dissection. Contrast dye poses a significant risk as most pts with renovascular disease have a high prevalence of DM, CHF, chronic renal insufficiency and diuretic-induced intravascular volume depletion. Dissection of the renal artery, itself, is also possible. Restenosis rates occur 14-37% of the time. Severe complications include renal failure, segmental renal infarction, perinephric hematoma and renal artery thrombosis or occlusion. Embolic strokes, permanently increased serum creatinine value, dialysis dependence, deep vein thrombosis and need for blood transfusion or surgical intervention are also possible.

The benefits of an endovascular procedure for renovascular hypertension are associated with lower morbidity rates and an earlier return to normal activity when compared to an open procedure. However, the mortality rates with angioplasty and stenting are generally higher, as the technique does have limitations. Careful consideration should be given to patients who are in need of renal artery revascularization.
WHAT LONG LASHES YOU HAVE: ACQUIRED HYPERTRICHOSIS LANUGINOSA AS A PRESENTING SIGN OF BREAST CANCER

Kirstin Bacani MD and Lori Roust MD

Introduction
Acquired hypertrichosis lanuginosa is a rare paraneoplastic syndrome characterized by the development of lanugo-type hair on the face, eyebrows, forehead, ears, and nose. There have been approximately 50 cases described in the literature since 1865, many of them associated with metastatic disease. We report a case of acquired hypertrichosis lanuginosa as a presenting sign of breast cancer.

Case Report
A 75-year-old woman presented for evaluation of a four-month history of eyelash lengthening and the development of fine, soft facial hair on her upper lip and cheeks. She denied use of new systemic or ocular medications. There were no systemic symptoms, including fever, night sweats, weight loss, or alterations in taste. There was no history of blood transfusions, tattoos, intravenous drug use, or sexually transmitted disease. Past medical history was significant only for hypertension and dyslipidemia; there was no personal history of malignancy. A screening mammogram six months prior was normal. A colonoscopy one month prior was without polyps. There was no family history of hirsuitism; one sister was diagnosed with colon cancer.

On exam, she had long eyebrows and eyelashes that touched the lens of her glasses and interfered with vision. There was fine, lanugo-type hair on both cheeks. The upper lip and chin had scattered soft hair; there were no terminal hairs. The scalp, hairline, and skin were normal. Breast exam was without palpable mass or nipple discharge. There was no lymphadenopathy. Pelvic exam was normal.

The following evaluations were within normal limits: complete blood count, electrolytes, creatinine, liver function tests, total testosterone, prolactin, sensitive thyroid stimulating hormone, 17-hydroxyprogesterone, cosyntropin stimulation test, creatine kinase, antinuclear antibody, sedimentation rate, lactate dehydrogenase, CA-125, carotene, blood porphyrins, hepatitis C antibody, urinalysis, and urine cytology. Chest x-ray and pelvic ultrasound were normal. Computed tomography of the chest, abdomen, and pelvis showed minute bilateral indeterminate pulmonary nodules but no other abnormalities. Mammogram with additional views of the left breast and a breast ultrasound were interpreted as probably benign with an area of summation artifact from overlapping fibroglandular tissue.

Six months after initial evaluation the patient underwent repeat mammogram which showed an area of suspicion in the left breast. Breast biopsy revealed lobular-type infiltrating carcinoma and associated duct cell carcinoma in situ. She underwent left mastectomy followed by chemotherapy and continues on trastuzumab infusions. She is doing well nearly one year after surgery and reports that her eyelash length is now normal.

Discussion
Acquired hypertrichosis lanuginosa is associated with internal malignancy. The most commonly associated malignancies are colorectal, lung, and breast cancer. A thorough investigation for malignancy should be undertaken in patients presenting with this condition.
EXTENSIVE PERSONAL EXPERIENCE: USE OF INSULIN PUMP THERAPY IN THE HOSPITAL

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PURPOSE: Patients on outpatient insulin pump therapy can be encountered in the hospital setting. It has been our practice to not always discontinue insulin pumps at the time of admission. The purpose of this analysis is to review the performance of our hospital's inpatient insulin pump policy, which provides guidance on contraindications for continued pump use and on procedures to be followed by the healthcare team.

METHODS: We identified and monitored hospital admissions involving a patient with insulin pump. Data was gathered from electronic medical records regarding patient demographics, compliance with the insulin pump policy and blood glucose values.

RESULTS: Out of 45 hospital admissions involving insulin pumps we encountered between November 1, 2005 and November 30, 2007, there were 32 unique patients who had been receiving outpatient insulin pump therapy. The average age and diabetes duration of these 32 patients was 54 and 31 years, respectively; 66% were women, 90% had type 1 diabetes, and all were white. The mean length of hospital stay was 4 days, and the average reported length of insulin pump therapy was 4 years. Twenty-six (58%) of the admissions were considered candidates for continued use of the insulin pump during the hospitalization. Over 80% of cases remaining on the insulin pump had documentation by nursing of the presence of the pump at the time of admission; 100% of patients had an admission glucose recorded; 77% had a record of signed patient consent; 81% had evidence of completed preprinted insulin pump orders; 77% received a required endocrine consultation; and 73% of cases had documentation of completed bedside flow sheet. A high frequency of both hypoglycemic and hyperglycemic events occurred in the patients; however, there were no complications (eg. infection, pump malfunction) directly related to the insulin pump.

CONCLUSIONS: We conclude that most patients on outpatient insulin pumps could continue their use while hospitalized and that therapy could be safely continued in the hospital setting in carefully selected patients. While staff compliance with required procedures was high, there was still room for improvement. More data are needed on whether this method of insulin delivery is effective for controlling hyperglycemia in hospitalized patients.
TEMPORAL AND GEOGRAPHIC VARIATION OF HYPOGLYCEMIA IN THE HOSPITAL

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PURPOSE: The frequency of hypoglycemia is low in our 208-bed hospital (Cook CB et. al. Journal of Hospital Medicine 2007 2:203), and may be low in hospitals in general (Cook CB et. al. Diabetes Technology and Therapeutics 2007 9:493). Nonetheless, hypoglycemia is still cited as a barrier to achieving inpatient glycemic targets, and, thus, requires further investigation. We further characterized hypoglycemic events in our institution, examining how values were related to work-shift cycle and location within the hospital.

METHODS: Capillary or blood glucose values < 70 mg/dl were extracted from our laboratory data base for hospitalizations spanning the period 01 October through 18 November 2007. A hypoglycemic value obtained within one hour of an index event for a specific patient was not counted as this likely represented a post-treatment value rather than a unique episode. Hypoglycemic events were analyzed according to 12 hour work-shift cycles (day shift 07:00 to 18:59; night shift 19:00 to 06:59), and by the 6 medical/surgical/intensive care wards within the hospital; events documented in the emergency department and post-anesthesia recovery area were not included in the analysis.

RESULTS: We found a total of 84 unique patients with 251 hypoglycemic events; 59% of patients had one hypoglycemic value, 14% had 2, 13% had 3, 7% had 4, and 12% had ≥5. There were 76% more hypoglycemic events occurring on the night shift (n=160 events in 69 patients) relative to the day shift (n=91 events in 47 patients). The greatest number of hypoglycemia measurements occurred between the times of 06:00 to 07:00 (33 events), followed by 04:00 to 05:00 (29 events). Most events (38%) were recorded during the first 72 hours of hospitalization, and the number declined thereafter. The prevalence of hypoglycemia varied across areas within the hospital, with most (31%) occurring in one patient care location.

CONCLUSIONS: We conclude that there are both temporal and geographic differences in the occurrence of hypoglycemia in our hospital. Further study is needed to understand the reasons underlying these variations so that specific interventions can be designed to lower the risk of hypoglycemia in the hospital.
ACHALASIA RESULTING IN CARDIAC AND RESPIRATORY FAILURE

A Case Report
Ciara Bozarth, D.O. and Michael Underhill, D.O.

Introduction: Achalasia is a disease characterized by the loss of distal esophageal peristalsis and the inability of the lower esophageal sphincter to relax. Though achalasia is typically an innocuous medical problem with an annual incidence of 1 case in 100,000, there are reported cases of cardiac and respiratory complications. We report a case of a 56 year old female with a 30 year history of untreated achalasia who presented to our hospital with respiratory compromise and heart failure secondary to massive esophageal dilatation. Patients diagnosed with achalasia, should be fully informed of the dangers of this disorder and ensure proper follow up and monitoring takes place.

Case Report: A 56 year old female presented to our hospital with new onset lower extremity edema. She did not complain of shortness of breath but was noted to have cyanotic lips, accessory muscle use in respiration, and pulse oximeter of 65% on room air. Additional physical exam revealed decreased breath sounds bilaterally, a 3/6 systolic ejection murmur, and 2+ pitting edema bilaterally. Initial chest X-ray showed a large opacity over the mediastinum with bilateral pleural effusions. A subsequent CT scan with contrast of the thorax showed massive dilatation of the entire intrathoracic esophagus from thoracic inlet to GE junction. The trachea was compressed to less than 15% of normal. A transthoracic echocardiogram confirmed right heart failure. The patient was admitted to intermediate care for ongoing evaluation of respiratory distress. She was considered too unstable for esophagectomy secondary to her cardio respiratory failure and debilitated state and underwent a laparoscopic Heller myotomy with placement of a jejunal feeding tube. She improved during her stay and was discharged from the hospital 4 days after surgery. She remained on jejunal feeds for one month. The lower extremity edema resolved. Her pulmonary hypertension improved but she remained with an intermittent need for home oxygen.

Discussion: Achalasia is a result of the degeneration of neurons in the esophageal wall with loss of peristalsis in the distal esophagus and a failure of lower esophageal sphincter relaxation. The cause of neuronal degeneration is unknown but hypothesized to be viral in origin. Patients typically present with dysphagia, difficulty belching, weight loss, regurgitation, or chest pain. The American College of Gastroenterology practice guidelines state that a barium esophagram with fluoroscopy is the single best diagnostic test but that all patients with a suspected diagnosis should undergo upper endoscopy to rule out tumors. The most effective treatment options are pneumatic dilation with a success rate of 60 to 85% and surgical myotomy with a success rate of 70 to 90%. There is no consensus regarding how often the dilations take place but all treatment options are aimed at improving patient symptoms and esophageal emptying. Decision on which treatment to choose is based on patient preference and availability of experienced personnel. Medications such as nitrates and calcium channel blockers can be used but are age based, frequently ineffective and have side effects. Botulinum toxin injections of the lower esophageal sphincter have a success rate of 43 to 82% in the short term but long term safety and efficacy is unknown. Patients should be counseled at time of diagnosis that delay in treating achalasia may result in significant morbidity. Patients with a diagnosis of achalasia must be monitored periodically and offered dilatations or myotomy based on symptoms. Although unusual, cardio respiratory failure can be a result of achalasia particularly those patients lost to follow up as in our case and should be considered as a diagnosis in the evaluation of respiratory distress.
RETROSPECTIVE CHART REVIEW ON THE INCIDENCE OF REMOVAL OF THE BRAVO CAPSULE AT MAYO CLINIC ARIZONA

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Purpose: Ambulatory, wireless pH-metry with the Bravo™ capsule (Medtronic Inc. Shoreview, MN) has gained popularity because of improved patient tolerability, reduced social stigmata and fewer restrictions on diet and activity. With increased utilization, several small studies and case-reports have suggested that some patients have substantial awareness and symptoms during Bravo monitoring. Typically the capsule sloughs off spontaneously, but occasionally severe chest discomfort requires endoscopic dislodgement of the capsule. The purpose of this study is to evaluate the incidence of unexpected events at Mayo Clinic Arizona, and the frequency of endoscopic capsule removal.

Methods: A retrospective chart review of 407 consecutive patients that completed 48 hr BRAVO™ pH-metry and standard catheter pH metry at Mayo Clinic Scottsdale from January 2004 to September 2007 was performed. Patients were referred for pH testing by both primary care and subspecialty consultants within the Mayo system. Demographics were documented such as race, gender and age as well as primary and secondary diagnoses, on or off proton pump inhibitor (PPI) therapy. All patients received sedation during oral capsule placement and conventional methods were used to deploy and place the capsule 6cm above the squamocolumnar junction (SCJ). Patients were encouraged to ingest their regular diets and return receivers after 48 hrs of recorded time.

Results: All four hundred and seven patients (134M, 273F, median age 58 years) were included in the study. Over 95% were Caucasian. Most common indication was heartburn or gastroesophageal reflux disease (GERD). Endoscopic dislodgement was required in 4/407 (<1%) patients, less than published literature (1%). All were on the female gender, ages ranged from 26 to 61 y/o. All but one had the Bravo capsule removed on the first day of the study.

Conclusion: Wireless pH monitoring by BRAVO was tolerated well. Wireless pH-metry was associated with relatively few, minor adverse or unexpected events. The safest and most efficacious method of endoscopic removal of the Bravo capsule has not been universally determined. Further investigation is warranted to identify predictors in patients who will most likely require endoscopic removal.
DYSPNEA AT THE 6 WEEK POSTPARTUM OFFICE VISIT: A CASE REPORT OF POSTPARTUM CARDIOMYOPATHY

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Introduction: Peripartum cardiomyopathy (PPCM) is a rare but serious disorder in which heart failure and dilated, non-ischemic cardiomyopathy occur in the peripartum period of previously healthy women. The incidence of PPCM in US women is approximately 1000 to 1300 cases each year. Diagnostic criteria include: 1) congestive heart failure secondary to deceased left ventricular systolic function from the 36th week of gestation through 5 months postpartum, 2) absence of pre-existing cardiac dysfunction, 3) absence of a determinable cause, and 4) ejection fraction (EF) <45% with end-diastolic dimension ≥2.7 cm/m². The etiology is unknown, but may include viral, autoimmune, or idiopathic causes. Risk factors include age >30 years, multiparity, African race, multiple gestation, chronic and gestational hypertension, and long-term tocolysis. Clinical presentation and treatment are similar to that of patients with other dilated cardiomyopathies. Early diagnosis and treatment are key to improving outcomes. Half of patients recover without serious complications but there is a poor prognosis in patients with persistent cardiomyopathy after 6 months. We report a case of postpartum cardiomyopathy presenting with dyspnea 6 weeks postpartum.

Case Report: A 40-year-old Filipino female with a history of asthma presented to her Family Medicine obstetrical physician approximately 6 weeks postpartum from an otherwise uncomplicated vaginal birth after C-section delivery. At the time of this routine follow-up visit, the patient noted a 2 week history of epigastric fullness, orthopnea, paroxysmal nocturnal dyspnea (PND) and dyspnea on exertion without chest pain or pressure. She reported lower extremity edema with some mild PND the last 2 weeks of her pregnancy, which had resolved immediately after delivery. There were no pregnancy complications, delivering a healthy 3665 gram female infant at 37.5 weeks gestation. At this postpartum visit, her heart rate was 100, resting pulse oximetry = 98% on room air, which dropped to 86% with ambulation. Physical exam only revealed end-expiratory wheezes on lung exam and was otherwise normal. A chest radiograph demonstrated a very large cardiac silhouette with normal pulmonary vasculature. An urgent 2-D echocardiogram showed severe biventricular enlargement with left ventricular end-diastolic diameter of 6.6 cm and an estimated left ventricular EF of 13%. There was also severe reduction in right ventricular systolic function and a moderately dilated inferior vena cava. Her B-type natriuretic peptide (BNP) was 685. The patient was immediately admitted to the intensive care unit for intravenous administration of dobutamine, nesiritide, furosemide, and an evaluation for possible cardiac transplantation. Along with vasopressor support, the patient was begun on an ACE inhibitor and Spironolactone. The patient improved clinically and was successfully weaned off intravenous medications and discharged following a 7 day hospitalization. Discharge medications included furosemide, spironolactone, lisinopril, digoxin, and carvedilol. Five months after discharge the patient continued to improve with a normal BNP, an EF of 33%, and improved diastolic function and exercise tolerance.

Discussion: The diagnosis of PPCM is challenging since many normal women in the last month of a pregnancy experience dyspnea, fatigue and pedal edema. Signs and symptoms suspicious for PPCM include, PND, orthopnea, dyspnea on exertion, chest pain, nocturnal cough, new regurgitant murmurs, pulmonary crackles, elevated jugular venous pressure and hepatomegaly. PPCM is a diagnosis of exclusion, and peripartum patients with these signs and symptoms should receive prompt evaluation and intervention as clinical deterioration and death can be rapid.
We present the case of a 19 year old female who believed herself to be healthy until she was admitted for the birth of her first child and found to be in end stage renal disease. Subsequent investigation revealed the cause to be primary hyperoxalosis, and she was commenced on daily dialysis. Medical complications have since included peripheral vasospasm and associated rhabdomyolysis, complex migraines with presyncope, and infections related to dialysis catheters. However, for this young lady the more significant hurdles to overcome include financial problems limiting her access to health care; social problems involving her ability to be the single parent of a small child and still meet her medical obligations; and past psychiatric issues including bulimia and illicit drug use.

The patient was referred for transplant workup, and these issues impacted the transplant process. In a disease such as primary hyperoxalosis, which is transmitted via autosomal recessive inheritance, the patient could be considered ‘blameless’ in the development of this disease. Many of the problems that limited her being listed stem from the fact that she is young. She has all the psychological problems of a teenager with a chronic disease but has only known of the disease for a year, and therefore has not had the luxury of adapting to a new reality. Her past poor decisions, such as drug use, qualify as being in the immediate past because of her youth, yet they affect her options going forward. Additionally, she has chosen to care for a baby alone; in any other circumstances this might be considered a brave decision, but now if she misses an appointment for the sake of childcare it is tallied against her.

It is easy in the complicated world of modern medicine to concentrate on the physical attributes of disease, and to set concrete rules by which patients must abide. Transplantation medicine is a clear example of this, and those patients who fall outside the normal parameters are sometimes disadvantaged, despite the fact that they stand to gain most in receiving the intervention. A young mother could arguably be considered the most desirable candidate for life saving transplantation, and yet due to circumstances beyond her control such as finances and childcare, she breaks the rules that she must abide by to survive. In this case, the outcome is optimistic as the patient was listed and now awaits transplant.

The non-medical hurdles our patients face have overwhelming implications on their health, happiness and overall outcome. This case reminds us to see our patients in the context of their own lives, not simply in the context of the rules.
THE UTILITY OF IMAGING IN DIAGNOSING METASTATIC MERKEL CELL CARCINOMA:
CASE REPORT
Christine Cole MD, Nguyen Ba MD

Introduction: Merkel cell carcinoma (MCC) is an aggressive, rare, dermal neuroendocrine skin cancer. It usually presents as a firm, non-tender, red or purple nodule that grows rapidly over a few weeks to months with an approximate 45% recurrence rate and 33% metastatic rate. MCC occurs 94% of the time in Caucasians and usually occurs in those greater than 65 years old. Risk factors include UV radiation and immunosuppression. Diagnosis is by pathology with immunohistochemistry to rule out similar appearing entities, including metastatic small cell lung cancer, and small cell variants of melanoma. Treatment includes wide local excision (2-3cm) and sentinel lymph node biopsy (SLNB). Complete regional lymphadenectomy should be done in lymph node positive disease along with adjuvant locoregional radiotherapy. Palliative chemotherapy/radiation therapy can be used in metastatic disease. Although there is no universally accepted imaging algorithm, and no evidence that early detection of metastatic disease has any impact on overall survival, imaging is useful for staging, surgical guidance, therapeutic management, and surveillance. We report two cases where imaging aided diagnosis of metastases.

Case Report: The first case is an 80 year old female who presented with a nontender, rapidly growing nodule on her left chest wall over a six week span. She subsequently underwent excisional biopsy via Mohs technique. The pathology came back as MCC with positive margins of the biopsy site. Wide local excision (WLE) and SLNB was done. The sentinel lymph node was found on the contralateral side. SLNB was positive as well as the superficial margin of the WLE. Re-excision and complete lymph node dissection was done a week later and the patient underwent post-op adjuvant radiotherapy.

The second case is a 69 year old female who presented to her dermatologist with a nodule near her left clavicle. Shave biopsy was done and the pathology was equivocal but margins were involved. Wide local excision was positive for MCC with involved margins. CT of the neck showed supraclavicular lymphadenopathy. Re-excision with wider margins and SLNB was performed. A sentinel lymph node was not found, however two suspicious lymph nodes were sent to pathology and came back positive with extranodal extension. She subsequently underwent palliative radiation therapy. Several months later the patient had a new nodule at the site of the previous MCC and pathology was a recurrent MCC. A PET scan demonstrated increased uptake at the left supraclavicular area, near the right acetabulum/superior ramus, proximal subtrochanteric left femur, and posterior right upper thorax. MRI of the pelvis demonstrated marrow-replacing metastases in the left femur and right pelvis. She then underwent palliative radiation therapy and chemotherapy.

Discussion: In the first case the lymph node scintigraphy aided the diagnosis and treatment for metastasis as although the original lesion was on the left chest wall, the sentinel lymph node was on the right and appropriate treatment was subsequently instituted on the right including complete lymph node dissection. In the second case, the PET scan showed the recurrent MCC had metastasized into the left femur, a site quite distant from the primary source. In node-positive disease, a CT or MRI is recommended to look for distant metastases. Somatostatin receptor scintigraphy (SRS) has been used secondary to the fact MCC has been found to have somatostatin receptors, but has not been shown to be reliable in detection of metastatic disease, possibly secondary to the loss of differentiation that may occur in the tumor. FDG-PET/CT may be a sensitive test secondary to MCC’s aggressive nature with high metabolic activity. Specificity is decreased secondary to enhancement in inflammatory and repair processes.
EFFECT OF HUMAN ADENOVIRUS-36 IN A LOCALIZED IN VIVO MODEL OF NEOADIPOGENESIS

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Background

The possibility that certain types of obesity may have a viral etiology has received little attention. However, published reports have linked at least 5 viruses to obesity in animals. A human adenovirus (Ad-36), has been shown to increase adiposity in experimentally infected chickens, mice, and nonhuman primates. Further, the prevalence of neutralizing antibodies to Ad-36 is 30% in obese humans compared to 11% in nonobese subjects.

Preliminary studies in mice compared an experimental group infected with 0.2 ml i.p. of Ad-36-infected media versus a weight-matched control group injected with 0.2 ml of noninfected media. Compared to the control group, the mean body weight was 9% greater in Ad-36 mice (P<0.05), total body fat was 35% greater (P<0.02), and visceral fat was 67% greater (P<0.02). Although damage to the hypothalamus is postulated to be the etiology of increased adiposity of mice infected with canine distemper virus, no overt lesions were seen in animals infected with Ad-36. In vitro studies conducted by Vangipuram et al. demonstrated that Ad-36 attaches to and enters preadipocytes (3T3-L1) cells to initiate the viral replication cycle as evidenced by expression of viral genes. When compared to 3T3-L1 cells infected with an adenovirus not known to be adipogenic (Ad-2) and cells undergoing mock infection, Ad-36 increased the number of cells that differentiated into adipocytes by three fold. To date, no in vivo model has been developed to demonstrate the adipogenic potential of this human adenovirus.

We have previously published our results on adipose tissue engineering in a murine model utilizing a vascularized chamber construct. I have hypothesized that this model can be used to demonstrate the adipogenic of human adenovirus-36 in vivo. 15 C57Bl6 mince were infected with As-36. 8 animals were infected with a human adenovirus not shown to be adipogenic in vitro (Ad-2) as a control. At 6 weeks, all Ad-36 animals demonstrated de novo adipose generation within their tissue engineering chambers (Fig A). Little to no fat was produced in the Ad-2 infected animals (Fig B) (P<0.01).

Conclusion: Our model represents the first in vivo demonstration of the neoadipogenic potential of a human infectious agent (adenovirus-36).
INTRA-OPERATIVE RADIATION THERAPY FOR EARLY-STAGE BREAST CANCER: MAMMOGRAPHIC CHANGES CLOSELY APPROXIMATE THOSE OF CONVENTIONAL WHOLE BREAST IRRADIATION

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Purpose: Breast conserving surgery followed by whole breast irradiation for early-stage breast cancer provides equivalent disease control as mastectomy and is now considered standard of care. Conventional whole breast irradiation entails 5-7 weeks of daily radiation treatments, which is inconvenient to patients, especially those who live far away from a radiation center. Some patients may elect to forego radiation after lumpectomy, thereby increasing their risk for local recurrence, or just opt for mastectomy.

Since the majority of ipsilateral breast recurrences after breast conserving therapy (BCT) occur near the initial site of disease, targeted irradiation of the lumpectomy bed may, in selected patients, achieve excellent local control. Ongoing studies are evaluating the use of partial breast irradiation (PBI) as a substitute for whole breast irradiation. PBI shortens the total treatment time while reducing the amount of radiation to adjacent normal tissues, such as heart and lung that are included in the treatment field. There are several modalities for PBI, one of which is intra-operative electron irradiation (IOERT).

While the mammographic findings and changes after BCT are well-known, little has been reported about the differing effects, if any, of PBI. This study seeks to determine if PBI, in the form of IOERT, alters the mammographic manifestations after BCT.

Materials, Methods and Procedures: A phase II study combining whole breast irradiation with IOERT enrolled 52 patients with T1-2N0 breast cancer from 11/2002-1/2005. After lumpectomy, a 10Gy IOERT boost was delivered to the tumor bed. This was followed by 48Gy of whole breast radiation in 24 fractions. IRB approval was obtained for our respective review of the baseline and serial postlumpectomy mammograms in 49 patients who remained at our institution for follow-up (mean follow-up 2.9 years). Specifically analyzed were the well-established ipsilateral post BCT findings of fluid collections, scarring, calcifications, edema and skin thickening.

Results: Similar to BCT, fluid collections, edema and skin thickening gradually regressed while calcifications and scarring developed. Evaluation of the lumpectomy bed was not appreciably impaired. To date, one patient has developed a local recurrence, three years after diagnosis, which was identified mammographically by the development of pleomorphic linear calcifications adjacent to the lumpectomy scar.

Conclusions: PBI is being offered to many patients as a component of BCT, while randomized trials comparing it to whole breast irradiation are still in progress. Our results suggest that the mammographic manifestations after IOERT parallel those of conventional whole breast radiation therapy, so mammographic surveillance for local recurrence in these patients is appropriate.
LIVE, ATTENUATED VARICELLA ZOSTER VACCINATION OF AN IMMUNOCOMPROMISED PATIENT

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Introduction: A vaccine for the prevention of herpes zoster (“shingles”) outbreaks has recently been approved by the Food and Drug Administration for use in the United States. Zostavax® contains 19,400 plaque forming units of the Oka/Merck strain of live, attenuated varicella zoster virus (VZV), and is administered in a single dose via subcutaneous injection. The Advisory Committee of Immunization Practices (ACIP) recommends administration of the vaccine to all individuals without contraindications over the age of 60 years. However, the safety and efficacy of Zostavax® have not been evaluated in immunocompromised individuals, and the vaccine is contraindicated in patients with primary or acquired immunodeficiency states, or those receiving immunosuppressive drugs. Here we report a case of disseminated cutaneous herpes zoster following Zostavax® administration to a patient with recurrent breast cancer receiving chemotherapy.

Case Report: A 76-year-old white female with a history of recurrent, left axillary breast cancer, undergoing chemotherapy with weekly paclitaxel and trastuzumab, presented to her primary care physician for a routine follow-up visit. Additional medical problems included Type 2 diabetes mellitus, hypertension, Stage III chronic kidney disease, and known coronary artery disease. For “health-maintenance” purposes, the patient was given a Zostavax® injection at the time of the visit. Eight days later, the patient telephoned the treating oncologist’s office to report the development of a rash. The patient described raised, mildly painful, non-pruritic nodules covering her lower abdomen, with intermittent serosanguineous-to-purulent appearing discharge. She denied fevers or chills, headache or cough. She then presented for further evaluation; physical examination showed a vesicular rash on the lower abdomen, including crusted lesions. Laboratory studies including CBC were unremarkable. Given the recent administration of live, attenuated VZV, a diagnosis of disseminated cutaneous herpes zoster was made. The patient was commenced on famciclovir at a reduced dose of 500 mg orally once per day (due to the history of impaired renal function) for 10 days. Subsequently, secondary bacterial infection developed, which was treated successfully with a 7 day course of cephalexin. The patient then made a full recovery with no sequelae of herpes zoster.

Discussion: A review of the medical literature disclosed no reports of Zostavax® given to adult cancer patients immunocompromised by systemic chemotherapy. Therefore, we believe this report is the first to describe the consequences of Zostavax® administration to such a host. In this case, disseminated cutaneous herpes zoster resulted, which was successfully managed through treatment with antiviral agents and oral antibiotics. With the recent recommendation by ACIP, clinicians around the country are beginning to vaccinate adults over the age of 60 years for herpes zoster. This patient was fortunate to have developed only cutaneous, not systemic manifestations of herpes zoster. However, disseminated herpes zoster infections may develop if immunocompromised patients are given Zostavax®. Clinicians should take care to review contraindications and precautions prior to administering the Zostavax® vaccine.
UNEXPECTED RITUXIMAB INDUCED LEUKOPENIA: 
FIRST REPORT IN RHEUMATOID ARTHRITIS

Ivana Dzeletovic, MD; Lester E. Mertz, MD

Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by painful swollen joints, which may result in impaired mobility and permanent damage to the cartilage and bone. Rituximab in combination with methotrexate is used for the treatment of RA patients with an inadequate response to tumor necrosis factor inhibitors. Rituximab is a chimeric monoclonal antibody directed against B cell-specific CD20 antigen. It depletes peripheral blood, bone marrow and lymph node B lymphocytes. The evidence suggests that B cells play an important role in RA pathophysiology by processing autoantigen and presenting it to T cells. The reported profile of side effects in patients with RA receiving rituximab is similar to that observed in the oncology setting, but the incidence is notably lower and less severe. The adverse events include infusion reactions, serious infections and mucocutaneous reactions.

We present a case of a 66 year old female with a medical history significant for rheumatoid arthritis diagnosed in 2003 and disseminated coccidioidomycosis. The patient’s medications include methotrexate, prednisone and fluconazole. Initially the patient’s RA was controlled with infliximab; however this treatment was discontinued when the patient developed disseminated coccidioidomycosis. Treatment with rituximab was then instituted hoping to avoid coccidioidomycosis flare up. The patient received two infusions of rituximab on June 22nd and July 10th of 2007. On November 17th of 2007 the patient presented to the hospital with severe leukopenia with a white blood cell (WBC) count of 1.9, absolute neutrophil count (ANC) of 741 and a hypocellular bone marrow with 20% cellularity, virtually absent mature neutrophils and no B-cells. The patient was treated with neupogen and cefepime while the rest of her medications were continued, including methotrexate. Her WBC count responded dramatically to the administration of neupogen and has remained in the normal range.

Severe delayed-onset neutropenia has been reported to date only in the oncology setting, occurring at a median of 95 days (range 67-420) after rituximab administration. Rituximab was the only medication recently added to our patient’s regimen and the development of neutropenia occurred 130 days post infusion. Review of the literature failed to find any previous reports of this serious side effect after the use of this medication in the treatment of RA. Since RA patients who receive rituximab therapy have most likely been on some type of long standing immunosuppressive therapy, developing of severe neutropenia could have serious consequences. We recommend close monitoring of the neutrophil counts in RA patients who receive rituximab in order to recognize this complication early and manage appropriately.
Purpose: Cardiovascular disease is the number one cause of mortality in the world. Effective primary prevention strategies make identification of those with subclinical atherosclerotic vascular disease clinically relevant. Population based screening tools such as the Framingham Risk Score (FRS) assign a risk probability and thus are limited in their ability to characterize risk in an individual. Individual risk is better derived through characterization of the presence or absence of subclinical disease rather than simply its probability. An ultrasound measure of the carotid intima-media thickness (CIMT) and CT coronary calcium score (CTCS) are two methods which can not only dichotomously characterize disease, but also predict a graded risk of adverse vascular events based on an assigned measure of disease burden. Coronary calcification represents an advanced stage of vascular disease whereby a low or even zero score may be falsely reassuring in young to middle aged individuals. The purpose of this study is to determine the utility of CIMT and CTCS examination in a young to middle-aged, low risk primary prevention population.

Methods: Individuals less than 60 years of age who had both CIMT and CTCS between December 2004 and December 2007 at our institution were included in this study. Excluded were those with diabetes mellitus, a prior history of coronary or cerebral vascular disease or a CTCS greater than zero. A FRS was derived for each individual and other clinical variables were obtained through review of clinical and laboratory information.

Results: Sixty three subjects who had a CIMT exam were also found to have a CTCS of zero. The mean age was 50 ± 5.69 years (86% male). Vascular risk factors from the FRS included smoking (31.7%), hypertension (12.7%), and hyperlipidemia (50.8%). A family history of premature coronary artery disease was noted in 7.9%. The mean FRS of this group was 4.35, with 96.8% (n=61) being low risk (less than 1% annualized event rate) by Framingham criteria and the remainder (n=2) having a FRS > 10. Of the 63 patients, 26 (41.3%) were found to have evidence of advanced atherosclerosis by carotid examination. Carotid plaque was found in 25.4% (n=16) and a CIMT >75th percentile for age, gender and race-matched controls in 15.9% (n=10).

Conclusions: Advanced subclinical atherosclerosis in a young to middle aged population as determined by carotid ultrasound is not uncommon in individuals with both low FRS and a CTCS of zero. CIMT is a more sensitive tool for detection of subclinical atherosclerosis than CTCS.
Q FEVER AS A CAUSE OF RECURRENT FEVER AND HEPATITIS IN A 35-YEAR-OLD HUNTER

Rodney A. Engel, MD, Janis Blair, MD

Introduction: Q Fever is an uncommon cause of fever in the United States. This is an atypical presentation of an uncommon disease causing severe debility in a patient.

Case: This is a 35-year-old avid hunter who presents with a history of debilitating illness recurring every summer for 5 years. The patient reports fever, anorexia, dark urine, headaches, and fatigue forcing him to remain bed bound for 4-6 weeks after his hunting trips. During his recurrent episodes the patient had a hemolytic anemia and elevated liver enzymes. On acute presentation to the Mayo Clinic he again had elevated liver enzymes and new onset diminished movement and numbness of the right upper extremity. He had multiple serologies drawn, liver biopsy and EMG. The patient’s EMG indicated a right brachial plexopathy. Liver biopsy showed characteristic “doughnut-like” granulomas. Serologies indicated active infection with C. burnetti.

Discussion: Q fever is the clinical symptoms associated with the highly infectious zoonotic gram negative bacilli, Coxiella burnetti. It can present with a variety of symptoms, including pneumonia, hepatitis, and a self-limited febrile illness. Many more other symptoms are attributed to Q fever, including hemolytic anemia and neuritis. The disease can also have an acute and chronic course. This patient is the second patient reported in the literature to have brachial plexopathy following Q fever. Additionally his serologies indicate an acute infection; however his serologies improved with appropriate therapy with doxycycline. Q fever should remain a diagnostic consideration in patients with an unusual presentation involving multiple organ systems.
YOU CAN JUDGE A BOOK BY ITS COVER: A PRACTICAL GUIDE TO HYPERVASCULAR LIVER MASSES
J. Mark Evans, Alvin C. Silva, and Amy K. Hara

Purpose
1. To review the pathophysiology of the most frequently encountered benign and malignant hypervascular liver masses.
2. To discuss a practical algorithm for diagnosis using state-of-the-art hepatic magnetic resonance imaging techniques and contrast agents.
3. To illustrate false-positive findings and pitfalls.

Methods
This is a review of pathophysiology/imaging findings of typical/atypical benign and malignant liver masses: Hemangioma; Focal Nodular Hyperplasia; Adenoma; Nodular Regenerative Hyperplasia; Hepatocellular Carcinoma; Angiosarcoma; Hepatoblastoma; Lymphoma, and Hypervascular Metastases (Renal Cell Carcinoma, Melanoma, Thyroid Carcinoma, Choriocarcinoma, and Neuroendocrine Tumors). Several magnetic resonance imaging techniques are discussed, including hepatocyte-specific contrast agents (gadobenate dimeglumine, MultiHance) and the role of advanced sequences – steady-state free precession (SSFP) and diffusion weighted imaging. A summary and illustration of a simple algorithm for diagnosis is provided.

Results
The major teaching point of this exhibit is that advanced magnetic resonance imaging techniques are now available to help distinguish the various liver lesions encountered on a daily basis. The multitude of advanced sequences can at times be overwhelming. Based on our own imaging experience, pathologic confirmation, and literature review, we have created a simple, defined approach to the diagnosis of frequently encountered hypervascular liver lesions.

As the liver can be primarily or secondarily involved by numerous vascular, metabolic, infectious, and neoplastic processes, the clinical history can have a significant impact on the imaging differential diagnoses. For example, primary hepatic malignancies are more common in the presence of chronic, diffuse liver diseases such as cirrhosis, hemochromatosis, and steatohepatitis; whereas secondary hepatic malignancies (metastases) are more common in a normal liver. Thus, an orderly approach to the diagnosis of focal hepatic lesions includes a familiarity with the discriminating imaging characteristics in conjunction with the knowledge of any pre-existing condition.

If the liver is normal, the most common etiologies are hemangioma, focal nodular hyperplasia, adenoma, and hypervascular metastases. In contrast, if chronic liver disease is present, the differential diagnosis includes hepatocellular carcinoma, nodular regenerative hyperplasia, and mimickers such as variant perfusion and dysplastic nodules.

Conclusion
Recent major technological advances in magnetic resonance imaging (MRI) have enabled the accurate, noninvasive detection and characterization of hepatic lesions. Newer pulse sequences, such as diffusion and steady-state free precession (SSFP), and the ability to use hepatocyte-specific contrast agents (gadobenate dimeglumine, MultiHance) allow for a more specific diagnosis of the lesion in question. A simple algorithm is presented to help differentiate hepatic lesions based on the pre-existing condition and the discriminating imaging characteristics.
A NOT SO TYPICAL CAUSE OF PAINLESS JAUNDICE

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Introduction: Pancreatic lymphoma, although a rare entity, should be considered in the differential diagnosis of pancreatic mass. It is important to establish pathologic diagnosis, as its treatment and outcome are distinctly different from those of pancreatic carcinoma.

Case presentation: 63 year-old white female presented with a 3-week history of painless jaundice, pruritus and weight loss. She was a former smoker with family history of colon cancer. Exam was unremarkable, except for generalized jaundice. Laboratory tests: AST 147, ALT 275, alkaline phosphatase 555, total bilirubin 16.6, albumin 3.5, LDH 299, lipase 564, CA 19-9 287, CBC and basic metabolic panel were normal. Abdominal CT scan showed prominent biliary and pancreatic duct dilatation with a 4 x 4.5 cm hypodense mass, consistent with neoplasm, in the head of the pancreas. Also present was a 1.9 cm retroperitoneal adenopathy. Chest CT revealed numerous lung nodules. CT-guided fine needle biopsy of lung nodule revealed large B-cell lymphoma. Biopsy of pancreatic mass confirmed non-Hodgkin lymphoma (NHL) of diffuse large B-cell type. Patient underwent successful ERCP with biliary stents and chemotherapy was started. After completing 6 cycles of R-CHOP she is currently in remission 8 months after diagnosis.

Discussion: Primary pancreatic lymphoma is an infrequent entity, accounting for less than 1% of extranodal NHL and less than 0.5% of pancreatic tumors. Clinical and imaging presentation can mimic that of pancreatic carcinoma, although lymphomas tend to be larger in size and have homogenous enhancement with IV contrast on CT imaging, which can help distinguish them from pancreatic cancer. Lymphomas have a better prognosis and therapy is certainly different from that of carcinoma, so that establishing correct histological diagnosis is of outmost importance. Fine needle aspiration is a useful tool in the diagnosis of a variety of pathological disorders in different anatomical sites, obviating the need for surgery in selected patients, such as the one described. Most patients with primary pancreatic lymphoma are treated with chemotherapy or combination of chemo- and radiation therapy, with good clinical response. As illustrated by the current case, a pancreatic mass represents a diagnostic and therapeutic challenge that requires prompt intervention from a combination of medical and surgical consultants under the guidance of the hospitalist physician, so as to expedite the diagnostic work-up and start appropriate treatment.
CASE OF A PATIENT WITH ACUTE LIVER FAILURE SECONDARY TO AN UNUSUAL ETIOLOGY

Justin Harris, MD

Introduction: Acute liver failure may result from a number of etiologies. Viral causes include hepatitis A, B, some cases of hepatitis C, and hepatitis E in endemic areas. Multiple drug toxicities and idiosyncratic hypersensitivity reactions can induce acute liver failure. Examples include alcohol, acetaminophen toxicity, antibiotics such as ampicillin, ciprofloxacin, and isoniazid, tricyclic antidepressants, glitazone antidiabetics, statins, antiepileptics, herbal supplements such as ginseng and kawakawa, and illicit drugs such as cocaine and ecstasy. Vascular causes include hepatic vein, portal vein, and hepatic artery thrombosis. Autoimmune disease and metabolic etiologies, such as fatty liver of pregnancy, galactosemia, and Wilson’s disease are additional causes.

Case Report: We recently encountered the case of a 71-year old female with past medical history of antiphospholipid antibody syndrome, hypertension, peptic ulcer disease, chronic lower back pain, degenerative joint disease, and tobacco abuse presenting with weakness, confusion, progressive lethargy, jaundice, and hepatomegaly. The patient’s liver enzymes and INR were elevated on admission and continued to rise throughout her hospitalization. She had no history of alcohol abuse, acetaminophen level was normal, a urine drug screen was negative, and she was taking no medications or herbal supplements that have been shown to induce acute liver failure. A CT of the abdomen showed a homogenously enlarged liver with no evidence of vascular thrombosis, biliary obstruction, or pancreatic masses and a chest x-ray showed consolidation in the right lower lobe. Finally, the patient had negative viral hepatitis serologies, negative autoimmune markers, and no history of metabolic diseases that would explain her acute liver failure. She rapidly deteriorated and developed worsening jaundice, lethargy, thrombocytopenia, continued elevation of liver enzymes and INR, hypotension, and renal failure. Due to the patient’s hemodynamic instability and multiorgan failure, she was not a candidate for liver transplantation and, upon discussion with her family, she was changed to DNR status and soon expired. An autopsy was performed, which showed a 2-cm small cell carcinoma in the superior segment of the right lower lobe as well as metastases to the hilar, mediastinal, right supravacuvicular, and pelvic nodes. Mild cardiomegaly, left ventricular hypertrophy, mild coronary artery disease, and moderate aortic atherosclerosis were noted. Spleen, kidneys, pancreas, uterus, and gastrointestinal tract were found to be normal. Most impressively, the liver was strikingly enlarged and weighed 2780 grams. Multiple fleshy white and hemorrhagic tumor nodules were found throughout the liver and completely replaced most of the hepatic parenchyma. Microscopic examination showed these tumors to be metastatic from the patient’s previously undiagnosed small cell lung carcinoma.

Discussion: In retrospect, the patient’s abnormal chest x-ray and significant smoking history were clues to possible lung carcinoma, which is a rare cause of acute liver failure. It is notable that the diagnosis was made utilizing a thorough autopsy.
PLASMAPHERESIS THERAPY FOR A NEAR FATAL REACTION TO RITUXIMAB

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Introduction: Rituximab is a genetically engineered chimeric murine/human IgG1monoclonal antibody directed against the CD20 antigen found on the cell surface of pre-B cell, malignant and mature B cells but not plasma cells. It is approved by the US Food and Drug Administration in 1997 for the treatment of low grade non Hodgkin’s lymphoma but is increasingly being used for treatment of many autoimmune diseases and has been used in renal transplant patients to diminish levels of alloreactive antibodies in highly sensitized patients and to treat acute antibody mediated rejection. Rituximab is a relatively safe drug. However, it carries a boxed warning indicating that deaths have occurred within 24 hours of infusion from a reaction complex that includes hypoxia, pulmonary infiltrates, acute respiratory distress, myocardial infarction, and ventricular fibrillation or cardiogenic shock. Most published reports of severe infusion reactions were fatalities.

Case: We report the case of a thirty-one year old who experienced a near fatal infusion reaction after being treated with rituximab for acute antibody rejection after a living donor kidney transplantation. Thirty five minutes after the start of the infusion she experienced a "tickling" sensation in her throat. Her symptoms progressed rapidly and she became tachypnic, hypoxic, and experienced severe chest pain. A CT scan of her chest showed ground glass opacities. The next morning she became acutely short of breath, hypoxic, hypotensive, and had an extremely elevated WBC. Despite fluid rescucitation, antibiotics and BIPAP, her condition deteriorated and she required intubation and inotropic support. Her chest film showed pulmonary edema, and bilateral infiltrates. The severe degree of her pulmonary edema was evident when her endotracheal tube was discontinued during repositioning and a large amount of serous fluid was expelled from her endotracheal tube. Following this event, her oxygen saturations rose to the 90s, and her SvO2 rose to the 60s. Subsequently, she was treated with plasmapheresis. She received a total of three plasmapheresis treatments. Approximately 36 hours after rituximab infusion her symptoms markedly improved. She was extubated after being ventilator dependant for 48 hours. She received one additional plasmapheresis and day 5 after admission she was discharged.

Discussion: Fatal infusion reactions after rituximab infusion are rare, and appear to be even less common in patients being treated for non-malignancy conditions. The etiology of these rare, severe reactions is not clear, but it is hypothesized that they are mediated by complement and other inflammatory cytokines. Currently, the recommended treatment for such reactions is simply supportive, with no clear evidence on effectiveness. Our patient fortuitously survived, as did a patient being treated for TTP who, like our patient, underwent plasmapheresis both before and following the reaction, raising the question of whether or not plasmapheresis may be of value in treating, or at the very least reducing the severity of these reactions. The specific mechanism by which plasmapheresis may act is unclear but it can be hypothesized that plasmapheresis may remove complement or other inflammatory mediators, hence short-circuiting the reaction. At this time, with no other specific treatment available for these severe "fatal" reactions, plasmapheresis seems a viable option, with little down side. While the incidence of severe or fatal infusion reactions to rituximab is low, as rituximab is used to treat a wider range of illnesses, the number of reactions will undoubtedly increase, and the need for a viable treatment option will become more critical.
A CASE OF COLD FEET: A HEMANGIOBLASTOMA IN HIDING

John T. Hippen, MD (Associate) and John N. Caviness, MD

**Introduction:** Hemangioblastomas are rare vascular tumors. The clinical presentation varies depending upon the location and size of the lesion and any tumor-associated hemorrhage.

**Case Report:** A 44 year-old female presented to the emergency room with a one month history of progressive bilateral lower extremity numbness, weakness, and pain. She awoke earlier in the day feeling as though both of her feet had been “stuck in ice cubes.” The patient described her symptoms as gradually progressive, but acutely worse on the day of presentation. Her symptoms had been bilateral, but worse on the right than the left. On physical exam the patient had normal strength in the upper extremities, but decreased strength in the lower extremities. The weakness was worse on the right than the left and was more pronounced distally. Right iliopsoas and quadriceps were 4/5 in strength. The hamstrings, anterior tibialis, and toe flexors on the right were only 3/5. In addition, the patient had slightly increased reflexes throughout, and the patellar reflexes were particularly brisk. The patient also had decreased sensation to light touch and pinprick on the right and decreased rectal tone. Radiographic imaging was obtained beginning with an MRI of the thoracic and lumbar spines, which was normal. The patient subsequently had an MRI of the brain and cervical spine which demonstrated a 2.2 x 1.4 cm mass in the region of the obex extending into the fourth ventricle with associated signal change in the cervical spine. Spinal fluid analysis demonstrated zero nucleated cells, 16 red cells, and a protein of 349.

**Discussion:** It was initially thought that a lower spinal process was more likely, but progressively higher imaging revealed the true localization within 24 hours of admission. This case demonstrates how a higher level lesion can cause lower extremity symptoms. Because of its location, the mass was actually compressing the motor and sensory tracts to the lower extremities. While hemangioblastomas can be associated with von Hippel-Lindau, sporadic tumors, such as this one, are typically solitary. The treatment is primarily surgical, though there have been cases where stereotactical radiosurgery has been used successfully. This patient underwent preoperative embolization of the tumor followed by complete surgical resection. She did well postoperatively and had some improvement in her lower extremity symptoms.
THE SPECTRUM OF NEUROLOGICAL DISORDERS ASSOCIATED WITH GAD65 AUTOIMMUNITY

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Introduction: Glutamic acid decarboxylase (GAD65) autoantibodies are associated with stiff-person syndrome, type 1 diabetes mellitus (DM), and autoimmune thyroid disease. More recently, a wide spectrum of neurological symptoms associated with GAD65 seropositivity has been described (Pittock et al, Mayo Clin Proc 2006). However, there are limited longitudinal data on the clinical course of this disorder and the response to therapy. Four cases of GAD65 seropositive patients were reviewed from the Mayo Clinic Arizona database. The objective of this case series is to further describe the clinical spectrum and therapeutic outcome of neurological disorders associated with GAD65 antibody seropositivity.

Case Series: Case 1 is a 46 year-old African-American female with progressive spastic quadriaparesis, visual loss, and later onset of severe cranial, truncal, and limb spasms and DM. Case 2 is a 45 year-old male with progressive kinetic and rest tremors, myoclonus, paroxysmal muscle spasms, and DM. Case 3 is a 47 year-old female with DM and autoimmune hypothyroidism who developed seizure-like episodes, cognitive deficits, tremor, and dysarthria. Case 4 is a 63 year-old male with stroke-like episodes, cognitive deficits, dysarthria, and fluctuating white matter lesions on brain MRI. GAD65 autoantibody titers ranged from 0.19 to 1.34 nmol/L (normal <0.02 nmol/L) in the four patients studied. All cases were first diagnosed as another neurologic disorder. Other nonneurologic autoimmune diseases were common. Diagnosis from onset of symptoms ranged from two to six years. Duration of follow-up ranged from seven to fifty-nine months. Therapies included corticosteroids, IVIG, mycophenolate, azathioprine and rituximab. Immunosuppression plus IVIG has stabilized or improved symptoms in these patients.

Discussion: GAD65 seropositive status, even at low titer, may be associated with a wide spectrum of neurologic symptoms and signs. A high index of suspicion is warranted since this antibody is not included in standard paraneoplastic or autoimmune screening batteries, and hence may be under-recognized. This series demonstrates the importance of screening for the GAD65 autoantibody because this is a treatable autoimmune disorder.
ROLE OF MAGNETIC RESONANCE ELASTOGRAPHY IN ASSESSING HEPATIC FIBROSIS

Mashal Jatoi, Forrest Walker, Vinodh Jeevanantham, Alvin Silva, Elizabeth Carey, Jorge Rakela, Thomas Byrne, David Douglas, Hugo Vargas

Purpose: Liver biopsy is currently the gold standard to detect the presence and degree of fibrosis despite its drawbacks of sample error and invasive technique. Preliminary studies suggest that magnetic resonance elastography (MRE), which utilizes shear waves and MR technology to measure stiffness/elasticity of organs in kilopascals (kPa), may have a role in distinguishing fibrotic from normal liver tissue with the benefits of presenting a more global hepatic image in a non-invasive manner. Our goal was to compare the fibrosis seen on liver biopsy samples to the stiffness measured on MRE in normal controls and patients known to have abnormal liver function tests (LFTs) and/or chronic liver disease.

Methods: The control group consisted of living donor liver transplant donors at our program at the Mayo Clinic Arizona (MCA) and patients with abnormal LFTs and/or known chronic liver disease were recruited from the MCA hepatobiliary clinic between June 2007 and November 2007. All controls and patients underwent a liver biopsy and MR elastography with no greater than 35 days between completion of the two modalities.

Results: Our analysis included 17 patients with known chronic liver disease and/or abnormal LFTs and 4 controls. The mean liver stiffness measurements obtained with MRE increased with the histologic liver fibrosis stage (one way ANOVA p = 0.014) and there was significant correlation between increasing stage of fibrosis and mean shear stiffness values ($R^2 = 0.537$, $p = 0.01$). Mean MRE measurement for controls was $2.15 \pm 0.37$ kPa and this was significantly lower than the mean value for patients $3.71 \pm 1.67$ kPa ($p < 0.05$). Significantly lower mean shear stiffness was seen in patients with no to moderate fibrosis (stages 0-2) versus severe fibrosis (stages 3-4) $3.10 \pm 1.08$ kPa vs $5.18 \pm 2.02$ kPa respectively ($P < 0.05$).

Conclusions: On this preliminary report, our analysis supports the results of previous data that MRE is a non-invasive, effective technique to assess presence and degree of liver fibrosis. It appears to be especially helpful in discriminating between zero to moderate degrees of fibrosis from the more advanced stages of scarring, an important differentiation other non-invasive modalities have not made well.
CAUGHT ON CT SCAN: A CASE OF SURREPTITIOUS INSULIN INJECTION

David Keckich MD, Rachel M. Bailon MD

Introduction: Factitious disorder is a relatively uncommon but highly morbid condition whereby a patient acts as if he has an illness by deliberately producing, feigning or exaggerating symptoms. The patient must have no incentive for their behavior other than to experience the role of a sick person. True prevalence is unknown; patients may be detected at several facilities under different names, or they may never be identified. Estimates are between 0.8% and 2% of admissions or consultations, with rates of up to 10% in case series of fever of unknown origin. Factitious Disorder is distinguished from two other conditions: Somatoform Disorder and Malingering. Patients with Somatoform Disorder present with multiple somatic complaints and physical symptoms for which there is no physical cause, and which are driven by psychological factors; however deception is not present, as the patient truly experiences symptoms and is unaware of their origin. In contrast, Malingering involves deliberately feigning or producing symptoms, but is driven by an external gain such as avoiding work or monetary gain. We present a case of a patient who presented with hypoglycemia found to be factitious in origin, identified by CT scan evidence of surreptitious insulin injection.

Case Report: A 30-year-old male with a history of bipolar disorder and panic attacks was found incoherent and diaphoretic by his partner. He had no history of diabetes. Paramedics were called and found a fingerstick blood glucose of 16 mg/dL. The patient allowed himself to be given 1 amp of D50 by paramedics but refused transport by ambulance. He was driven to ED by private car, and on arrival his blood sugar was measured at 26 mg/dL with a serum potassium level of 2.8 mEq/L. He was again given 1 amp of D50, and consumed a large meal. Blood glucose level returned to normal; however several hours later the patient complained of nausea and was found to have a blood glucose level of 29 mg/dL. He was given another amp of D50 and started on a continuous infusion of D5 normal saline. A CT scan of the abdomen was ordered to evaluate for an insulin-secreting tumor. The scan showed medication vials in the patient’s pocket, as well as subcutaneous air in his abdomen consistent with recent injections. Laboratory testing revealed an insulin level of 459 (2.6-35) mcg/mL, and a C-peptide level of 0.5 (0.9-4.3) ng/mL, consistent with exogenous insulin administration. The vials were examined and found to contain insulin. When questioned, the patient denied knowledge of the vials and stated that the pants he was wearing belonged to a diabetic friend. He continued to have episodes of hypoglycemia throughout a 6 day hospitalization; many of these episodes occurred during or shortly after visits by his friends. When a 24-hour sitter was introduced, the patient left AMA.

Discussion: Factitious Disorder must be considered in patients with uncommon or inexplicable presentations. Since providers may wish to avoid a high index of suspicion of patient deceit, history, laboratory studies, and radiology all contribute to firmly establishing this difficult diagnosis.
ENDOSCOPIC EVALUATION IMPROVES SURVIVAL IN PATIENTS WITH PANCREATIC CANCER
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EUS is often utilized in the diagnostic evaluation of patients with pancreatic cancer although there is no direct evidence that EUS improves patient outcome.

**Purpose:** to study the association of receipt of EUS with overall survival in a cohort of patients with pancreatic adenocarcinoma.

**Methods:** All persons aged 66 years or older, who were diagnosed with pancreatic cancer, resided in a SEER area, and were captured in both the SEER cancer registry and the Medicare claims database between January 1994 (when procedural codes for EUS became generally available) and December 2002 were identified. Relevant demographic, cancer specific information and EUS procedural information was extracted from the linked SEER-Medicare database. Survival curves were compared for patients who underwent EUS within 90 days of diagnosis (group I) to those who did not (group II). A COX proportional hazards model, adjusted for impact of other relevant covariates was constructed to assess the independent association of receipt of EUS and survival in these patients.

**Results:** After excluding those patients with unknown stage or known metastatic disease, 4,236 patients with loco-regional pancreatic adenocarcinoma were identified. Only 535 (12.6%) patients underwent EUS evaluation. Median survival (Inter-quartile range) by Kaplan Meier estimate in group I and II patients were 9(4-17) and 5 (IQR 2-11) months, respectively, P <0.0001. The proportion of patients with regional disease was higher in group I compared to those in group II (81% vs. 75%, p < 0.01). Curative intent surgery (23% vs. 10%, p < .001) and radiation treatment (18% vs. 11%, p < .001) were also performed more frequently in group I patients. Receipt of EUS, adjusted for age at diagnosis, race, gender, co-morbidity score, and tumor stage was an independent predictor of improved survival (Relative hazard, 0.82, 95% CI, 0.73-0.90).

**Conclusion:** This is the first evidence that EUS evaluation is associated with improved outcome in patients with pancreatic cancer. Receipt of EUS in patients with loco-regional cancer is independently associated with improved survival, possibly because of detection of earlier cancers or improved stage-appropriate management including more selective performance of curative intent surgery.
THE BRAIN’S ARCHENEMY

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Introduction: It is estimated that over 750,000 ischemic strokes occur each year in the United States and most of them are embolic in nature. Atrial fibrillation and severe carotid artery disease are well-characterized risk factors for embolic events and are part of routine work up after an ischemic cerebrovascular event. One area that has received less attention in the past is aortic arch disease yet the reported incidence ranges from 20 to 33% in individuals 55 or older. It seems reasonable to hypothesize that significant aortic arch disease might be a source of emboli and various studies have identified arch disease as an independent risk factor for stroke. Transesophageal echocardiography (TEE) has allowed the identification of aortic plaques and the study of their size, morphology, and mobility. We present a case demonstrating the utility of TEE when investigating the etiology of embolic cerebrovascular disease.

Case: A 61-year-old male with no known past medical history presented with complaints of persistent frontal headache after the onset of transient numbness bilaterally which was more pronounced over his left side. On presentation he was noted to have a subtle left-sided neglect with visual and tactile extinction and a mild left lower extremity drift. Magnetic resonance imaging of the brain revealed multifocal cortical diffusion abnormalities in the right frontal and parietal cortices. Small defects were also noted in the posterior portion of the insular cortex at the temporal and right parieto-occipital lobes. Transthoracic echocardiogram revealed no thrombus or valvular abnormalities. Carotid ultrasound did not show any significant stenoses. The suspicion for embolic disease remained and prompted a TEE revealing a large oval-shaped mobile echogenic mass in the aortic arch. Anticoagulation was initiated and the patient was seen three months later at follow-up with a repeat TEE demonstrating resolution of the previously visualized mass. He was asymptomatic at follow-up.

Discussion: Atherosclerotic disease of the aortic arch is recognized as a potential source of systemic emboli and should be investigated following a stroke. Various studies have detected an association between plaque size ≥4 mm, noncalcified appearance, and mobility with greater risk of ischemic stroke and recurrence. These features have been associated with plaque rupture and thrombosis. Despite recent controversy regarding the significance of aortic arch disease in the presence of stroke, TEE remains a powerful tool for clinicians to uncover possible sources of emboli. It should be used when other risk factors are absent and suspicion for embolic disease is high.
COEXISTING CELIAC DISEASE AND RHEUMATOLOGIC DISORDERS

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Purpose: There is a preponderance of musculoskeletal symptoms in patients with Celiac Disease (CD). We have also observed patients with rheumatologic disorders (RDs) that were diagnosed with CD. We, therefore, undertook this study to assess the frequency of coexisting CD and RDs.

Methods: We retrospectively reviewed the electronic medical records of Mayo Clinic Arizona patients who were identified through cross matching of the electronic registry for diagnosis of CD and RDs between 1994 and 2007.

Results: During the study period, 641 patients were identified with diagnosis of CD and of these patients, 10 were found to have a confirmed rheumatologic diagnosis. Among these 10 patients, a female predominance was observed; 7 females and 3 males, which correlates with the known baseline female prevalence in RDs. Three patients were diagnosed with CD between the ages of 36 and 77, for 2 - 11 (mean of 6.5) years prior to the diagnosis of a RD, whereas 7 patients were diagnosed with a RD between the ages of 19 and 69, for 6 – 60 (mean of 20) years prior to their diagnosis of CD. Diagnosis of the CD was established by the presence of serological markers and confirmed with small bowel biopsies sometime during their course of the CD except for one who had abnormal serologies but normal biopsy while on a gluten-free diet. Specific rheumatologic diagnoses were established based on clinical signs, symptoms, and serological studies and confirmed by a rheumatologist. These patients included 1 with Sjögren’s syndrome, 2 with systemic lupus erythematosus, 2 with limited scleroderma (CREST syndrome), 2 with dermatomyositis, 1 with rheumatoid arthritis, 1 with seronegative inflammatory arthritis, and 1 with polymyalgia rheumatica.

Conclusion: Although, Celiac Disease and rheumatologic disorders share few musculoskeletal symptoms and immunopathogenesis as part of their disease manifestations, we found a relatively small number of patients with coexisting CD and RDs. The observed lower frequency could be explained by the inherent limitation of a retrospective study relied upon a cross matching of the diagnostic registry of patients or due to unrecognized or undiagnosed RDs among patients with CD or vise versa. To our knowledge this is the first such comprehensive attempt in medical literature investigating the coexistence of CD and all RDs. Future retrospective and prospective studies evaluating the signs or symptoms and not just diagnoses as well as gastrointestinal assessment of patients with RDs who have signs or symptoms of CD may further address
C8-T1 RADICULOPATHY WITHOUT STRUCTURAL CORRELATE: A CASE REPORT

Joseph Martellotto DO, Ibrahim Aksoy MD, PhD, Ben Smith MD

Introduction: Cervical radiculopathy is a pathological process affecting the cervical nerve root caused by compression and inflammation of the root in the region of the neural foramen. Disc herniation is the most common cause of radiculopathy, followed by cervical spondylosis. Cervical radiculopathy occurs annually in 85 out of 100,000 people. While the onset of symptoms, precipitating events, and severity are variable, diagnostic clinical hallmarks are the same. Patients typically complain of neck and unilateral arm pain along with paresthesias over a specific dermatomal distribution. There may be associated motor and sensory loss and diminished reflexes depending on the affected nerve roots. Electromyography (EMG) and magnetic resonance imaging (MRI) have been shown to be useful, diagnostic modalities in the evaluation of cervical radiculopathy and the findings coincide in the majority of patients with the clinical syndrome. We report a case of clinical and electrophysiological C8-T1 radiculopathy without structural correlate in MRI.

Case Report: A 68-year-old right-handed white female with rheumatoid arthritis and chronic monocytosis developed the acute onset of pain in her right shoulder blade after carrying a recycle box to the curbside. She received deep tissue massage three days after onset, and her symptoms worsened. The pain began radiating from the right shoulder into the lateral arm and dorsal forearm with burning, numbness, and tingling in her 3rd, 4th, and 5th digits. Subsequently, the patient developed weakness in her right hand, noting that she was unable to extend or spread her fingers and her grip strength was significantly reduced. Musculoskeletal examination revealed limitation in active range of motion in the cervical spine in lateral bending and rotation to the right as well as in extension. The patient had a positive Spurling’s test on the right. Shoulder impingement signs were negative. Neurological examination showed early atrophy of intrinsic muscles of the right hand with profound weakness noted in the interossei, wrist and finger flexors and extensors, and in the thenar and hypothenar muscles. Deep tendon reflexes were physiologic and symmetric and sensory examination was normal. A cervical spine MRI performed prior to presentation to our institution demonstrated degenerative changes at the third, fourth, and fifth interspaces with moderate central canal stenosis and foraminal narrowing. No disk herniation or neural foraminal narrowing was present at the C6-7 or C7-1 levels. Initial impression was a possible lower trunk plexopathy given no findings on MRI to suggest a radiculopathy in the clinically affected myotomal distribution. Laboratory studies obtained showed an elevated sedimentation rate and C-reactive protein, with negative ANA, and ANCA panel. Nerve conduction study/EMG evaluation was consistent with a subacute, right C8-T1 radiculopathy. A cervical spine MRI with gadolinium enhancement was performed to search for inflammation of the cervical nerve roots. Similar to the previous MRI there was advanced cervical disc degeneration and spondylosis from C3-4 through C6-7 resulting in multilevel foraminal narrowing. Once again, there was no evidence of C8, or T1 nerve root impingement, inflammation, signal change or swelling. The patient was given the diagnosis of a right C8-T1 radiculopathy without structural correlate.

Discussion: A C8-T1 radiculopathy by EMG in a patient with profound distal muscle weakness but without structural correlate in MRI, draws attention to this case. This suggests an imperfect agreement between physiologic and anatomic tests for nerve root pathology. Impact of these findings in management decisions such as epidural steroid injection for symptomatic relief will be discussed.
MIBG (I-131) TREATMENT OF METASTATIC PARAGANGLIOMA IN A 30 YEAR-OLD U.S OLYMPIC MEN’S VOLLEYBALL PLAYER: A CASE REPORT

Domingo L. Maynes III M.D., Jose Leis M.D., and Donald Northfelt M.D.

Introduction: Paragangliomas are rare neoplasms found in the abdomen (85%), thorax (12%) and head/neck region (3%). Accounting for less than 0.05% of non-urothelial bladder cancers, they are usually benign. As neuroendocrine tumors, they are closely related to pheochromocytomas and contain neurosecretory granules (norepinephrine and epinephrine), which result in severe hypertension, sweating and palpitations if over-secreted. Clinical evidence of over-secretion occurs in only 1-3% of all paragangliomas. Surgery is imperative, but local tumor irradiation using [131-I] metaiodobenzylguanidine ([131-I] MIBG) is also being employed for treatment. MIBG, resembles norepinephrine and accumulates in neuroendocrine cells, thus allowing attachment of the 131-I radioactive isotope for localized treatment.

Case Report: On 4/1999, a previously healthy 30 year-old, Vietnamese man presented with a severe headache and elevated blood pressure for which he received treatment. In 1/2000, he developed gross hematuria and dysuria after exercising. After six months of intermittent symptoms, he sought medical attention. A bladder tumor was found and resection via cystoscopy revealed a paraganglioma. Postoperatively, the hematuria and hypertension resolved for six years. By 4/2006, he began to experience right shoulder pain while participating as a member of the U.S. Men's National Volleyball Team. The pain was significant enough to interfere with his training and he again sought treatment. An MRI of the right shoulder revealed a large, lytic, intermedullary mass of the scapula, measuring 3.6 x 2.7 x 1.9 cm, and a second, 2-cm lesion in the lesser tuberosity. Needle biopsy of the right scapula revealed a tumor infiltrating muscle suggesting paraganglioma. Immunohistochemical stains were positive for: chromogranin A, NSE and S-100, but negative for cytokeratin AE1/AE3. He was referred to Mayo Clinic AZ for evaluation of metastatic paraganglioma. A chest CT and MIBG scan on 7/2006 confirmed a mass measuring 3.2 x 2.6 x 2.7 cm. Radiation therapy to the scapula greatly improved his pain. Tumor staging revealed additional small metastases in his right lung and pelvis. MIBG scanning showed avidity in the right scapula, pelvis and distal femur. On 8/2007, autologous blood stem cells were collected for rescue of hematopoietic function in the event of severe treatment-related myelosuppression. At UCSF Medical Center, the patient received 950 mCi of high-dose 131-I MIBG targeted radioisotope therapy. To date, no use of the stem cells has been warranted. CT of the chest on 12/31/2007 revealed decreased size in the right scapula lesion from 2.7 cm to 1.8 cm in the short axis. The right lower lobe lung nodule has decreased in size by 1-2 mm in short axis.

Discussion: High-dose 131-I MIBG targeted radioisotope therapy is a valuable treatment option for patients with metastatic paraganglioma. As radiological cancer treatments become more specialized, patients with metastatic cancers will hopefully derive less morbidity than is associated with other conventional treatments.
DIARRHEA ASSOCIATED WITH WEST NILE VIRUS INFECTION AND MYCOPHENOLATE MOFETIL
Ethan D. Miller, MD, Russell I. Heigh, MD, Giovanni De Petris, MD

INTRODUCTION Infection with West Nile Virus (WNV) can present as a flu-like illness, as encephalitis, or with gastrointestinal symptoms that include abdominal pain, nausea, vomiting and diarrhea\(^1,2\). There are, however, no previously-published cases of diarrhea with WNV that also describe pathologic changes on colon biopsies.

CASE REPORT A 70 year-old male presented to Mayo Clinic Hospital with a 3-month history of diarrhea. The diarrhea was watery, non-bloody, occurred 3-4 times each day, and recently was associated with weakness and a fever to 103 F. He had no known sick contacts. Nine years earlier, he had undergone an orthotopic heart transplant for non-ischemic cardiomyopathy and had been maintained on mycophenolate mofetil (MMF) and tacrolimus. He was given IV fluids and started on antimicrobial medications after stool and blood samples were obtained. Stool studies showed no \textit{C. difficile} toxin, parasites or bacterial infection; serum PCR did not show cytomegalovirus (CMV) infection. Blood cultures remained negative. Colon biopsies obtained by colonoscopy revealed edematous mucosa with mild architectural distortion; increased apoptotic bodies (Fig. A, black arrows); no viral inclusions; and no CMV by immunostain. Crypts showed marked epithelial simplification and flattening (Fig B). These findings are similar to those seen with MMF colitis, and distinct from the pattern seen with infectious colitis\(^3\).

His fever, weakness and diarrhea continued, along with progressive confusion. Evaluation of his cerebrospinal fluid by lumbar puncture led to the diagnosis of WNV encephalitis. The next day, he was unresponsive and developed hypoxic respiratory failure; he was intubated for ventilatory support. Nine days later, still unresponsive, he exhibited minimal brain electrical activity. The medical team and family concurred with withdrawal of supportive care and discharge for palliation. He died a short time later.

DISCUSSION Diarrhea has been found in 16\% of patients with West Nile Virus infection in two independent reports. The changes exhibited in this patient’s colon biopsies are consistent with those of MMF colitis. However, this patient had been taking MMF for nine years at a steady dose without GI symptoms, suggesting MMF colitis was not the likely cause of his diarrhea. His diarrhea developed around the time he was diagnosed with WNV encephalitis, raising the possibility that WNV infection may have been responsible for his diarrhea, and may have caused the apoptosis and crypt distortion observed on this patient’s colon biopsy samples. The histopathology of WNV-related cryptitis may therefore have been described for the first time in this patient.

1. Emerging Infectious Diseases (2001), 7; 654-658.
FUNCTIONAL IMAGING OF CONVERSION: SISCOM IN ATYPICAL PSYCHOGENIC NON-EPILEPTIC SEIZURES

Authors: Eli S. Neiman DO, Katherine H. Noe MD, PhD, Jennifer J. Bortz, PhD, Joseph F. Drazkowski, MD, Joseph I. Sirven, MD, Michael C. Roarke, MD

Purpose: To evaluate the utility of SISCOM in patients with atypical psychogenic non epileptic seizures (PNES).

Video EEG monitoring is the gold standard for diagnosis of PNES, but like any modality, has its limitations including diagnosing brief spells, simple partial and frontal lobe seizures. In difficult cases, it would be desirable to have a complementary functional imaging study which could help differentiate epilepsy from conversion. Patients with conversion disorders have been previously reported to have abnormal interictal SPECT imaging, a difficulty which could potentially be overcome by use of SISCOM technique. SISCOM is of proven utility in localization of seizure onset in extratemporal epilepsy which might be confused with psychogenic seizures, and therefore has the potential to be useful in distinguishing these disorders.

Methods: The Mayo Clinic Arizona (MCA) SISCOM database was reviewed between the years 2004-2007. We retrospectively evaluated 11 patients with PNES who had SISCOM performed. In all cases typical events were recorded and had ictal injections for SPECT analysis during a PNES without abnormal electrographic correlate. 11 patients were identified, representing about 5% of all those diagnosed with PNES during this time. The history, physical exam, neuropsychological profiles, and imaging results were reviewed in detail to determine the indication for and the result of SISCOM imaging.

Results: 11 patients (10 female and 1 male) met the above mentioned criterion. The patient’s ages ranged from 18-79 years (mean age 43.73 yrs). In 6 of 11 patients their spells were initially described as generalized and 5 of 11 had partial complex like events. PNES were found to be occurring for 1 month to 18 yrs (avg 4.62 yrs) prior to presentation and were occurring at a minimum of one spell per week to 40-50 spells daily (average frequency 6.86 daily) lasting seconds to an hour in duration. Confounding features leading to the use of SISCOM included: 5 of 11 patients had a history of an abnormal brain MRI, 4 of 11 had histories of abnormal EEGs or video EEG monitoring, and 5 of 11 patients had focal descriptions of their spells making them suspect for possible epileptic events. All of the patients were on 1-2 antiepileptic medications (AEDs) at the time of evaluation, and had historically used 1-7 AEDs (avg 4.09 AEDs) since their initial spell. The MMPI performed on 8 of the 11 patients with 6 of the 11 patients meeting the criterion for somatic reactivity to stress or the conversion V type pattern. 8 of 11 patients had a history of depression, and 6 of 11 had a history of an anxiety disorder. 5 of 11 patients had a history of physical or sexual abuse, and 7 of 11 patients had a chronic pain disorder with 3 of 11 patients having a history of drug use and abuse. Video EEG recording in all the patients showed no change in the background rhythm or epileptiform abnormalities during ictal injection of the radiotracer Tc 99m-labeled ethyl cysteinate diethylester (Tc99m-EDC) (Neurolite) for SPECT and SISCOM imaging. 2 of 11 patients had abnormal EEG tracings with one patient having infrequent sharps and the second having mild slowing in the left temporal head region overlying an area of gliosis from head trauma. The MRI imaging performed at MCA was normal in 7 of 11 patients. Interictal SPECT imaging was non laterlazing and non localizing in 8 of 11 patients. Ictal SPECT imaging showed 7 of 11 patients to have non laterlazing and non localizing results. Subtraction ictal SPECT co-registered on MRI (SISCOM) showed 10 of 11 patients to have non laterlazing and non localizing findings. One patient with right-sided shaking spells had mild hyperperfusion in the left insular region which has been reported as a SPECT finding in patients with somatofom disorders, anxiety disorders and PTSD.

Conclusion: SISCOM may be a useful tool as an adjunct diagnostic modality to video EEG monitoring and neuropsychological evaluation in helping to differentiate epileptic from non-epileptic seizures. In this series of patients with atypical presentations of PNES, SISCOM was negative in 10 out of 11 patients and was felt to be helpful in increasing the diagnostic certainty of conversion. Previously reported interictal SPECT abnormalities in conversion patients were not noted in the case series.
DONOR RISK INDEX AND THE RISK OF RECURRENT HEPATITIS C POST LIVER TRANSPLANTATION

AYODELE OSOWO, VINODH. JEEVANATHAM, MARSHAL JATOI, AMIR YOUSFI, JORGE RAKELA, HUGO VARGAS

Purpose: Hepatitis C virus (HCV) - induced cirrhosis is the most common indication for liver transplantation (LT) worldwide. HCV recurrence is virtually universal after LT making this entity a challenging clinical problem. As the proportion of LT patients with HCV has increased to 50%, it is apparent that these patients also have lower 3 yr survival. Several models and factors that may influence recurrence of HCV have been proposed. In this study we evaluate the impact of the newly defined Donor Risk Index on HCV recurrence in our HCV LT recipients.

Methods: A retrospective study was performed using data obtained from the Mayo Clinic Arizona transplant database on all post transplant patients with HCV. DRI was calculated using the standard formula that includes: donor age, cause of death, race, cold ischemia time, donor height, share status, use of donor after cardiac death and split graft. Patients with incomplete data were excluded. A logistic regression model was used to evaluate factors that influence HCV recurrence. Recurrence was defined for the purposes of this study as pathological evidence of recurrence and documentation of increased hepatic activity index (HAI).

Results: Data was analyzed on a total of 188 patients. Mean age, BMI, native meld and DRI were 52.3 ± 6.4, 28.2 ± 7, 18.5 ± 8 and 1.3 ± 0.34 respectively. A total of 106 (56.4%) had a DRI of > 1 and 144 (76.6%) had pathological recurrence of HCV. HCV recurrence was present in 55 (29.2%) and 144 (78.1%) patients within 3 and 12 months respectively. After controlling for all confounding factors that may influence HCV recurrence there was no significant correlation between DRI and recurrence of HCV (p = 0.6).

Conclusion: DRI does not influence the outcome of LT for HCV in our center. We observed a low mean DRI (1.3). This was due to low cold ischemia time, non-use of DCD donors and minimal use of split organs in our patient population. This may explain why DRI does not influence HCV recurrence in our patient population. Studies in patients who receive grafts with higher DRI (>2) need to be done before concrete conclusions about this lack of association can be drawn.
SCREENING FOR ESOPHAGEAL VARICES IN END STAGE LIVER DISEASE: UTILITY OF ESOPHAGEAL CAPSULE ENDOSCOPY

A. OSOWO, R. CHERUVATTAH, V. JEEVANATHAM, K. CHOPRA E. CAREY, J.RAKELA, H. VARGAS

Purpose: Esophageal varices are a major complication of liver cirrhosis. 50% of patients with esophageal varices will eventually bleed and this is associated with 20% mortality at about 6 weeks. Current AASLD guidelines recommend screening for esophageal varices in patients with cirrhosis. This should be done yearly and every 2-3 years in patients with and without varices respectively. Esophagogastroduodenoscopy (EGD) has been the standard tool used for this evaluation. We describe our experience with the esophageal capsule endoscope (ECE).

Methods: A prospective observational study was conducted on 217 consecutive patients in an outpatient hepatology/liver transplantation setting. The Pillcam Eso esophageal capsule was used on all the patients. This device acquires 14 images/second (7 frames/second/end). All patients fasted prior to the procedure and data was collected on all 217 patients. The video capsule images were evaluated by a trained investigator.

Results: The average age was 57.1 and 50.2 % of the patients were male. Esophageal varices were seen in 38% (83/217). Other findings include gastric varices 1.3% (3/217), portal hypertensive gastropathy 11% (24/217). Barrett’s esophagus and esophageal erosion was seen 2 and 1 patient respectively. The mean esophageal transit time was 3.8 ± 3.7 minutes. Stigmata of recent bleed were seen in 8.8% (19/217). Esophageal ring was seen in 3 patients and in 10 patients the capsule did not reach the stomach during the 20 minutes of study. Gastric visualization was obscured in 5 patients with retained food in the stomach.

Conclusion: Our study shows that ECE is a valuable screening tool for esophageal varices in cirrhotic patients. Other findings in this study suggest it may also be useful for diagnosis of other co-existent esophageal and gastric pathologies. Failure rate was very low as the capsule failed to reach the stomach within the study period in only 10 patients. Studies have estimated the sensitivity and specificity of the esophageal capsule endoscopy to be 92-97% and 95-100% respectively. The overall concordance between ECE and EGD for diagnosis esophageal varices has been estimated to be 96.9%. Relative ease of swallow and convenience may make this a more attractive alternative for patients in future.
PALLIATIVE MEDICINE EMERGENCY: A CASE OF CORD COMPRESSION

Gobi Paramanandam MD, Palliative Medicine Fellow

Introduction: Cord compression is a palliative medicine emergency that can often present with vague symptoms. Palliative medicine physicians must recognize cord compression in order to improve the early diagnosis of these patients and outcome is critically dependent on the speed of diagnosis and treatment. Spinal cord compression occurs in patients with cancers that tend to metastasize to bone and is usually caused by expansion into the spinal canal of metastases within the vertebral body or neural arch. In addition palliative medicine physicians in conjunction with supportive care teams must help patients and families anticipate and cope with the psychological and social issues that may result in those patients who remain paraplegic.

Case Report: We present a case of a 36-year-old female with a history of stage 4 metastatic rectal cancer who presents to her palliative medicine clinic with approximately four days of increasing numbness of her lower extremities and the inability to walk. The patient noted that she could not move her right lower extremity and her left lower extremity was weak. The patient initially felt that her symptoms were secondary to her pain pump that was implanted one month ago. She was immediately admitted to the hospital and urgent MRI was obtained that demonstrated spinal cord compression opposite T7 secondary to a pathological fracture and epidural tumor. Neurosurgical consultation was obtained and spinal cord decompression was performed that day. Unfortunately the outcome was not as hoped and the patient remained paraplegic. The supportive care team addressed this patient’s immense physical, psychological, and social pain associated with her cord compression. She was subsequently transferred to an inpatient Hospice unit for comfort care.

Discussion: 1) Present a case of cord compression and the ensuing complications that can occur. 2) Provide a brief overview of presenting symptoms and treatment options for cord compression. 3) Demonstrate how each component of the supportive care team was of benefit to a patient from the perspective of: a) pain management; b) psychological support and end-of-life decision making; c) social- family support to husband, parents and 8 year old child; and d) spiritual pain.
Introduction
Sclerosing mesenteritis (SM) is a rare, non-malignant condition affecting the small bowel mesentery with chronic, fibrosing inflammation. It is commonly associated with intra-abdominal malignancy, and may pose a diagnostic conundrum as it can mimic malignancy. This case report describes sclerosing mesenteritis presenting as an abdominal mass in a patient with a prior history of Non-Hodgkin’s lymphoma (NHL).

Case Report
A 68 year old gentleman presented with chronic diarrhea for 2 years and abdominal CT imaging revealed a calcified mesenteric mass. He denied weight loss, fatigue, nausea, fevers, night sweats or chills. Nine years prior to presentation, he was diagnosed with stage IIB NHL, and sustained a complete response after six cycles of CHOP chemotherapy followed by radiation therapy. He was subsequently underwent surveillance annual CT scans, none of which showed any evidence of recurrence. However, his most recent CT scan in June 2007 revealed a large calcified mesenteric mass, measuring 8.0 x 2.4 x 3.9 cm, adjacent to the third portion of the duodenum and partially compressing the superior mesenteric vein. PET scan showed increased uptake with an SUV of 6.7 in the mesenteric mass, but no other sites of increased uptake. A CT guided needle biopsy of the mass was non-diagnostic. Diagnostic laparoscopy and biopsy of the mass was then performed. The mass was found to be unresectable as it was fixed to the pancreas, aorta and mesocolon. Biopsy revealed densely hyalinized fibrous tissue and fat necrosis, suspicious for sclerosing mesenteritis. There was no evidence of lymphoma. Further workup was done including peripheral blood flow cytometry which did not show a monoclonal population. CBC and SREP were normal. A repeat CT scan of the abdomen and pelvis was done (four months after the initial CT scan), and was stable with no evidence of change in size of the mass. Gastroenterology consultation was obtained and the patient underwent an EGD and colonoscopy. Biopsies taken from the duodenum, ileum and colon were unremarkable. The patient was also seen in consultation by Rheumatology. It was finally recommended that the patient initiate tamoxifen along with prednisone. The patient elected not to undergo any treatment. Due to concern about future possible recurrence of lymphoma, he was advised to undergo close follow-up with surveillance CT scans.

Discussion
Sclerosing mesenteritis is part of a spectrum of disorders, including mesenteric lipodystrophy, mesenteric panniculitis, and retractile mesenteritis, all of which can affect the mesentery with fat necrosis, inflammation and fibrosis. The inciting event is thought to be abdominal surgery or trauma. However, infectious and autoimmune mechanisms may also play a role. In our patient, it is possible that radiation was a contributing factor. Clinical features of this entity include abdominal pain, distention, nausea, vomiting and diarrhea. About 10% of patients are asymptomatic and are diagnosed incidentally. Treatment is recommended for symptomatic patients only. Surgery is reserved for patients presenting with obstruction. Tamoxifen is the mainstay of medical management due to its anti-fibrotic properties. The mechanism of action is increased production of TGF-β, resulting in decreased inflammation and fibroblast proliferation. Other treatments include prednisone, colchicine and thalidomide, which are felt to work via an anti-inflammatory mechanism. While the prognosis of sclerosing mesenteritis is often favorable, approximately 20% of patients can have a chronic course with significant morbidity. Several reports have described the concurrent finding of intra-abdominal malignancy, such as lymphoma, at the time of diagnosis of sclerosing mesenteritis or during follow-up. Our patient had a rare presentation with sclerosing mesenteritis and prior diagnosis of lymphoma with no evidence of lymphoma recurrence. Although sclerosing mesenteritis has a relatively favorable prognosis, patients need to be closely followed. The development of fevers, weight loss, night sweats should prompt immediate evaluation for an underlying lymphoproliferative disorder.
THE EFFECT OF SILDENAFIL ON SPHINCTER OF ODDI PRESSURE IN PATIENTS UNDERGOING ERCP FOR SUSPECTED SPHINCTER OF ODDI DYSFUNCTION

Kevin Ruff MD

Purpose: Determine if sildenafil reduces SO pressure in patients undergoing ERCP for evaluation of suspected SO dysfunction.

Methods: IRB approval was obtained prior to enrolling study subjects. Adults referred for ERCP with sphincter of Oddi manometry to evaluate suspected SO dysfunction were recruited for the study. SO pressures were measured using a hydraulic capillary infusion system. Initial readings of biliary sphincter pressures were obtained using the 10-station pull-through technique. Fifty milligrams of sildenafil dissolved in 20 mL of water was injected through the therapeutic channel of the duodenoscope into the duodenum after removing the manometry catheter. Repeated pressure measurements were obtained with the same technique, after allowing 30 minutes for absorption of the medication.

Results: A total of seven patients completed the study ranging in age from 31 to 57 years old. Six of the seven participants were women and three of the seven participants were hospitalized at the time of the testing. Six out of seven patients had sphincter of Oddi dysfunction, as defined by basal biliary sphincter pressures >40 mmHg: the average pre-treatment SO pressure for the group was 81.96 +/- 51.78 mm Hg. After instillation of sildenafil, the average SO diminished to 29.12 +/- 26.99 mm Hg. The mean change in SO pressures was found to be 52.84 +/- 40.62 mm Hg (95% CI, 10.21 mm Hg to 95.46 mm Hg, p=0.02).

Conclusions: Sildenafil administration into the duodenum during ERCP significantly decreased the basal biliary pressure of the SO in individuals undergoing SO manometry for the evaluation of SO dysfunction.

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† 95% CI 10.21 mm Hg to 95.46 mm Hg; ‡ p = 0.02
BULBAR NEURONOPATHY AND BAROREFLEX FAILURE AS LATE SEQUELAE OF NECK IRRADIATION

Sara Schrader MD and Brent Goodman MD

Introduction: Baroreflex failure and bulbar palsy have been rarely reported as potential complications of radiotherapy for head and neck tumors. However, the occurrence of both disorders in the same patient has not been well-described. We present a unique patient with radiation-induced bulbar palsy and baroreflex failure.

Case: A 54-year-old man underwent surgical resection of tonsillar squamous cell carcinoma and received 7200cGy of post-operative radiation therapy in thirty-five fractions. Six years later, he experienced intermittent postural lightheadedness, progressing over time to include syncopal episodes. Ten years following radiation therapy, he began to experience progressive slurred speech, tongue weakness, and dysphagia.

On examination, a moderately-severe flaccid dysarthria with marked tongue atrophy, undulating tongue movements, and marked inability to move the tongue was present. Gag reflex was reduced bilaterally, and sensation was diminished in the 3rd division of the left trigeminal nerve.

Extensive laboratory testing of blood and spinal fluid revealed no significant abnormalities. CT of the head, neck, and cervical spine were unremarkable.

Nerve conduction studies were normal in the upper and lower limbs and bilateral face. Needle EMG showed fibrillation potentials in the tongue and upper trapezius muscles, with large motor unit potentials and reduced recruitment. Myokymia was present in the tongue, and neuromyotonic discharges were present in the upper trapezius muscle. Autonomic testing showed a massive drop in blood pressure with head-up tilt, from 196/97 to 87/59, with no change in heart rate. Postganglionic sympathetic sudomotor function was normal.

Conclusion: This is a unique case of radiation-induced bulbar palsy and baroreflex failure. The recognition of these late sequelae of radiation therapy and their accompanying findings on diagnostic testing distinguishes the condition from other neuromuscular and autonomic diseases with similar signs.
PREVALENCE OF VENOUS THROMBOEMBOLISM (VTE) AMONG PATIENTS WITH
BIOPSY-PROVEN USUAL INTERSTITIAL PNEUMONITIS

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1 – Mayo Clinic Arizona

Purpose
Venous thromboembolism (VTE) is a common disorder among hospitalized patients. A thorough review of the literature revealed limited data about the association of Usual Interstitial Pneumonitis (UIP) with VTE. The purpose of this study is to analyze the prevalence of VTE in patients with biopsy-proven UIP.

Methods
We retrospectively collected data of patients with UIP diagnosed by either open surgical biopsy or autopsy. Variables examined included demographics, smoking history, body mass index (BMI), diagnosis of VTE, pulmonary function tests, and D-dimer levels. Patients with a history of malignancy were excluded. Logistic regression analysis identified the risk factors for VTE. Prevalence of VTE in patients with UIP was calculated. We also calculated the prevalence of VTE in patients with Idiopathic Pulmonary Fibrosis (IPF), a subset of UIP.

Results
221 charts were reviewed over a period of 10 years (1997-2006). 51 with biopsy-proven UIP were analyzed for the purpose of this abstract. 29 (56.86%) had IPF, while 22 (43.14%) had other forms of UIP (NonIPF). Prevalence of VTE was 25.49% among all patients, and it was not statistically different between the two groups (IPF 24.14%, NonIPF 27.27%; P=0.79). Logistic regression analysis of VTE predictors revealed only two significant factors: BMI [OR: 1.023 (1.005-1.04) P=0.015] and a negative smoking history [OR: 0.75 (0.58-0.97) P=0.042]. It is interesting to note that smoking was associated with lower probability of VTE, but the magnitude was minimal.

Conclusion
Prevalence of VTE is relatively high in a cohort of patients with biopsy-proven UIP. Prevalence is not statistically different according to type of UIP. We found that a higher BMI and no smoking history are risk factors for VTE. Small sample size limits our analysis; nevertheless, this is the first study that reported prevalence of VTE in UIP.

Clinicians need to be aware of the association between VTE and UIP; however, the impact of this association on outcome is yet to be explained. Lack of a prospective, systematic study for VTE may have underestimated the true prevalence. A larger, prospective study is required to further clarify our findings.
CASE REPORT: PARADOXICAL VOCAL CORD MOTION, AN UNDERDIAGNOSED CONDITION

Esan Simon, MD, MBA; Jesus Bracamonte, DO

ABSTRACT

1. Introduction. Paradoxical Vocal Cord Motion (PVCM) is a condition where the larynx demonstrates paradoxical adduction during inspiration resulting in symptoms that often reflect underlying pulmonary obstructive disease such as wheezing, dyspnea and stridor.

2. Case Report. Highlighted is a case of a 17-year-old female admitted to the intensive care unit with an initial presumptive episode of new onset asthma with limited response to conventional therapies such as bronchodilators and steroids. Following acute evaluation with laryngoscopy, it was determined that the patient's acute respiratory distress was secondary to PVCM. Once further evaluation and treatment entailing speech therapy, biofeedback, psychiatric evaluation and video stroboscopic examination was completed, the patient recovered uneventfully.

3. Discussion. PVCM is characterized by paroxysmal periods of vocal cord adduction with clinical manifestations such as dyspnea, wheezing, or stridor. Mainly affecting children and young adults, the incidence of PVCM in the general population is poorly defined largely due to lack of physician knowledge of the condition and frequent misdiagnosis of PVCM as asthma. This misdiagnosis of asthma results in considerable morbidity with unnecessary treatment courses of corticosteroids, bronchodilator therapies, intubation and even tracheotomy. Laryngoscopy with direct visualization of the vocal cords exhibiting paradoxical adduction during symptomatic periods is the gold standard for this condition. While various etiologies have been postulated for PVCM, there often is a psychogenic component to the disorder. Speech therapy has been a mainstay of treatment for PVCM, and additional treatment modalities may also include psychotherapy as well as biofeedback.
Purpose: Become familiar with performing and interpreting CT enterography. Understanding the normal variation in appearance of small bowel will avoid interpreting pitfalls and allow for the accurate interpretation of clinical pathology. Demonstrate both typical and atypical appearance of common clinical pathologic diseases.

Methods: CT enterography was performed according to standard departmental Mayo Clinic Scottsdale protocol. The protocol includes obtaining contrast enhanced images from the lung bases through the pelvis in the enteric phase (of contrast) in the axial plane, followed by creating coronal and sagittal multiplanar reformatted images to better evaluate the anatomy. Representative normal and abnormal multiplanar images were placed into a poster format to best demonstrate specific disease entities. For each specific disease, in addition to the CT appearance, a brief background discussion and key point(s) section was made to allow for more complete understanding.

Results: CT enterography static images were placed into a poster format providing the viewer with the opportunity to acquire an understanding for the logical interpretation of small bowel abnormality. Categories include common pitfalls, examples and teaching points-inflammatory diseases, polyps and masses, vascular diseases. Additionally, a quiz section provides the viewer with an interactive ability to test recently gained knowledge/understanding.

Conclusions: CT enterography is a powerful diagnostic tool to characterize a wide variety of small bowel abnormality. This presentation will provide the necessary background and knowledge, through demonstration of normal and abnormal examples as well as pertinent didactic information, to allow for accurate interpretation of CT enterography.
VULVODYNIA IN THE GASTROENTEROLOGY CLINIC:
ASSESSMENT OF PREVALENCE AND ASSOCIATED GASTROINTESTINAL SYMPTOMS

Umar S, Harris L, Janarthanan S, Lunsford T, Jones M, Crowell M

Purpose:
Vulvodynia is a chronic disorder which can cause persistent vulvar irritation, burning and/or pain and has been reported to affect up to 18% of women. Vulvodynia has also been shown to have a negative impact on quality of life. Vulvar symptoms may be associated with concomitant urinary and/or gastrointestinal symptoms. Minimal evidence supports a link between vulvodynia and irritable bowel syndrome but there are no data examining the prevalence of vulvodynia in gastroenterology patients nor what GI symptoms these patients experience. The aim of this case-control study was to examine the prevalence of vulvodynia in a population of gastroenterology motility patients and to assess whether the GI phenotype differs in patients endorsing vulvodynia versus GI patient controls.

Methods:
2440 patients (1744 females) undergoing motility testing at Mayo Clinic Arizona from 2003-2007 completed the validated Gastrointestinal Symptom Severity Index (GISSI). Data included the frequency, severity and bothersomeness of various gastrointestinal, urinary and pelvic complaints. Component scores were derived for the symptom clusters of Constipation/Difficult Defecation, Abdominal Pain/Discomfort, Dyspepsia, GERD, Diarrhea and Pelvic symptoms. Univariate and multivariate statistics were used to measure group differences while controlling for multiple comparisons. Data are presented as Mean ± SD.

Results:
208 (12%) patients reported vulvodynia symptoms. These women were compared to 424 randomly selected, age-matched patient controls. Women with and without vulvodynia were similar in age (56±15 v 56±15 yrs) and BMI (26±6 v 27±7 kg/m²). Patients with vulvodynia reported more severe urinary (p<0.001) and pelvic symptoms (p<0.001). Vulvodynia was associated with a significantly higher severity on all GISSI component scores (Table 1). Primary items contributing to group differences were constipation (Hard BM and Digitation) and altered visceral sensitivity (Urgency and Pain).

Conclusion:
The prevalence of vulvodynia amongst a sample of gastroenterology patients was similar to that previously reported in other populations. Patient with vulvodynia report increased severity of both upper and lower GI symptoms compared to GI patient controls.
PERFORMANCE OF TRIPHASIC CT ENTEROGRAPHY AND CAUSES OF FALSE-NEGATIVE STUDIES

Walker, FB, Hara AK, Leighton JA

Purpose: To determine the sensitivity and specificity of a triphasic CT enterography (tri-CTE) protocol and determine causes of false negative studies.

Methods: All tri-CTE (from Jun 2006-July 2007) with endoscopic, pathologic, or other imaging confirmation were included. The electronic medical record was retrospectively reviewed for the following information: indication and results of endoscopy, tagged RBC studies, angiography, surgery and pathology. The sensitivity and specificity of CTE was calculated using pathology or endoscopy as the gold standard, and if either was unavailable, use of correlative imaging to confirm or exclude tri-CTE findings.

Results: 52 patients underwent triphasic CTE for the following indications: hematemesis/hematochezia or melena (32), obscure gastrointestinal bleeding (15), and abdominal pain/nausea (5). The patients underwent a total of 41 EGD, 37 colonoscopies, 17 capsule endoscopies, 7 double balloon enteroscopies, 9 tagged RBC, 4 angiographies, and 3 surgeries. The sensitivity and specificity of CTE was 45% (9/20) and 90.6% (29/32), respectively. CTE failed to prospectively identify the following findings in 11 patients: 5 ulcers, 3 AVMs, 2 hemorrhoids, and 1 bleeding diverticulum. False negatives were attributed to perceptive errors (4), technical error (1) and resolution limitations (6). Among the confirmed lesions identified at CTE were solitary duodenal ulcer (2), and one each of active ulcerative colitis, esophageal varices, Peutz-Jegher polyp, multiple NSAID ulcers in duodenal bulb, sprue, colon cancer, and active diverticular bleeding. There were 3 FP CTE findings.

Conclusion: Tri-CTE demonstrated clinically significant abnormalities in almost half of the patients with few false-positives. Training on tri-CTE interpretation could improve sensitivity.
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Phoenix Baptist Hospital
Family Medicine

IF IT LOOKS LIKE A DUCK...: A CASE OF COLOVESICAL FISTULA
Roman Lal M.D. and Timothy Owolabi M.D.

Introduction: Diverticulitis is the inflammation of diverticuli, small outpouchings of colonic mucosa, and typically occurs in older individuals. Although several complications result from this condition, up to 20% of surgically treated cases of diverticular disease are for fistula formation. Fistulas are abnormal communications between two normally separate body cavities. The most common fistula formed as a complication of diverticulitis is colovesical (CV) fistula, one that forms between the colon and bladder. In one study, symptoms most frequently reported in patients with CV fistula included pneumaturia (77%), dysuria or irritative symptoms (45%), and fecaluria (36%). These findings are quite specific for the presence of a fistula, but the available diagnostic modalities have poor sensitivity for visualizing the fistula and CT, the currently excepted test of choice, rarely provides actual visualization of CV fistulas. This is a case of colovesical fistula diagnosed clinically and subsequently confirmed surgically due to limited radiological evidence.

Case Report: The patient is a 45-year-old Caucasian male with an extensive cardiac history who during an admission for aortic valve replacement is discovered to have a urinary tract infection (UTI). He has a history of recurring UTI and a two month history of passing air on urination. The patient's medical history is notable for diverticulitis of six months duration that resolved three months prior to his current presentation. The patient's presentation is highly suggestive of colovesical fistula, and as such the appropriate work-up is initiated. Abdominal and pelvic CT are negative for fistula but reveal gas in the bladder and possibly in the kidneys. Cystoscopy is performed and uncovers a small lateral bladder wall tumor but no fistula. Prior to discharge, he undergoes a CT cystogram that is also negative for fistula. Two weeks later, the patient is admitted again for continued pneumaturia, UTI, and possible sepsis. After a Gastrografin enema that only reveals diverticulosis, a more aggressive evaluation is deemed necessary to prevent infection of the patient's prosthetic valve. The patient agrees to an exploratory laprotomy through which a colovesical fistula is finally identified and corrected.

Discussion: As many clinicians know, not every diagnosis will follow the classic description given in our textbooks. However, these descriptions are still taught in this modern era of medicine despite the advent of new diagnostic modalities because experience will likely always remain the most powerful diagnostic tool. Otherwise, our profession would do away with teaching the art of history taking and the physical exam. This case clearly demonstrates this reality. Several retrospective studies of surgical cases involving colovesical fistula have reported sensitivities of CT identification of fistula ranging from 90-100% and understandably endorse this modality as a first line test. This number is misleading because in these studies, the actual visualization of the fistula tract is reported to be infrequent and the true diagnostic power of CT comes from a constellation of findings. They include air in the bladder, thickened bowel and/or thickened bladder wall, and the presence of colonic diverticula. In this case report, the only objective finding on CT was air in the bladder and kidneys although the patient's history and the contrast enema already revealed diverticulosis. Other imaging modalities are better suited to visualize fistulas, but the associated sensitivities to do so are poor. Numerous studies have evaluated cystoscopy, the previous gold standard, as well as contrast enema, and cystography. The diagnostic sensitivity of each of these tests individually has consistently been below 50% and as low as 4% in the case of cystography. Fortunately, the absence of definitive evidence was no deterrent to continued investigation in this case, and using the clinical history to guide decision making paid great dividends. The old adage certainly applies here: If it looks like a duck and walks like a duck, it must be a duck.
ADULT FOREIGN BODY ASPIRATION: A CASE REPORT

Issadora Lara MD, Silvio Azzolini MD

Introduction: Tracheobronchial Foreign Body Aspiration (FBA) is uncommon in adults. In contrast to children with FBA, the clinical presentation of FBA in adults is often subtle, and the diagnosis requires careful clinical assessment and the judicious use of bronchoscopy. Overall death caused by suffocation following FBA is the 5th most common cause of unintentional-injury mortality in the United States. Adults over 75 years of age have an increased risk of dying following FBA. Neurological disorders, loss of consciousness, and alcohol or sedative abuse predispose to FBA. The foreign body usually is wedged distally in the lower lobe bronchi or the bronchus intermedius. The diagnosis of FBA in adults is complicated by the fact that patients do not always volunteer or recall a history of choking. The diagnosis is frequently overlooked, except when patients report of typical choking episode, or in the presence of radiopaque foreign body. Dyspnea is uncommon in adults with confirmed FBA, reported only 25% of patients. Coughing is seen in up to 80% of all cases; other associated symptoms include fever, hemoptysis, chest pain or wheeze.

Case Report: A 57-year-old hispanic female with a history of hypertension, non-insulin dependant diabetes mellitus, dyslipidemia, chronic cough and recurrent pneumonia presented to the emergency department with 3 days of hemoptysis. She reported paroxysmal coughing followed by retching of blood and localized retrosternal pain associated with chills. Physical exam revealed decreased breath sounds at the right lung base and diffuse inspiratory crackles. Upon admission the first initial task was to distinguish between true hemoptysis vs hematemesis. Gavage with a nasogastric tube was negative for gastrointestinal bleeding and the chest X-ray showed a right lower lobe infiltrate. Tests for tuberculosis, coccidiomycosis, additional serology and blood cultures were all negative for an infectious process. A CT scan of the chest revealed a curvilinear calcification in the right mainstem bronchus measuring approximately 12x4 mm. Findings suggested calcific changes within the endobronchial tree suggestive of possible broncholith and right lower lobe pneumonia. Review of previous chest X-rays suggested that this abnormal finding may have been present in 2004-2006. This prompted pulmonologist intervention with bronchoscopy. Bronchoscopy confirmed a large broncholith with piercing of the anteromedial right mainstem bronchus, with evidence of marked inflammatory changes, purulent in nature consistent with obstruction. Pathology studies reported the foreign body to be consistent with macroscopic findings of a broncholith, hard 1.5 x 0.7 x 0.3 cm irregular portion of brown material. Further history taking revealed that the patient recalled choking on a piece of chicken bone approximately 15 years ago.

Discussion: There are no studies that evaluate the diagnostic utility of clinical and radiographic abnormalities in adults with suspected FBA. Bronchial obstruction by a foreign body can result in potentially serous complications, including asphyxia, hemoptysis, post-obstructive infection, and bronchiectasis. Fiberoptic bronchoscopy has become the cornerstone of the diagnostic evaluation in adults and children with suspected foreign body aspiration. The patient after years of debilitating symptoms and recurrent pneumonia of unknown etiology improved significantly after extraction of the foreign body.
A DEADLY GAME OF TRUTH OR CONSEQUENCES: A TRAGIC CASE OF COCAINE AND ALCOHOL ASSOCIATED ISCHEMIC STROKE
Timothy Owolabi M.D.

Introduction: Stroke, or cerebrovascular accident (CVA) is an injury to the brain from a vascular event. Strokes can be classified as either ischemic or hemorrhagic. Several risk factors have long been established for stroke such as poorly controlled hypertension, diabetes mellitus, hypercholesterolemia, family history, and arteriosclerotic vascular disease. These factors to a degree are out of one's control because of hereditary considerations. In contrast, smoking, cocaine use, and the excessive consumption of alcohol are personal choices that also have been established as risk factors for CVA. This case report is of a young man who kept many secrets and became trapped by his life choices. Subtle physical exam findings provided the only clues to the impending catastrophic event that would befall him.

Case Report: A 29-year-old male returns to the emergency department with cough, fever, and sore throat two days after being evaluated, diagnosed with pneumonia, and discharged with oral antibiotics. He is now a febrile, but his exam is notable for a blood pressure of 162/108 and a heart rate of 124. In addition to his respiratory symptoms, he has left grasp weakness and left sided ataxia. Initial head CT is negative. Initially, the patient's history appears benign. He denies any medical history and takes no medications other than the antibiotics given to him two days prior. Both his parents are alive and sitting at bedside with his wife. His father (46) has diabetes and hypertension. His mother (48) has asthma and hypertension. The patient is unemployed and lives with his wife and two children. He reports 'social drinking', denies any history of drug use, and quit smoking ten years prior.

The patient is admitted for treatment of his pneumonia and further evaluation of his neurologic symptoms. In light of his unstable vital signs, a drug screen is ordered. When questioned alone about his drug use, he admits to having used cocaine periodically since the age of 16 but none in the previous one year. He fervently denies any other substance use. The drug screen is positive for both cocaine and opiates, which were not given to the patient during this admission. Given the half life of cocaine, his last use was in the preceding four hours. One of his visitors reports that he and the patient drink together and that the patient routinely drinks 20 beers daily. His last drink had been the previous day.

His neurologic symptoms are further evaluated by MRI which reveals multiple right-sided cerebral infarcts. CT angiography of the head and neck reveal the likely origin of his evolving ischemic stroke. High grade stenosis of the right internal carotid artery is noted and an ulcerated plaque is identified on its posterior aspect. Additionally an intraluminal thrombus is discovered in the right middle cerebral artery. On hospital day #3, the patient becomes tachypnic and hypoxemic despite the use of a 100% non-rebreather mask. He is intubated secondary to respiratory failure. Alcohol withdrawal certainly may have influenced this development. Tragically, on hospital day #5, the patient is found to be unresponsive with fixed dilated pupils. Stat head CT reveals a right subfalcine herniation with right-to-left midline shift. The patient is extubated on hospital day #6 and rapidly expires.

Discussion: In light of the extensive differential diagnosis for stroke, as in this case, an elevated index of suspicion is paramount to discover cocaine use as an antecedent cause of CVA. Although the mechanism behind the association has yet to be determined, numerous cases reports and retrospective reviews have been published suggesting a causative relationship between cocaine use and stroke in young people. Unfortunately as in the outcome of this case, knowing the cause may not be enough to stave off a patient's inevitable demise. Obtaining an accurate history about patient drug use may be difficult especially in active addicts but is vital for timely intervention to prevent the devastating sequelae of use.
AML-M7 DIAGNOSED IN A PATIENT WITH DOWN SYNDROME

Heidi Benyamin MD, Tressia Shaw MD

**Introduction:** Patients with Down Syndrome have a 1 to 1.5% chance of developing leukemia. Transient leukemia, also known as transient myeloproliferative disorder (TMD), is a form of leukemia that almost exclusively affects newborns with Down Syndrome. The majority of newborns are asymptomatic and most have spontaneous resolution of the disorder by two to three months of age. Up to 26% of children with transient myeloproliferative disorder develop the M7 subtype of acute myeloid leukemia (AML-M7), also known as acute megakaryoblastic leukemia (AMKL). AML-M7 may result from a mutation in the gene on the X chromosome encoding the transcription factor GATA-1 that is required for normal differentiation of megakaryocytes. Reports have shown that mutations in GATA-1 were identified in blasts of infants with Down Syndrome and TMD. It has been reported that the same mutation is present in blasts of these infants who subsequently develop AML-M7. The incidence of AML-M7 is 500 times greater in children with Down Syndrome than without. AML-M7 occurs in 1 in 50 to 200 children with Down Syndrome and develops within the first four years of life.

**Case Report:** A 19 month old Hispanic female with Down Syndrome is referred to the emergency department for further evaluation of anemia. Her primary care doctor noted her to be pale with a fingerstick hemoglobin of 4.8. On initial examination the patient was noted to be playful, in no acute distress with vitals within normal limits with the exception of tachycardia to the 160s. On further questioning her mother reported a diagnosis of transient myeloproliferative disorder at birth. This had completely resolved by the age of 6 months. She had serial complete blood counts checked every 3 months until the results had normalized. There was no history of recent illness. She was not taking any medications. Her mother had now noticed her to be pale for the past week without any bleeding or easy bruising. Her initial labs in the emergency department revealed a white blood cell count of 6.7 with 13% blasts, hemoglobin of 5.9, hematocrit of 17.1, and platelets of 250,000. She was then admitted to the hospital for further work up for leukemia. She underwent a bone marrow biopsy and aspirate with results consistent with a diagnosis of AML-M7. She underwent induction chemotherapy and tolerated this well.

**Discussion:** When encountering this child in the emergency room we had a high suspicion that she had developed acute megakaryoblastic leukemia given her history of transient myeloproliferative disorder. Further case reports and studies will help with determining more closely the likelihood of patients with TMD to develop AMKL. Gene expression profiling such as GATA-1 may help in distinguishing transient leukemia from AMKL. This type of profiling can also help distinguish AMKL seen in children with Down Syndrome from AMKL seen in those without Down Syndrome.
SALMONELLA JAVIANA SPLENIC ABSCESS PRESENTING AS PLEURAL EFFUSION

Wendy Bernatavicius, MD and Ryan Bode, MD

Introduction: Splenic abscess is an uncommon clinical entity, with fewer than 700 cases reported in English literature from the beginning of this century until 1995. The actual incidence of splenic abscess is difficult to estimate, autopsy data revealing an incidence of 0.14-0.7%. Splenic abscess often presents with either vague or nonspecific signs, thus making a clinical diagnosis difficult. A high degree of clinical awareness and an aggressive diagnostic approach are essential for early diagnosis, as delay in diagnosis is associated with a high mortality rate.

Case Report: A 13 year old female, without any significant past medical history, presented to an outside community hospital with a two and a half week history of increased fatigue, seven pound weight loss secondary to poor appetite, fever, cough and left shoulder pain. The patient was diagnosed with a left lower lobe pneumonia and was started on antibiotics. She continued to worsen and a repeat chest x-ray revealed a large left-sided pleural effusion. While preparing for an ultrasound guided thoracentesis an enlarged spleen and possible splenic abscess was revealed on ultrasound. The patient was subsequently transferred to Phoenix Children’s Hospital for further evaluation and treatment. On exam, the patient was awake, alert and in no apparent distress with stable vital signs. There was marked decreased air entry on the left side. The abdominal exam revealed tenderness in the left upper quadrant with no rebound tenderness or masses palpated. A repeat abdominal ultrasound revealed a large intrasplenic cyst versus abscess. Pediatric surgery was consulted and performed a laparoscopic drainage of the splenic abscess with a partial splenectomy. Evidence of chronic inflammation in the left upper quadrant was present with adhesions of the spleen to the undersurface of the diaphragm and to the left lobe of the liver with additional adhesions of the colon to the lower portion of the spleen and abdominal wall. A large amount of very cloudy, turbid material was removed from the splenic lesion and was sent for culture. Culture results eventually were positive for Salmonella Javiana. Upon further questioning of the family, there was history of a snake and turtle exposure as a possible Salmonella exposure. Intravenous antibiotics were tailored based on sensitivities and the patient was sent home to complete a 21 day course of intravenous antibiotics.

Discussion: Splenic abscesses are usually encountered in patients with underlying disorders, including infection, emboli, trauma, recent surgery, malignant hematologic conditions and immunosuppression. Bacteria, including streptococci and staphylococci, are commonly the pathologic agents. Less commonly anaerobes, mycobacteria, fungi, and protozoa, are encountered; however, they are seen more commonly in immunosuppressed patients. An extensive pediatric literature search revealed case reports of Salmonella Javiana infection in children and splenic abscesses in pediatric patients; however, this is the first case report of Salmonella Javiana causing a splenic abscess in a pediatric patient. The treatment of choice for splenic abscess is antibiotic therapy and splenectomy, although recently either ultrasound-guided or CT-guided percutaneous drainage procedures have shown to preserve the spleen and be effective.
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Phoenix Children's Hospital / Maricopa Integrated Health System
Pediatrics

DE NOVO INVERTED DUPLICATION 2Q33.3-37.3: A CASE REPORT

Michelle Buenafe MD, Margaret Pearson MD

Introduction: Pure partial duplication of chromosome 2q is rare however, a facial phenotype associated with a 2q33 to 2q37.3 duplication has been described. We present the case of a de-novo inverted duplication of chromosome 2q from 2q33 to 2q37.3 is identified in a newborn female with microcephaly and craniofacial dysmorphism compatible with previously reported cases but markedly different corporal physical findings.

Case Report: A 29 month old female was noted prenatally to have an elevated alpha-feto-protein and abnormal cardiac exam on ultrasound. She was born at 39 ½ weeks gestation with a birth weight of 3200 gm (50%), length of 54.5 cm (>90%), and OFC 34.5 cm (25%). On physical exam she was noted to have multiple anomalies of the head and face including a tiny fontanelle, unruly scalp hair pattern, low anterior hairline, eyebrows extended laterally to hairline, short palpebral fissures, corneal clouding, small low set ears, underdeveloped philtrum, thin lips, micrognathia, and redundant nuchal skin. She also had wide spaced and inverted nipples. On her back she had a large sacral dimple. Markedly abnormal genitalia were noted as she had absent minora and clitoris. Examination of extremities showed ridged palmar creases with proximally placed thumb, fifth finger clinodactyly and camptodactyly, elongated great toes with increased spacing and a leg length discrepancy. Neurologically she demonstrated hypotonia and splaying of toes.

After thorough evaluation the infant was also noted to have left eye cataract requiring corneal transplant and normal hearing screen with OAE. A swallow study showed significant aspiration and GER necessitating placement of a feeding tube and Nissen fundoplication. Upper GI was normal except for reflux. An echocardiogram demonstrated only initial PDA with spontaneous closure, patent foramen ovale with spontaneous closure, and mild hypoplasia of thoracic aorta and proximal descending aorta with normal function. Given the abnormal genitalia, a VCUG was performed and showed bilateral grade 4/5 vesicoureteral reflux. CT brain on day of life one was significant for open sutures with very small anterior fontanelle, normal sized ventricles with prominent cavum septum pellucidum and normal midline structures. A spinal US on day of life four showed thickening of filum terminale but subsequent MRI of brain and spinal cord were normal.

Discussion: Our patient has a facial phenotype strongly associated with chromosome 2q33 to 2q37.3 duplication, but markedly different corporal findings. There is some controversy regarding band specificity for the facial findings due to varying phenotypic findings reported in the literature. In most cases reported, the orientation of the duplicated region was identified with fluorescence in situ hybridisation (FISH) or high resolution chromosomes only. DNA microarray analysis (DMA) is a relatively new and as yet expensive technique that may identify further differences accounting for the varied phenotypic findings and may be useful in our case.
STINGRAY ENVENOMATION OR RED HERRING? ALTERED MENTAL STATUS FROM INTRACRANIAL BLEEDING IN A 8 YEAR OLD MALE WITH HEREDITARY HEMORRHAGIC TELANGIECTASIA

Matthew Clayton DO, Alan Hartsook MD, Robert Macleod DO

Introduction: Hereditary hemorrhagic telangiectasia (HHT, Osler-Weber-Rendu syndrome) is an autosomal dominant disorder manifested by telangiectasias of the skin at characteristic sites, epistaxis, arteriovenous malformations (AVMs), and a positive family history of HHT in a first-degree relative. Spontaneous, recurrent epistaxis is the most common manifestation of HHT, affecting up to 90% of HHT patients by age 21. AVMs can occur in multiple sites, with pulmonary and CNS AVMs being the most significant clinically. An estimated incidence of 5-10% CNS AVMs and 7% cerebral aneurysms occur in HHT patients. Our case report demonstrates how taking a good history and doing a thorough exam was able to prevent serious CNS complications in a previously undiagnosed HHT patient after an acute stingray envenomation.

Case Report: An 8 year old boy was playing in shallow water near Rocky Point, Mexico, when he began screaming and emerged from the water complaining of a stingray “bite” to his left foot. He was brought to the resort first aid station and received wound care, including local lidocaine for pain. Approximately one hour after the envenomation, the patient complained of a headache and difficulty breathing. The parents decided to return to the US, however, an hour into the drive the child became limp and began having a seizure. They quickly returned to the first aid facility, then rushed to a local ED, where he was reportedly “coded” by the medical team, including CPR and administration of cardiac medications. After stabilization, the patient was air evacuated to Phoenix Children’s Hospital, where he was evaluated by the toxicology fellow and found to have an essentially unremarkable physical exam with the exception of slight confusion, a dysconjugate left lateral gaze, and edema surrounding a penetrating wound on the dorsum of his left foot. Plain films of the foot and a head CT were ordered and the patient was transferred to the PICU. Prior to PICU arrival, the head CT was reviewed by the ICU attending, toxicology fellow, and the resident and showed parenchymal hemorrhage in the posterior left parietal lobes associated with a cystic area of approximately 5x5 cm. Neurosurgery was immediately consulted and patient was intubated due to declining mental status and ICH. Parents initially denied any significant patient past medical or family history, however, upon further questioning, it was noted the patient had a past history of recurrent, prolonged episodes of epistaxis and a strong family history of HHT, including patient’s dad and paternal grandfather, was discovered. An MRI/MRA suggested an AVM without evidence of aneurysm. No surgical intervention was deemed necessary after the ICH was noted to be stable on serial head imaging. The patient was kept sedated and intubated for two days and then extubated without complication. He was continued on dexamethasone and AED throughout hospital course and recovered back to baseline over the week. He was discharged on oral steroids and AED, with instructions to follow up with neurosurgery and genetics. It was hypothesized that the acute ICH and AVM rupture may have been due to an acute elevation in BP secondary to the stingray envenomation.

Discussion: The history of stingray envenomation prior to the onset of CNS symptoms in this case provided a formidable red herring for the medical team. Although seizures can occur after a stingray envenomation, the findings on initial physical exam and subsequent CNS imaging caused the medical team to act quickly and effectively in stabilizing the patient upon arrival to the PICU. Thorough history taking and diagnosis of HHT helped provide the family with anticipatory guidance regarding complications of this disease and arrange for follow up medical care. This hopefully will aid future medical management of this patient.
MAROTEAUX-LAMY SYNDROME IN A 2 YEAR OLD BOY WITH MULTIPLE BONY DEFORMITIES

Reyna Cuellar MD, Kirk Aleck MD

Introduction: Maroteaux-Lamy Syndrome, mucopolysaccharidosis type VI (MPS VI), is a lysosomal storage disease estimated to affect only 1100 people worldwide. Mucopolysaccharidoses are a family of disorders in which there is a deficiency of an enzyme that breaks down mucopolysaccharides, also known as glycosaminoglycans (GAGs). MPS VI is an autosomal recessive disorder that results in a deficiency of N-acetylgalactosamine 4-sulfatase (arylsulfatase B). Deficiency of this enzyme leads to the accumulation of dermatan sulfate, a GAG that is an important component of connective tissues in the heart, skin, airway, valves, joints, and bones. Given the breadth of tissues that can be involved, patients can display a wide array of symptoms. In the following case, a toddler presents with kyphosis and wrist abnormalities.

Case Report: A developmentally normal 2 year old boy presented to the Genetics Clinic after referral from an orthopedist for evaluation of severe kyphosis as well as cupping of his distal radial and ulnar epiphyses. He had been noted by his family since birth to have prominent ribs and chest. As an infant he developed a rounded back they initially attributed to his history of frank breech presentation. His past medical history was significant for a positive triple screen for Down syndrome as well as CVS revealing a normal male karyotype. Shortly after birth the patient developed direct hyperbilirubinemia of unknown etiology that self-resolved after an extensive work-up. Liver biopsy to rule out biliary atresia revealed the presence of an unknown storage material, but peroxisomes were normal. Maternal family history was negative for genetic or bony disorders. The patient’s father was adopted. On exam the patient was 10-25th percentile for height, 25th percentile for weight, and 50-90th percentile for head circumference. He was normocephalic, without any coarse facial features or corneal clouding noted. His chest had an increased AP diameter with a mild pectus carinatum. He had a marked thoracolumbar kyphosis with a gibbus deformity in the region. He had prominent wrists bilaterally, slight blunting of the fingertips, and broadened fingernails. Elbow extension was limited by approximately 10 degrees. He also had mild genu valgus deformities. Neuromuscular tone was mildly diminished, particularly in his hands. A skeletal survey revealed flattening and “beaking” of cervical, thoracic, and lumbar vertebrae. Bilateral humeral and femoral epiphyses were mildly dysmorphic, and there was a mild widening of proximal radial and ulnar diaphysis and metaphyses. Ribs were mildly widened. A complete MRI of the spine revealed a kyphotic deformity centered at L1-L2, anterior disc herniation at T5-T6, T7-T8. There was reversal of normal cervical lordosis and stenosis noted at the level of the foramen magnum. Urine mucopolysaccharide analysis revealed an elevation of GAGs and a strong presence of dermatan sulfate. Serum lysosomal studies revealed low arylsulfatase B activity, confirming the diagnosis of MPS VI. The patient had a port placed to begin treatment with Naglazyme (galsulfase), a recombinant form of human N-acetylgalactosamine 4-sulfatase. He was referred to a neurosurgeon and ophthalmologist for further evaluation.

Discussion: Although rare, Maroteaux-Lamy syndrome should be considered in the differential diagnosis of pediatric patients presenting with multiple bony malformations. Prompt diagnosis of MPS VI can lead to early initiation of enzyme replacement therapy that shows promise of improving patient mobility and exercise tolerance.
PROLONGED BLEEDING IN A 10 MONTH OLD MALE FROM HEMOPHILIA

ALAN DAKAK, MD AND TERRY WOOD, MD

Introduction: Hemophilia A is a bleeding disorder caused by a factor deficiency in the coagulation cascade. It is an X-linked recessive, inherited disorder in which one of the proteins needed to form blood clots is missing or reduced. In about 30% of cases, there is no family history of the disorder and the condition is the result of a spontaneous gene mutation. Hemophilia is classified into two types, A and B. The first type is Hemophilia A, which is the most common type, is also known as factor VIII deficiency or classic hemophilia. The second type is Hemophilia B, the far less common type, is also known as factor IX deficiency, or Christmas disease. The incidence of Hemophilia A in the US is one in 5,000 males. All races are equally affected. There are different levels of hemophilia: mild, moderate, and severe. We report a case of a new-onset mild Hemophilia A in a 10 month old male without a family history of a bleeding disorder.

Case Report: A 10 month old previously healthy male presented to his primary physician with 5 days of continuous bleeding from the underside of his tongue. He was admitted to PCH by his pediatrician with a hemoglobin of 5. Prior to admission, patient was seen in two different urgent care clinics due to his profuse bleeding and hemostasis was temporarily achieved using pressure gauze. However, bleeding soon recurred at home after both visits. On arrival, the patient had tachycardia with a heart rate of 195 and had a blood pressure of 103/39 with 100% oxygen saturation. He had pale mucous membranes with moist bright red blood in the mouth with a healing lesion on his frenulum. He had a grade 2/6 vibratory systolic ejection murmur with a hyperactive precordium. There were no areas of bruising. His initial CBC demonstrated a hemoglobin of 5.1, hematocrit of 15.9 with normal platelets of 460,000, and a normal white count. His PT was normal at 10.9 and his PTT was mildly elevated at 53.1. Fibrinogen level was normal. CMP was within normal limits. Coagulation factor studies demonstrated a low factor VIII level of 16% (50-150% is normal limits) and normal factor IX and XI levels. Von Willebrand’s disease was ruled out. He was initially transfused with blood in the ER. Hematology was consulted and recommended treating with IV amicar, an inhibitor of fibrinolysis and recombinant Factor VIII for treatment of his acute bleed. His repeat Factor VIII level was 54. He was diagnosed with mild Hemophilia A and was transferred to the PICU where IV amicar was continued until it was obtained orally. His bleeding stopped about 2 days after admission and he was discharged the third day after admission as he was thought to be stable for discharge home. He completed a total of 4 days of amicar and followed up about one week later in Heme/Onc clinic where he was found not to have any bleeding.

Discussion: A 5 day history of persistent oral bleeding with a hemoglobin level of 5 draws attention to this case. Presentation is variable in hemophilia depending on its severity. In severe hemophilia, most children become symptomatic by age two. About 50% will bleed during circumcision but many will not bleed until after age four. The major manifestations include abnormal bleeding in association with procedures or injury (frequently in the oral cavity) or excessive bruising, hematomas, or hemarthroses with activities considered normal for age. Onset occurs later in those with mild to moderate hemophilia, which may go undetected until adulthood. As many as one-third of patients with mild disease have very few or no bleeding episodes, which occur only with trauma or surgery. Management of mild hemophilia A involves treatment for clinical bleeding only, which is not likely to happen in the absence of direct trauma or other risk factors. However, should such a patient experience head contusions or any trauma that might provoke a serious bleed, he/she will need evaluation in an emergency department and would be a candidate for factor replacement and amicar at that time if bleeding was present. An alternative treatment for mild hemophilia A involves DDAVP therapy. Early diagnosis and treatment may prevent associated complications.
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EPISODIC HYPOGLYCEMIA AND VENTRICULAR TACHYCARDIA IN A NEWBORN: A CASE REPORT

Bharat Dara MD, Kirk Aleck MD

Introduction: Hypoglycemia in the newborn period is a common problem with a wide range of causes including gestational diabetes mellitus, prematurity, and perinatal stress. Comparatively, ventricular tachycardia is an infrequent event in the newborn period with a majority of episodes occurring in the setting of structural congenital heart disease or a prolonged QT interval. The co-occurrence of these symptoms is an extremely rare event and should prompt an evaluation for inherited metabolic diseases, particularly those of fatty acid oxidation or carnitine transport. We report a case in which the diagnosis of Carnitine Acylcarnitine Translocase Deficiency (CACT) was ultimately made in a newborn with episodic hypoglycemia and ventricular tachycardia.

Case Report: On his second day of life a full term new born male experienced an acute episode of hypothermia (93 degrees Celsius) associated with respiratory distress and profound hypoglycemia (12 mg/dL). The patient was urgently intubated and placed on a cardiac monitor which revealed ventricular tachycardia with a heart rate of approximately 300bpm. The patient underwent CPR and treatment of the dysrhythmia with epinephrine and calcium chloride. An echocardiogram was performed which was unremarkable and the hypoglycemia was corrected with a bolus dose of intravenous dextrose. With these interventions the patient temporarily stabilized. However, approximately 2 hours after the initial event occurred there was sudden recurrence in the hypoglycemia and ventricular tachycardia that required further CPR, epinephrine, and glucose. At this time a dopamine drip was started for hypotension, a lidocaine drip was started for the dysrhythmia, and the patient was transferred to the Phoenix Children's Hospital PICU for further evaluation. Immediate evaluation found an elevated ammonia level (141 micromol/L) along with an elevated lactic acid (4.8 mmol/L). There was also evidence of end organ renal damage with an elevated BUN and creatinine. The patient went on to develop seizure activity that was treated with Phenobarbital. With an uncertain diagnosis, the patient was managed in a manner so as to treat several types of inborn errors of metabolism. His diet was completely restricted of protein and fat while providing an ample supply of glucose. He was not started on ammonia scavengers, however a carnitine drip was started. Metabolic diagnostic testing included serum amino acids, urine organic acids, serum carnitine profile, serum acylcarnitine profile, and a mitochondrial DNA mutation analysis. While these tests were pending the patient was slowly weaned off the lidocaine drip onto an oral beta-blocker without any recurrence in his ventricular tachycardia. He was also slowly introduced to dietary protein without an increase in his ammonia levels. He was ultimately discharged home on carnitine and propranolol. The results of the metabolic tests ultimately proved the diagnosis of CACT and an outpatient DNA mutation analysis further established the diagnosis.

Discussion: The fatty acid oxidation and carnitine transport disorders are an extremely rare class of metabolic defects which can present with various nonspecific severe symptoms. Arrhythmias and hypoglycemia can be presenting signs of these disorders and recognition of this may prevent significant morbidity and mortality to newborns.
IMPERFORATE ANUS WITH PERINEAL FISTULA IN A 17 MONTH OLD GIRL PRESENTING AS CHRONIC CONSTIPATION: A CASE REPORT
Adam Eyre MD and Sarah Beaumont MD

Introduction: Imperforate anus is an anorectal abnormality in which the anal orifice has failed to develop in the correct anatomic position, approximately halfway between coccyx and scrotum or introitus. It is usually accompanied by a communicating fistula. Historically, imperforate anus is classified anatomically as a “low” or “high” lesion. Low lesions occur when the rectum has descended through the sphincter complex (made up of puborectalis, levator ani, and external & internal sphincter muscles), whereas high lesions occur when the rectum has not. The spectrum of malformations, in boys, range from an anterior ectopic anus opening somewhere along the median raphe of the perineum (low lesion), to fistulization into the urinary tract (high lesion). In girls, the spectrum extends from an anterior ectopic anus (low lesion) to a rectovaginal fistula or even a cloacal anomaly in which the rectum, vagina, and urethra all empty into a common channel with one cutaneous opening (high lesions). 1 Typically, diagnosis is made early in the neonatal period. However, low lesions with proximal fistulas are not always obvious. Suspicious findings on exam include dimples along buttock fold and the absence of radiating skin creases around the apparent anus. The mere presence of meconium on perineal or perianal area does not rule out imperforate anus, given frequency of associated fistulas.

Case Report: A 17 month old girl presented to the resident clinic for the first time accompanied by her grandmother for a second opinion regarding chronic constipation. At 6 months age, she developed a severe diaper rash and began withholding stool. Mother was instructed at that time to perform rectal stimulation with thermomether to help pass stool. Stooling difficulty persisted along with painful bowel movements. She presented to our clinic at 17 months of age, after almost 12 months of daily rectal stimulation and manual disimpaction. Birth history was significant for 36 week gestation and 9 days hospital stay for feeding/growing. Family history was significant for older brother with rectal fistula, repaired as an infant. On exam, her perianal area appeared normal except for mild anterior placed anus with large perianal skin tag which gave concern for possible rectal prolapse. Rectal vault was dilated with decreased tone and firm stool palpable at depth of 1 cm. Patient was manually disimpacted in clinic, started on aggressive laxatives with Miralax and Mineral Oil, instructed to stop rectal stimulation, and referred to GI. By time of initial GI visit, stools had changed to liquid and then to soft by reducing laxative dosing. However, 3 months later, GI team noted her exam to be quite different than initially: she had a labial adhesion that began to open during exam, which resulted in the anus now appearing much more anterior than previously thought - opening right next to the labial adhesion. Several dimples were also noted along buttock fold. She was therefore referred to pediatric surgery, whereupon she was diagnosed with imperforate anus and perineal fistula at base of the vagina. She underwent repair which included lysis of labial adhesion, fistula-ectomy, mobilization of rectum away from vaginal wall and into sphincter complex, anoplasty, and creation of perineal body. Currently, she is undergoing progressive anal dilatation to keep the repair patent without stricture.

Discussion: Delayed diagnosis of imperforate anus draws attention to this case. The case stresses the importance of closer evaluation/examination of patients with constipation in conjunction with anteriorly displaced anus. In such patients, physicians should always consider the possibility of fistulization, especially when the history has potential red flags.

HEALTH ISSUES AMONG UNINSURED CHILDREN VISITING AN INNER CITY PEDIATRIC EMERGENCY DEPARTMENT (PED) AND PATTERN OF FOLLOW-UP CARE

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Background: A significant percentage of the growing number of uninsured children in the United States are non-citizens. The financial burden of providing health care to them is often debated, yet there is little information about their health, access to care and health needs.

Purpose: To study the demographic and socio-economic characteristics of uninsured children (US and non-US citizens) visiting an inner city PED and to assess their access to care, unmet health care needs, barriers to care and follow-up care

Design/Methods: A cross-sectional study was conducted in October and November 2006; parents of children visiting an inner city PED underwent face-to-face interview regarding their socio-economic status, access to health care, unmet medical needs and barriers to care. A follow-up telephonic interview was conducted within 1 week of the ED visit to assess compliance with follow-up care. Prior to publication, Maricopa Medical Center IRB approval was sought and obtained.

Results: 385 patients [Mean age 4.63 years, 51.9% male] were enrolled prospectively. 297 (77%) children had health insurance and 88 (23%) were uninsured. 38 (43%) uninsured children were non-US citizens. Of those uninsured, 53 (60%) were uninsured for > a year and 35 (40%) had been uninsured part year. Compared with insured children, fewer uninsured children had a regular place for medical care (89% vs. 46%, p < 0.001), a regular PCP (95% vs. 68%, p < 0.001), and regular dental care (46% vs. 26%, p < 0.001). Almost one-third of parents of uninsured children reported a perceived barrier to care (31% vs. 8%, p < 0.001). Uninsured children, who were non-US citizens, were older (mean age 8.9 years vs. 4.9 years, p < 0.001), primarily Spanish speaking (95% vs. 76%, p < 0.02), poorer, with household income less than 100% of the Federal poverty level and had poorer access to care. They also used the PED as their primary source of care more frequently (87% vs. 66%, p <0.03). In a multivariate logistic regression analysis, children with no health insurance, and those children who were non-US citizens were more likely to have poor access to care with odds ratio (95% CI) of 0.19 (0.08-0.42) and 0.39 (0.16-0.96), respectively.

Conclusions: Significant proportions of uninsured children who visit the PED in inner city hospitals, are non-US citizens, do not qualify for public insurance, are poor, and use the PED for their healthcare needs. This is likely to be growing problem in certain regions of the country requiring targeted health policy intervention.
THE EFFECT OF VIDEO OTOSCOPES ON RESIDENT CONFIDENCE OF OTITIS MEDIA DIAGNOSIS

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Purpose: Otitis media is one of the most frequent diagnoses in pediatric practice, but studies have shown that pediatricians are often incorrect in their diagnosis. Despite this fact, further studies have shown that many residency programs do not have a set curriculum for teaching about acute or serous otitis media. An important adjunct to correctly diagnosing otitis media is pneumatic otoscopy, but many pediatricians do not utilize this important tool either. Residency programs are looking for ways to teach and assess otitis diagnostic skills and using video otoscopes may be a beneficial tool. The objective of this study is to assess the improvement of residents’ diagnostic skills with the addition of a video-otoscope. The secondary objective was to assess the prevalence of the use of pneumatic otoscopy during the 3 years of resident training.

Methods: Multiple measures of self-report in the diagnosis of otitis media and usage of pneumatic otoscopy were assessed by anonymous surveys of the continuity clinic residents at a 3-year pediatric residency program. The initial surveys were completed on PGY1, 2, and 3 residents in March 2007 just before a video otoscope was available. Usage of the video otoscope was then demonstrated and implemented. The incoming interns only were surveyed in July 2007. Then the final survey for this study was completed in February of 2008.

Results: Forty residents were surveyed in March 2007; 8 incoming residents in July 2007; and 28 residents in February 2008. Fourteen surveys were not included in the initial data analysis, because the participant did not mark their residency year. At the time of this abstract, there are still seven outstanding surveys that have yet to be returned and analyzed. Overall resident baseline confidence in diagnosing otitis media was 5.44 using a scale of 1 (no confidence) to 7 (very confident). A year later and after introduction of a video otoscope, the overall level of confidence increased to 5.76. Residents’ baseline confidence in diagnosis of acute otitis media improved with residency years from PGY1, 2, to 3, with self-ratings of 4.62, 5.92, and 6.40, respectively. After introducing the video otoscope, the confidence improved in 1st and 3rd years with ratings of 5.00 and 6.56. PGY1 ratings in March 2007 compared to their now PGY2 ratings in February 2008, increased from 4.62 versus 5.55, and PGY2 to their PGY3 ratings, 5.92 versus 6.56, which showed improvement in confidence with advancement through residency. In March 2007, residents reported using pneumatic otoscopy only 26-50% of the time on average and this increased to 51-75% of the time in February 2008.

Conclusions: Using a self-ratings survey, this study found that, residents do improve in their confidence in otitis diagnosis as they progress through residency. In addition, the interns and the PGY3 residents showed improvement versus their predecessors when comparing data before and after the introduction of a video otoscope. Improvement was also shown in the percentage of residents reporting the use of pneumatic otoscopy. These improvements may be related to the availability of the video otoscope to help these residents refine their skills, but further research is needed to help delineate the best way to teach and learn about diagnosing otitis media.
NEUROLEPTIC INDUCED ACUTE DYSTONIA IN A PEDIATRIC PATIENT
Maggie Keane, MD, Madhumita Sinha, MD

Introduction:
Dystonic reactions are adverse extra pyramidal effects that can occur shortly after starting neuroleptic drug therapy. Neuroleptics include typical antipsychotics, such as chlorpromazine, haloperidol, and fluphenazine, as well as newer atypical antipsychotic agents such as Risperidone. Risperidone has recently gained popularity in pediatric population for treatment of attention deficit and hyperactivity disorder (ADHD) with co-morbid disruptive behavior disorder, and treatment-resistant aggression in children with ADHD.

Case Report:
A 3 year old male patient presented to the pediatric emergency department (PED) with new onset seizure-like activity. The patient’s mother described that the child started with intermittent “stiffening” of his arms and legs earlier that morning. The stiffening progressively worsened throughout the day, and the child was eventually unable to walk on his own and had to be carried. She also noted that he was holding his head in a rigid position and developed slurring of speech. Physical exam revealed stable vital signs. Patient was awake and alert. His head was in a fixed and downward position and the patient was noticed to have bilateral involuntary flexion of his lower extremities.

On further questioning, mother revealed that the child had been diagnosed with attention deficit and hyperactivity disorder (ADHD) almost a year ago and only recently had been started on a new medication. She was unable to recollect the name of the new medication, which her child had received only 5 days prior to presentation with current symptoms. After reviewing the history, a presumptive diagnosis of medication induced dystonic reaction was made and patient was administered a single dose of diphenhydramine. Patient demonstrated a quick response with complete resolution of his symptoms. The new medication, which the patient had been prescribed in place of the stimulant, was later found to be Risperdal (Risperidone).

Discussion:
The medical management of ADHD has undergone major changes during the past several years. Antipsychotic medications with or without psycho stimulants are being increasingly used for the treatment of children with co-morbid ADHD. Although antipsychotic medications such as Risperidone have been approved for older children for specific psychiatric disorders, its use in younger children with co-morbid ADHD remains largely off-label. Aman et al. found treatment with Risperidone with or without a combined psycho stimulant to be safe and effective for both disruptive behavior disorders and co morbid ADHD in the pediatric population. In the case presented here, the child exhibited dystonic reactions acutely during initiation of treatment. However considering the very young age of the child, its use as a first line treatment for ADHD as revealed in this case, is puzzling. Indiscriminate prescribing of such medications in very young children with potentially serious adverse effects needs be strongly discouraged. In a recently published case series, three children presented with severe hyperactivity, agitation and irritability, when medication change was made from Risperidone to Methylphenidate. The reason for this reaction may be explained by the fact that methylphenidate and Risperidone have opposite effects on the dopaminergic neurotransmitter system. This effect has been labeled as the “switch reaction” and is rare. In our patient signs of dystonia appeared acutely on starting therapy, which was controlled with administration of an anticholinergic agent. With the increasing number of children being medicated for various mental health conditions, it is a challenging issue for the PED physician to keep up with the various drug treatment regimens and accurately diagnose and treat adverse reactions, which may arise from use of such medications.
HYPOCALCEMIA IN AN 8 YEAR OLD BOY: A CASE REPORT

Theresa LoCoco MD, Jared Berkowitz MD, Dustin Rayhorn MD, and Tala Dajani MD

Introduction: Hypocalcemia is defined as an ionized calcium < 4.5 mg/dL and total calcium < 8.5 mg/dL with normal serum albumin, and may present with symptoms such as muscle cramps, tetany, weakness, cardiac arrhythmias/syncope, paresthesia, laryngospasm and seizure-like activity. The differential diagnosis of hypocalcemia includes hypoparathyroidism (acquired or hereditary), parathyroid hormone resistance (pseudohypoparathyroidism), hypomagnesemia, hyperphosphatemia, vitamin D deficiency/resistance, and medications (including phenobarbital, furosemide, antineoplastic agents and fluoride). We present a case of an 8 year old boy with noteworthy physical features and a one week history of syncopal episodes, prolonged QTc and hypocalcemia.

Case Report: An 8 year old boy presented with multiple episodes of syncope for one week and severe hypocalcemia. Significant history included chronic hypocalcemia and mild developmental delay with difficulties in reading, concentration and comprehension. He was on no medications. Initial exam revealed an obese Caucasian boy in no acute distress. Weight was greater than the 95th percentile and height below the 5th percentile. Multiple subcutaneous nodules were noted in his axilla, chest and posterior knees. Neurological exam was unremarkable. His labs revealed hypocalcemia (ionized Ca 3.3, nl = 4.6-5.17 mg/dL), hyperphosphatemia (10, nl = 3.0-5.4 mg/dL) and a normal albumin. A PTH level (343, nl = 9-59 pg/mL), urinary calcium (< 5 mg/dL), magnesium level (2.1, nl = 1.7-2.3 mg/dL) and total 25-hydroxyvitamin D level (24, nl =15-80 pg/ml) were obtained. EKG revealed prolonged QTc of 488 msec (nl < 440 msec). Head CT was remarkable for extensive basal ganglia and white matter calcifications. The patient was transferred to the PICU for cardiac monitoring and IV calcium supplementation. The patient’s prolonged QTc improved with treatment, and no further syncopal episodes occurred.

Discussion: After review of the patient’s history, exam findings, and laboratory results, the diagnosis of pseudohypoparathyroidism, a condition of parathyroid hormone end-organ resistance known as Albright’s Hereditary Osteodystrophy (AHO), was suspected. AHO is a syndrome characterized by several features including short stature, obesity, round facies, osteoma cutis, brachydactyly and developmental delay. In addition, end-organ resistance to parathyroid hormone leads to hypocalcemia and hyperphosphatemia as well as a subsequently elevated parathyroid hormone level. Further radiographic evaluation of our patient showed brachydactyly and review of old records revealed a previous dermatological diagnosis of osteoma cutis at one year of age. An autosomal dominant condition, AHO is caused by mutations in the GNAS1 gene on chromosome 20q13-11 that encodes for the G-protein component of the adenylate cyclase complex. This complex helps to regulate PTH responsiveness, and a decrease in its activity leads to resistance to PTH. Not only do patients with AHO show defects in PTH G-protein coupled receptors, but other endocrine pathways which use G-protein coupled receptors can be affected, including the gonadal and thyroid axes. The latter of which was affected in our patient (hypothyroidism with TSH of 10.23, nl = 0.52-5.08 mIU/L, and free T4 of 0.46, nl = 0.59 – 1.17 ng/dL). Genetic testing of our patient was positive for the GNAS1 mutation, confirming the rare diagnosis of AHO.
ABCA3 PROTEIN DEFICIENCY IN A FULL TERM MALE WITH RESPIRATORY DISTRESS AND PULMONARY HYPERTENSION: A CASE REPORT

Joy Mead MD, Deborah Tom MD

Introduction: ATP-binding cassette transporter A3 (ABCA3) is in a family of proteins known to transport lipids across lipid bilayer membranes. ABCA3 is localized in lung tissue, specifically the limiting membrane of lamellar bodies of alveolar type II pneumocytes. In neonates with severe and/or fatal lung disease unrelated to other etiologies, studies have described abnormal type II pneumocytes consisting of small, densely packed lamellar bodies, as well as hyperplasia of alveolar macrophages with indications of alveolar proteinosis. These histologic patterns have been described in patients with ABCA3 mutations. Genetic studies of families with histories of severe and fatal neonatal lung disease have demonstrated several mutations in the ABCA3 gene inherited in an autosomal recessive pattern.

Case Report: A full term male infant was born to a 29 year old G2P0 at 38 weeks gestation via cesarean section for breech position and macrosomia. Prenatal labs were significant for GBS+ but were otherwise unremarkable. The pregnancy was complicated by PIH during the latter two months. The mother received antenatal steroids and was past the steroid window. Membranes were ruptured at the time of delivery. APGARs were 9 and 9. Shortly after birth the infant developed tachypnea, retractions, grunting and desaturations, requiring oxygen. The infant was transferred to the NICU, placed on CPAP at age 3 hours and a sepsis work-up was initiated. His CXR was unremarkable. The infant continued to demonstrate respiratory distress and was placed on conventional ventilation. An echocardiogram revealed PPHN with pulmonary pressures ¾ systemic. Inhaled nitric oxide (iNO) was initiated, with improvement in his pulmonary pressures. He was placed on high frequency ventilation by DOL 2 for hypoxemia. On DOL 6 he was placed on VV ECMO for persistent hypoxemia, and on DOL 8, VA ECMO for hypoxemia and hypotension. His pulmonary pressures initially improved but became suprasystemic later in his course, again requiring iNO. He received surfactant without improvement. He was unable to wean from ECMO and was considered for lung transplant. Genetic screens for ABCA3 mutations and BAL specimens for surfactant protein B deficiency were obtained. On DOL 24, he developed a severe left intraparenchymal cerebral hemorrhage incompatible with life, and care was withdrawn. His genetic screen returned positive for a compound heterozygous mutation in the ABCA3 gene, resulting in a valine substitution for glutamine in codon 292 and a leucine substitution for proline in codon 933. Results of his parent’s genetic tests revealed that his father is heterozygous for E292V and his mother is heterozygous for P933L. They received genetic counseling.

Discussion: Full term infants infrequently develop respiratory distress in the newborn period from primary pulmonary causes. In this particular case, the infant initially responded to iNO therapy in regard to his pulmonary pressures, but had worsening respiratory distress and hypoxemia despite aggressive interventions. Ultimately his pulmonary pressures became suprasystemic. His unusual course prompted further investigation into genetic causes of his respiratory disease, resulting in the discovery of his ABCA3 mutations. Although the specific function of ABCA3 is unknown, it is suspected to be important in surfactant processing. There are descriptions of older children with atypical chronic lung disease who have ABCA3 mutations, suggesting a spectrum of severity based on the specific mutations identified. Further investigations of ABCA3 function are underway.
URACHAL CYST ABSCESS: CASE REPORT

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Introduction: In early fetal life, the allantois connects the urogenital sinus with the umbilicus. Normally, the allantois is obliterated during development and is replaced by a fibrous cord known as the urachus or median umbilical ligament. Failure of fibrous closure of the allantois results in a variety of urachal remnants. Urachal cyst is incomplete closure of the allantois with fluid-filled cyst between the umbilicus and bladder. In North America the incidence is 1.7%. Most cases of urachal cyst are asymptomatic; they are frequently detected after complication by infection. We report a case with Urachal cyst abscess.

Case Report: A 17 year old male with known medical history of Spina bifida, neurogenic bladder and bilateral hydrocephalus with VP shunts in place brought in by mom with chief complaint of tactile fever, decreased appetite and increased sleepiness. On arrival to Maricopa PICU, patient was not oriented to time and place and confused. Neurologic exam was persistent with his baseline tone and posture. Patient had benign abdomen exam. CT scan of head and shunt series were performed for suspicion of shunt failure. Neurosurgery consult was called and tapped the shunt twice which was not consistent with shunt malfunction. Secondary to recent history of urinary tract infection CT scans of abdomen and pelvis with oral and intravenous contrast was performed. CT scan demonstrated a large fluid accumulation above the bladder extending to the level of the umbilicus. The tip of the ventriculo peritoneal shunt was not related to the fluid accumulation. Blood, urine and CSF cultures are performed. Interventional radiology placed the drain in the cyst which drained purulent discharge about 150 ml per day. The drain was left in until the cyst reduced in size. As there was bactremia triple antibiotics were give intravenously. Patient was then taken to elective excision of the remnants.

Discussion: Urachal anomalies are often recognized in children but they may persist into adulthood and cause considerable morbidity. Although the course of the urachus is extraperitoneal, the possible development of intraperitoneal complications has also been reported; episodes of abdominal obstruction related to localized inflammatory episodes have been reported. At the present time, treatment is initiated with intravenous antibiotics followed by complete excision of the umbilicovesical tract including a cuff of bladder. For lesions not communicating with the bladder, conservative excision of the remnant cyst is adequate. Traditionally excision of the urachus starts at the umbilicus and extends down to the bladder through an extraperitoneal approach. More recently laparoscopic excision of the urachal remnant has been proposed to be as effective and as safe as the open operation with the additional advantages of decreased hospital stay. However, the high recurrence rate and the possibility of degeneration to carcinoma development in the urachal remnant make surgery the recommended definitive treatment.
Abstract
Phoenix Children's Hospital / Maricopa Integrated Health System
Pediatrics

RECURRENT ESOPHAGEAL STRICTURE IN A CHILD WITH RECESSIVE DYSTROPHIC EPIDERMOLYSIS BULLOSA: A CASE REPORT

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Introduction: Epidermolysis bullosa is a rare group of inherited disorders characterized by severe blistering of the skin, occurring either spontaneously or with minor trauma. There are four major types of epidermolysis bullosa, however several subtypes exist with symptoms ranging from minor blistering of the skin to multiorgan involvement. Common symptoms include blistering around the eyes and nose, lesions in the mouth and throat, alopecia, and dental abnormalities. Skin lesions are usually present at birth or shortly thereafter, and occur as a result of minor trauma or fluctuations in temperature. Complications include digit and joint deformity, infection, anemia, eye disorders and even death. Recessive dystrophic epidermolysis bullosa (RDEB) is a rare subtype that is associated with significant esophageal involvement. Recurrent mucosal blister formation leads to extensive scarring and eventually esophageal stricture formation. Feeding difficulties make nutrition very challenging, and severe malnutrition and failure to thrive often ensue.

Case Report: A 10 year old female with a history of epidermolysis bullosa diagnosed in infancy presented to her primary care physician with blistering lesions on her tongue and oral mucosa. On further history, the patient revealed that she had been having significant weight loss and anorexia. She complained of painful and difficult swallowing, initially with solids and progressing to include liquids. She reported food getting “stuck in the throat”, with associated chest pain and frequent choking episodes during meals. On vital signs, the physician noted that the patient was less than 5th percentile for both height and weight. Her pulse was elevated at 160, and she appeared thin and dehydrated. She had multiple fluid filled blisters on her lips, tongue and oral mucosa. She was admitted to the hospital for intravenous rehydration and work up. Laboratory investigation revealed a mild decrease in hemoglobin and an elevation of the erythrocyte sedimentation rate. Liver function tests, leukocyte count and chest radiograph were within normal limits. A gastroenterology consult was sought and nasogastric feeds were initiated to optimize nutrition. Esophagram was performed which revealed an obstructing stricture in the mid esophagus approximately 4 cm in length with irregular contractility and dilation of the proximal segment. The patient subsequently underwent upper endoscopy which confirmed the presence of mucosal involvement with significant bleeding, edema, and severe esophageal stricture. Esophageal balloon dilation was performed. The patient improved quickly in the post operative period. Her dysphagia improved, odynophagia resolved, and within a few days of the procedure she was tolerating both liquids and solids. Although the patient’s nutritional status and quality of life have significantly improved, her follow up course has continued to be challenging. As a result of continued esophageal inflammation and scarring, she has required multiple subsequent endoscopic procedures with balloon dilatation.

Discussion: Recessive dystrophic epidermolysis bullosa is a rare but severe form of the disease. Esophageal stricture as a result of repetitive mucosal trauma and scarring is a serious complication and can lead to growth disturbances, delayed puberty, and nutritional failure. Esophageal balloon dilation shows a clear benefit in alleviation of symptoms, thus improving nutritional status and overall quality of life.
Purpose: Research pertaining to development of chronic lung disease (CLD) or bronchopulmonary dysplasia (BPD) has centered on finding out which inflammatory cytokines are responsible for producing the damage known to occur in the lungs of prematurely born neonates. With the idea that inflammation and elevation of inflammatory cytokines plays a central role in BPD, it can be proposed that there could be changes in the complete blood count early in life that could reflect this inflammatory process. Having an inexpensive and relatively sensitive test to determine which neonates are at higher risk could be helpful in ventilator and medical management of these patients. The purpose of this study was to determine if there was any correlation between complete blood count indices on the day of birth to developing CLD.

Methods: After receiving IRB approval, a retrospective chart review was used to find the study population which was composed of neonates born at Maricopa Medical Center and cared for in the NICU, January to December of 2005. Included in the study were neonates weighing 1250 grams or less which totaled 86 of the newborns that were cared for in the MMC NICU in 2005. Of these neonates, 13 did not survive to 28 days of age and 7 were transferred to other facilities prior to 28 days leaving a total of 66 neonates. From the remaining 66 neonates laboratory data was obtained for this group on the first day of life. Twenty eight day oxygen requirement data was then found on all eligible infants and the information was then evaluated to see if there was a correlation. Prior to publication, Maricopa Medical Center IRB approval was sought and obtained.

Results: In the study group identified above the prevalence of BPD was 74%. Cut-off values were obtained from scatter plot analysis and currently used normative values. In comparing CBC results to 28 day oxygen requirements; a number of different CBC values were used. Multiple cut-off values were used for each CBC value and the most significant results are represented here. Comparing WBC count of 10,000 or above versus 28d O2 requirement there was a sensitivity of 40% and a specificity of 76% , negative predictive value = 30% and a p value= 0.2. When looking at absolute band count greater than 500 sensitivity = 42%, specificity =82%, negative predictive = 33% and p value= 0.08. Using I:T ratio of greater than 0.2 sensitivity = 63%, specificity = 53% and a p value = 0.27. Other cell line counts were analyzed and percent of monocytes sensitivity = 53%, specificity = 58%, with a p value = 0.5.

Discussion: Complete blood count values do not appear to have appropriate predictive value in determining early in life if extremely low birth weight neonates will develop bronchopulmonary dysplasia. While comparing CBC indices it was difficult to come up with appropriate cut-off values as there was significant overlap amongst the patients having BPD. Future considerations could include looking at development of CBC abnormalities over the first week of life or looking at more specific markers of inflammation and their ability to predict chronic lung disease.
MENKES DISEASE PRESENTATION MIMICKING AN ACUTE INFECTIOUS ENCEPHALOPATHY

Jennifer Snell MD and Saunder Bernes MD

Introduction: Menkes disease is an infantile onset neurodegenerative disorder that is usually fatal by three years of age. It is caused by mutations in an x-linked recessive copper-transporting ATPase, ATP7a. Many clinical features are a consequence of impaired copper absorption resulting in dysfunction of copper dependent enzymes. The clinical presentation is highly heterogeneous. Presenting symptoms include seizures, developmental delay, failure to thrive and hypotonia. These patients may also have connective tissue and skeletal abnormalities, and abnormal hair with hypopigmented, kinky or “steel wool” appearance. We report a patient with an ATP7a splice mutation presenting with an acute febrile illness and focal leukoencephalopathy with clinical and subclinical temporal lobe seizures mimicking an infectious process. Neuropathologic, radiologic, metabolic and electroencephalographic studies are described with this unusual disease phenotype.

Case report: The patient was born at term by to a 37 year old G1P0 Caucasian woman. No temperature instability or developmental problems were noted prior to presentation. At 4 months of age he presented to an outside facility with a 2 week history of low grade fevers, poor oral intake decreased activity and increased drooling. In the emergency department he was noted to have a focal seizure. A computerized tomography scan revealed a right parietotemporal abnormality resulting in transfer to a tertiary care center. On physical exam he was afebrile with normal vital signs. He was sleepy but aroused with physical stimulus. Neurological exam was significant for poor tracking and markedly decreased tone and spontaneous movement. He had symmetric 2+ reflexes. There were no pectus abnormalities and his skin was not redundant or lax. Heart, lung and abdominal exams were normal. He had no hair and there were no neurocutaneous lesions or rashes. Routine serum biochemical profile including cbc with differential, platelet count, electrolytes, calcium, glucose, lactic acid, hepatic and renal functions were normal. Brain MRI with contrast revealed an extensive abnormality of the right temporal and parietal lobes with mild mass effect with lack of enhancement. MRI spectroscopy was suggestive of necrosis possibly related to infection or hypoxic damage. Video EEG recorded frequent electroencephalographic seizures alternating between right and left hemispheres. Seizures were prolonged, lasting multiple minutes with repetitive high frequency, high voltage, epileptiform patterns. CSF cytology and evaluation for infectious disorders were normal including HSV PCR. Repeat MRI one week later showed no interval change. PET scan two weeks after presentation indicated a diffuse hypoactive infiltrative process in the right temporal-occipital cortex. Cerebral biopsy revealed cortical gliosis. The diagnosis of Menkes was confirmed with the development of sparse, brittle hair prompting the measurement of low serum copper and cerruloplasmin with subsequent ATPase gene sequencing.

Discussion: Brain MRI abnormalities in Menkes disease include generalized white matter changes reflecting impaired myelination, diffuse atrophy, ventriculomegaly, subdural effusions and cerebrovascular tortuosity. The patient presented with CT/MRI findings of a focal leukoencephalopathy with high frequency subclinical temporal lobe seizures suggesting an infectious or malignant disorder. The common clinical findings of Menkes Disease including abnormal hair, connective-tissue abnormalities and skeletal changes were not present in this patient contributing to a delay in diagnosis.
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Pediatrics  

PRIMARY AMEBIC MENINGOENCEPHALITIS: A SILENT KILLER  
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Introduction: Primary amebic meningoencephalitis (PAM) is a rare and sporadic acute central nervous system infection with very high mortality within a week of inoculation. PAM is predominantly caused by a pathogenic, free-living ameba, Naegleria fowleri. N. fowleri is a ubiquitous thermophilic ameba that grows well in warm fresh water and soil and rarely causes clinical disease. Exposure to N. fowleri is common, as exemplified by the widespread presence of anti-N. fowleri antibodies in the general population.

Case Report: A 6 year old male presented to a community emergency department with a history of acute onset of fevers, headache, emesis, altered level of consciousness, and a seizure. Presenting Glasgow Coma Score (GCS) was 15. A lumbar puncture was performed and he received meningitic doses of Ceftriaxone and Vancomycin. Over the next two hours his mental status rapidly declined, GCS was 9 on arrival to the pediatric intensive care unit (PICU). Examination in the PICU was significant for a lethargic young boy who was confused and intermittently irritable. Vital signs were normal. Cranial nerves II-XII were intact with pupils 3-4 mm bilaterally, reactive, without any papilledema. He had meningismus, but no focal neurologic deficits. Skin exam was significant for peeling sunburn on his face and bilateral upper extremities. Shortly after admission, he had a brief non-focal seizure. Two hours after admission to the PICU, GCS declined to 7 and he was intubated. At that time viral and amoebic sources for meningitis were suspected and Acyclovir and Amphotericin B were administered. Laboratory results were significant for a WBC count of 23,600 with neutrophilic predominance (88.4%). Non-traumatic lumbar puncture was significant for turbid CSF with a WBC count of 2,130/ml (85% neutrophils), glucose 32 mg/dl (serum glucose 168 mg/dl), protein 350 mg/ml, and no organisms reported on gram stain. His head CT was negative for hemorrhage, mass, or acute intracranial abnormality. Further history revealed that he had been swimming at Lake Pleasant, one week prior to onset of symptoms. With a confirmed negative gram stain, in addition to recent exposure to man-made lake water, a wet mount of CSF was performed which demonstrated mobile, single-celled organisms with flagella, confirming the diagnosis of PAM.

Despite early suspicion and aggressive treatment, patient expired sixteen hours after initial presentation due to malignant cerebral edema and herniation of the brain.

Discussion: PAM presents similarly to acute bacterial meningitis, but the diagnosis is often missed due to its infrequent occurrence and inappropriate laboratory examination of the CSF. The risk of contracting Naegleria is estimated at 1 in 100 million exposures. PAM is almost uniformly fatal, with only 10 survivors currently reported in medical literature. Diagnosis should be suspected in any child or young adult presenting with rapidly progressive meningitis-like symptoms after exposure to bodies of fresh free-standing water. Prompt intravenous and intrathecal treatment with Amphotericin B in conjunction with intravenous miconazole, rifampin, and doxycycline is warranted when history as well as clinical picture is suspicious for PAM, primarily in the setting of severe meningitis with a CSF gram stain with no organisms. Unfortunately, even with prompt initiation of appropriate medical therapy, PAM is usually fatal. Our case represents the sixth reported case in Arizona over the past several years illustrating the need for increased awareness of N. fowleri as an atypical cause of meningitis. Prevention strategies for limiting exposure include avoidance of swimming in lakes epidemiologically associated with this disease especially during times of high temperature (>30°C) and low water levels, plugging or blowing out the nose when jumping or diving into warm fresh water, and adequate chlorination of swimming pools. Parental education regarding exposure and early recognition in high risk areas is crucial to prevent PAM.
PREGNANCY AND CERVICAL CANCER IN AN ADOLESCENT PATIENT: A CASE REPORT

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Introduction: Cervical cancer is the second most common cause of cancer-related morbidity and mortality among women in the developing world, with approximately 370,000 new cases each year and a mortality rate of 50 percent. In the United States, there are over 11,000 new cases and 3,600 deaths annually. The incidence of invasive cervical cancer is related to age. During the period 2000-2004, the US incidence of cervical cancer in women under the age of 20 was 0.1/100,000/year compared to an overall incidence of 8.7/100,000. Cervical cancer in pregnancy creates multiple diagnostic and management problems. We present a case of cervical cancer during pregnancy, illustrating the difficulties in management and potential pitfalls of less vigorous screening of adolescents.

Case Report: This patient, an 18-year-old Hispanic gravida 2 para 1001, was approximately 7 weeks gestational age at the time of her new obstetric screening cytology. Patient’s gynecologic history was unremarkable with age of menarche being 10 years old. The patient delivered her first child almost a year prior and reported having normal screening cytology in the preceding 2 years. She admitted to being treated for Chlamydia two years prior, but denied any history of pelvic inflammatory disease or previous treatment for HPV lesions or other lower genital tract lesions. Cytology was sent with a reflex HPV and was significant for high-grade squamous intraepithelial lesion (HGSIL). Colposcopy was performed at 16 weeks gestation and was significant for minimal cervical changes consistent with CIN II. A biopsy was taken and pathology returned with diagnosis of CIN III with the possibility of invasion not excluded. Because the patient was pregnant, she was referred to a provider with expertise in cervical pathology. She was seen at 20 weeks gestation, where a follow-up colposcopy was not done due to an obvious tumor revealed by a speculum exam. A biopsy was taken of the friable cervical tissue and found to be invasive squamous cell carcinoma (SCC). A gynecological oncologist was consulted immediately, and on bimanual examination noted a cervical mass of 5-cm in the anterior-posterior dimension and 4-cm in the transverse dimension. The exophytic tumor was noted to replace the central 2/3rds of the cervix consistent with a 3-cm visible lesion. The parametrial tissue showed no evidence of involvement and tissue samples sent confirmed previous diagnosis. An abdominal MRI scan was performed, and, significant for a 2-cm cervical mass, no pelvic or para-aortic lymphadenopathy was noted. The patient was initially counseled regarding her disease and treatment modalities at 20 weeks. She strongly wished to defer treatment of her clinical stage-IB1 invasive SCC until fetal viability could be achieved. The patient was admitted at 35 weeks gestation to undergo a classical cesarean section followed by a type III radical hysterectomy with pelvic node dissection. Due to the patient’s age, ovarian conservation surgery was performed. The post-operative pathology was significant for an infiltrating poorly differentiated squamous cell carcinoma with invasion of 1-cm and a surgical margin of 0.3-cm. The tumor measured 2.5 x 2 x 1.5-cm. Pelvic lymph nodes were negative.

Discussion: Multiple physicians were utilized in this case to ensure that this patient received optimum care. This young patient confronted issues of future fertility and survival from cancer. During a colposcopy, any lesions that look suspicious should be biopsied. Once a diagnosis of cancer is made, a treatment plan should be offered to the patient using expert opinion and statistics to help the patient make the difficult decisions specific to her case.
THE RELATIONSHIP BETWEEN MODE OF VENTILATION AND DEVELOPMENT OF PERIVENTRICULAR LEUKOMALACIA IN THE NEWBORN: A COHORT STUDY

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**Purpose:** Periventricular Leukomalacia (PVL) is an important cause of neurologic impairment in preterm infants. Previous studies have suggested multiple risk factors for this condition, but few have examined the length and type of respiratory treatment postnatally on PVL development. The purpose of this study was to examine the significance of different modes of respiratory therapy (CPAP, conventional ventilation, and jet ventilation) that affect the risk of PVL using a retrospective case control study.

**Methods:** Arizona birth certificates from 1994 to 1998 (372,276 births) were linked to a database created by the Newborn Intensive Care Program (19,890 infants) using a deterministic matching process (98.39% match rate). Neonates (24-32 weeks) were matched by birth year and gestational age on 1:4 bases of cases to control. From the matched population, we identified 54 cases of PVL that were compared to 223 controls. The relationship between respiratory therapy and PVL was determined using multivariate logistic regression to control for potential confounding variables.

**Results:** Conventional therapies compared to no therapy showed no statistical difference in PVL development. There was a significantly increased risk of PVL associate with jet ventilation (OR=2.26, 95% CI 1.05-4.86). After adjusting for confounding variables, this effect remained significant (OR=2.55, 95% CI 1.16-5.62).

**Conclusion:** In this analysis, jet ventilation was a significant risk factor for the development of PVL in the newborn. Premature infants receiving jet ventilation had a twofold of developing PVL. Mode of respiratory treatment in newborn infants needs to be considered carefully.
PERINEUM AND GENITAL HIATUS LENGTH AND RISK OF PERINEAL LACERATIONS IN HISPANIC PRIMIPARAS

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Purpose: The purpose of this study is to determine whether an association exists between perineal length, genital hiatus length, and clinically significant obstetric lacerations in Hispanic primiparas. Furthermore, this study will establish demographic norms for perineal length in Hispanics. Previous studies have demonstrated that a perineal length of less than or equal to 2.5 cm had a significantly higher chance of a 3rd or 4th degree laceration. The data also show differences in perineal length between different ethnic/racial groups, although Hispanics only comprised a minimal proportion of those study populations. Understanding perineal and genital hiatus length as a predictor for lacerations may help prevent sequelae of significant laceration, including, but not limited to, fecal incontinence and pelvic floor disorders.

Methods: Pregnant primiparas self-identifying as Hispanic, aged 18 years or older, and presenting to Maricopa Medical Center at term for labor and delivery, were eligible. Excluded were those with malpresentation, prior vaginal surgery, who delivered operatively, via cesarean, or who had an episiotomy. After admission and prior to reaching complete dilation, participants were informed about the study and consent obtained. The perineum and genital hiatus of patients were then measured to the nearest mm using disposable plastic measuring devices. At time of delivery, a trained certified obstetrics gynecology intern delivered the patient. Information regarding duration of Stage II, neonatal head circumference, neonatal weight, anesthesia, and laceration type was collected. Lacerations were classified into standard categories, with Grade 1 being minor superficial lacerations, through to Grade 4 being through the rectal mucosa. Severe lacerations were those grade 3 or higher; significant lacerations grades 2 or higher. The data were analyzed using logistic regression.

Results: Of a total of 47 patients enrolled, 29 met all inclusion criteria for the study. Of these 29 women, 26 had documented lacerations. The average perineal length of our patients was 3.8 ± 1.1 cm. 13.7% of patients had severe lacerations and 55.1% had significant lacerations. Average perineal lengths for severe and non-severe lacerations were 33.8 ± 5.9 cm and 38.8 ± 11.1 cm (p=ns); significant versus non-significant, 34.1 ± 6.6 cm and 42.9 ± 12.8 cm (p=.04). No relationship between severe lacerations and perineal length was demonstrated with logistic regression. However, logistic regression demonstrated that decreased perineum length was associated with significant lacerations, odds ratio 0.89 (95% CI .80, 1.00) (p<0.05).

Conclusion: This pilot study demonstrates that longer perineal length may be protective against significant lacerations, which are those that require suturing. Hispanic women also appear to have similar perineal lengths to non-Hispanic populations.
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**FROSTBITE OF THE FEET OF A 16 YEAR-OLD MALE IN ARIZONA: A CASE REPORT**
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**Introduction:** Frostbite is an unfortunate and preventable injury affecting both novice and experienced outdoor enthusiasts alike. Morbidity can be severe but mortality is rare. Tissue damage occurs during the process of both freezing and thawing. With exposure to the cold, blood vessels constrict, capillaries become damaged and cellular membrane permeability is altered. Cells become dehydrated, and proteins denature causing cellular function and DNA synthesis to cease. Destructive ice crystals expand destroying tissue as they form. When tissue thaws, cells swell, free radicals and prostaglandins are released, platelets and erythrocytes aggregate and thrombose causing ischemia, edema, bleb formation and necrosis. The extent of tissue damage is inversely related to the time spent freezing and/or thawing. Refreezing causes considerable more tissue destruction and must be avoided. Frostbite is graded into one of four categories based on clinical findings. Grade I frostbite shows erythema, hard waxy-appearing plaques and sensory deficits. Grade II reveals blisters full of clear to milky fluid high in thromboxane that develop within 24 hours. Grade III blisters fill with blood and become black eschars. Grade IV results in injury to deep tissues including muscle, tendon and bone. Treatment begins with a rapid and thorough evaluation for other serious comorbid conditions such as hypothermia and dehydration. Frostbite treatment consists of rapid rewarming with water maintained between 40-42ºC. Protect the affected areas from pressure or friction with soft, dry dressings and elevation when possible. Medications include large doses of scheduled NSAIDs for inflammation. Adequate pain control will require high doses of opiates; morphine is the drug of choice. Prophylactic penicillin G given IV every six hours and a tetanus booster are also indicated. Prompt surgical consult for blister debridement or compartment syndrome may be necessary but delay amputation as long as possible. Transfer the patient to a burn unit when injuries are extensive or severe. We report a case of Grade I frostbite of the feet of a young man in Arizona.

**Case Report:** A 16 year-old male arrived via helicopter from a nearby mountain range where he was camping and hiking for two weeks. During his adventures his boots and his sleeping bag had become cold and wet. The evening before his evacuation the boy reported two days of pain and swelling in his feet to his youth leaders. The patient was taken to shelter, dried and there they started re-warming his feet using hot water bottles. Upon arrival at our hospital the patient complained of numbness and tingling in his feet with severe pain. The patient's vital signs were stable with core body temperature of 96.9ºF. Physical exam was unremarkable except for bright red, strikingly swollen feet with splaying of the toes, and exquisite tenderness. No mottling or blisters were noted. The feet were warm with non-pitting edema, which inhibited the range of motion of his toes but not his ankles. Good pulses were present bilaterally. Sensory testing revealed decreased sensation of the medial-plantar surface of the left great toe and metatarsal-phalangeal joint but otherwise intact. X-rays of the feet showed soft tissue swelling but no acute fractures or dislocations. All labs were within normal limits except for an elevated creatine kinase of 3317 IU/L. The patient was hydrated with warm IV fluids and treated with ibuprofen for inflammation and with morphine then hydromorphone for his intense pain. His feet were kept elevated. A wound consult was ordered and the patient was put on IV furosemide for the edema and pregabalin and nortriptyline for the neuropathic pain. After five days the pain and edema had improved sufficiently to discharge the patient home with a wheelchair to follow-up with his family physician.

**Discussion:** Frostbite is rare in the warm and arid climate of Arizona but does occur. Arizona physicians should be aware of how to treat frostbite to minimize the potential morbidity.
DELIBERATE FOREIGN BODY INGESTION IN A 36 YEAR-OLD WOMAN WITH PREVIOUSLY UNDIAGNOSED PSYCHIATRIC DISEASE: A CASE REPORT

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Introduction: Deliberate foreign body ingestion (DFBI) is a behavior that is associated with many psychiatric diagnoses, including psychosis, borderline personality disorder, borderline psychotic behavior, post traumatic stress disorder and narcotic abuse. An estimated 1500 deaths occur yearly due to foreign body ingestion, and up to 30% of those ingestions are deliberate. The behavior often begins in late adolescence and, since rarely lethal, reoccurs frequently unless treatment is started. It is more common in females, with some studies citing a female predominance of up to 90%. The behavior is usually triggered by a perceived sense of rejection or abandonment by the patient. Short term treatment involves possible object removal and close monitoring to prevent further ingestion. Long term treatment consists of diagnosing the underlying psychiatric disorder and instituting appropriate treatment, in addition to beginning behavioral therapy to correct the ingestion behavior. This approach, called dialectal behavioral therapy, targets shame, guilt, self-blame, negative attitude and emotional disregulation, all of which play key roles in DFBI. We report a case in which a patient with extensive history of DFBI presents with acute abdominal pain following ingestion of a wire coat hanger.

Case Report: A 36 year-old female with a significant history of DFBI presented to the ED complaining of abdominal pain. The patient readily admitted to swallowing a 10-inch portion of a metal coat hanger as a suicidal gesture. She was visibly upset with blood present on her clothing. She stated that prior to swallowing the hanger she attempted to abort a pregnancy by shoving the straightened hanger into her vagina, as she was upset about a recent altercation with her significant other. Initial abdominal films showed a wire in the mid-epigastrium in addition to a metal object in the LLQ consistent with an earring. There was no free air present and the patient was hemodynamically stable. She had a negative pregnancy test and a urine drug screen was positive for amphetamines. The patient was found to be under court-ordered treatment from a previous ingestion episode involving a razor blade. Care was coordinated between general surgery, GI, gynecology and anesthesiology to evaluate her under anesthesia. In the OR the patient underwent a vaginal and cervical exploration with no evidence of trauma. EGD followed which revealed two 4-inch pieces of metal wire in her stomach, which were successfully removed. The patient returned to the floor with 1:1 observation with a sitter. On the second hospital day the nursing staff saw the patient swallow a thermometer probe cover while routine vitals were being done. The patient returned to the OR for another EGD, at which time 2 probe covers and another piece of wire hanger were removed. It was later discovered that the patient had another coat hanger in her bag, which she obtained from her room. The patient returned to the floor under strict observation. The following day she reported swallowing several thumbtacks she found in the bathroom, which was confirmed by abdominal imaging. She again returned to the OR for a third EGD to remove the thumbtacks. The patient was again returned to the floor and was closely monitored until transfer to a psychiatric facility was completed.

Discussion: Acute management of DFBI involves a multidisciplinary approach, including primary care, psychiatry, gastroenterology, surgery and supportive staff. It is critical to clear the patient room of all potential offending objects and educate all staff who come in contact with the patient about their behavior. Due to difficulty in diagnosing underlying psychiatric disease during short-lived acute hospital stays, it is important that these patients be transferred to a psychiatric hospital once medically stable in order to obtain accurate diagnoses and to initiate therapy.
PERICARDIAL EFFUSION SECONDARY TO PRIMARY HYPOTHYROIDISM IN A 53 YEAR-OLD FEMALE

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Introduction: Pericardial effusion may occur in patients as a component of almost any pericardial disorder, such as acute pericarditis, or may be seen as an incidental finding in a variety of systemic disorders. Examples include patients with malignancies, recent MI, end stage renal disease, and severe hypothyroidism. The rate of different causes of pericardial effusion varies in published reports, somewhat related to geography and patient demographics. Evaluation of pericardial effusion can be quite extensive and may not yield a direct cause. The clinical setting can provide clues to assist with diagnosis and treatment, however. Massive pericardial effusions are rarely seen in early mild hypothyroidism, but may be found more frequently with myxedema. Cardiac tamponade is the most feared complication of pericardial effusion and must be recognized promptly. We present a case of pericardial effusion with tamponade thought to be caused by primary hypothyroidism.

Case Report: A 53-year-old female came to the ED for mild chest pain with inspiration and increasing shortness of breath over the past four days. Initial vital signs were stable. Her past history was significant for COPD. She had not seen a physician in four years and took no medication. She had a 35 pack-year smoking history. Family history was significant for lung and brain cancer. ED physicians initially suspected influenza. EKG showed a normal sinus rhythm with low voltage. CXR showed no acute process and a new 1cm lung nodule. The patient acutely had oxygen desaturation to 70%, followed by hypotension to 60 mm Hg systolic, which initially responded to IV fluid. Pulmonary embolism was suspected, and CTA of the chest showed a large pericardial effusion. Review of systems was positive for chronic fatigue, subjective fever and chills, 70 lb. unintentional weight loss over one year, and hair loss. Physical exam showed significant periorbital edema, trace ankle edema and a pericardial friction rub best heard at the apex,. Cardiology was consulted immediately due to unstable vital signs and suspected cardiac tamponade. Echocardiography confirmed the large effusion and showed cardiac tamponade. The patient was urgently taken to surgery for a pericardial window and pericardial biopsy. The procedure was performed without difficulty with removal of 250 cc of fluid. Fluid analysis and culture were negative for bacterial or fungal infection, influenza, and malignancy. Pericardial biopsy was negative for any inflammatory process. Anti-double stranded DNA titers returned positive. TSH was significantly elevated at 45. Antithyroglobulin and antithyroid peroxidase antibodies returned significantly elevated as well. Treatment of her hypothyroidism was initiated with levothyroxine. The patient recovered well from the procedure, yet remained quite hypoxic. Interestingly she never appeared in respiratory distress, stating “this is how I always feel.” She went home in stable condition on oxygen, and, most importantly, thyroid replacement medication.

Discussion: The importance of the history and physical exam of a patient and the rarity of pericardial effusion with hypothyroidism call attention to this case. While the initial cause of the effusion was uncertain, malignancy was essentially presumed due to the history of smoking, weight loss, and a new lung nodule. Lab data assisted with the final diagnosis of primary hypothyroidism, yet in retrospect, some of the clinical signs were consistent with this diagnosis. A brief review of the literature shows pericardial effusion due to hypothyroidism is a rare case, usually only seen under extreme circumstances.
CHEST PAIN AND SHORTNESS OF BREATH IN A 31 YEAR-OLD PREGNANT WOMAN 
AT 34 WEEKS GESTATION

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Introduction: When a patient presents with sharp, stabbing chest pain, associated with
dyspnea, diaphoresis, radiation to jaw or arm, we are taught to think of acute coronary
syndrome. The typical patient is older, male, with hypertension, diabetes, hypercholesterolemia, smoking and/or family history of coronary artery disease. Rapid
interventions, based on the timeline of the infarction and ST-segment morphology, include
aspirin, oxygen, morphine, nitrates, beta blockers, ACE inhibitors and possible anticoagulation.
What happens when the patient is a previously healthy, pregnant female? How is the
presentation similar to or different from the norm? Are these interventions safe during
pregnancy? We report a case in which a non-STEMI was diagnosed in a 31 year-old female
during her third trimester of pregnancy.

Case Report: The patient is a 31year-old Hispanic female G5 P4004 at 34 3/7 weeks who
presented with chest pain, shortness of breath and abdominal pain. She was at work on the
day of admission when a coworker found her hidden in a corner with her head down,
hyperventilating and complaining of chest pain. EMS was called and she was brought to
Scottsdale Healthcare – Osborn via ambulance. En route, her blood pressure was 170/110 and
blood glucose was 225. She had positive fetal movements and denied contractions, rupture of
membranes or vaginal bleeding. Review of systems was positive for sharp chest pain for most
of the morning and afternoon, shortness of breath and epigastric pain. She denied headaches,
nausea, vomiting, right upper quadrant pain, and blurry vision. She had prenatal care in
Phoenix and Mexico, but records were unobtainable. Past medical history was negative. Upon
examining the patient, her blood pressure was 175/111, pulse 84, fetal heart tones 140s-150s
with moderate variability and positive accelerations, no decelerations and contractions were
recorded externally every 4-6 minutes. She was diaphoretic and quite distressed. Heart, lung
and abdominal exams were normal; sterile vaginal exam showed her cervix at 1 cm/ 50%
effacement/ high. An ultrasound placed her at 34 3/7 weeks, consistent with her last menstrual
period. She was given 2L O2, started on magnesium sulfate, an insulin drip and group B strep
prophylaxis while labs and an EKG were obtained. Her urinalysis showed a glucose >2000
mg/dL and protein of 100 mg/dL. Cardiac enzymes were: CK 46, CK-MB 2.5, Troponin-I 0.22.
Her blood glucose was 264 and other labs were unremarkable. Her blood type was A negative
and her urine drug screen negative. An EKG showed normal sinus rhythm, nonspecific T wave
abnormalities and prolonged QT interval. Based on the patient’s symptoms, vital signs, and
EKG abnormalities, perinatology was consulted and requested that the patient be transferred to
Banner Good Samaritan Medical Center as a high risk obstetrical case. Differential diagnoses at
the time included severe preeclampsia, pulmonary embolism, angina and myocardial infarction.
Records from Banner indicate that her Troponin-I rose to 1.37 overnight and the patient was
diagnosed with a non-STEMI. She remained hospitalized for the next four weeks and her blood
pressure was controlled medically. She made an uneventful recovery and a forceps-assisted
vaginal delivery was completed. The infant had APGARs of 9/9 and birth weight was 3360
grams. Mother and baby were discharged to home; mom was on the following medications:
aspirin, lovastatin, and metoprolol.

Discussion: Pregnant females are among the healthiest patients we encounter. However, as
this case illustrated, unusual situations can occur. We must remember that common problems
are common, even when presented in an uncommon situation. Even during pregnancy, patients
who present with typical symptoms of acute coronary syndrome must be worked up for cardiac
causes and symptoms should not be attributed to pregnancy or labor alone.
BILIARY ATRESIA AND AN ELUSIVE HEPATIC MASS IN A 2-MONTH-OLD BOY: A CASE REPORT

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**Introduction:** In contrast to unconjugated hyperbilirubinemia, which can be physiologic in the neonate, conjugated hyperbilirubinemia is always pathologic and prompt differentiation is imperative. Neonatal cholestasis is defined as prolonged conjugated hyperbilirubinemia beyond the first 14 days of life. Extrahepatic biliary atresia accounts for 25 to 30% of cases of neonatal cholestasis. It occurs with a frequency of 1 per 8,000 to 15,000 live births, and is the most common cause of neonatal jaundice for which surgery is indicated.

**Case report:** A 2-month-old African American male infant with unremarkable prenatal and birth history was referred to our hospital by his pediatrician for persistent jaundice and distended abdomen present since birth. The infant has been developing appropriately at around 50th percentile for weight, height and head circumference. Per parental history, the review of systems was unremarkable except for light-colored stools. On admission, the physical exam revealed a well-nourished, playful infant with icteric sclerae and an enlarged firm liver reaching 6 cm below the right subcostal margin without signs of portal hypertension. The initial workup included a CMP that confirmed direct hyperbilirubinemia and elevated liver enzymes with normal serum albumin level, the presence of bilirubin in the urine, a normal CBC and coagulation times, a negative workup for TORCH and hepatic infections, a negative urine amino acid screen and an inconclusive urine organic acid panel. Abdominal ultrasound showed hepatomegaly with a 1 cm hepatic mass, which was later confirmed by CT, and was suspicious for hemangioma vs hepatoblastoma. The consequent measurement of the serum alpha-fetoprotein (AFP) resulted in a highly elevated 99,300 ng/ml level. Meanwhile, the infant was started on phenobarbital prior to the hepatobiliary scintigraphy, which somewhat lowered the bilirubin levels. The scintigraphy was suggestive for biliary atresia with no correctable lesion. Thus the Kasai procedure (hepatoportoenterostomy) with liver biopsy was performed that confirmed extrahepatic biliary atresia, but could not locate the 1 cm mass previously seen on abdominal imaging. A repeat AFP measurement is pending, and the infant is being considered for liver transplantation.

**Discussion:** The majority of cases of conjugated hyperbilirubinemia fit into the differential diagnostic categories of obstruction, infection and genetic/metabolic diseases. In our case, a high serum level of alpha-fetoprotein along with the hepatic mass detected by imaging brought up the possibility of neoplasia, however this was later not confirmed. As AFP is synthesized in the fetal liver in high quantities, with a gradual fall after 12 weeks of gestation, several possible causes of elevated postnatal serum AFP levels have been considered in biliary atresia: (1) Synthesis of AFP by regenerating liver cells after massive necrosis; (2) Disturbance of AFP metabolism due to liver cell damage; (3) Inhibition of normal postnatal disappearance of AFP from the serum. Further follow-up is needed to reveal if postsurgical improvement of biliary flow and the consequent slowing of hepatocellular damage would result in normalization of the serum AFP level, and if AFP could be used as a potential surrogate prognostic marker.
ACUTE AXONAL POLYNEUROPATHY COMBINED WITH ACUTE DISSEMINATED ENCEPHALOMYELITIS: A CASE REPORT
Roberto Bomprezzi, MD and Timothy Vollmer, MD

Introduction: It is well accepted that an autoreactive immune process directed against self-components of the peripheral nervous system following an acute infectious illness is causative of the acute inflammatory polyneuropathies known as Guillain-Barre’ syndromes (GBS). There is sufficient evidence that cross-reactivity between antigens of infectious agents and constituents of self is at the basis of the nerve damage. Similarly, the pathogenic mechanisms of acute disseminated encephalomyelitis (ADEM) have been linked to a self-limited autoreactive process that follows an infectious illness or a vaccination with neural tissue contaminants. Based on the hypothesis of a widespread autoreactive immune response triggered by a microorganism, the simultaneous presentation of GBS and ADEM may seem a likely event that however is not frequently encountered in a clinical setting. Here we present a rare case of a young patient who manifested a severe acute axonal sensory-motor polynueropathy with radiological evidence of multifocal CNS involvement.

Case report: Pt is a 30 yo F who presented with sore throat for which she was given oral antibiotics at an urgent care center. Two weeks later she manifested nausea, vomiting and abdominal pain that motivated a second visit to the urgent care. Pt was prescribed anti-emetics but shortly after, as she complained of chest pain, SOB, palpitations, she was hospitalized at another facility. Within 24 hours of hospital admission, Pt developed anisocoria with non-reactive pupils, left greater than right, followed by rapidly progressive external ophthalmoplegia, flaccid tetraplegia, and respiratory failure requiring ventilator assistance ensued. The CSF testing showed no white cells, protein 59, glucose 58, and the MRI brain, obtained to clarify the issue of the anisocoria, was normal. Pt was diagnosed with GBS and underwent six cycles of plasmapheresis before being transferred to St. Joseph’s hospital. At that time the anisocoria had resolved and the eye movements were possible in all directions with L hypertropia noted in L gaze. Pt remained tetraplegic with no volitional movements in all districts. Impaired sensation perception was noted all over but worse in the lower body with upper level around T8. A second CSF testing demonstrated worsening of the albumin/cytological dissociation with increased intrathecal IgG synthesis, breakage of the blood brain barrier and negative OCB. A comprehensive list for viral and bacterial etiologies was tested by serology and, where available, by PCR, and it was concluded that there were no ongoing active infections. GM1 antibodies were negative. The MRI of the brain was repeated and a few scattered white matter and justacortical lesions were detected, some of them contrast enhancing. In addition multiple areas of signal abnormalities were noted in the thoracic spinal cord, the most prominent at the T2-3 and T5-6 levels contrast enhancing as well. The post-contrast scans also evidenced a marked increased in signal of all the thoracic nerve roots consistent with acute polyradiculoneuropathy. Patient was treated with a course of IV Ig at standard dosing and on hospital day seven she showed a very slow, gradual recovery of motor function.

Discussion: The axonal variants of GBS are rarer than the demyelinating forms, and the occurrence of disseminated involvement of the central nervous system in the same patient is even more a unique event, and very few cases are reported in the literature. This event raises an interesting question on the possible mechanisms underlying the coexistence of the two pathologies, and poses therapeutic difficulties on the use of steroids that are indicated in one and contraindicated in the other condition.
REVERSIBLE LAMOTRIGINE-INDUCED NEUROBEHAVIORAL ACTIVATION IN EPILEPTIC CHILDREN

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Purpose: To describe the clinical features of lamotrigine-induced severe neurobehavioral exacerbation in epileptic children.

Methods: Retrospective review of patients who developed neurobehavioral adverse reactions to lamotrigine. All patients were under the care of the authors at a tertiary, hospital-based practice. Data were obtained from interviews with parents, examination of patients and routine medical records.

Results: There were seven male and two female epileptic patients, having a mean age of 5 years (range 1-11 years). All nine patients became hyperactive, agitated and upset at only low or moderate doses of lamotrigine (1.3 – 14.0 mg/kg/day). Five patients developed both self-abusive and violent behaviors (e.g., attacking other people). Two patients developed severe insomnia. The most affected patient was a mentally retarded, 6-year-old boy whose mood and affect became extremely volatile (i.e., laughing and then crying spontaneously). He also experienced threatening visual and auditory hallucinations, often held his hands and arms in a persistently contracted state, and could not exhibit normal sleep. All nine patients had dramatic improvement and/or resolution of the adverse neurobehavioral effects shortly following discontinuation or a reduction in dose of lamotrigine.

Conclusions: Reversible, severe neurobehavioral exacerbation associated with lamotrigine therapy has not yet been reported in the literature. While idiosyncratic and uncommon, this is a potentially significant, clinical side effect. Further studies are necessary to clarify the population at risk.
Introduction: Opsoclonus is rapid, involuntary, multivectorial (horizontal and vertical), unpredictable, conjugate fast eye movements without intersaccadic intervals. Opsoclonus-myoclonus syndrome is a rare neurological condition which consists of opsoclonus and one of the following: myoclonus, ataxia, tremor, gait abnormalities, or encephalopathy. In children, it is usually a paraneoplastic disorder associated with neuroblastoma. It is less common in adults, usually associated with a paraneoplastic condition associated with other tumors, lung being the most common. Parainfectious opsoclonus-myoclonus syndrome has also been described although less frequently. We report a case of opsoclonus-myoclonus syndrome which was associated with Coxsackie B3 viral infection.

Case Report: A 36-year-old man presented with a one-week history of gait instability. He had had flu-like symptoms approximately one month before symptom onset. He had been river rafting two weeks before flu symptoms began. The flu-like symptoms resolved although he continued to complain of feeling dizzy and lightheaded. He then noted ‘shakiness’ of his head as well as associated blurry and ‘jumpy’ vision. His gait became unsteady, and he had difficulty rising from a chair or standing. He was admitted to a local hospital and was diagnosed with viral cerebellitis. He was treated with intravenous acyclovir and methyl-prednisolone. There was no improvement so he was transferred to the Barrow Neurological Institute at St. Joseph’s Hospital and Medical Center for further management. On admission, opsoclonus, truncal ataxia, postural instability and head titubation were noted. The diagnosis was opsoclonus-myoclonus syndrome. Magnetic resonance imaging of the brain was negative for pleocytosis with lymphocyte predominance, normal protein and glucose. Computed tomography of the chest/abdomen/pelvis was negative for malignancy. He was treated with a five-day course of plasmapheresis followed by a five-day course of intravenous immunoglobulin. Viral studies were positive for Coxsackie B3 virus with a serum titer of 1:320. During hospitalization there was gradual improvement of opsoclonus-myoclonus symptoms. When medically stable he was transferred to an acute inpatient rehabilitation facility. At his three-month follow up visit, he reported that he was back to approximately 95% of his previous status with no significant deficit. He was able to return to work in his prior position as a warehouse supervisor.

Discussion: Parainfectious opsoclonus-myoclonus syndrome is a rare syndrome that has not been noted to be associated with this Coxsackie B3 infection in literature in adults. It is associated with a good outcome. The treatment with corticosteroid as well as plasmapheresis and intravenous immunoglobulin may accelerate recovery in such cases.
SOX2 EXPRESSION IN GLIAL AND NEURONAL NEOPLASMS: IMMUNOHISTOCHEMISTRY AND GENE EXPRESSION ANALYSIS


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Introduction: Glioblastomas are the most common primary CNS tumor in the adult population and carry the most dismal prognosis. These tumors share similar histopathologic features with astrocytomas, oligodendrogliomas and ependymomas, and a possible common stem cell origin. SOX2 is a transcription factor that functions to maintain pluripotency in the stem cell of the developing embryo and is expressed during neurogenesis in the adult human CNS.

Methods: We analyzed 128 gliomas and 47 non-glial primary CNS tumors by immunohistochemistry for expression of SOX2 protein. Non-glial tumors included those with a neuronal phenotype (medulloblastoma, central neurocytoma, pineocytoma, pineoblastoma, esthesioneuroblastoma, supratentorial primitive neuroectodermal tumor) and those lacking the expression of neuronal markers (atypical teratoid rhabdoid tumor, choroid plexus tumors). We also evaluated expression array data for SOX2 in Grade II-IV astrocytomas, Grade II and III oligodendrogliomas and in medulloblastomas.

Results: SOX2 protein expression was found in 95% (122/128) of gliomas, including astrocytomas (WHO grades 1-4), oligodendrogliomas (WHO grades 2, 3), ependymomas (WHO grades 1-3) and oligoastrocytomas (WHO grade 2). Of 47 non-glial primary CNS tumors, 83% (39/47) were nonreactive for SOX2 protein, including 81% (29/36) of tumors with neuronal features. Our analysis of published gene expression microarray data showed strong SOX2 expression in astrocytomas and oligodendrogliomas and decreased expression in medulloblastomas, consistent with our immunohistochemistry results.

Conclusion: Our data show that SOX2 is expressed in the great majority of gliomas but only rarely in most tumors with neuronal features. Our results also suggest a common pathway of lineage for gliomas, paralleling that of neurogenesis. The almost ubiquitous expression of SOX2 in gliomas may provide a target for directed chemotherapeutic treatment.
INTEROBSERVER AGREEMENT IN THE INTERPRETATION OF EEG PATTERNS IN CRITICALLY ILL ADULTS

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Purpose: The significance of rhythmic and periodic EEG patterns in critically ill patients is unclear. A universal terminology is needed to facilitate study of these patterns, and consistent observer agreement should be demonstrated in its use. We evaluated inter- and intraobserver agreement using the standardized terminology (Hirsch et al., 2005) recently proposed by the American Clinical Neurophysiology Society (ACNS).

Methods: Trained electroencephalographers viewed a series of 10-second EEG samples from critically ill adults (Phase I), a set of ≥20-minute EEGs from the same patient cohort (Phase II), and then re-evaluated the first sample set (Phase III). The readers used the proposed terminology to "score" each EEG. For each possible term, interobserver agreement (Phase I and II) and intraobserver agreement (Phase III) were calculated using pairwise kappa (k) values.

Results: Moderate agreement beyond chance was seen for the presence/absence of rhythmic or periodic patterns and for localization of these patterns. Agreement for other terms was slight to fair. Inter- and intraobserver agreement was consistently lower for optional terms than mandatory terms.

Conclusions: Even when standardized terminology is used, the description of rhythmic and periodic EEG patterns varies significantly. Further refinement of the proposed terminology is required to improve inter- and intraobserver agreement.
THE MANY FACES OF SPORADIC CREUTZFELD-JACOB DISEASE: A CASE SERIES

Marie Grill, MD, Eric Hastriter MD, Teddy Wu, MD

Introduction: Creutzfeld-Jacob disease (CJD) is a transmissible spongiform encephalopathy caused by a proteinaceous particle known as a prion. Annual incidence of human prion disease is one per million per year. CJD is known as a rapidly progressive neurodegenerative disorder with manifestations including memory loss, language impairment, behavioral changes, myoclonus, and ataxia. Diagnostic modalities used to make the diagnosis include brain MRI, EEG, detection of 14-3-3 protein in cerebrospinal fluid, brain biopsy, and ultimately autopsy. We present a case series of six patients demonstrating the variation in initial presentation of CJD as well as the multiplicity of adjuvant study results.

Case Study: Six cases of probable CJD were seen in our tertiary referral hospital presenting between 2004 and 2008. Age at presentation ranged between 66 and 85 years of age (median age of 67) and group consisted of two males and four females. Initial symptoms consisted principally of behavioral changes, although several noted balance difficulties. Time from first symptom onset to presentation at hospital ranged from two weeks to ten months. All complained of some manifestation of gait instability at time of presentation, though each had a varying degree of accompanying symptoms including tremors/myoclonus, language impairment, memory difficulties, sensory complaints, visual disturbances, sleep dysfunction, and paranoia. Physical exam findings revealed myriad changes reflective of symptoms though all demonstrated paucity of speech with a lack of spontaneous interaction with their environment. EEG was abnormal in all patients but one, though periodic sharp wave complexes were only seen in four of the six patients (the remainder had diffuse background slowing). Four patients had characteristic FLAIR and diffusion restriction abnormalities on brain MRI. Lumbar puncture revealed normal cell counts in all patients and elevated 14-3-3 protein in five of the six cases. Brain biopsy was performed on two patients and revealed spongiform changes consistent with CJD in both cases. Autopsy was performed in one case and confirmed spongiform encephalopathy. Of note, this latter case was the only case that was negative for the 14-3-3 protein in CSF though post-mortem testing for prion protein proved positive. All patients rapidly deteriorated during hospitalization and were transferred to hospice within several weeks of their diagnosis.

Conclusions: The examined cases showed significant diversity in initial presentation. In addition, this case series of probable/proven CJD reflects the variability in abnormalities observed in adjunctive tests including CSF studies, EEG, and brain MRI. We found some test results evolved as the disease rapidly progressed. For example, in one patient an initial EEG demonstrating only diffuse background slowing was followed by an EEG with periodic sharp wave complexes just several days later. The aforementioned observations underscore the value of understanding both heterogeneity in clinical presentation and variability of adjunctive tests in making the historically challenging diagnosis of CJD.
SURROGATE MICROVASCULAR MARKERS FOR NON-INVASIVE DIAGNOSIS OF GLIOMA RECURRENCE AND POST-TREATMENT RADIATION EFFECT

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Purpose: Initial treatment for most high grade gliomas (HGG) requires surgery followed by chemo- and radiation therapy. Patients must be closely monitored for both tumor regrowth and side effects from treatment itself. Conventional magnetic resonance imaging (MRI) is currently the best method to detect early changes within the treatment bed; however, tumor growth and post-treatment radiation effect (PTRE) can look identical on MRI. Accurate diagnosis to differentiate these entities is crucial to appropriate clinical management since treatment options differ. Currently, this requires surgical biopsy, which is associated with operative risks and morbidity. We hypothesize that an imaging technique called Dynamic Susceptibility Contrast (DSC)-MRI can provide a non-invasive but accurate diagnosis without need for surgery. DSC-MRI quantifies relative cerebral blood volume (rCBV) as a surrogate marker of tissue microvascular density (MVD) [1,2] and can potentially distinguish between high MVD in tumor growth and low MVD in PTRE; however, clinically useful threshold rCBV values currently do not exist. We postulate that a project design which directly compares rCBV values with histopathologic diagnosis of PTRE or tumor recurrence will better define accurate threshold rCBV values.

Methods: Following IRB approval, we have enrolled subjects previously treated (including RT) for WHO grade III or IV HGGs who are undergoing surgical resection of new enhancing MRI lesions. Stereotactic MRI and DSC-MRI (TR/TE/flip angle = 2000/20/60°; FOV 24x24cm, matrix 128x128, 5 mm slices; bolus i.v. Gadolinium-DTPA at 3-5 cc/sec) are obtained on a GE 3T scanner prior to surgery. Preload dose of 0.25 mmol/kg Gd-DTPA corrects for T1W leakage effects [3,4]. During surgery, 3-4 tissue specimens (standardized volume of approximately 0.3-0.4 cm$^3$) are obtained from separate regions of abnormal enhancement in each patient for histopathologic analysis. We document the stereotactic locations of all specimens using the STEALTH® neuronavigation system and co-register all data sets. DSC-MRI regions of interest (ROIs) (standardized area of ~ 0.8 cm$^2$) correspond to specimen stereotactic locations and yield rCBV values [3,4] which are statistically compared to corresponding histopathologic diagnosis.

Results: We have enrolled 10 subjects and documented stereotactic locations of 32 tissue specimens. Histopathology diagnosed PTRE (n=14) or tumor recurrence (n=18). Tumor recurrence rCBV (range = 0.39 to 3.58) was significantly higher than the PTRE group (range = 0.0 to 0.38; $p < 0.001$), establishing a preliminary threshold rCBV value.

Conclusion: These preliminary data support the feasibility of this project design and suggest that rCBV values can differentiate between PTRE and tumor recurrence. The goal of this pilot project is to establish accurate guidelines which will aid future clinical management and serve as vital tools in future large scale, longitudinal studies to assess efficacy of novel therapies and predict long-term clinical outcome.


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"SUBACUTE SCLEROSING PANENCEPHALITIS" – A VIDEOGRAPHIC REPORT OF A RARE CLINICAL ENTITY

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Introduction: Subacute sclerosing panencephalitis (SSPE) is a rare, chronic, progressive encephalitis that affects primarily children and young adults. It is caused by a persistent infection of immune-resistant measles virus or as a result of a mutation in the virus itself. The incidence is reported at 1 in 100,000 in places where measles is still common, especially in Asia and in the Middle East. In the USA, SSPE has become a non-entity (with the exception of presentation in recent immigrants). SSPE is characterized by a history of primary measles infection in the early years, followed by a dormant, asymptomatic period of 6-15 years. Following that, a gradual, progressive neuropsychiatric deterioration manifested as personality change, seizures, myoclonus, ataxia, spasticity, and encephalopathy ensues. A classic pattern of EEG is observed. Usually the disease is fatal, although spontaneous remission has been reported in 5% of the cases. Although no known cure exists at this time, alpha interferons have been used with variable results.

Case Report: A 23-year old female was brought to the emergency room by her parents, with a 4-month history “declining mental functions”, a 1-month history of “difficulty walking normally” and a 2-week history of “arm-jerking”. The patient had no known history of seizures or mental retardation or travel to the United Kingdom or ingestion of beef. There was no family history of neurological disorders. Additional history revealed that patient was born in the Philippines and had not received the Measles, Mumps, Rubella (MMR) vaccine. It was also reported that she had had a severe red rash with very high temperatures (>103 deg F), when she was about 4 years old. On examination, the patient was intermittently following commands. Cranial nerve examination did not reveal any deficits. Motor examination was significant for generalized weakness, greater in lower extremities than in the upper extremities. Spasticity was noted in the lower extremities and toes were up going bilaterally. Myoclonic spasms were noted semi-periodically at about every 5-10 seconds. CSF evaluation was significant only increased protein levels and oligoclonal bands in the CSF; no nucleated cells or 14-3-3 antigen were detected. PCR testing for Herpes Simplex Virus, West Nile Virus, HIV, amongst others, were all negative. Serological testing did not reveal any infection with Coccidiomycosis or Cryptococcus, however detected high titers of Rubeola antibodies in the CSF. MRI revealed multiple, sub-cortical T2 and FLAIR abnormalities, without any obvious enhancement with contrast. EEG revealed semi-periodic high amplitude sharp waves at 5-10 seconds interval. A diagnosis of SSPE was made. Myoclonus was symptomatically treated with clonazepam and leviteracetam. A trial of treatment with inosine pranobex, interferon alpha and ribavirin did not improve the symptoms.

Discussion: SSPE remains a rare clinical entity in the USA, thanks to the MMR vaccine. In a young adult presenting with myoclonic spasms and progressive mental decline, one has to consider SSPE in the differential, especially in the context of extensive immigration, and “activist parents”. Identification of Rubeola antibodies in the CSF remains the gold standard for diagnosis of SSPE. Videography of the characteristic myoclonus, MRI findings, EEG findings will be presented.
EXACERBATION OF STROKE SYMPTOMS BY INFECTION AND METABOLIC PERTURBATIONS—A DIFFUSION WEIGHTED MRI STUDY

Kerry Knievel, DO, Stanley Jones P Iyadurai, MD, PhD, Murray Flaster, MD

Introduction: Stroke is the leading cause of acute-onset, focal neurological deficits in adults. Acute ischemia secondary to a thromboembolic event is the most common cause of stroke in adults. It is extremely important to distinguish new ischemia from exacerbation of prior ischemic deficits. This is crucial in deciding upon initial therapy (i.e. thrombolytics) or further secondary prevention. Conventional teaching has emphasized that acute exacerbations of prior neurological deficits may happen in conjunction with acute microbial infection or metabolic derangement. However, no study has actually demonstrated that acute worsening does not represent new ischemia or that clinical worsening believed to reflect infectious or metabolic perturbation of old neurological deficits is not in fact new ischemia. To date, Diffusion-weighted Magnetic Resonance Imaging (DW-MRI) remains the most sensitive and specific marker for new ischemia and we have set out to establish the usefulness of diffusion restriction and clinical outcome in ambiguous cases involving either new stroke or worsening of old deficits.

Objective: To report the use of Diffusion-weighted Magnetic Resonance Imaging to help distinguish new brain ischemia from acute exacerbation of prior stroke symptoms/deficits, in the face of infection or metabolic abnormalities.

Design/methods: Case Series, Prospective study: collecting a series of consecutive ambiguous clinical cases where timely DWI and adequate clinical prior and subsequent data are both available.

Results: Our initial analysis included patients with history of previous strokes, who presented with acute-onset of worsening of their prior neurological deficits (n = 33), DW-MRI was performed on 27 patients. DW-MRI analysis in most instances (n = 15) did not reveal any new strokes (DW-MRI negative). However, in those patients, infection or metabolic abnormality was concurrently noted. CT angiography was performed in the 6 patients in which MRI DWI was not done and all 6 were negative for acute vessel occlusion. Clinical recovery after medical treatment did correlate with resolution of the neurological worsening.

Conclusions/Relevance: It is commonly believed that systemic infections exacerbate previous stroke symptoms. Our study bolsters such an idea with evidence from DW-MRI. A history of past strokes and a concurrent infection most likely identifies a state were old symptoms are exacerbated by infection rather than a new stroke event. A larger study of this kind may yield predictive features that would help an emergency room physician or stroke neurologist distinguish new ischemia from simple worsening where emergent DWI is not available. More accurate treatment decisions regarding use of tissue plasminogen activator (tPA) versus aspirin versus antimicrobials versus correction of metabolic abnormalities may be possible.
Introduction: CIDP is an acquired inflammatory demyelinating polyneuropathy of peripheral nerves and nerve roots, which is proposed to be of immunological mechanism. Acute Inflammatory Demyelinating Polyneuropathy (Guillain-Barre syndrome) and Chronic Inflammatory Demyelinating Polyneuropathy are thought to be related in this regard. Unfortunately, CIDP is under-recognized due to heterogeneous presentation and consequently under treated. Early diagnosis and treatment are critical in preventing irreversible axonal damage. Time course appears to be a quick way of differentiation CIDP and AIDP. But CIDP is not simply a prolonged version of AIDP. AIDP progresses rapidly and often plateaus within three weeks of commencement, whereas CIDP’s peak exceeds 4 weeks, averaging 3 months. Further, AIDP is monophasic, but CIDP could be, monophasic, relapsing or progressive.

Case Report: A 78 year-old male with borderline diabetes presented with an 8-week history of general weakness, difficulty ambulating and frequent falls. He had a subacute left cerebellar infarct two weeks prior and despite rehab, he had continued to have progressive generalized weakness and falls. He was unable to recall if the progression of muscle weakness was distal to proximal or vice versa. He had trouble getting out of chairs, combing his hair and gripping with his hands. He had a mild bilateral facial weakness. Motor exam consisted of 4/5 strength in bilateral upper extremities through out and -4/5 bilateral proximal muscles of lower extremities and 4/5 in distal muscles. Sensory examination revealed pain and temperature decreased in a stocking more than glove distribution. Additionally, there was noted severe vibration and mild proprioception deficits in the lower extremities bilaterally. Romberg sign was positive. The patient was globally areflexive and had left dysmetria. CSF revealed cytoalbuminological dissociation with protein of 201.6 and WBC of 201. All other lab work up, including infective work up of CSF was negative. The nerve conduction study was suggestive of a demyelinating process with some axonal involvement, but inconclusive. The patient was diagnosed with CIDP and treated with five days of methylprednisolone. The patient’s follow up exams showed continued improvement and he was discharged with instruction for weekly methylprednisolone infusions for two months and mycophenolate mofetil daily.

Discussion: In this case, the recognition of proximal and distal muscle involvement from initial onset, and a time course that did not plateau after 3 weeks, was the key in suspecting CIDP. The fact that the patient had a recent stroke confounded the case, but his motor complaints were not sequelea of the CVA. Along with other confirmatory studies the remarkable response to steroids is classic in CIDP versus no response in AIDP. Some features of CIDP are: symmetrical weakness in both distal and proximal muscles, abnormal reflexes (75% areflexic), elevated CSF protein, multifocal demyelination with or without axonal degeneration, symmetrical sensory signs in 85%, facial weakness (less than AIDP), symptomatic dysautonomia (uncommon), and respiratory support requirement (5%).
PROGRESSIVE PARAPARESIS IN A 71 YEAR-OLD MALE DUE TO SPINAL DURAL ARTERIOVENOUS FISTULA: CASE REPORT
Susan Lee DO, Leslie Freidman MD, Denise Campagnolo MD

Introduction: Spinal Dural Arteriovenous Fistula (SDAVF) is an uncommon entity with an estimated annual incidence of 5-10 individuals per million, per year. SDAVF commonly affects middle-aged men (mean age 55-60) and 90% are located in the thoracic or lumbar region. It is a condition in which a slow flow fistula is formed between a radicular artery and the corresponding radicular vein within the dural root sleeve. The increased pressure from this abnormal connection causes the venous system to arterialize and results in venous hypertension, venous congestion, and decreased tissue perfusion. The net effect may eventually lead to venous infarction. Although the course of this condition is generally slow and progressive, this disease entity must be recognized early in order to prevent permanent spinal cord damage. We report the case of a 71 year old male with progressive paraparesis developing over 8 months, and ultimately found to be a result of SDAVF.

Case Report: A 71-year-old male was transferred to our facility for evaluation and treatment of paraplegia. The patient’s symptoms began 8 months prior to admission when he began to experience mild bilateral lower extremity weakness and what he described as an “achy” pain. The symptoms would occur approximately 10 minutes after the onset of any activity and resolved with rest. He also noted a few episodes of bowel incontinence and increased urinary urgency during this period. He presented to an outside facility after sudden and painful onset of bilateral lower extremity pain that left him paraplegic. He was diagnosed with Transverse Myelitis at the outside facility and treated with 5 days of IV solumedrol. He was discharged to a rehabilitation facility with no significant improvement of his lower extremity leg strength. While in rehab, he began to experience a sharp sensation in his abdomen, in a band-like distribution. He was discharged home after 4 weeks of rehab, but was readmitted to the outside facility 2 months later for increasing pain in a band-like distribution around his abdomen. He was then transferred to our facility for further evaluation. On admission to our facility, the patient had flaccid paralysis of his lower extremities. He also had loss of pinprick, vibration, light touch, and proprioception in a T8 distribution. He had absent patellar and Achilles reflexes bilaterally and his toes were mute. His rectal tone was diminished. An MRI of the thoracic and cervical spine revealed diffusely abnormal T2 signal from C5-T12, suggestive of vasogenic edema. An area of diminished cord signal was noted from T8-10. Additionally, nodular flow voids were identified along the dorsal surface of the spinal cord. A subsequent MRA demonstrated a dilated vascular structure along the right L1-2 neural foramen, consistent with a SDAVF. A conventional spinal angiogram confirmed the presence of a SDAVF at the right L1 level. The patient underwent ligation and resection of his SDAVF without complications. Post-operatively, the patient did not demonstrate any improvement in his lower extremity strength as it was believed that his spinal cord had already suffered infarction at the T8-10 level (as noted by the diminished cord signal on the MRI). He was discharged to a rehabilitation facility 5 days after surgery in stable condition, and without any further progression of his paralysis.

Discussion: SDAVF typically presents as a gradual, progressive course of lower extremity weakness, with step-wise deterioration. Bowel and bladder dysfunction usually occur later in the course of the disease. Deep tendon reflexes are usually increased, but may be absent late in the disease if the spinal cord has undergone infarction. It is important to consider SDAVF in the differential of progressive paraparesis, and to properly diagnose this condition early as it is a potentially reversible condition. Spinal Angiogram is the gold standard for diagnosis and direct visualization of the fistula, and treatment consists of either surgical resection or endovascular embolization.
UTILITY OF CT SCAN CRITERIA FOR IVTPA TREATMENT IN PATIENTS WITH UNKNOWN TIME OF STROKE ONSET

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Objective: To ascertain the utility of basic CTH in determining IVTPA eligibility in patients whose time of stroke onset is unknown.

Background: The 3 hour time window for IVTPA excludes patients who awaken (AW) or are found down (FD) with stroke. We hypothesized that relative normalcy of CTH could reliably establish TPA eligibility in AW and FD patients.

Design/Methods: Between 2001 and 2006 we offered IVTPA to AW and FD patients utilizing CTH eligibility criteria from the TPA guidelines, where early ischemic changes (EIC) do not preclude treatment. Patients consented after being informed that the benefits and risks were uncertain. Statistical methods were Fisher's Exact Test for categorical variables and comparison of means for continuous variables. Patients who died were excluded from calculations of length of stay (LOS), NIHSS change, and discharge NIHSS.

Results: 20 patients were treated: 11 AW, 9 FD. Characteristics were: age 68; males 13; glucose 124; systolic blood pressure 188; admission/discharge NIHSS 10.9/7.65; ER to TPA 77 minutes; hours awakened/found to TPA 2.8; EIC 25%; CTA occlusion 40%; ICH 0; LOS 8.25 days; home 5 (25%), rehab 5 (25%), SNF 6 (30%), death 4 (20%).

Significant differences/trends between AW and FD were: age 63 v 73 (p=.086); male10 v 6 (p=.017); home 5 v 0 (p=.038); death 0 v 4 (p=.026); hours from last seen intact 9.0 v 3.3 (p<.001).

There were no significant differences between AW and FD in ethnicity, risk factors, NIHSS on admission/discharge/change, times to treat, EIC, occlusion on CTA, LOS.

Conclusions/Relevance: Outcomes in this preliminary experience suggest the possibility that CT scan criteria may be safely utilized to ascertain eligibility for IVTPA, moreso for AW patients, whose more favorable outcomes suggest that their strokes may occur near the time of awakening. Confirmation with randomized data will be essential.
TIME TO FIRST INTERICTAL EPILEPTIFORM DISCHARGE IN EXTENDED RECORDING EEGS

Travis Losey MD and Lori Uber-Zak DO

Purpose: The outpatient interictal EEG is commonly performed as a part of the evaluation of patients with a suspected seizure disorder. The presence of interictal epileptiform discharges (IEDs) on an EEG can provide support for the diagnosis of a specific epilepsy syndrome, such as a generalized onset epilepsy, and aid in identifying the seizure focus in localization related epilepsy. Current guidelines recommend that an outpatient EEG be recorded for at least 20 minutes. In clinical practice, the duration of routine, outpatient, interictal EEGs varies widely between institutions, ranging from 15 to 120 minutes. 29-56% of patients with epilepsy will have IEDs on a single outpatient EEG of at least 30 minutes duration. When the routine EEG is repeated, IEDs are seen in 82% of people with a clinical diagnosis of, but the yield of a single extended recording EEG has not been well established.

Methods: We retrospectively reviewed the reports of all outpatient, routine EEGs of greater than 60 minutes duration acquired at Loma Linda University from January 2003 to March 2006 on adults at least 18 years of age. EEGs were acquired using the International 10-20 system on Nicolet digital EEG equipment. All EEGs were obtained to evaluate for evidence of a seizure disorder when uncertainty was present as the patient’s diagnosis. Patients were instructed not to sleep the night before the EEG. One patient was sedated with chloral hydrate for the EEG. Hyperventilation and photic stimulation were performed at the end of the EEG. In studies where IEDs were reported, the tracing was reviewed by a study investigator and the time to the first IED was recorded. Statistical analysis was performed using Excel. Approval from the local Institutional Review Board was obtained prior to the study.

Results: 171 EEGs performed on 156 patients were identified. 60 patients had at least one prior EEG at our institution, of which 10 had definite and 2 had questionable epileptiform abnormalities. 59% of patients were on at least one anti-epileptic drug at the time of the EEG. The duration ranged from 65-384 minutes with a mean of 187 minutes. 89% attained stage II sleep and 40% attained stage III sleep. 26% of the EEGs captured IEDs. Of these, 53% showed IEDs within the first 20 minutes and 47% showed IEDs only after 20 minutes of recording. The mean time to the first IED was 32.8 minutes with a range of 1-216 minutes and a standard deviation of 48.2 min. Results were skewed to the right (skew 2.22) with a median time to the first IED of 10 minutes. In 71% of the abnormal studies the first IED occurred within the first 30 minutes, and 93% within the first 90 minutes of the EEG. In no cases was the first IED seen during hyperventilation or photic stimulation. The mean duration to the first IED in the 20 patients with temporal discharges was 56 minutes while the duration for the 14 patients with generalized discharges was 22 minutes (p=0.053).

Conclusions: Our study demonstrates that interictal, outpatient, extended recording EEGs can capture interictal epileptiform discharges that would be missed on shorter routine interictal EEGs. Of the patients in our population with IEDs, 47% would be missed by a single 20 minute EEG and 29% would be missed even with a 30 minute EEG. A shorter duration to the first IED was seen in patients with generalized discharges in our study, in agreement with prior studies. This suggests that extended recording EEGs may be more helpful when temporal lobe epilepsy is suspected. Weaknesses of our study include the heterogeneous patient population and the fact that activating procedures were performed at the end of the EEG. It is possible that if activating procedures were performed earlier the initial IEDs would have occurred earlier in the EEG. Current guidelines for the duration of routine interictal, outpatient EEGs are not evidence based. Prospective studies incorporating extended recording EEGs including all patients undergoing routine EEGs are needed to define the optimal duration of this procedure. In many patients, an extended recording EEG will capture epileptiform abnormalities that would otherwise be missed by a routine 20 minute EEG.
HEADACHE AND MILESTONE REGRESSION
Allison McClelland, MD

Introduction: Missing or not initiating a timely work-up of concerning clinical findings can lead to a late diagnosis of a treatable condition or effects that are no longer reversible. When persistent or progressive symptoms are present, it is important to do a thorough work-up to rule out serious pathology prior to attributing the symptoms to psychiatric or other non-organic causes.

Case Report: A 7 year old girl presented to the Emergency Department after having an episode of enuresis and period of confusion while at school. Upon questioning, mom reported the girl to have been experiencing headaches for the last two years. Over the previous three months, the headaches had been increasing in frequency and severity and did not respond to acetaminophen. Mom also related that she was having a harder time getting ready for school, beginning to have difficulty in school, and experiencing difficulty with concentration. In the early course of the onset of these symptoms, they were attributed to the stress of losing her father. Later, she was diagnosed with ADHD and hypothyroidism and was started on levothyroxine. During the summer break after onset of symptoms, her mom noticed loss of gross and fine motor skills. When starting the second grade, mom reported her skills to be less than her four-year-old sister. Her pediatrician had referred her to see the neurologist, who she was scheduled to see in four months. By this time, she was having “staring spells” with increasing frequency and duration. She was having occasional loss of bowel and bladder control. When asked, mom reported that she was drinking and urinating more than her four year old sister as well as her peers.

Brain imaging showed a pituitary mass. Ophthalmic examination found her to have intact visual fields, decreased visual acuity, and optic atrophy. She underwent trans-sphenoidal endoscopic resection of mass. She was treated for DI. Pathology revealed the mass to be a craniophyngioma. After removal of the mass, she began to recover motor skills.

Discussion: In this case, the patient’s symptoms were attributed to behavioral and social causes, such as ADHD and the stress of losing her father. Evaluation of other causes that may lead to similar presentation were not done. When the loss of milestones was first noticed, a neurological evaluation needed to be initiated in a timely manner. With a constellation of symptoms (chronic headache, loss of milestones, difficulty in school, change in behavior, “staring spells”, hypothyroidism, secondary eneuresis) were developing, an urgent neurological evaluation and further investigation must pursued.

Indications for neuroimaging in children with headaches include any abnormal neurologic signs, recent school failure, behavioral change, or fall-off their linear growth curve. When the history of the child’s headache reveals that they occur early in the morning, wake the child from sleep, or are increasing in frequency or severity, neuroimaging should be done. Other reasons for neuroimaging would be headaches and seizures coinciding, migraines with preceding vascular symptoms occurring with seizure. Any child with focal neurological signs or symptoms during a headache or a child under 6 years old whose principal complaint is headache requires radiologic evaluation. A cough headache, recent trauma, meningismus, headache worsening with recumbancy, alteration in mental status, or acutely progressive symptoms deserves neuroimaging as well.

An expanded differential and vigilance to early evaluation of concerning signs and symptoms can prevent significant morbidity.
TELL ME WHAT’S WRONG!

Steven Milius, DO

Introduction: Many physicians may find it very difficult to discover the root cause of a ‘difficult child’. Is it a medical problem, is the child trying to get some attention, or is it simply poor parenting? This case uncovers one of the many potential causes of a child who is thought to be a problem, yet ended up having apraxia of speech.

Case: M.J., a 2 year old Caucasian boy, presented with his mother to the Behavior and Development clinic because the maternal grandmother believes that M.J. has autism because he doesn’t talk and he is aggressive with other children. On further questioning, M.J. had little babbling as an infant. He can hardly imitate sounds, using the sound “da” for everything. In order to communicate, he uses gestures and grunting sounds. The remainder of his development appears normal; he can jump up, throw a ball overhead, build a tower of 7 cubes, put on clothing, and imitate strokes with a pencil. He can parallel play, however if there is a toy he wants that another child has, he gets frustrated and will sometimes get aggressive by simply taking it. His birth history, past medical history, and family history is insignificant. Physical exam is completely benign. He interacts with both his mother and the physician during the visit, but as the history states, he communicates with gestures and grunting after getting frustrated when he tried to speak. He obviously does not have autism because he does interact and communicate, but it is clear that he has a communication disorder. After further discussion with his parents about the child’s history, and ruling out other causes of communication disorders, it is thought that M.J. has apraxia of speech, or also known as developmental apraxia of speech.

Discussion: Communication is a multidimensional dynamic process that allows human beings to interact with their environment. Communication involves cerebration, cognition, hearing, speech production, and motor coordination. With communication disorders, one must consider all aspects of the normal communication process. Thoughts are organized by the brain and encoded into a sequence according to learned grammatical and linguistic rules. These rules govern the way sounds are organized (phonology), the meaning of words (semantics), how words are formed (morphology), how words are combined into phrases (syntax), and the use of language in context (pragmatics). Speech involves the coordinated motor activity of muscles involved in respiration, phonation, resonance, and articulation. All of this is modulated by central and peripheral innervation, including cranial nerves V, X, XI, and XII, as well as phrenic and intercostal nerves. Sound waves are transformed by the auditory system into neural input for both the speaker and the listener. Thus the process of communication begins and ends in the brain. Apraxia is a disorder with the capacity to program the positioning of the speech musculature and sequence the movements necessary for speech. The problem is neurologically based with subtle brain impairment or malfunctioning. This likely occurs with left frontal lesions adjacent to the Broca area, however, no one really knows exactly what the brain impairment is or what causes it. There are similar symptoms in patients who have apraxia of speech, which helps to make the diagnosis. With early diagnosis and specific treatments, many children can lead normal lives. The alternative can mean a child experiencing sadness, declining self-esteem leading to depression and pessimism, and eventually lose interest in life with eventual loss of motivation and lack of effort. This should provide physicians the motivation to not give up on a ‘difficult child’, but to be persistent in finding a cause, such as apraxia of speech.
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RECURRENT RESPIRATORY Papillomatosis LEADING TO squamous cell CARCINOMA
Sang Nguyen, DO, Kelly Hughes, DO, and Nicole Anania, DO

Introduction: A papilloma is a benign epithelial tumor that appears wart like. Papillomaviruses are double-stranded DNA viruses that belong to the papillomaviridae family and the human papillomavirus (HPV) is so named because it only infects humans (all papillomaviruses are species specific). There are more than 100 types of HPV and it infects epithelial tissues of the skin and mucous membranes resulting in cutaneous disease, anogenital disease, oral papillomas and respiratory papillomatosis. In fact, papillomas are the most common laryngeal neoplasm in children. Recurrent respiratory papillomatosis (RRP) is a symptomatic condition brought on by recurrent papillomas, which are usually caused by Human Papilloma Virus (HPV) types 6 and 11. This disease is usually diagnosed in childhood and the younger the age at diagnosis, the worse the prognosis. It is believed to be acquired during passage through an infected birth canal. The symptoms are hoarseness, stridor, croupy cough, foreign body sensation, dyspnea, wheezing, and vocal changes. Diagnosis is by direct laryngoscopy. Treatment is repeated laser vaporizations or cold knife resections via laryngoscopy. In severe cases, treatment is needed every 6 weeks to maintain airway patency. Disease can extend into the trachea and lungs. Although recurrent respiratory papillomatosis is generally regarded as a benign condition, there are known cases of malignant transformation.

Case Report: 18 year old female with history RRP presented to the ED with 1 day history of dyspnea, difficulty with inspiration and wheezing. Patient also reported a non-productive cough for the previous 3 weeks, a 14-lb weight loss over the previous 6 months, and a 2-yr history of RUQ pain with a negative abdominal ultrasound previously. ROS was otherwise negative. Patient acquired Human Papilloma Virus at birth and since age 1 year had undergone papilloma resection by her ENT every 8 weeks. A tracheostomy tube was placed at 2 years and was removed 13 months prior to presentation. Complications of her illness included sub-glottic stenosis and she had undergone a tracheal reconstruction in Wyoming. Several months prior to presentation, she had been started on Cidofovir, a cytosine nucleotide analog, normally used to treat CMV retinitis. Initially, the patient was diagnosed with pneumonia and she was treated with Rocephin, Azithromycin, Solumedrol, Albuterol and oxygen. On the third day of hospitalization, she experienced increased respiratory distress requiring transfer to the PICU and Bipap. A CT scan done there showed RLL atelectasis, lytic lesions in her thoracic vertebrae (T5-8), posterior ribs (5-8), right posterior mediastinal mass, mass surrounding the thecal sac, spinal cord displacement, pulmonary papillomatosis, and a mass in the right main bronchus. MRI of the thoracic spine showed a right paraspinal mass. CTH and neck showed a 2.4 cm paraspinal mass. A biopsy showed a well differentiated squamous cell carcinoma. A hematology-oncology and radiation oncology consult were subsequently obtained.

Discussion: Currently, the patient is undergoing chemotherapy and radiation therapy. However, her prognosis is poor because of the extent of disease at presentation and the type of squamous cell carcinoma. Unfortunately, there are no antiviral drugs currently licensed in the United States for treatment of HPV. Acyclovir and Cidofovir have been tried with some success. The most promising therapy we have in medicine currently is the FDA approved quadrivalent recombinant HPV vaccine (Gardasil), which was licensed in 2007. If every eligible female receives this vaccine, we may be able to prevent future generations of children from being born infected with Human Papilloma Virus. The HPV vaccine is recommended for girls 11 and 12 years (or 13 to 26 years of age who did not receive it when they were younger) and is given as a series of three injections over a six-month period. It also may be given at the same time as other vaccines.
HEADACHE AND BLURRY VISION:  
A CASE OF VOGT-KOYANAGI-HARADA SYNDROME

Adel Olshansky MD and Vance M. Julian MD

Introduction: Vogt-Koyanagi-Harada (VKH) syndrome is granulomatous multisystem inflammatory disorder, frequently involving uvea, meninges, inner ear, and skin. Pathogenesis involves aberrant T-cell mediated immune response directed against melanocyte self-antigens. Indocyanine green angiography reveals typical signs of VKH syndrome (exudative retinal detachment and granulomatous preservation of chorocapillaris), however, diagnosis is often made by clinical history and ocular examination. Uveitis, poliosis, vitiligo, dysacusis, and meningitis are typical presenting features. There are 3 categories of disease: complete, incomplete, and probable VKH. To diagnose VKH disease: patients must have no prior history of ocular trauma or surgery, no evidence of another ocular disease based upon clinical or laboratory evidence, and bilateral ocular involvement. Prompt aggressive immunomodulatory therapy is associated with good prognosis. We report a case where VKH syndrome was misdiagnosed as pseudotumor cerebri and mild cerebrospinal fluid pleocytosis remained unaccounted for causing a delay in the diagnosis and initiation of therapy.

Case Report: A 46 year old Hispanic female reported two weeks of progressing daily headaches associated with nausea, photophobia and blurry vision to an optometrist. Dilated eye exam revealed bilateral disc swelling and concern for optic neuritis. Brain MRI with and without contrast showed normal optic nerves. Three days later, an ophthalmologist diagnosed bilateral papilledema and suggested an inpatient neurological evaluation. Worsening headache, nausea, photophobia dominated patient's complaints. Blurry vision persisted. Lumbar puncture yielded negative gram stain and culture, normal protein and glucose, and lymphocyte predominant (95%) pleocytosis (64 WBC, 26 RBC). Head CT without contrast was unremarkable. Physical exam was only notable for papilledema and conjunctival erythema. Cerebral MRV ruled out venous thrombosis. Pseudotumor cerebri was diagnosed, and Acetazolamide therapy was initiated with some improvement in the headache intensity. Two weeks after discharge, patient returned complaining of further deterioration of visual acuity, worsened headaches, nausea, and severe photophobia. Non-contrast head CT was unremarkable. Lumbar puncture was unsuccessful. Headache improved with medical management. In twelve days, patient returned to the emergency department with headache and almost complete vision loss – perceiving shades only. OD <20/800, OS 20/400. Lumbar puncture was done: opening pressure of 17 cm, RBC 890, WBC 500 (85% lymphocytes and 15% macrophages), protein 66, and normal glucose. Head CT was remarkable for the development of new hyperdensities in the posterior globes bilaterally (presumed hemorrhage). Ophthalmologic evaluation in emergency room resulted in diagnosis of uveitis and iritis. Based on CSF cytology, head CT results, and ocular exam, diagnosis of uveo-meningitis, or VKH Syndrome was made. A small area of hypopigmentation was noted on the face. Patient reported decreased hearing bilaterally. Patient was admitted to hospital and started on oral Prednisone 80 mg, steroid eye drops, and Atropine eye drops. Viral meningitis was considered as a possible cause of the lymphocyte-predominant pleocytosis. HSV, Cocci, enterovirus, West Nile virus, VZV, Toxoplasma, Aspergillus serologies were sent and returned negative. After five days of steroid treatment, vision improved significantly. Patient was discharged on Prednisone.

Discussion: In this case, diagnosis of VKH syndrome took almost two months. Multiple retrospective studies reported that early steroid therapy plays major role in the treatment of uveitis and improving vision. VKH syndrome is a rare disorder that can lead to great morbidity if misdiagnosed. VKH syndrome should be included in the differential of aseptic meningitis and vision loss.
WORK UP FOR FAILURE TO THRIVE IN 6 MONTH OLD MALE YIELDS DIAGNOSIS OF TUBEROUS SCLEROSIS COMPLEX

Ann Pickard-Overy D.O.

Introduction: Tuberous sclerosis complex (TSC) is an autosomal dominant condition with a very broad clinical spectrum. The varying age of presentation, severity of symptoms, specific organ system involvement, and family history can make this diagnosis challenging. This case demonstrates an unusual presentation of seizures leading to the diagnosis of TSC.

Case presentation: A 6 month old male previously diagnosed with gastro-esophageal reflux (GER), presents to the emergency department with a 2 week history of increase vomiting and weight loss. Mother reports vomiting that is non-bilious, non-projectile and usually associated with feeds. Mother also states that her child is hard to feed due to 20-30 episodes of hiccups per day lasting 15-60 seconds. She states that he has increased irritability after these periods and is uninterested in feeding. Past medical history is significant for GER and a heart murmur that has not been worked up. A family history is significant for an older brother with ADHD and the mother has a history of “teeth problems”. Initial physical exam was negative other than a soft II/VI systolic murmur LSB which was thought to be an innocent flow murmur. All initial labs where negative, an UGI, MBS, and pH probe ruled out GER and anatomical causes for non-bilious vomiting. On a subsequent evaluation, the patient was observed having an episode of hiccups. The patient made short “hiccup-like” noises and had brief head extensions for about 20 seconds. This episode was followed by irritability and intermittent bilateral upper extremity extensions. Child neurology became involved and an EEG was read as hypsarhythmia, a chaotic pattern of high voltage, multifocal, slow wave epileptic spikes. The patient was diagnosed with infantile spasms based on EEG and clinical presentation. A MRI revealed multiple, calcified subependymal nodules protruding into both lateral ventricles. A closer physical exam revealed 2 small ash leaf macules on the patient’s lower back, which were only visible with a woods lamp. At this time a diagnosis of TSC was now considered the most likely etiology of the infantile spasms. An ECHO showed a small ventricular rhabdomyoma confirming the diagnosis as definite TSC. The patient was treated with ACTH for 8 weeks for the infantile spasms and had a complete resolution of seizure activity. No other interventions were recommended at this time and the patient was discharged home with close follow up. Upon genetic testing, the patient’s brother was diagnosed with probable TSC and his mother was diagnosed with definite TSC. Both family members had only nonspecific symptoms including ADHD, enamel pits, and few ash leaf macules.

Discussion: This case demonstrates that infantile spasms and TSC can be difficult to diagnose. Infantile spasms can be mistaken for GER, hiccups, colic, transient posturing, and other types of seizures. In about 50% of cases of infantile spasms the etiology is TSC. Definite TSC is defined by clinical findings of one primary and two secondary features or one secondary and two tertiary features. The clinic presentations are so variable due to the many systems that can be involved, including skin, brain, eye, kidney, heart, lung, teeth enamel and rarely mucous membranes, bone, liver, and uterus. Prognosis is directly related to the specific features of each individual, with a poor prognosis if patient has seizures in the first year of life.
CASE REPORT OF EVANS SYNDROME IN A 13-YEAR OLD FEMALE
Omar Rodriguez, M.D, and Colan Kennelly, MSIII

Introduction: Evans syndrome is a rare disorder, which involves a combination of autoimmune hemolytic anemia (AIHA) and immune thrombocytopenic purpura (ITP) first described by Robert Evans in 1951. Dr. Evans proposed a common etiology for the two conditions, and his eponymous syndrome describes patients who experience both — either simultaneously or at different times. The disease typically has a chronic course characterized by relapses and reoccurrences, with approximately 60% having recurrent thrombocytopenia and 31% having recurrent anemia. The morbidity of this condition is estimated at 7%. The typical first-line therapy for the syndrome is oral prednisone or intravenous immunoglobulin, both of which are effective in most patients. Alternative therapies include immunosuppressants, rituximab, and splenectomy, although splenectomy typically has a low long-term remission rate. For severe cases, an allogenic stem cell transplant is considered, but carries its own risks.

Case Report: EC is a 13-year female who presented to the clinic with headaches and failure to thrive. She was born in Cuba and immigrated to the United States at age 11. As a child in Cuba she was diagnosed as having epilepsy and malnutrition, but once in the United States Neurologist did not find any evidence of patient having seizures. Patient has not reported any symptoms of seizures since Cuba, although her malnutrition and anorexia was evident in the first visit. Upon presenting to the St. Joseph’s Family Medicine Clinic her height was 59” (10th percentile) and her weight was 68 lbs. (10th percentile). She described chronic fatigue and low appetite and her physical exam was significant for conjunctival pallor. Labs showed a hemoglobin of 11.3 gm/dL and hematocrit of 33.7% with a MCV of 76fL and iron studies confirming microcytic anemia. EC was started on oral iron supplements. Several months later, EC returned to the clinic complaining of fevers, dysuria and flank pain. Labs revealed a urinary tract infection, hemoglobin of 6.8 gm/dL, hematocrit 19.5%, and platelets of 62,000. She was admitted to the hospital, given 2L of packed red blood cells and improved immediately on prednisone therapy. She was diagnosed with Evans Syndrome, and the anemia resolved. She reports resolution of symptoms and improved appetite, and she has gained 15 pounds since therapy was started.

Discussion: Evans syndrome is an uncommon but serious condition, which presents as autoimmune hemolytic anemia and immune thrombocytopenic purpura. It should be considered in all patients with anemia who develop thrombocytopenia before, during, or after the episode of anemia. This case illustrates the importance of considering anemia as a cause of failure to thrive. It also illustrated the severity of Evans Syndrome, but once the diagnosis was made, she made a rapid response to steroid treatment. The median age of presentation was between 5.5-7.7 years. Our patient is slightly older than the “typical” age, but based on her social history it may have been missed earlier in life.
NON-TRAUMATIC BROWN-SEQUARD SYNDROME IN A PREGNANT PATIENT

Arshia Sadreddin, MD, Stanley Iyadurai, PhD, MD, Michael Snyder, MD

Introduction:
Brown-Séquard syndrome is a hemi-cord syndrome and is characterized by ipsilateral hemiplegia, vibration and proprioception loss with contralateral pain and temperature sensation deficits below the level of lesion. While penetrating trauma remains the most common cause, other etiologies such as ischemia, infection, spinal cord processes and disk disease have been invoked. In some cases, no specific etiology is apparent or identified, although ischemic microcirculatory insufficiencies have been suspected (Gottesman et al., 1992). Here we report the case of a pregnant female who presented with Brown-Sequard syndrome, in whom no specific etiology was identified by laboratory and imaging findings.

Case Report:
A 27-year old, 26-week pregnant female (G1P0) with remote history of neck trauma, presented with an 8-hour history of gait instability, right leg numbness and tightness around her chest, following an episode of sudden-onset chest pain that lasted transiently. No urinary incontinence or perianal sensory change was reported. Neurological examination revealed no cranial nerve deficits. Motor examination was significant for left lower extremity weakness at 2/5. Sensory examination showed a T4 sensory level, decreased proprioception on the left lower extremity, and a decreased pain and temperature sensation on the right lower extremity. Increased reflexes, clonus and a positive Babinski’s sign were observed on the left lower extremity. Various laboratory evaluations, including vitamin B12, folate levels, CSF studies were within normal limits, except for a mildly elevated SS-A level. Imaging studies did not reveal any evidence of aortic aneurysms or dissections, thromboses of the deep venous system. MRI of the brain and the spinal cord were within normal limits.

Discussion:
We report a case of acute-onset, non-traumatic Brown-Sequard Syndrome in a previously healthy woman in her second trimester of pregnancy. Laboratory and imaging studies did not reveal any obvious cause, including structural, infectious, or long-lasting ischemic event as identified by MRI. However, we suspect that she may have had an episode of ischemia likely secondary to transient hypercoagulable state due to fluctuating levels of SS-A as has been described in patients with SLE (Khare.et al., 2003). To our knowledge, this is the first report of pregnancy-related Brown-Sequard Syndrome.
RIGHT LOWER TRUNK BRACHIAL PLEXOPATHY IN A 56 YEAR-OLD WOMAN FROM BILATERAL CERVICAL RIBS: A CASE REPORT

Young Min Song MD, Richard Stanley Burns MD, Shafeeq Ladha MD

Introduction: Neurogenic thoracic outlet syndrome (TOS) is a rare condition, occurring with an incidence of one per 1 million. It results in chronic hand wasting and sensory loss. It is caused by a rudimentary cervical rib or elongated C7 transverse process, which compresses the T1 nerve root. Frequently it is misdiagnosed as an ulnar neuropathy, a much more common entity. We report clinical, radiographic, and electrophysiological findings in a middle-aged woman with unilateral wasting of hand.

Case Report: A 56 year old woman developed right hand weakness and numbness over 6 or 7 years. She reported grip weakness as well as numbness of the 4th and 5th digits and medial forearm. Past medical history was significant for chronic human immunodeficiency virus infection for 10 years, hypertension, and hepatitis C infection. She denied any current alcohol, tobacco, or drug use, but did have a history of intravenous drug use in the past. Neurological examination revealed normal mental status and cranial nerve examination. On motor exam, the strength was 5/5 (MRC grading) in upper and lower extremities, except for the right intrinsic hand muscles which were atrophic with 4/5 strength and the right finger extensors which were 4+/5. No fasciculations were evident. On sensory exam, there was panmodal sensory loss over the medial aspect of the hand and distal forearm, on both the palmar and dorsal side. Reflexes were 2+ and symmetric throughout. Gait and coordination were normal. Nerve conduction study showed a low amplitude right median motor response with a normal right ulnar motor response. Motor latencies and velocities were normal. The medial antebrachial cutaneous nerve sensory response was absent on the right and normal on the left. The ulnar antidromic sensory amplitude was slightly low on the right and normal on the left. Needle electromyography revealed enlarged, poorly recruited motor unit potentials with decreased insertional activity in right C8/T1 innervated muscles. The electrophysiologic findings were those of a very chronic, right lower trunk brachial plexopathy. Chest CT revealed bilateral cervical ribs. MRI revealed no abnormality of the brachial plexus or apical lung mass.

Discussion: Neurogenic TOS is a rare condition causing weakness and wasting of the intrinsic hand muscles. It is frequently associated with bony abnormalities of the lower part of the cervical spine. Electrophysiologial study is essential to the diagnosis in order to distinguish the disorder from more common causes of hand wasting. Resection of the cervical rib may halt progression.
FULMINANT PSEUDOTUMOR CEREBRI SECONDARY TO BILATERAL TRANSVERSE / SIGMOID SINUSES INCREASED PRESSURE GRADIENT WITH ATYPICAL PRESENTATION OF ATAXIA AND HYPERREFLEXIA: A CASE REPORT

Mohamed Teleb MD, Michael Synder MD

Introduction: Pseudotumor cerebri, now more correctly referred to as Idiopathic Intracranial Hypertension, is a disorder of raised ICP with no identifiable source. The Modified Dandy criteria are as follows: 1. Signs and symptoms of increased intracranial pressure. 2. No localizing neurologic signs otherwise, with the single exception being unilateral or bilateral VI nerve paresis. 3. Normal CSF with increased pressure. 4. Normal to small symmetric ventricles must be demonstrated. The criteria were modified in 2002 by Freidman and Jacobson by adding a requirement that MRI and MRV showed no thrombosis and that ICP was measured in lateral decubitus position. We present a case of fulminant Idiopathic Intracranial Hypertension in a non-obese female with atypical features.

Case Report: 22 year old white female with no significant past medical history presents after 10 days of neck stiffness, headache for 9 days with nausea and vomiting, 5 days of blurry vision, 4 days of diplopia, 3 days of ataxia, and 1 day of disconjugate gaze. She had a BMI of 28. Her exam revealed bilateral six nerve palsy, left more than right. Visual acuity was also decreased with small peripheral scotomas bilaterally. Pupils were reactive. No meningeal signs were found. She had wide based gait and could not perform tandem gait. In addition she had left hand ataxia. Finally, asymmetric lower extremity hyperreflexia was noted, left more than right, with corresponding left-sided Babinski sign. Evaluation included CT of head, MRI, MRA, and MRV of brain, which were normal. A lumbar tap revealed an opening pressure of 48 cm H2O and close fundoscopic exam revealed bilateral papilledema. CSF studies were all normal. Her headache improved after large volume tap and she was started on Diamox. Neurosurgery was consulted due to the fulminant presentation. Despite having a negative MRV, the retrograde cerebral venography with manometry revealed a high pressure gradient bilaterally between the transverse sinus and the sigmoid sinus. Pressures were 31 in sagittal and bilateral transverse sinuses and only 5 in the sigmoid sinuses. She underwent stent placement in the transverse/sigmoid sinus junction on the right side and her pressures were normalized. Patients symptoms resolved including ataxia, hyperreflexia, abducens palsies, and her visual acuity returned to 20/20 in right eye and 20/30 in left eye. She also had repeat formal visual field tests which were almost back to normal on 1 month follow up and continues to be headache free.

Discussion: Fulminant Idiopathic Intracranial Hypertension is rare and in addition this case has many atypical features. She presented with ataxia and upper motor neuron signs along with the typical headache and vision changes. Patient was not obese and had actually lost weight. MRV showed no stenosis yet retrograde venography with manometry showed a pressure gradient between transverse sinuses and sigmoid sinuses, which was resolved with stenting. Perhaps the technique or user reading the MRV is not sensitive to what is stenosis versus normal narrowing. As for the patient's ataxia and hyperreflexia this could be due to pressure on the posterior fossa as children with increased intracranial pressure do present with ataxia and it is thought to be due to pressure in the posterior fossa.
CONGENITAL HEART DEFECT MASQUERADING AS SEPSIS
Sean White, MD

Introduction: Congenital heart defects in the newborn have varied presentations and, clinically, they can mimic a picture of sepsis. This, coupled with the infrequency with which symptomatic heart defects are seen in the newborn period, (0.8% of live births), can make diagnosis difficult. Timely diagnosis, however, is imperative and a physician’s index of suspicion for a congenital heart defect in newborn presenting with signs & symptoms of sepsis should be high.

Case Report: The patient was the product of a 25 year old, G1P1 pregnancy, delivered vaginally at term without complication. Per mother, the patient was bottle fed and never fed more than 10-15 cc q3 hours, and seemed to be “working hard” to eat. The patient was subsequently discharged after 24 hrs, and followed up with her pediatrician on day of life number 2 with continued complaints of poor feeding. A formula change was made by her pediatrician, however there was little improvement of feeding.

At day of life #6, she presented to a local ED with tachypnea, vomiting, diarrhea, lethargy and poor feeding. The patient was worked up for sepsis. Diagnostics included a CBC, BMP, blood culture, and a lumbar puncture. The staff was unable to obtain a urine sample. The patient was then given a dose of ampicillin and cefotaxime for presumed sepsis, although the white blood cell count was 18.7 and no fever had been reported. Chemistries revealed a serum sodium 155, potassium level of 9.1 (sample not hemolyzed), chloride 116, HCO3 12, bun 78, and creatinine 3.0. An ABG was obtained, pH 7.16, pCO2 41, pO2 <30, HCO3 14.2, and lactate 8.6. The infant was subsequently intubated and, as the facility was not equipped to handle pediatric patients, she was transferred emergently to St. Joseph’s Hospital ICU for further treatment. The transfer diagnosis was listed as suspected sepsis.

Upon arrival to SJHMC, physical exam revealed a pale, lethargic infant with clinical signs of poor perfusion. Expanded diagnostics revealed elevated liver enzymes, creatinine, & bilirubin, thrombocytopenia and prolonged coagulation times. This, coupled with an enlarged cardiac shadow on chest x-ray prompted an echocardiogram. Patient was immediately started on PGE, based on suspicion of ductal dependent systemic flow. It was felt that the end organ damage was secondary to ductal closure and the hypoperfusion that followed. Echocardiogram revealed tricuspid atresia with normally related great vessels, malalignment VSD with subaortic obstruction, discrete coarctation of the thoracic aorta, nonrestrictive atrial septum, nonrestrictive ventricular septum, and a restrictive PDA. The patient was evaluated by the cardiothoracic surgeon and, after resolution of her hypoperfusion injuries, was scheduled for repair.

Discussion: This case illustrates the importance of including congenital heart defects in the list of differential diagnoses in neonates who present with a clinical picture of sepsis. While sepsis can lead to shock and would be an obvious candidate in an infant with tachypnea, vomiting, diarrhea and lethargy, prompt recognition of a cardiac defect initiates a considerably different treatment. This is especially true in an infant with ductal dependent systemic blood flow in the face of ductal closure. Sepsis, when recognized early, typically responds to current antibiotic therapy. Circulatory arrest secondary to hypoperfusion, however, will not.
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REVERSED DIFFERENTIAL CYANOSIS IN THE NEWBORN: A CLINICAL FINDING IN TOTAL ANOMALOUS PULMONARY VENOUS RETURN ABOVE THE DIAPHRAGM

Shook H.Yap MBCh, Nicole Anania DO, Ernerio Alboliras MD, Lawrence D Lilien MD.

Introduction: Two types of differential cyanosis (DC) occur in the newborn. The common type of DC occurs when oxygen saturation in the right hand is greater than in the foot. DC is seen when right to left shunting occurs from pulmonary artery to descending aorta through a patent ductus arteriosus (PDA). The differential for the common type of DC is normal transitional pulmonary hypertension or persistent pulmonary hypertension. The differential also includes interrupted aortic arch and preductal coarctation of the aorta. The second type of DC is reversed differential cyanosis (RDC) and occurs when oxygen saturation is lower in the right hand than in the foot. In pediatric cardiology textbooks, RDC is pathognomonic for transposition of the great vessels (TGV) with PPHN or TGV with left ventricular outflow obstruction. It occurs when oxygenated blood from the pulmonary circulation enters the descending aorta through a PDA.

Case report: A term male infant, 3.0 kgs, born by normal spontaneous vaginal delivery had Apgar scores of 8 and 9. At 24 hours of age, he developed tachypnea and desaturation. A radial arterial blood gas with FiO2 of 0.75 showed pH 7.53, pCO2 25, pO2 46. Because of low pO2, the infant was transferred to a level III NICU where on FiO2 0.60, he had preductal saturation of 80% and postductal saturation of 93%. Cardiovascular examination revealed no murmur, a split second heart sound, and normal pulses in upper and lower extremities. Chest radiograph was normal. The Infant was alert and active. Echocardiography and CT angiography of the chest showed mixed total anomalous pulmonary venous return (TAPVR). The left pulmonary veins entered a left ascending vertical vein. The right superior pulmonary vein entered the superior vena cava (SVC) just above the SVC-right atrial junction. The right middle and lower pulmonary veins emptied into the right atrium. He underwent elective reparative surgery on day 26.

Discussion: The differential of RDC listed in common pediatric cardiology textbooks consists of TGV with aortic arch anomaly (preductal coarctation or interruption of the aortic arch) or TGV with PPHN. We add to this differential a case of RDC with above the diaphragm TAPVR. RDC occurred via pulmonary venous streaming of oxygenated blood into the right ventricle, PDA, and the descending aorta. We also believe that checking a single extremity saturation will have missed this infant’s cardiac pathology. Therefore, as part of a cardiovascular work up to rule out CHD, simultaneous pre and post ductal saturations should be documented. When RDC is present a full cardiac evaluation including an echocardiogram should be done.
The Arizona Medical Education Consortium (AzMEC) is dedicated to collaboration between and among all Accreditation Council for Graduate Medical Education (ACGME) accredited institutions and programs in Arizona. AzMEC assists member hospitals for all program and institutional accreditation requirements, and the development of necessary administrative processes to enhance all of the training programs. The Consortium is an active clinical partner in the state biomedical research initiative.

AzMEC serves as the crucible of innovative approaches for GME and UME among all the teaching programs in Arizona, and develops new programs and processes to address regulatory and accreditation standards as they evolve.

The Arizona Medical Education Consortium naturally evolved from the Phoenix Area Medical Education Consortium (PAMEC), established in 1996. The state-wide organization was incorporated in 2003. This metamorphosis took place due to the recognition of the rapid changes in the standards and competency based parameters that were being developed for accreditation of GME programs and that they would best be served by this collaborative and collective approach.

AzMEC is proud to work with all of our member hospitals to continue Academic Excellence Day to celebrate the accomplishments of our residents and fellows and their supporting faculty.

Consortium Members:
Banner Good Samaritan Medical Center
Carl T. Hayden VA Medical Center – Phoenix
Maricopa Integrated Health System
Mayo Clinic Arizona
Phoenix Baptist Hospital
Phoenix Children's Hospital
St. Joseph's Hospital and Medical Center
Scottsdale Healthcare
Southern Arizona VA Medical Center – Tucson
Tucson Medical Center
University Medical Center
University of Arizona College of Medicine
Kirksville College of Osteopathic Medicine – AZ Region
Mission

We exist to make a difference in people’s lives through excellent patient care.

Overview

Banner Good Samaritan Medical Center has served as a leader in healthcare in the Southwest since 1911. It is the flagship, quaternary care hospital of not-for-profit Banner Health which has 21 facilities throughout Arizona and other western and midwestern states. Banner Good Sam is located in the heart of Phoenix on a 60-acre campus including a modernistic 12-story inpatient complex and state-of-the-art diagnostic, emergency, ambulatory and support services. We are a major teaching affiliate of the University of Arizona's College of Medicine and an integral component of its expanding Phoenix Campus. Our Medical Center’s academically oriented clinical setting with over 250 residents and fellows, medical students, other healthcare trainees and an excellent hospital-based faculty, fosters a very stimulating and rewarding educational atmosphere.

Banner Good Samaritan has core residencies in Internal Medicine, Surgery, Family Practice, Obstetrics and Gynecology and Psychiatry. There is a Combined Internal Medicine-Pediatrics Residency and first year Transitional and Preliminary Medicine programs as well. Our subspecialty fellowships include Cardiology, Interventional Cardiology, Endocrinology, Gastroenterology, Geriatrics, Medical Toxicology, Maternal-Fetal Medicine, and Pulmonary Disease and Critical Care Medicine.

ACGME Approved Residency Programs

Internal Medicine

The Internal Medicine programs at Banner Good Samaritan Medical Center ("Good Sam") include categorical internal medicine, combined medicine-pediatrics and preliminary medicine. All programs, including the internal medicine subspecialty programs described below are fully integrated with the Phoenix Veterans Affairs Medical Center.

Two years ago, the internal medicine program was invited to participate in the Residency Review Committee for Internal Medicine’s (RRC-IM) Educational Innovations Project, based upon stringent educational criteria for participation, 17 were selected. The Banner Good Sam internal medicine program was selected to be in this group of 17 “Best in Class” internal medicine programs and qualified for a 10 year accreditation cycle.

All faculty members hold academic appointments at the University. Each year, 40% or more of University of Arizona medical students complete their core clinical clerkship and elective rotations at Good Sam.

The categorical medicine program provides 36 months of training in internal medicine. The program is designed to train physicians who will enter the field of general internal medicine or one of the subspecialties. Residents are exposed to patients from different socioeconomic backgrounds who have a variety of common and uncommon medical problems. The program is designed to provide residents with elective time that allows the house officer to explore individual interests in the inpatient and outpatient settings. Required rotations include emergency medicine, neurology, geriatrics,
ambulatory medicine and a research month. The program matches for 20 interns per year. In addition there are 11 preliminary medicine interns.

**Medicine-Pediatrics**

The combined program in internal medicine and pediatrics is a four-year program that contains the core elements of training in both Internal Medicine and Pediatrics. The goal of the combined program is to train physicians who are fully capable of caring for the spectrum of illnesses that affect newborns, children, adolescents and adults.

Residents who complete the four-year curriculum are eligible for board certification in both Internal Medicine and Pediatrics. Most physicians who complete the combined training experience join primary care physician. Others choose to pursue subspecialty training in fields that include the care of both children and adults. As a result of recent restructuring of many medical practices, there are many positions available for medicine-pediatrics graduates to work as full-time hospitalists, providing in-hospital care for a wide variety of patient groups.

**Family Medicine**

As the first family medicine training program in Arizona and the 15th in the nation, Good Sam has a long and rich tradition in family medicine. The largest teaching hospital in the Southwest, Good Sam offers a unique site where family physicians learn and practice in an academically stimulating and supportive environment. The faculty includes superb, experienced family medicine educators and creative, dynamic new members.

The primary focus of our program is to provide superior family medicine education in a "real world" medical setting that will prepare our graduates to thrive in a wide range of practice settings from inner-city metropolitan to frontier rural locations.

**Obstetrics & Gynecology**

This residency program helps new physicians make the transition from student to specialist by providing the support they need to develop clinical competence, relationship building with patients, methods for life long learning and health management experience.

Residents learn, first-hand, the importance of continuity of care by caring for their own patients at Good Samaritan's outpatient Women's Health Service under the supervision of faculty. All major subspecialties are represented and the faculty includes 16 perinatologists, many who enjoy national recognition. This fully accredited program functions on a single campus and accepts seven categorical residents each year for a total of 28.

**Orthopaedic Surgery**

The Banner Good Samaritan Orthopaedic Residency program is a collaboration between seven medical centers, two universities, and seven private clinics/surgicenters in the Phoenix metropolitan area. Residents serve the participating facilities over five years during which they complete surgical, specialty and sub-specialty rotations. World-class, volunteer faculty lead the residents through the program while demonstrating a clear vision of the role an orthopaedic surgeon plays in the medical community.

**Surgery**

The Phoenix Integrated Surgical Resident training program is primarily housed within two integrated hospitals, yet it is well supported by rotations at several affiliated institutions. At BGSMC you to participate in the care of patients with myriad surgical disease entities under the rubrics of general
surgery and the specialties, including (to name a few): trauma and emergency surgery, advanced laparoscopy, cardiothoracic surgery, colon and rectal surgery, surgical endocrinology, transplantation, oncology, plastic and reconstructive surgery, surgical critical care and vascular/endovascular surgery. The second integral component, located a few miles up the road, is the Carl T. Hayden Veterans Affairs Medical Center. With more than 450 inpatient beds and an extensive outpatient system linked by a state-of-art informatics system, this facility provides house officers with additional opportunities to hone their clinical skills in general surgery and a variety of additional subspecialties.

Beyond these opportunities, house officers spend a considerable amount of their training at several affiliates during the middle years of their training. Another central Phoenix facility, Phoenix Children’s Hospital, provides residents with their primary experience in management of age-specific congenital and acquired surgical diseases. To the east, in Mesa, is the Banner Desert Medical Center, a burgeoning medical center that exposes house officers to a large private practice opportunity in contemporary general, oncologic, and pediatric surgery. Finally, both junior- and senior-level residents spend several months at the Alaska Native Medical Center.

**Psychiatry**

Over the past four decades, the Psychiatry Residency at Banner Good Samaritan Medical Center has provided excellent opportunities for our residents to acquire contemporary clinical skills and a solid foundation of knowledge for lifelong professional development. Beyond the fundamental goals of training competent, caring and ethical psychiatrists, our educational philosophy genuinely considers an integrated, biopsychosocial model the cornerstone of understanding and treating patients. A strong sense of responsibility is fostered in a variety of clinical settings with supervision by experienced and enthusiastic full-time faculty. The clinical rotations are complemented by daily organized lectures, seminars and conferences addressing the rapidly expanding body of information in modern Psychiatry.

The clinical Psychiatry programs at Banner Good Samaritan include 22 inpatient beds and attractive outpatient clinics with personal offices for each resident. Our active consultation-liaison and emergency psychiatric services allow routine interaction with non-psychiatric colleagues throughout the Medical Center. Our residents are exposed to an excellent mixture of public, managed care and private patients with diverse economic and socio-cultural backgrounds and every type of psychiatric illness, level of acuity and age. Our Psychiatry Residency Program also offers required and elective experiences at other well-supervised, nearby clinical sites, including the Veteran’s Administration Medical Center (VAMC), Phoenix Children’s Hospital (PCH), a community mental health clinic, forensic settings, Arizona State University and outreach to rural areas.

**ACGME Approved Fellowship Programs**

The following internal medicine subspecialty fellowships are fully integrated between Banner Good Samaritan Medical Center and the Phoenix Veterans Affairs Medical Center: Each program leads to board eligibility in the subspecialty.

**Cardiology**

The Cardiology Fellowship Program encompasses full-time and part-time faculty members at both institutions. There are 3 fellows in each of the 3 years of training.
Interventional Cardiology

There are three fellows in this one year fellowship, based primarily at Banner Good Samaritan.

Endocrinology

This is a 2-year training program with an optional 3rd year for those interested in furthering their skills in biomedical research. There are two fellows in each year of training.

Gastroenterology

This is a 3-year program with 3 fellows in each year. There is a core group of full and part-time faculty at BGSMC and at the Phoenix VAMC.

Geriatrics

The Geriatric Fellowship is a one year program with two positions. It is based at Banner Good Samaritan Medical Center, and the Hayden VA Medical Center.

Pulmonary Disease and Critical Care Medicine

This is a 3-year program with 2 fellows in each year. Full-time faculty at both hospitals as well as part-time staff at Banner Good Sam provides teaching.

Hepatology

This 1 year program is based at the Liver Disease Center at Banner Good Sam and the Liver Transplant unit. There is 1 fellow each year. Currently, there is no board certification in this subspecialty.

Other Specialty Training Programs

Maternal-Fetal Medicine

There is one fellow every other year in this three year program that is integrated with the University of Arizona College of Medicine.

Medical Toxicology

The Department of Medical Toxicology consists of five board-certified medical toxicologists who along with the fellows work in conjunction with the Banner Poison Control Center. Two fellows are chosen to enter the 2 year fellowship each academic year.
Maricopa Integrated Health System is dedicated to providing quality patient care in a setting of education and research. We are committed to fostering the academic programs that train physicians for this community and the clinical research that improves health care outcomes.

AN OVERVIEW OF MARICOPA INTEGRATED HEALTH SYSTEM

Maricopa Integrated Health System (MIHS) includes a tertiary care hospital licensed for 639 beds (450 at Maricopa Medical Center, 190 at Desert Vista Behavioral Health Center and the Psychiatric Annex), a 141,560 square foot Comprehensive Health Care Center, and 11 primary care and family health care centers located throughout Maricopa County. A separate educational and administrative building has auditorium seating for 400 and teleconferencing capabilities. Psychiatric services are offered in several venues, and include Desert Vista Behavioral Health Center in Mesa and an on-campus inpatient facility.

MIHS is licensed by the Arizona Department of Health Services and accredited by the Joint Commission on Accreditation of Health Care Organizations. MIHS is officially recognized for its Level 1 Trauma Center, ACS-verified Level I Arizona Burn Center, Perinatal Level 3 Unit, and the Behavioral Health Center.

MIHS is also accredited by the Accreditation Council for Graduate Medical Education and the Accreditation Council for Continuing Medical Education, and is a member of the American Hospital Association, the AAMC Council for Teaching Hospitals, the Association of Western Hospitals, and other local, state and national groups that represent and collaborate on behalf of under-graduate, graduate, and continuing medical education, and medical research.

Maricopa Integrated Health System provides care for a diverse patient population including a high percentage of low-income patients. This environment provides residents with a wide range of interesting and challenging learning opportunities for medical diagnosis and treatment. Patient care activities are supported and enhanced by morbidity/mortality conferences and inter-departmental and inter-disciplinary conferences. Visiting professors and physicians from across the nation broaden perspective and opportunity for clinical and research applications of current information.

MIHS’ residents represent top medical graduates from some of the finest medical schools across the country. A wide variety of ethnic backgrounds adds to the overall cultural diversity of the institution, its patients, and its employees.

Residents participate in clinical, bench, and outcome research. The MIHS Research Department, in addition to the clinical departments, provide research support and opportunities for travel to academic meetings. Bio-statisticians and departmental research coordinators and staff are available to assist residents with project design, implementation, technical support, and statistical analysis.

In addition to our own 214 residents (expanding to 218 in July 2008), MIHS trains many residents based at other hospitals throughout the valley and nationwide, and medical students from local, national, and international schools. Throughout their training programs, therefore, our residents have opportunities to work with outside residents from a wide range of background and experience, and develop their teaching skills by mentoring rotating medical students through the many learning modalities of a medical education.
program. In particular, MIHS hosts numerous medical students from the University of Arizona pursuing 3rd and 4th year electives available through our clinical departments.

MIHS residents contribute to the wider mission of the health system as full members of numerous hospital committees and engage in ongoing departmental peer review activities. In addition, the Residents’ Association advocates for resident issues, represents residents throughout the health system, promotes social events among residents of all departments, supports charitable activities, and provides financial support of approved resident service on select outside rotations. The Association also plays an active role in the review and development of MIHS policies and procedures that affect residents.

Maricopa Integrated Health System has both full-time and part-time clinical attending staff that dedicate their time and expertise to further medical education and guide residents throughout their training. Many of these highly-qualified and teaching-oriented physician staff maintain dual academic appointments with other facilities, such as the Mayo School of Medicine and the University of Arizona College of Medicine.

ACGME Approved Residency Programs

**Emergency Medicine**: Maricopa Integrated Health System is the third busiest trauma center in the Phoenix area. Our residents are exposed to a wide variety of trauma situations, as well as routine emergency medicine cases. To broaden the experience, residents also rotate to emergency departments in other hospitals throughout the valley to expand their experience of emergency medicine as practiced in private hospital settings. At the current time, therefore, MIHS maintains affiliation agreements with Banner Thunderbird and Scottsdale Healthcare. The Emergency Medicine program also sponsors a toxicology fellowship at Banner Good Samaritan Medical Center. Our Emergency Medicine residency program recently received five years continued accreditation from the ACGME.

Positions per level: 10
Chair: Stephan Stapczynski, MD
Boston UCLA School of Medicine
Program Director: Eric Katz, MD
Albert Einstein College of Medicine

**Medicine**: More than half of the graduates of this residency program enter general internal medicine. The program is ideally designed to train well-rounded, competent internists to care for patients both in hospitals and in ambulatory clinics. Approximately forty percent of resident training in this program takes place in the ambulatory setting. Our program also offers diverse exposure to the practice of medicine in family health care centers, where residents are able to participate in the continuity of patient care. The Medicine program also includes rotations at Mayo Clinic Scottsdale to broaden their experience of medical care in a large private clinic. The program offers further opportunities for residents to pursue electives at the Mayo Clinic in Rochester.

Position per level: 14
Chair: David Wisinger, MD
University of South Florida
Program Director: Jaya Raj, MD
Columbia University

**Obstetrics & Gynecology**: Known as the Phoenix Integrated Residency in Obstetrics and Gynecology, this program is sponsored by Maricopa Integrated Health System and is integrated with St. Joseph’s Hospital, thereby offering residents the benefits of both a public and private hospital experience. Encompassing more than 11,000 deliveries and over 4000 major GYN operative procedures, the program is the largest in the state and one of the largest in the country. Residents also rotate through
other hospitals in the Phoenix area to expand their learning experience.

Positions per level: 7  
Chair: Dean Coonrod, MD  
University of Washington  
Program Director: R. Michael Brady, MD  
University Of Virginia

**Pediatrics:** As an integrated program with Phoenix Children's Hospital, the Pediatrics Residency offers a balanced educational curriculum encompassing a full spectrum of general and subspecialty pediatrics. The core value of the program is a focused commitment to excellence in patient care and support of each resident's professional and personal growth.

Positions per level: 21  
Chair: Kote Chundu, MD  
Guntur Medical College, India  
Program Director: Grace L. Caputo, MD, MPH  
State University of New York, Downstate Medical Center  
Harvard School of Public Health

**Podiatric Medicine & Surgery:** During the 36-month Podiatry Residency Program, residents establish a strong base in surgical principles in the PGY-1 training year, after which they begin training in podiatric medicine and surgery. We maintain close relationships with our affiliated and integrated institutions to provide residents experience of a diverse patient population in the private and public sectors, including: Canyon Surgery Center, Banner Desert Surgery Center, John C. Lincoln Hospital Deer Valley, John C. Lincoln North Mountain, Paradise Valley Hospital, Phoenix Baptist Hospital, and Warner Park Surgery Center. The program is currently approved for 6 residents, two per year for three years.

Positions per level: 2  
Program Director: Stephen Geller, DPM, FACFAS  
California College of Podiatric Medicine

**Psychiatry:** The Psychiatry program provides residents with individualized and progressive responsibilities to treat patients in acute and long-term settings. Affiliations with the Arizona State University Student Health Service, the Arizona State Hospital, and numerous community-based treatment settings allow the resident to gain a wide perspective on patient care while receiving extensive supervision in a broad range of classical and contemporary treatment modalities. In 2007, the Psychiatry Residency Program was granted another five years of continued ACGME accreditation.

Positions per level: 4  
Chair: Carol Olsen, MD  
University of Arizona  
Program Director: William James, MD  
Stanford University

**Child Psychiatry:** The Child Psychiatry Residency Program is sponsored by Maricopa Integrated Health System and is a two-year program. This program is unique in that the majority of the training occurs in community settings. The ACGME recently granted the program five more years of continued accreditation.

Positions per level: 2  
Chair: Carol Olsen, MD  
Program Director: Shayne Tomisato, MD  
Baylor College of Medicine

**Radiology:** In 2007, the Radiology Residency Program was granted another four years of continued ACGME accreditation. The program maintains affiliation agreements with the University of Arizona and St. Joseph's Hospital and Medical Center, and looks forward to the commencement of a new agreement with Carl T. Hayden Veterans Affairs Medical Center. The resident compliment has been operating at its full capacity of 8, with an additional resident from the New Orleans  

Associate Director: J. Timothy Harlan, DPM  
California College of Podiatric Medicine
Recently, however, the program was granted another 2 positions per year for a total of 4 positions per year, and will begin to move toward the expanded level in July 2008.

Positions per level: 4
Chair: Theron Ovitt, MD
Marquette University College of Medicine
Program Director: Mary Connell, MD
Georgetown University College of Medicine

**Surgery:** The MIHS General Surgery program is now fully integrated with Scottsdale Healthcare. At Maricopa Integrated Health System, approximately 106 beds are currently dedicated to surgery and surgical specialties. Residents see large caseloads of Level I traumas, and our 20-bed burn center also serves as a regional burn center. Affiliations include the Mayo Clinic Scottsdale, Arizona Heart Institute, University Medical Center, Carl T. Hayden Veterans’ Affairs Medical Center, Good Samaritan Regional Medical Center, and Legacy Health System in Portland, Oregon. These relationships provide residents with a diverse patient population and a wide variety of pre-operative experiences. In addition, a Trauma and Acute Care Surgery Fellowship began in July 2007, and a Surgical Critical Care ACGME-approved residency program will commence in July 2008.

Positions per level: 4
Chair: Daniel Caruso, MD
Wayne State University
Program Director: Kevin Foster, MD
Medical College of Ohio

**Other Affiliated Programs & Departments with Rotating Residents**

**Family and Community Medicine**
Chair: William Ellert, MD
Northeastern Ohio University
Program Director: John Andazola, MD
University of New Mexico
Since opening its doors in 1987, Mayo Clinic Arizona/Mayo School of Graduate Medical Education has developed ten Mayo Clinic Arizona-based residency programs in addition to thirty advanced fellowship training programs. These programs exemplify the Mayo School of Graduate Medical Education’s long-standing tradition of academic excellence. The academic milieu at Mayo Clinic Arizona also includes short term rotations for residents from Mayo Clinic Rochester and Mayo Clinic Jacksonville, as well as residents from other institutions with whom Mayo Clinic Arizona has an academic affiliation, such as Maricopa Medical Center. The Mayo Clinic Hospital opened its doors in the fall of 1998. This 208-licensed bed facility provides Mayo Clinic residents with a state of the art inpatient facility utilizing state of the art robotic surgery equipment and an electronic medical record.

Information regarding specific medical student clerkship, residency, or fellowship opportunities can be obtained from the appropriate clinical department or by contacting the Mayo Clinic Arizona Education Office at 480-301-8071 or e-mail at http://www.mayo.edu/msgme/

**Anesthesiology:** The Anesthesiology Residency at Mayo Clinic in Arizona, offered through the Department of Anesthesiology, provides an outstanding clinical anesthesia experience that can be tailored to meet individual educational goals. You will receive thorough preparation for board certification in anesthesiology, extensive didactic training, subspecialty training, and clinical and laboratory research opportunities.

Positions per Level: 3
Chair: Daniel J. Cole, MD
Loma Linda University
Program Director: Daniel J. Cole, MD

**Dermatology:** Mayo Clinic in Arizona offers a categorical program, which combines a one-year Transitional Year Residency (PGY-1) with a three-year Dermatology Residency Program (PGY-2 through PGY-4), which will prepare residents for a career in private practice or academic medicine. The Dermatology training includes: outpatient and inpatient clinical dermatology, pediatric dermatology, dermatologic surgery, dermatopathology, immunodermatology, clinical research and elective rotations at Mayo Clinic in Jacksonville, Mayo Clinic in Rochester and other approved institutions.

Positions per Level: 2
Chair: James A. Yiannias, M.D.
Baylor College of Medicine, Houston
Program Director: Karen E. Warschaw, M.D.
University of Minnesota

**Family Medicine:** The three-year Family Medicine Residency Program at Mayo Clinic in Arizona offers comprehensive training for family physicians who wish to assume responsibility for the total health care of individuals and families. This program provides a solid base of clinical skills and exposure to a variety of patient populations and health-care settings. It emphasizes the principles of family medicine and the importance of accessible, affordable and cost-effective health care. The program has developed an advanced system of competency-based education and offers a safe learning environment where ongoing formative evaluation is the norm.

Positions Per Level: 4
Chair: Robert L. Bratton, M.D.
University of Kentucky, Lexington
Program Director: Andrea L. Darby-Stewart, M.D.
UCLA School of Medicine
General Surgery: The five-year General Surgery Residency Program at Mayo Clinic in Arizona offers training in advanced surgical techniques with an emphasis on evidence-based surgery. Training includes; a “mentoring and mastery” model of education delivered through personal, ongoing patient-based teaching, provided directly from faculty surgeons supported by a robust, dynamic electronic core curriculum, daily didactic programs and acquisition of the judgment and skill sets to become a leader in general or subspecialty surgery.

Categorical Positions Per Level: 3
Chair: Richard J. Fowl, M.D.
Rush University
Program Director: Richard J. Gray, MD
Michigan State University

Internal Medicine: The three-year Internal Medicine Residency Program at Mayo Clinic in Arizona will prepare residents for board certification and a career in clinical practice, research or academic medicine. The program is designed so that responsibilities will increase with knowledge, experience and performance. There is extensive contact with the faculty, and residents have the opportunity to develop close working relationships with faculty members from all areas of general and subspecialty medicine. The clinical component of the program emphasizes training in general internal medicine and education over service. Residents gain extensive experience in outpatient ambulatory care and take rotations in all internal medicine subspecialties. Residents have ample opportunity to become skilled in diagnostic procedures such as arthrocentesis, endotracheal intubation, lumbar puncture and thoracentesis.

Positions per Level: 10
Chair: Jorge Rakela, M.D.
Universidad de Chile
Program Director: Keith J. Cannon, MD
UCLA School of Medicine

Neurology: Combined with the Transitional Year Residency at Mayo Clinic in Arizona, this 4-year Adult Neurology Residency Program is a subspecialty-focused training program. Subspeciality neurologists in behavioral neurology, cerebrovascular diseases, clinical neurophysiology, epilepsy, headache, movement disorders, multiple sclerosis, peripheral nerve disorders and neuromuscular diseases serve the ongoing needs of a large local population, as well as an extensive national and international referral network.

Mayo Clinic in Arizona enjoys the advantages of a large metropolitan area with expertise in pediatric neurology and neuropathology offered to our residents through Barrow Neurological Institute.

Positions per Level: 3
Chair: Richard J. Caselli, M.D.
Columbia University
Program Director: David W. Dodick, M.D.
Dalhousie University

Otolaryngology: This five-year residency will prepare the resident for either private practice or academic medicine by training with a board-certified staff that teaches management concepts in Otology, Rhinology, Laryngology, Endoscopy, Pediatric otolaryngology, Head and neck trauma, facial plastic and reconstructive surgery and head and neck oncology.

Positions Per Level: 2
Chair: Richard E. Hayden, MD
McGill University
Program Director: Michael Hinni, MD
University of Missouri

Preliminary Surgery: There are four one-year Preliminary Surgery Residency positions available per year. Two designated positions are for matched Mayo Clinic Arizona urology residents. The other two positions are non-designated and available to any applicant seeking one year of surgical training prior to starting formal residency training in fields such as
anesthesiology, radiology, or surgical specialties.

**Positions Per Level:** 4

**Chair:** Richard J. Fowl, M.D.
Rush University
**Program Director:** Richard J. Gray, MD
Michigan State University

**Transitional Year:** The Transitional Year Residency Program at Mayo Clinic in Arizona is designed to introduce you to a wide range of medical and surgical specialties through elective rotations and self-planned learning activities.

The goal is that during this year’s experiences, you will build a broad foundation of clinical skills as a base for your future training.

The positions offered in this program are designated to the Mayo Clinic Arizona Dermatology and Neurology Residency programs. The program offers a solid foundation in the fundamental skills of clinical medicine so residents will emerge prepared for these two areas of specialty.

**Positions per Level:** 5
**Program Director:** Mark K. Edwin, M.D.
McGill University

**Urology:** The five-year Urology Residency Program, in conjunction with the Preliminary Surgery Program at Mayo Clinic in Arizona, provides a well-rounded clinical and research experience, with exposure to all aspects of urology. The Urology Residency program is accredited by the ACGME and offers training towards clinical proficiency in a broad area of urologic fields including infertility, endo-urology, laparoscopic urology, neuro-urology and sexual dysfunction.

**Positions per level:** 2

**Chair:** Robert G. Ferrigni, MD
Emory University School of Medicine
**Program Director:** Scott K. Swanson, MD
Tulane University School of Medicine

**Advanced Fellowships:** After completing a residency, many physicians pursue placement in one of the following programs offered at Mayo Clinic Arizona. Among these are:

- Adult Reconstructive Orthopedic
- Aesthetic and Reconstructive Surgery
- Cardiovascular Diseases
- Echocardiography
- Clinical Cardiac Electrophysiology
- Cerebrovascular Neurology
- Chief Medical Resident (Internal Medicine)
- MRI/Cross-Sectional Imaging
- EEG/Epilepsy/Neurophysiology
- Emergency Medicine Services
- Electromyography [EMG]
- Female Pelvic Medicine and Reconstructive Surgery
- Foot/Ankle Surgery
- Gastroenterology
- Head & Neck Surgery and Microvascular Reconstruction
- Headache
- Hematology/Oncology
- Hepatology Transplant
- Interventional Cardiology
- Laparoscopic Colon & Rectal Surgery
- Minimally Invasive Surgery Gynecologic Oncology
- Movement Disorders
- Multiple Sclerosis/Neuroimmunology
- Musculoskeletal Imaging
- Pain Medicine
- Palliative Care
- PET/CT Imaging
- Physical Medicine and Rehabilitation
- Pulmonary Medicine
- Women’s Imaging
The Phoenix Baptist Hospital Family Medicine Residency Program was established in 1978. Located in central Phoenix, we are an unopposed, community-based program serving a culturally diverse and underserved population. We value our affiliation with the University of Arizona College of Medicine and enjoy having third and fourth year medical students rotate from the University of Arizona, Kirksville and Midwestern medical schools. We are a member of the Arizona Medical Education Consortium (AzMEC) and collaborate with other programs to maintain high standards of quality for medical education in Arizona.

Our family medicine residents benefit by being the only residents within the hospital. The experience gained in caring for the full spectrum of healthcare needs in a diverse population is both rewarding and challenging. The broad scope of training includes exposure to a vast array of inpatient and outpatient procedural skills. Residents can become competent in obstetrical procedures including ultrasonography, fracture management, joint injection, dermatologic procedures, vasectomy, circumcision, colposcopy and LEEP, to name a few.

Our faculty are committed to providing an energetic and enthusiastic learning environment. We apply evidence-based principles in our approach to patient care and strive for safety and high quality. Because our outpatient clinic is on the hospital campus, we tend to have great continuity of care between the inpatient and outpatient service.

Our residents and faculty participate in research as well as quality improvement activities. The residency and staff are involved in outcome measurements and work collaboratively with the hospital to drive quality improvement. Our house staff are part of the general medical staff and sit on hospital and departmental committees, including peer review sessions. Family medicine residents present cases for monthly Grand Rounds, Morbidity/Mortality and Tumor Board staff conferences.

It is our mission to develop family physicians who not only practice in any setting, but successfully manage a practice in any setting. A strong practice management curriculum is the cornerstone of our program. With an emphasis on business management, office administration, quality improvement, billing and coding, we provide the skills required for family physicians to be successful in any practice environment. You will find many of our graduates in successful private and group-owned practices.
The Pediatric Residency program has been in existence since 1974, and integrates the programs at Phoenix Children's Hospital and Maricopa Medical Center. We are fully accredited by the ACGME, and a primary affiliate of the University of Arizona College of Medicine and Mayo Graduate School of Medicine. One of the strengths of our program is the access to a large and diverse patient population, which provides a rich clinical experience. Our faculty and staff provide excellent clinical instruction in a supportive environment. We accept 21 categorical pediatric positions per year.

Our primary mission is to provide excellent training for pediatric residents and medical students, while offering high quality medical care to all children and their families. Research and community service are important aspects of our program. We are proud to provide quality training in general pediatrics as well as in all subspecialty areas of pediatric medicine. Special emphasis is given to the cultural and developmental aspects of pediatric care, health care supervision, advocacy, and community medicine.

Phoenix is a culturally diverse area that provides residents the opportunity to work with Native American and Hispanic population. The goal is to provide excellent training for residents, whether they are interested in pursuing a career in general pediatrics or applying for subspecialty fellowship training experience. Many of our graduates have entered prestigious fellowship programs, while others have chosen to pursue careers in general pediatrics in a variety of settings.

The Phoenix Children's Hospital is a 299-bed multi-specialty freestanding children's hospital which brings together a full range of specialists in the field of Pediatrics. Advanced technology, innovative research and a spirit of community involvement are combined to promote health educations and the well-being of children. Comprehensive services offered at Phoenix Children's Hospital include a fully equipped Pediatric Intensive Care Unit, two Neonatal Intensive Care Units, a dedicated Pediatric Emergency Department, cardiac catheterization and cardiac surgery, renal transplantation, the Children's Cancer Center, a bone marrow transplant program, the Cystic Fibrosis Center and the Pediatric Subspecialty Care Center.

Maricopa Medical Center is a 450-bed major public teaching hospital, of which 92 beds are designated to pediatrics, 40 beds are for Neonatal ICU and 12 beds are for Pediatric ICU. It is a designated Level One Trauma Center and its accredited regional burn unit the Arizona Burn Center is the 2nd largest in the nation. The Maricopa Medical Center also provides a fully equipped Pediatric Intensive Care and Neonatal Intensive Care Units, and a 24 hour Pediatric Emergency Department. Maricopa Integrated Health System supports 10 community-oriented family health centers, and a pediatric multi-specialty Comprehensive Health Center adjacent to the main hospital that offers care to a culturally diverse population with complex medical and social problems. Annually, MIHS has nearly 20,000 inpatient admissions and 300,000 outpatient visits.

The leadership of the program is an innovative group of physician directors, chief residents, and resident representatives who are actively involved in residency training. Educational issues, curriculum innovations, and professional development strategies are openly discussed in regular planning meetings. We offer resident retreats each year for each class, and involve the residents in creative planning. There are scheduled luncheons with the program directors, and an annual program
evaluation that provides extensive resident involvement in program development.

Phoenix Children’s Hospital sponsors four fellowship programs: pediatric dermatology, pediatric emergency medicine, pediatric endocrinology and pediatric hematology/oncology.
Catholic Healthcare West and our Sponsoring Congregations are committed to furthering the healing ministry of Jesus. We dedicate our resources to: delivering compassionate, high-quality, affordable health services; serving and advocating for our sisters and brothers who are poor and disenfranchised; and partnering with others in the community to improve the quality of life.

An Overview of St. Joseph’s Hospital and Medical Center

Driven by a commitment to excellence in teaching, research and clinical care, St. Joseph’s Hospital and Medical Center has been a symbol of quality healthcare in the Valley for 110 years. The hospital offers a wide range of services to treat the most severely ill and injured in our community and has more than 150 medical residents in its teaching programs.

St. Joseph’s is home to Barrow Neurological Institute, which is annually recognized as one of the top 10 neuroscience centers in the nation, and the Children’s Health Center, which offers a full range of specialty pediatric services. St. Joseph’s Trauma Center is the only Level 1 trauma center in the state that is verified by the American College of Surgeons. In addition, the hospital offers high-risk obstetrical, neonatal intensive and a wide range of cardiovascular care programs.

St. Joseph’s is developing into an academic medical center with a teaching structure that is based on diverse clinical experience, a comprehensive curriculum, as well as a balance between acute and primary care medical training opportunities. Residency programs are available in internal medicine family medicine, pediatrics, neurology, neurosurgery, OB/Gyn, pathology and radiology. For more information, go to www.ichosestjoes.com.

ACGME Approved Residency Programs

Family Medicine: The Family Medicine Residency Training Program at St. Joseph’s Hospital & Medical Center was established in 1975. The program is now in its 30th year, with over 148 graduates who are practicing all over the United States and the world. Our graduates are extremely well trained at St. Joe’s, due to a curriculum that is not only comprehensive, but taught by some of the best health care professionals in the industry. Graduates from our program are capable of moving into any practice setting that may include inpatient medicine, obstetrics, comprehensive outpatient continuity care, and also careers in Academic medicine. We are the only Family Medicine Residency Program in Arizona in which all core rotations to be done are at the sponsoring institution, allowing residents to get an excellent education. St. Joseph's Family Medicine program is affiliated with the Sun Health Geriatric Fellowship Program. In addition to Family Medicine residents, we train geriatric fellows, 3rd and 4th year U of A Medical Students and OB/GYN residents from the PIROG Program.

Positions per level: 8
Academic Chair and Program Director: Paul Steinberg, MD

General Surgery: The St. Joseph’s Hospital and Medical Center General Surgery Residency Program recently received its accreditation from the Accreditation Council for Graduate Medical Education in 2007. This program is a five-year program that will provide residents with a broad experience in surgery. The program will be well rounded with an excellent balance of clinical training, structured education, and research opportunities. The main goal is to prepare the resident for a career in community surgical practice,
research, academic surgery, or post-residency fellowship training. There are currently 15 approved categorical positions in the General Surgery Residency Program. Additional preliminary residents train in the program during the first one to three years will matriculate into subspecialties such as neurosurgery, orthopaedic surgery, plastic surgery, anesthesiology and urology. Rotations during the five years include the general surgery services, trauma services, and surgical specialty services.

Positions per level: 3
Academic Chair and Program Director: Scott R. Petersen, MD

Internal Medicine: The Internal Medicine Postgraduate Training Program is committed to a comprehensive inpatient and ambulatory training experience designed to produce compassionate and highly skilled general internists. An academically rigorous program teaches residents state-of-the-art medicine, skills of critical thinking, self-study habits, and techniques of information access that promote lifelong learning in our ever-changing field. Residents who train at St. Joseph’s Internal Medicine program are well prepared for today’s medical marketplace for positions such as: hospitalists, sub-specialists, or primary care physicians. We believe that the continuing role of evidenced-based learning and outcomes-based teaching are the core of the program.

Positions per level: Preliminary 8, Categorical 9
Academic Chair and Program Director: Richard Blinkhorn, M.D.

Obstetrics and Gynecology: This program is sponsored by Maricopa Integrated Health System, and is an integrated program, thereby offering the benefits of both a public and private hospital experience. With over 11,000 deliveries and over 4000 major GYN operative procedures, the program is the largest in the state and one of the largest in the country. The residents also rotate through other hospitals in the Phoenix area.

Positions per level: 7
Preliminary positions: 2
Academic Chair: Dean Coonrod, M.D. and James Balducci, M.D.
Program Director: Michael Brady, M.D.

Pediatrics: The Pediatric Residency Program consists of a division of general pediatrics and ambulatory care, a division of child abuse assessment, fellowships in child development and child abuse and a division of developmental and behavioral pediatrics. We have 22-employed faculty; 32-contracted faculty; and a full complement of pediatric subspecialty faculty. Each year approximately 3,500 patients are admitted to the pediatric ward. An average of 1,300 patients are admitted to the Pediatric Intensive Care Unit (PICU). Of the patients admitted to the PICU in the past 3 years, an average of 250 were cardiology/cardiovascular surgeries. In addition, approximately 170 pediatric cardiac catheterizations are performed at the Children’s Health Center each year.

Positions per level: 10
Academic Chair: Bruce White, D.O.
Program Director: Lilia Parra-Roide, M.D.

Neurology/Pediatric Neurology: As an integral part of Barrow Neurological Institute at St. Joseph’s Hospital and Medical Center, the Departments of Neurology and Pediatric Neurology have been chosen for its highly skilled neuroscience care. The Divisions within Neurology offer comprehensive diagnosis, treatment, rehabilitation and education for patients suffering from diseases and injuries of the nervous system. Adult and children receive both inpatient and outpatient care from world-renowned specialists and have the opportunity to participate in pharmaceutical clinical trials. Diagnostic and research studies are perfected by scientists utilizing state-of-the-art equipment. Experts at BNI provide teaching for medical residencies,
fellowships and sponsor on-going educational programs for physicians, health care professionals, patients and their families. Clinics include: Pediatric Neurology, Clinical Neurophysiology, Epilepsy, Neuro-Oncology, Parkinson's Disease, Movement Disorders, Neurovascular/Stroke, Neuromuscular, Neurorehabilitation, Neuro-Immunology, Alzheimer's Disease, Muscular Dystrophy, Cognitive Disorders, Dementia, Headache, and Dizziness/Balance Disorders.

Adult Neurology Residency (ACGME Accredited)
Positions per level:  6
Academic Chair: William Shapiro, M.D.
Program Director: Steve S. Chung, M.D.

Pediatric Neurology Residency (ACGME Accredited)
Positions per level:  1
Academic Chair: John Bodensteiner, M.D.
Program Director: Kara S. Lewis, M.D.

Epilepsy/Clinical Neurophysiology Fellowship (PGY-5, PGY-6) (ACGME Accredited for PGY-5)
Positions per level:  3 (2 Adult, 1 Peds)
Academic Chairs: John Bodensteiner, William Shapiro, M.D.
Program Directors: David M. Treiman, M.D. and John Kerrigan, M.D.

DBS Movement Disorders Fellowship (PGY-5)
Positions per level:  1
Academic Chair: William Shapiro, M.D.
Program Director: Abraham Lieberman, M.D.

Clinical Movement Disorders Fellowship (PGY-5)
Positions per level:  1
Academic Chair: William Shapiro, M.D.
Program Director: Abraham Lieberman, M.D.

Neuro-Immunology Fellowship (PGY-5, PGY-6)
Positions per level:  1
Academic Chair: William Shapiro, M.D.
Program Director: Timothy Vollmer, M.D.

Neurovascular/Stroke Fellowship (PGY-5, PGY-6) (ACGME Accredited for PGY-5)
Positions per level:  1
Academic Chair: William Shapiro, M.D.
Program Director: Joni Clark, M.D.

Neuro-Oncology Fellowship (PGY-5, PGY-6) (ACNS Accredited)
Positions per level:  1
Academic Chair: William Shapiro, M.D.
Program Director: William Shapiro, M.D.

Neurosurgery: The Residency Program in Neurological Surgery is rigorous and fully accredited by the Accreditation Council for Graduate Medical Education. The first year is a mandatory internship in General Surgery at the Good Samaritan Regional Medical Center in Phoenix. During the PGY-1 year, rotating 3 months on Neurology Services at the Barrow fulfills the first Neurosurgery Board requirement. Five years are dedicated to the Neurosurgery Residency Training, including rotations in Neuropathology, Laboratory Research (12 months), or electives in addition to the core neurosurgical training. An additional post-graduate year is devoted to further laboratory research or other electives. Residents develop their clinical skills by caring for patients in need of the entire spectrum of neurological surgery: trauma, cerebrovascular, spine, neoplastic, functional, and pediatric. The breadth of clinical experience available to residents is reflected by the volume of patients at the Barrow.

Positions per level: 4
Academic Chair: Robert Spetzler, MD
Program Director: Volker Sonntag, MD

Pathology: The combined anatomic and clinical pathology program at St. Joseph's Hospital provides excellent training opportunities for residents. A busy inpatient and outpatient surgical service, as well as tertiary referrals, keeps cases diverse and interesting. The four-year curriculum
includes training in surgical pathology, cytopathology, autopsy pathology, immunohistochemistry, cytogenetics, flow cytometry, forensic pathology, immunohematology, hematology, chemistry and microbiology. Five months are available for electives. Our most recent graduates have completed fellowships (forensic pathology, dermatopathology, hematopathology) or have joined private practice groups in the Phoenix area. Currently, fifteen former residents are in practice in the Phoenix area. A recent addition to the curriculum has been a research requirement. This has resulted in several original articles and poster presentations. In addition, an annual pathology conference has been held on the St. Joseph's Campus, attracting local and national speakers. The conference has been a highlight for our residents.

Positions per level: 2
Academic Chair and Program Director: Jeffrey Oliver, MD
Department Chair: Roy Davis, M.D.

**Diagnostic Radiology:** The academic structure of our program is based on a rich and diverse clinical patient experience with a flexible curriculum designed for the individual resident's needs and a balance between tertiary and primary care experiences. Our world-renowned Barrow Neurological Institute provides training in the field of Neuroradiology. The majority of the resident's training is spent at St. Joseph's Hospital and Maricopa Medical Center. In addition, Residents will rotate through the McAuley Office Building and Biltmore outpatient imaging facilities and will be exposed to pure outpatient imaging, performing and interpreting studies in areas such as CT, Ultrasound, Mammography, MRI, Fluoro and Breast Biopsy (U/S and Stereotactic Guided).

Positions per level: 4
Department Chairman: Donald Lawson, MD
Program Director: Randy Richardson, MD
Scottsdale Healthcare's Heuser Family Medicine Residency Program was established in 1974. Our community-based program has an affiliation with the University of Arizona College of Medicine. The high standards of training in our program have been documented through a long history of successful graduates and a 100% pass rate on the American Board of Family Medicine Certification Examination year after year.

We are a member of the Arizona Medical Education Consortium (AzMEC) to collectively ensure high quality medical education in the Phoenix area. Other consortium participants include Carl T. Hayden Veterans Affairs Medical Center, Catholic Healthcare Arizona (St. Joseph's Hospital), Banner Health Arizona (Samaritan Health System), Phoenix Baptist Hospital & Medical Center, Phoenix Children's Hospital, Kirksville College of Osteopathic Medicine and the University of Arizona.

Our mission is to produce excellent family physicians that are knowledgeable, capable, and compassionate. This is accomplished through an academic and stimulating learning environment, where residents and faculty are encouraged to pursue a regular and systematic program of lifelong learning. Over and above disease orientation, we value maintaining health and preventing disease throughout the life of the patient.

Our graduates have gone on to practice in a wide variety of settings, including private practice, academic institutions, rural settings, urgent care or ER based practices, and as hospitalists.

Since the program's inception, approximately one half of our graduates have remained in the state of Arizona, while others have gone on to practice throughout the United States and internationally.

Positions per level: 8
Program Director: Robert Creager, MD
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