

North Texas Chapter of the American College of Surgeons

2008 Annual Meeting

Cityplace Conference Center

Dallas, Texas

February 22-23, 2008

Final Program



Table of Contents

- 2 2007-2008 Chapter Officers and Councilors
- 3 Exhibits and Sponsorship
- 4 Objectives and Outcomes
- 5 Accreditation Statement
Endowed Lectureship Funds
- 6 Andrew L. Warshaw, MD
Robert S. Sparkman Memorial Lecturer
- 7 Thomas W. Mayo, JD
Ethics Lecturer
- 8 Michael E. Carley, MD
Harry M. Spence Memorial Lecturer
- 9 Meeting Schedule
- 14 Oral Session Abstracts
- 33 Interesting Cases Abstracts
- 38 Oncology Panel Abstracts
- 41 Oral Poster Session Abstracts
- 49 Posters for Display Only Abstracts



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Exhibits and Sponsorship

The North Texas Chapter of the American College of Surgeons gratefully acknowledges the educational grants from:

American Cancer Society

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The North Texas Chapter of the American College of Surgeons extends sincere appreciation to the following Exhibiting Companies:

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Objectives and Outcomes

Session One Course Objectives

- To Understand the Importance of Peripheral Arterial Catheterization in the Intensive Care Setting
- To Evaluate the Role of Paramedics in the Trauma Team
- To Define the Accuracy of CT Scan in Trauma and in Blunt Vascular Injury
- To Define the Role of Preoperative Embolization in the Treatment of Carotid Body Tumors
- To Determine the Importance of Limb Disarticulations in Burn Patients

Session Two Course Objectives

- To Define the Use of Biological Patch and Fibrin Glue in Pediatric Population Hernias

Session Three Course Objectives

- To Determine the Importance of Stapler Reinforcement
- To Understand the Outcomes and Complications after Sleeve Gastrectomy for Morbid Obesity
- To Define the Role of Laparoscopic Resection in GIST

Session Four Course Objectives

- To Understand the Importance of a Practice Management Education During Surgical Residency
- To Realize if There is a Different Perception of Trauma Related Morbidity and Mortality Between Health Care Providers
- To Evaluate and Treat the DVT in Morbid Obese Patients
- To Define the Role of the PTH Assay and Imaging Guidance in Parathyroid Surgery

Session Five Course Objectives

- To Define the Benefit of Pyloric Preservation after Pancreatoduodenectomy
- To Determine Cushing's Syndrome Following Adrenalectomy
- To Define the Role of Genomic and Proteomic Analysis and Stored Platelets in Cancer Invasion

Session Six Course Objectives

- To Understand How the Nitric Oxide Donor could be a Radiosensitizing Agent
- To Study How We can Reduce Ischemia During Heart Oxygenated Preservation
- To Evaluate the Role of Partial Cholecystectomy in the Setting of Severe Inflammation



Accreditation

The American College of Surgeons is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.



American College of Surgeons
Division of Education

CME Credit

The American College of Surgeons designates this educational activity for a maximum of 14.0 *AMAPRA Category 1 Credits*[™]. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Endowed Lectureship Funds

The Harry M. Spence Memorial Lectureship Fund

On February 17, 1990, during the annual business meeting of the North Texas Chapter of the American College of Surgeons, an annual lectureship was established to honor Harry M. Spence, MD. It was proposed that each year a distinguished guest speaker be invited to deliver the Harry M. Spence Lecture as a special feature of the annual chapter meeting.

Established at the outset as a permanent fund, the Harry M. Spence Endowed Lectureship had an initial goal of \$50,000. The fund reached its initial goal in December 1995, henceforth providing income used to support the lectureship. Further donations are welcomed and encouraged in order to guard against inflationary deterioration of this excellent endowment.

The Robert S. Sparkman Lectureship Fund

During the annual business meeting of the North Texas Chapter of the American College of surgeons on February 16, 1995, an annual lectureship was established to honor Robert S. Sparkman, MD. It was proposed that each year a distinguished speaker be invited to deliver the Robert S. Sparkman Lecture as a special feature of the annual chapter meeting. It was further proposed that a permanent fund with an initial goal of \$50,000 be established to provide an income to support this lecture.

The Robert S. Sparkman Fund was established as a permanent fund after reaching its initial goal in October 1996. The Council of the North Texas Chapter instructed that the fund remain in an open investment account until the close of the annual chapter meeting on March 1, 1997. Since that time, the fund has provided an income to support the lectureship. The friends, patients, pupils and colleagues of Dr. Sparkman are invited to participate with the Fellows of the North Texas Chapter in contributing the funds necessary to endow the Sparkman Lectureship. Donations of an size are welcome and are tax-exempt. The amounts of individual contributions will be kept confidential. Checks should be made payable to the North Texas Chapter of the ACS, and forwarded to the Chapter Secretary-Treasurer.



Andrew L. Warshaw, MD

Surgeon-in-Chief and Chairman of the Department of Surgery
Massachusetts General Hospital
Boston, Massachusetts



Dr. Andrew Warshaw is a graduate of Harvard College and of Harvard Medical School. His residency training was at the Massachusetts General Hospital. He also spent two years as a Clinical Associate in the Section on Gastroenterology of the National Institutes of Health. Since 1972, he has been on the staff at the Massachusetts General Hospital and the faculty of Harvard Medical School. In 1987, he became Professor of Surgery at Harvard and in 1997, the W. Gerald Austen Professor of Surgery, Surgeon-in-Chief and Chairman of the Department of Surgery at the Massachusetts General Hospital.

Dr. Warshaw has been President of the Society for Surgery of the Alimentary Tract, the International Association of Pancreatology, the Massachusetts Chapter of the American College of Surgeons, the New England Surgical Society, the Halsted

Society, the Boston Surgical Society, and the Society of Surgical Chairs. He was a Director of the American Board of Surgery and its Chairman in 1993. He has served as a Governor of the American College of Surgeons and chair of its Socioeconomic Issues Committee. He was First Vice-President of the College and remains a member of its Health Policy Steering Committee and Chair of the Board of Directors of the American College of Surgeons Professional Association/Political Action Committee. In 2007 he was elected Treasurer of the American College of Surgeons.

Dr. Warshaw's major interests focus on benign and malignant diseases of the pancreas. He has done much to define the pathogenesis and treatment of inflammatory and malignant lesions in the pancreas. His bibliography lists 345 original reports as well as 240 book chapters, reviews, and monographs and 10 books. He is Editor-in-chief of the journal SURGERY.



Thomas W. Mayo, JD

Director, Maguire Center for Ethics and Public Responsibility
Associate Professor, SMU/Dedman School of Law
Adjunct Assoc. Prof., Internal Medicine, UT-Southwestern Medical
School
Dallas, Texas



Thomas Mayo is Director of the Cary M. Maguire Center for Ethics and Public Responsibility at Southern Methodist University, where he is also a Law Professor in the Dedman School of Law. He is an Adjunct Associate Professor in Internal Medicine at the University of Texas – Southwestern Medical Center. He serves on five hospital ethics committees in North Texas and is co-chair of the committees at Parkland Memorial Hospital and Children’s Medical Center Dallas. In 2002 he received the Dallas County Medical Society’s Heath Award for outstanding contributions to medicine and leadership in Dallas.



Michael E. Carley, MD

Medical Director of Urogynecology
Baylor University Medical Center
Dallas, Texas



Dr. Carley began his medical career at the Albany Medical College in New York. He then completed residency training in UT Southwestern/Parkland Hospital in obstetrics and gynecology. Following residency he entered a 3-year fellowship program and completed a basic science Masters degree in urogynecology and reconstructive pelvic surgery at the Mayo Clinic in Rochester, Minnesota. He was then recruited to his current position at Baylor University Medical Center in Dallas where he serves as medical director of urogynecology.



Meeting Schedule

FRIDAY

FEBRUARY 22, 2008

7:00am - 5:45pm Registration Open

7:00am - 8:00am Continental Breakfast

7:00am - 3:30pm Exhibits

7:00am - 5:45pm Poster Displays

8:10am - 9:40am Scientific Session I

Moderator: Warren Lichliter, MD

8:10am - 8:25am

1. Peripheral Arterial Catheterization in the Intensive Care Setting: Is a Temporal Factor Alone an Indication for Discontinuation?

RC Mooty MD, V Johnson MD, M Lorenzo MD/MBA, E Dunn MD, A Mangram MD

Discussant: Ari Halldorsson, MD

8:25am - 8:40am

2. Evaluation of the Utilization of Paramedics to Activate the Trauma Team from the Field: A Prospective Study at a Level I Trauma Center

R Lewis MD, W McNabb RN, J Griswold MD, M Berry RN, B Mwrey LP, E Sasin MD, A

Halldorsson MD, S Dissanaikie MD

Discussant: Alicia Mangram, MD

8:40am - 8:55am

3. Accuracy of Surgery Residents Interpretation of CT Scans in Trauma

C Arentz MD, J Griswold MD, A Halldorsson MD, F Quattromani MD, S Dissanaikie MD

Discussant: Ernest Dunn, MD

8:55am - 9:10am

4. CTA-Based Screening Reduces Time to Diagnosis and Stroke Rate in Blunt Cervical Vascular Injury

AL Eastman MD, V Muraliraj MD, JL Sperry MD, MPH, JP Minei MD

Discussant: Dixon Santana, MD

9:10am - 9:25am

5. Preoperative Embolization in the Treatment of Carotid Body Tumors

D Santana MD, G Dhillon MD, G Schmedes BSc, J Griswold MD, A Halldorsson MD

Discussant: Kyrone Tamar, MD

9:25am - 9:40am

6. Limb Disarticulations Performed at a Burn Center - Review of a 24-Year Experience

LE Stuke MD, LR Lau MD, BD Arnoldo MD, JL Hunt MD, GF Purdue MD

9:40am - 10:00am Refreshment Break

10:00am - 11:00am Robert S. Sparkman Memorial Lectureship

Cystic Pancreatic Tumor: New Frontier

Andrew L. Warshaw, MD, Surgeon-in-Chief and Chairman of the Department of Surgery,

Massachusetts General Hospital, Boston, Massachusetts

11:00am - 11:45am Jeopardy: Round One

11:45am - 1:00pm Annual NTC-ACS Luncheon on 42nd Floor

The Role of the PACs in the Political Scenario of 2008

Andrew L. Warshaw, MD, Surgeon-in-Chief and Chairman of the Department of Surgery,

Massachusetts General Hospital, Boston, Massachusetts



1:00pm - 1:30pm Scientific Session II

Moderator: Peter Rutledge, MD

1:00pm - 1:15pm

7. Permacol: A Potential Biologic Patch for Congenital Diaphragmatic Hernia?

I Mitchell MD, R Barber RN, NM Garcia MD, A Fischer MD

Discussant: Joseph Murphy, MD

1:15pm - 1:30pm

8. Use of Fibrin Glue for Closure of Mesenteric Defects - Improved Outcomes and Decreased Symptomatic Hernias

KJ Fritz MD, JA Kuhn MD, DT Arnold MD, GS Barnes, TL Fisher RN, CI Kennedy MD

Discussant: Anne Fischer, MD

1:30pm - 1:55pm Ethics Lecture

The End of Life Ethical Issues for Surgeons

Thomas W. Mayo, JD, Director, Maguire Center for Ethics and Public Responsibility, Associate Professor, SMU/Dedman School of Law, Adjunct Associate Professor, Internal Medicine, UT-Southwestern Medical School, Dallas, Texas

1:55pm - 2:55pm Scientific Session III

Moderator: Robert Rege, MD

1:55pm - 2:10pm

9. Circular Staple Line Reinforcement - One Year Results

CA Williams MD, TL Fisher RN, LA Kerich PA, CI Kennedy MD, JA Kuhn MD

Discussant: Robert Rege, MD

2:10pm - 2:25pm

10. Outcomes and Complications of Laparoscopic Sleeve Gastrectomy

GY Alsop Jr MD, TL Fisher RN, CI Kennedy MD, DT Arnold MD, JA Kuhn MD

Discussant: Eldo Frezza, MD

2:25pm - 2:40pm

11. Complications After Sleeve Gastrectomy for Morbid Obesity

S Reddy MSIII, L Gee BS/BA, EE Frezza MD

Discussant: Joseph Kuhn, MD

2:40pm - 2:55pm

12. Expanding the Indications for Laparoscopic Gastric Resection for GIST: Size is Not a Limitation

J Sokolich MD, C Galanopoulos MD, E Dunn MD, R Jeyarajah MD

Discussant: John Howton, MD

2:55pm - 3:15pm Refreshment Break

3:15pm - 4:30pm Scientific Session IV

Moderator: Ernest Dunn, MD

3:15pm - 3:30pm

13. Practice Management Education During Surgical Residency

A Mangram MD, K. Jones MD, R. Lebron MD, E. Dunn MD

Discussant: Eldo Frezza, MD

3:30pm - 3:45pm

14. Variations in the Perception of Trauma Related Morbidity and Mortality between Surgery Residents, Attending Surgeons, Nurses and Medical Students

SE Brooks MD, S Dissanaikie MD, M Berry RN, C Cline RN, J Griswold MD, A Halldorsson MD

Discussant: Ernest Dunn, MD

3:45pm - 4:00pm

15. Venous Thromboembolic Events and Risk Stratification: Evaluation of Prolonged Prophylaxis in High Risk Bariatric Patients

KL McQuade MD, TL Fisher RN, DT Arnold MD, GS Barnes MD, CI Kennedy MD, JA Kuhn MD

Discussant: Javier Varela, MD



4:00pm - 4:15pm

16. The Use of Intraoperative PTH Assay and Predictive Factors for Postoperative Calcium Replacement

ST Steen MD, BC Rabeler MD, TL Fisher RN, DT Arnold MD

Discussant: Shelby Holt, MD

4:15pm - 4:30pm

17. Parathyroidectomy with Image Guidance Alone Leads to Higher Failure Rates: Making the Case for Intraoperative Parathyroid Hormone Monitoring

SL Woodruff MD, SA Holt MD, FE Nwariaku MD, WH Snyder III MD

Discussant: David Arnold, MD

4:30pm - 5:00pm Interesting Case Presentation

Moderators: Joseph Kuhn, MD and Eldo Frezza, MD

25. Omental Patches Reduce the Clinical Leak Rate Following Distal Pancreatectomy

P Rutledge MD

26. Laparoscopic Identification and Management of Gallbladder Duplication: A Case Report

TN Dao MD, GR Stephenson MD

27. Visceral Organ Resections Combined with Synchronous Major Hepatectomy: Feasibility and Outcomes

D Hui MD, RE Schwarz MD

28. Simple Cystectomy for Side Branch IPMN

MC Yoo MD, CL Roland MD, RA Iyengar MD, CC Barnett MD

29. Circulating Tumor Cells in Patients Undergoing Surgery for Hepatic Metastases from Colorectal Cancer

P Papavasiliou MD, JA Kuhn MD, JJ Nemunaitis MD, JP Lamont MD

30. Aortic Dissection in a Pregnant Woman

D Santana MD, G Dhillon MD, A Sun, J Griswold MD, A Halldorsson MD

5:00pm - 5:45pm Jeopardy: Round Two**5:45pm Wrapup and Adjournment****6:00pm - 7:30pm Cocktail Reception on 42nd Floor**

All meeting participants are invited to stop by the Cocktail Reception on the 42nd Floor. This is a great opportunity to visit with your colleagues. Light hors d'oeuvres and beverages will be served. This event is complimentary to all registrants.

SATURDAY**FEBRUARY 23, 2008****7:30am - 1:00pm Registration open****7:30am - 8:00am Continental Breakfast****7:30am - 11:00am Exhibits****7:30am - 1:00pm Poster Displays****8:00am - 8:45am Scientific Session V**

Moderator: Mitchell Willens, MD

8:00am - 8:15am

18. Pancreatoduodenectomy with or without Pyloric Preservation: a Clinical Outcomes Comparison

SP Dineen MD, CL Roland MD, RE Schwarz MD

Discussant: Peter Rutledge, MD



8:15am - 8:30am

19. "Subclinical" Cushing's Syndrome is not Subclinical: Improvements Following Adrenalectomy
IC Mitchell MD, RJ Auchus PhD, K Juneja MD, AY Chang MD, SA Holt MD, WH III Synder MD, FE Nwariaku MD

Discussant: Chad Tate, MD

8:30am - 8:45am

20. Genomic and Proteomic Analysis of High Risk Cancer Patients

JA Kuhn MD, ST Steen MD, NN Senzer MD, P Maples PhD, JJ Nemunaitis MD

Discussant: Roderich Schwarz, MD

8:45am - 9:00am American Cancer Society's Cancer Resource Network

Donna Rankin, Regional Director for Health Initiatives American Cancer Society, North Texas Region, Fort Worth, Texas

9:00am - 9:45am The Role of Minimally Invasive Surgery in Oncology Panel

Panel Discussants: John Howton, MD, Warren Lichliter, MD and Tom Shires, MD

31. ZeroLeak and Mortality Rate for a Two Year Review of a Minimally Invasive Oncologic Approach to Esophagectomy in a High Volume Tertiary Referral Center

CA Galanopoulos MD, J Jay MD, A Vo RN, R Jeyarajah MD

32. Initial Experience with Laparoscopic Liver Resection at a Single Center

A Mejia MD, S Cheng, MD

33. Laparoscopic Non-Touch Technique for Colon Cancer. Is it Better Than Open Technique?

R Ford MD, EE Frezza MD

9:45am - 10:30am The Harry M. Spence Memorial Lectureship

Common Uro-Gynecologic Pathology

Michael E. Carley, MD, Medical Director of Urogynecology, Baylor University Medical Center, Dallas, Texas

10:30am - 10:45am Refreshment Break

10:45am - 11:30am Oral Poster Presentations

101. Retroperitoneal Paraganglioma Requiring Partial Vena Caval Resection

A Siddique MD, GP Clagett MD, CC Barnett MD

UT Southwestern Medical Center — Dallas, TX

102. Asynchronous Independent Lung Ventilation Using High Frequency Oscillator in the Management of Tracheal Injury

A Halldorsson MD, J Shannon MD, T Warren MD, S Dissanaika MD, M Couch MD, R Ford MD, J Griswold MD

Texas Tech University Health Sciences Center — Lubbock, TX

103. Predicting Normocalcemia After Total Thyroidectomy Using Post Operative Intact Parathyroid Hormone Level

MG Cusick MD, ZH Lieberman MD, JT Preskitt MD, TL Fisher RN, CR Tate MD

Baylor University Medical Center — Dallas, TX

104. Tuberculosis Abscesses in the Central Nervous System. Presentation of a Case Report

LA Ruano MD, V Hernandez MS

University Juarez of Durango, Faculty of Medicine — Durango, Mexico

105. Residual Tumor in Re-Excision Specimens: Correlation Between Time Interval and Degree of Inflammation

A Moldrem MD, Y Peng MD, C Menendez MD, V Andrews MD, T Zogakis MD, R Rao MD

UT Southwestern Medical Center — Dallas, TX

106. Intravascular Rewarming for Accidental Hypothermia Associated with Traumatic Injury

EE Taylor MD, JP Carroll MD, MA Lovitt MD, LB Petrey MD, PE Gray MD, C Mastrogiropieri RN, ML Foreman MD

Baylor University Medical Center — Dallas, TX



Oral Poster Presentations cont'd

107. Smac Mimetic JP1201 has Potent Anti-Tumor Activity in a Preclinical Orthotopic Model of Pancreatic Cancer

SP Dineen MD, CL Roland MD, L Li PhD, H Sun PhD, JG Carbon BS, B Pronk PhD, RA Brekken PhD.

UT Southwestern — Dallas, TX

108. Is There Any Benefit to Multi-Disciplinary Rounds in an "Open" Trauma Intensive Care Unit Regarding Ventilator Associated Pneumonia?

V Johnson MD, A Mangram MD, C Mitchell MD, M Lorenzo MD, D Howard MSN, E Dunn MD Methodist Hospital of Dallas — Dallas, TX

109. A Computer Based Trauma Alcohol/Drug Intervention Program

RC Mooty MD, AJ Mangram MD, J Fagan BSN/RN, M Lorenzo MD/MBA, EL Dunn MD Methodist Health Systems Dallas, Tx — Dallas, TX

11:30am - 12:30pm Scientific Session VI

Moderator: Joseph Kuhn, MD

11:30am - 11:45am

21. The Acellular Fraction of Stored Platelets Promotes Cancer Invasion

SP Dineen MD, CL Roland MD, M Kelher BS, J Toombs BS, CC Silliman MD PhD, RA Brekken PhD, CC Barnett Jr MD

Discussant: John Howton, MD

11:45am - 12:00noon

22. Feasibility of the Nitric Oxide Donor (Deta/NONOate) as a Radiosensitizing Agent

D Chen MS, L Ortega PhD, D Chen PhD, EH Livingston MD, S Huerta MD

Discussant: Joseph Kuhn, MD

12:00pm - 12:15pm

23. Oxygenated Perfusion of Donor Hearts Reduces Ischemic Damage during Preservation

A Halldorsson, HA Goolsby PhD, MD Tomison BS, SD Prien PhD

Discussant: Robert Goldstein, MD

12:15pm - 12:30pm

24. Partial Cholecystectomy in the Setting of Severe Inflammation is an Acceptable Consideration with few Long-Term Sequelae

CF Sharp MD, RZ Garza MD, K Jones MD, AJ Mangram MD, EL Dunn MD

Discussant: Antonio Castaneda, MD

12:30pm - 1:00pm Jeopardy: Final Round

1:00pm

Awards & Concluding Remarks



Oral Session Abstracts

1. Peripheral Arterial Catheterization in the Intensive Care Setting: Is a Temporal Factor Alone an Indication for Discontinuation?

RC Mooty MD, V Johnson MD, M Lorenzo MD/MBA, E Dunn MD, A Mangram MD
Methodist Health Systems — Dallas, TX

Introduction: Better care techniques in association with new catheters for peripheral arterial catheterization (PAC) question the traditional practice of removing arterial lines after 72 hours. The purpose of our study was to evaluate the complications associated with prolonged use of PAC, with particular emphasis on distal ischemia.

Methods: We conducted a retrospective 18-month review of all patients requiring PAC while in our medical/surgical intensive care units. Our study comprised all patients who had an arterial line for a period greater than 72 hours.

Results: A total of 385 cases were reviewed. Thirty-seven percent (143) of these cases met our inclusion criteria, recognizing only the patients with indwelling arterial catheters in place greater than 72 hours. The average length of PAC in this group was 8.27 days (range 4 – 34 days). The admitting diagnoses included patients with sepsis, trauma, neoplasms, and/or end organ compromise (i.e. cardiovascular, respiratory, neurologic, etc). During this time, over 40% (58) of the patients were on pressors (i.e. phenylephrine, dopamine, etc.) and less than three percent (4) were on anticoagulation drips (i.e. heparin). All patients were seen daily in the ICU as well as on the medical/surgical wards until discharge. From the inclusion group, only two patients (1.39%) were found to have long-term complications – permanent distal ischemia. One patient, while on pressor support, had distal ischemia on arterial line day 6. The other patient, without the adjunct of pressors, was found to have distal ischemia on day 8. The rate of ischemia in the pressor versus non-pressor subgroup was 1.1% to 1.7%, respectively.

Conclusion: We recognized that the duration of cannulation is an important factor in regards to arterial occlusion. Prior studies report a higher incidence of occlusion when cannulation surpasses the 48 to 72 hour time frame. Despite historical references, our study indicates that prolonged arterial cannulation may be acceptable with minimal long-term complications.

2. Evaluation of the Utilization of Paramedics to Activate the Trauma Team from the Field: A Prospective Study at a Level I Trauma Center

R Lewis MD, W McNabb RN, J Griswold MD, M Berry RN, B Mwrey LP, E Sasin MD, A Halldorsson MD, S Dissanaikie MD
Texas Tech University Health Sciences Center — Lubbock, TX

Background: Trauma team activation in West Texas is determined by the nursing and physician staff in the Emergency Room (ER), based on field report given by paramedics. At the present time, paramedics do not directly activate the trauma team or specify which level of activation is required. Activation on scene or en route by qualified personnel would not only move the decision making to those in direct patient



care contact, but also possibly facilitating better utilization of resources in a busy trauma center.

Objective: To determine the accuracy of paramedic judgment from the field in the activation of the appropriate level of trauma team.

Methods: A prospective observational study was conducted in conjunction with Lubbock Emergency Medical Services (EMS), and the University Medical Center, Lubbock, TX. A computer-based questionnaire was provided for EMS paramedics to document their assessment regarding level of activation required before arriving in the ER. Their assessment was based upon severity of injury, mechanism, and/or degree of damage to vehicles. This information was used for research purposes only, and had no bearing upon actual activation level by the ER. A trained trauma nurse coordinator subsequently reviewed all the charts and determined the appropriate level of activation based on criteria published by the American College of Surgeons.

Results: We assessed 64 trauma activations. The ER staff over activated 2 (3%) and under-activated 5 (8%) and trauma patients. The EMS paramedics over-activated 3 (5%) with no under-activations. There was no statistically significant difference between groups with either over- or under-activation ($p = 1$ and 0.057). The over-activations were based on vehicle damage and mass casualty scenarios.

Conclusion: EMS determination of the level of trauma team activation is comparable with that of the ER staff. There was a trend toward fewer under-activations, which is in accordance with American College of Surgeons' guidelines, and may imply a potential benefit of EMS triage of trauma activations.

3. Accuracy of Surgery Residents Interpretation of CT Scans in Trauma

C Arentz MD, J Griswold MD, A Halldorsson MD, F Quattromani MD, S Dissanaik MD
Texas Tech University Health Sciences Center — Lubbock, TX

Background: Treatment decisions on trauma patients are often urgent. The need for operation or intensive monitoring is frequently determined by surgeons based on radiographic studies, in addition to clinical findings. Many institutions, including our own, do not have 24-hour in-house attending radiologist support, and initial decisions on trauma patients are usually made by the surgical team prior to an official report.

Goal: To evaluate the accuracy of surgery residents (PGY 3-5) in reading and interpreting computed axial tomography (CT) scans of trauma patients.

Methods: We performed a prospective study comparing surgery resident interpretations of CT scans of the head, chest, abdomen and pelvis versus official radiologist reports of trauma activations at our Level I Trauma Center between September 2006 and April 2007. Resident interpretations were entered into a computerized system at the time of initial patient management, prior to an official report becoming available. Computerized time-stamping of this record was performed to ensure integrity of the data. The resident interpretation was used for research purposes only, and was not an official part of the medical record. Resident identity was blinded prior to data analysis. The residents' reading was compared to the on-call radiology attendings' final report. All studies were over-read by an experienced radiologist and in those cases where discrepancies were noted between the residents reading and the on-call radiologists, careful re-evaluation by an independent panel of radiologists and surgeons, served as the correct interpretation.



Results: Complete resident reads were available for 128 CT scans on 32 patients. Our residents correctly identified 25 of 26 (96%) injuries to the head, 28 of 42 (67%) chest injuries and 15 of 16 (94%) injuries to the abdomen and pelvis. The accuracy of resident chest CT scan reads was significantly lower ($p = 0.035$) than for other body areas. The missed injuries were rib fractures in 4 cases, pulmonary contusions in 4 cases, and other missed fractures. In comparison, the on-call radiologist correctly identified 23 of 26 (89%) head injuries, 38 of 42 (90%) chest and 14 of 16 (88%) abdomen and pelvis injuries. There was no overlap in the missed injuries i.e. no injuries were missed by both groups. No immediately life threatening injuries were missed by either group and none of the missed injuries effected clinical decision making.

Conclusion: Our residents compare favorably with radiologists in identifying injuries to the head, abdomen and pelvis on CT scan. The deficiency seen on missed chest injuries provided us with an opportunity to improve resident education. This study shows that mid- and upper level surgery residents at a level one trauma center are as safe as an on- call radiologist in interpreting immediately life threatening injuries on a CT scan during evaluation of severely injured patients. The best overall accuracy of the final read is achieved by using both the residents' and radiologists' interpretation.

4. CTA-Based Screening Reduces Time to Diagnosis and Stroke Rate in Blunt Cervical Vascular Injury

AL Eastman MD, V Muraliraj MD, JL Sperry MD, MPH, JP Minei MD

The University of Texas Southwestern Medical Center — Dallas, TX

Introduction: Advances in computed tomography capabilities have enabled trauma surgeons to screen for and diagnose the severity of blunt cervical vascular injury (BCVI) using CTA alone. We hypothesized that the use of CTA-only screening and diagnostic methods would reduce the time interval from admission to diagnosis and hence, also reduce the stroke rates associated with these injuries.

Methods: All patients admitted to a level I trauma center after December 1999 at risk for BCVI were screened. Until March 2005, patients were screened with cervical catheter angiography (CA). Subsequently, a CTA-only screening/diagnostic program was initiated simultaneously with standardized interdisciplinary treatment protocols for BCVI. Data for controls were subsequently obtained by reviewing trauma registry records.

Results: Of 3012 trauma admissions from April 2005 through July 2006, 26 patients were found to have BCVI diagnosed by CTA alone. A standardized, injury grade-based treatment protocol was then initiated immediately based upon CTA findings. Time to diagnosis and stroke rate in these patients were then compared to 79 patients found to have BCVI from December 1999 to March 2005 during CA-based screening. There were no differences in sex, mean age, ISS, head/neck AIS, or arrival GCS between the CA and CTA groups. With CA-based screening, the mean \pm SD time from trauma center admission to diagnosis was 31.2 \pm 41.1 hours. After transition to CTA screening in Mar 05, this time was reduced to 2.65 \pm 3.3 hours ($p < .001$). During the era of CA-based screening, the overall stroke rate for BCVI at our institution was 15.2% ($n=12/79$). Following the initiation of CTA-based screening, the stroke rate was reduced to 3.8% ($n=1/26$, $p=.046$).

Conclusions: The initiation of a CTA-based screening and diagnostic program, along with interdisciplinary standardized treatment protocols, reduced the time to diagnosis of BCVI twelve-fold and the institutional stroke rate due to BCVI four-fold. This may be due to earlier diagnosis and initiation of definitive therapy.



5. Preoperative Embolization in the Treatment of Carotid Body Tumors

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Introduction: Carotid body tumors, also known as paragangliomas or glomus tumors, are rare tumors that represent 0.6% of head and neck cancers and 0.03% of all neoplasms. These tumors commonly present as a lateral, slow growing neck mass noticed by the patient. They usually cause death by invading the arteries in close proximity, carotid and/or its main branches. Surgical excision is the treatment of choice but has historically been associated with significant morbidity and mortality. These complications are often a direct result of difficulties in achieving hemostatic control in these highly vascular tumors. We hypothesize that preoperative coil embolization (PCE) of carotid body tumors would lead to a reduction in operative time, perioperative bleeding and hospital stay.

Methods: A retrospective review of medical records of all patients with carotid body tumors who were surgically treated at Texas Tech University Health Sciences Center from 2003-2007. All patients underwent PCE 1-14 days preoperatively. Epidemiologic data, age, gender and race were used to categorize the patient population. The following end results were extracted from each patient's medical records: tumor volume, as calculated by multiplying the three perpendicular planes measured by pathology, tumor type, intraoperative bleeding, hospital stay and outcome. Our results were compared with recent published data from comparable patient population where the patient had not undergone coil embolization preoperatively. All results are expressed as mean +/- standard deviation (S.D.).

	Number of Patients	Blood Loss Mean +/- S.D	Operative Time Mean +/- S.D.	Morbidity % of Patients
Our patients (with PCE)	9	118 mL +/-148	85 min +/- 40	11%
Lamuraglia et al. (without PCE)	8	609 mL +/- 564	270 min +/- ?	9%
Liapis et al. (without PCE)	13	700 mL +/- ?	Unknown	33%
Plukker et al. (without PCE)	35	750 mL +/- ?	174 +/- ?	Unknown

Results: We identified nine patients, six (67%) female and three (33%) male. Eight patients (89%) had carotid body tumors, while one (11%) had a vagal paraganglioma. The patients mean age was 58.1 +/- 11.4 ranging from 40-77. All patients underwent complete excision of the tumor. One patient experienced transient hemiplegia following PCE that resolved completely and he underwent surgery five days later without complications. No other morbidity or mortality was documented. The mean hospital stay was 2.8 days +/- 2.5 (median 3 days). Mean tumor volume was 12.5 cm³ +/- 9.6 cm³. Average blood loss was 119 mL +/- 148 mL (range 20-500 mL), mean blood loss per tumor volume was 14.8 mL/cm³ +/- 5.8. The mean operative time was 85 minutes +/- 40.7. Table 1 summarizes our findings compared to two studies from the literature with comparable patient populations.



Conclusion: Carotid body tumors are extremely vascular and surgical excision can therefore lead to significant blood loss resulting in increased risk of morbidity and mortality. The size and vascularity of these tumors in the region of the carotid bifurcation make dissection often difficult and dangerous and in attempt to get control of the vascular supply the vagus, hypoglossal or recurrent laryngeal nerves can be injured. Preoperative coil embolization is an attractive adjunct to surgical treatment of these tumors and our study shows that this is very feasible with low morbidity preoperatively. Our results indicate that there is a significant reduction in operative time, intraoperative blood loss and overall hospital stay. Although, a larger randomized retrospective studies are needed to validate the outcome of this study, preoperative coil embolization is currently preferred in all patients undergoing carotid body tumor excision at our institution.

6. Limb Disarticulations Performed at a Burn Center — Review of a 24-Year Experience

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Introduction: Burn centers are often asked to assume care for patients requiring extremity disarticulations due to expertise in the multidisciplinary management of major wounds and infections. Disarticulations may be required for a variety of reasons including thermal burn, electrical injury, trauma, or severe infection. These patients have significant morbidity and mortality and often require more resources than the usual burn patient.

Methods: A single burn center registry was queried for all patients requiring limb disarticulations over a 24-year period. The general burn population was compared to the disarticulation population, including mechanism of injury, hospital and ICU length of stay, ventilator days, mortality, complications, and the number of operations performed.

Patient Demographics	Total Burn Population (n=11,843)	Disarticulation Population (n=51)
Gender, M:F	2.8:1	2.7:1
Mean age (years)	29 (0-98)	39 (0.3-84)
Mortality	939 (8%)	13 (25%)
ICU admissions	3,866 (33%)	45 (88%)
Intubations	2,506 (21%)	36 (71%)
Ventilator days/patient intubated	14	27
Tracheostomies	678 (6%)	22 (43%)
Mean length of stay (days)	13	34
Mean operative procedures/patient	1.9	5.3
Units PRBC/patient	2.7	18.4

Results: There were 11,843 admissions to our center during this period, 51 of whom required a limb disarticulation (0.4% of the total burn population). Of those requiring disarticulation, 12 had a thermal burn injury (23%), 18 had an electrical injury (35%), 9 had traumatic injuries (18%), 11 had a limb-threatening infection (22%) and 1 patient had severe frostbite (2%). Multiple limb disarticulations were performed in 9 patients (18%). Ventilator and ICU days, mortality, number of operations performed, and mean



length of stay were increased in the disarticulation population. In the first half of our study period (1983-1995), 67% of disarticulations were due to a primary burn or electrical injury, as compared to 53% during the last 12 years (1996-2007). This reflects an increasing percentage of disarticulated patients in our burn center who have a traumatic or infectious etiology.

Conclusions: As burn prevention programs continue to decrease burn admissions, burn units are increasingly being asked to care for a wider range of patients, including those needing limb disarticulations. Review of our center's experience identifies a diverse patient population requiring extremity disarticulation. Practitioners must become familiar with management of major limb injuries and their associated wound care and rehabilitation issues as burn centers increasingly attract these challenging patients.

7. Permacol: A Potential Biologic Patch for Congenital Diaphragmatic Hernia?

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Purpose: The most commonly used graft for Congenital Diaphragmatic Hernia (CDH) repair is Gore-Tex. However, up to 50% of patients with Gore-Tex patch repairs have recurrent herniation. Reoperative surgery on such medically complex children is not trivial. Thus, identifying a biologic prosthetic graft may solve these clinical morbidities and ideally incorporate in the autogenous tissue of the patient. Currently available biologics are easily accessible, nonimmunogenic, and have gained widespread use in ventral hernia repair in adults. The purpose of this study is to compare the outcomes of synthetic Gore-Tex to a biologic graft, Permacol.

Methods: An IRB-approved, retrospective review was performed on 67 subjects with CDH. Subjects that underwent CDH repair and survived greater than 30 days were included. The methods of repair were analyzed: Primary repair (29) and graft repair (28), including Gore-Tex (20) and Permacol (8). Permacol is a biologic graft of porcine acellular dermal collagen. They were evaluated for the incidence and timing of recurrence. Comorbidities, such as prematurity, ECMO, congenital heart disease, and prior surgeries, were evaluated.

Results: The recurrences were: 1 (3%), 6 (30%), and 0 in the Primary, Gore-Tex, and Permacol groups, respectively. The median time for follow up was 37 and 48 months for the Primary and Gore-Tex groups. The recurrences occurred at 6months in the Primary group and 7 months (the median) in the Gore-Tex group. Patients in the Permacol group were followed for a median of 11 months which exceeded the median time for recurrences in the other groups. Permacol and Gore-Tex groups had a similar incidence of congenital heart disease, prematurity, and relatively similar ECMO support (25%, 45%, respectively).

Conclusion: Prior studies have shown that the incidence and timing of reherniation using another biologic, such as Surgisis (submucosal graft), did not differ from those of Gore-Tex. Our results show that Permacol actually had a lower incidence of reherniation in comparison to Gore-Tex and is a potentially promising alternative biologic graft for CDH repair.



8. Use of Fibrin Glue for Closure of Mesenteric Defects - Improved Outcomes and Decreased Symptomatic Hernias

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Introduction: The risk of internal hernia after gastric bypass remains a significant source of morbidity and mortality. The rate of symptomatic internal hernia post operatively is reported at up to 10% (1-10.5%) in individual series. Strategies for closure or nonclosure of the mesenteric defects have been proposed. In laparoscopic patients these obstructions are more commonly from non-adhesive disease (internal hernias, strictures) than in open procedures. We evaluated the use of fibrin sealant at the Peterson and jejunajo-jejunostomy (J-J) defects for closure of the mesenteric defect and prevention of hernia.

Methods: A retrospective database was maintained and reviewed. Patients undergoing laparoscopic antecolic gastric bypass between January 1, 2003 and January 1, 2007 were included. We stratified the patients into three groups: Group A - no closure, Group B - Closure of J-J with suture and group C - closure of J-J with suture and application of fibrin sealant to J-J and Peterson's space. Patients were evaluated for presence of internal hernia and timing of presentation.

Results: 2434 patients met criteria to be included in the study (1973 female/461 male). Mean BMI was 47.4 (29-92). Mean age 43 (18-77) Group A: 1278 patients, Group B: 328 and Group C: 828. There were a total of 82 internal hernias (3.3%) which were distributed in Group A n= 67 (5.2%), Group B n=4 (1.2%) and Group C n=11 (1.3%). Distribution of hernias were 43 (52%) at Peterson's defect and 39 (48%) at the J-J. In evaluation of J-J hernias 28/39 (72%) were seen with no closure of the mesentery. Peterson hernia defects were seen 91% (39/43) in patients where no fibrin sealant was used to close the defect.

Discussion: Effective and efficient closure of the mesenteric defects after gastric bypass remain an ongoing debate for bariatric surgeons. Many large series have touted the benefit of closure of these defects. We once again demonstrate the importance of closure of all defects. These data also illustrate a novel approach to closure of the Peterson defect. The use of fibrin sealant allows effective closure of the defect in a timely manner.

9. Circular Staple Line Reinforcement - One Year Results

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Background: Circular stapled gastrojejunostomy anastomosis has become a standard technique in bariatric patients undergoing lap-RNY gastric bypass surgery (lap-RYGB). Circular staple line reinforcement with remodelable biomaterial has recently become available with the potential for decreased complications. Long term effect on stricture formation and weight loss are unknown. The purpose of this study is to compare reinforced versus non-reinforced staple lines of the gastrojejunostomy.

Methods: A retrospective review of all patients undergoing lap-RYGB was performed to compare circular staple line reinforcement using Peri-Strips Dry® with Veritas® Collagen Matrix (Synovis Surgical Innovations) versus non-reinforced staples. The reinforced strips were placed on both ends of the 25 mm circular stapler. Study endpoints included weight loss at six weeks, six months, and one year. Additional endpoints were postoperative complications including strictures, anastomotic leaks, bowel obstructions, fistulas, and bleeding.



Results: Seven hundred seventy eight consecutive patients were identified who had lap-RYGB and were treated using reinforced staple lines (n=308) or non-reinforced staple lines (n=470). Patient characteristics based on BMI, age, and gender were similar for both groups. There was no significant difference in the percent of excess body weight loss for reinforced versus non-reinforced patients at six weeks (25% vs. 26%), six months (59% vs. 60%), or one year (76% vs. 79%). There was no significant difference in stricture rate (7.4% vs. 6.5%) or fistula rate (0.3% vs. 0.2%). There was a slight decrease in bleeding (1.2% vs. 3.2%) ($p < .09$) and leak rate (0.3% vs. 0.6%).

Conclusion: These data suggest that circular staple line reinforcement is safe and may be associated with slight decrease in bleeding and leak rate without change in weight loss or stricture rate. A larger patient study group may show a significant decrease in bleeding in the immediate postoperative period. More long term follow up is needed to assess long term weight loss in the reinforced staple line group.

10. Outcomes and Complications of Laparoscopic Sleeve Gastrectomy

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Background: Laparoscopic gastric bypass surgery has become a common treatment modality for morbidly obese patients. Recently the laparoscopic sleeve gastrectomy has been suggested as an alternative procedure for weight loss. The purpose of this study is to explore the outcomes and complications following sleeve gastrectomy.

Methods: A retrospective review of all patients undergoing sleeve gastrectomy was performed to examine the outcomes and complications of the surgery in those patients. Study endpoints included reflux, weight loss, nausea, readmission, leaks, length of stay, and complications.

Results: Forty one patients were identified who had undergone the sleeve gastrectomy. Patient characteristics included 11 males and 30 females, mean age 47 years (range 20–64), and mean BMI 44 (range 32–60). The average length of stay was 1.27 days with a range of 1 to 4. Three patients were found to have delays in discharge due to nausea while still in the hospital. During the six week follow up period one patient was readmitted for dehydration, two patients had a leak, one patient had a wound infection, and one patient was readmitted for nausea, vomiting, and an internal hematoma. During the six month follow up period one patient was found to have a partial small bowel obstruction due to adhesions. Average weight loss at six months was 62% of excess body weight (range 30%–115%). At 12 months the average excess body weight loss was 69% (range 47%–98%). This was compared to a matched cohort of patients undergoing lap RNY who experienced an average of 60% excess body weight loss at 6 months (range 29%–103%) and 79% at 12 months (range 35%–152%). Reflux symptoms at six months were reported as mild in 2 patients (4.8%), moderate in 5 (12%), severe in 2 (4.8%), and none in 32 (78%),

Conclusion: The data obtained to this point suggest that the laparoscopic gastric sleeve has minimal complications during the 6 week and 6 month follow up periods. Early weight loss at 6 months was comparable to the RNY patients. Weight loss at 12 months was inferior to the RNY patients. Postoperative symptoms of reflux are common (22%). Preoperative assessment of hiatal hernia and reflux severity are important. Further follow up will be important to assess long term benefit



11. Complications After Sleeve Gastrectomy for Morbid Obesity

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Introduction: Sleeve gastrectomy has become a more common operation in bariatric and metabolic surgery. One of the most recognized potential complications is leak, given the long staple line. In this paper, we discuss leaks and other potential complications after sleeve gastrectomy.

Materials and Methods: This is a retrospective study considering sleeve gastrectomy (SG) or partial gastrectomy with banding (GBSR) performed for bariatric surgery. We found 68 patients where data was retrieved and showed an average BMI of 53.5%, average age of 51 years, and average comorbidities of about 8. There were a total of 59 women. Twenty-nine patients underwent partial gastrectomy. Average operating room (OR) time was 70 minutes. Reinforcement of the staple line was performed with either SeamGuard (Gortex) or Peri-Strips (Synovis).

Results: Three (4%) patients returned to the OR for oozing from the staple line after GBSR. Only one patient (1%) had stitches placed to control severe oozing. Two patients (3%) had leak from the staple line with SG; the first patient after developing pneumonia two days after surgery and the second one after having an acute symptomatology of salmonellosis. Nausea was present in 90% of the patients. No regurgitation or reflux was reported. One patient with partial gastrectomy (1%) developed stenosis which resolved with an endoscopic treatment and balloon dilatation. At 18 months, EWL was 55% for the partial gastrectomy combination procedure and 59.7% for sleeve gastrectomy.

Conclusion: Bleeding was controlled with decreased preoperative Lovenox and was more common with the use of SeamGuard. The two leaks were in patients who had Peri-Strips. All of the leaks were in the presence of potential abdominal increased pressure, coughing and vomiting in our experience. Reinforcement of the staple line is necessary both for bleeding and for leak, but the perfect tool is not available.

12. Expanding the Indications for Laparoscopic Gastric Resection for GIST: Size is Not a Limitation

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Objective: GIST tumors are of mesenchymal origin. Survival is based on tumor size, avoidance of tumor cell spillage during resection, and negative surgical margins. Laparoscopic resection of large gastric GISTs has been controversial. We hypothesize that laparoscopic manipulation and resection using, in some cases, extracorporeal anastomosis of the GI tract is a safe, alternative and an efficient mode to approach these tumors, even when they are large.

Methods: Between August 2007 and November 2007, four patients underwent a laparoscopic approach for GIST tumors larger than 2 cm at Methodist Dallas Medical Center. Outcome measures included patient demographics, operative findings, post operative course, and pathologic characteristics. Lack of violation of the pseudocapsule was confirmed in all cases.

Results: The mean age in this patient group was 58 (range, 36 - 77 years). GI bleeding and dyspepsia were the most common symptoms. 75% of the patients were



females. Mean tumor size was 10 cm (range, 2.5 - 20 cm) with distribution in the stomach as follow: 75 % greater curvature and 25% antrum. The gastric GIST tumors were removed by wedge, sleeve and partial gastrectomies. 50% of these tumors showed high grade and the other 50% moderate grade of differentiation. The number of mitosis was less than 5/50 HPF in all the tumors. There was no intraoperative spill in any patients, even with the largest tumor (20cms). Average length of stay was 4 days. No patients required re operation and there were no complications post operatively.

Conclusion: Minimally invasive approaches can be safely used to treat large GISTs. Obeying principles of minimal touch, no spill, obtaining a negative margin and a safe operation with a laparoscopic approach is feasible, even in giant tumors. Large size of diagnosed GISTs should not preclude a minimally invasive approach to these tumors.

13. Practice Management Education During Surgical Residency

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Surgical education has undergone radical changes in the past decade. The introductions of laparoscopic surgery and endovascular techniques have required program directors to alter surgical training. The six competencies are now in place. One issue that still needs to be addressed is the business aspect of surgical practice. Often residents complete their training with minimal or no knowledge on coding of charges or basic aspects on how to set up a practice. We present our program over the past two years designed to teach the residents practice management.

Methods: The program begins with a series of ten lectures given on a monthly basis beginning in August. Topics include an introduction to types of practices available, negotiating a contract, managed care, and marketing the practice. Both medical and surgical residents attend these conferences. In addition, the surgical residents meet monthly with the business office to discuss billing and coding issues. These are didactic sessions combined with in-house chart reviews of surgical coding. The third phase of the practice management plan has the coding team along with the program director attend the outpatient clinic to review in real time the E&M coding of clinic visits.

Results: Resident evaluations were completed for each of the practice management lectures. The responses were recorded on a Likert scale(1-5). The scores ranged from 4.1- 4.8 (average = 4.3). Highest scores were given to lectures concerning negotiation employee agreements, recruiting contracts, malpractice insurance and risk management. The medical education department has tracked resident coding compliance over the past two years. Surgical coding compliance increased from 36% to 88% over a 12 month period. The program director who participated in the educational process increased his accuracy from 50% to 90% over the same time period.

Conclusion: When residents finish their surgical training they need to be ready to enter the world of business. These needs will be present whether pursuing a career in academic medicine or the private sector. A program which focuses on the business aspect of surgery enables the residents to better navigate the future while helping to fulfill the systems-based practice competency.



14. Variations in the Perception of Trauma Related Morbidity and Mortality between Surgery Residents, Attending Surgeons, Nurses and Medical Students

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Background: Trauma programs employ performance improvement in an effort to provide better future care for the trauma patient population. One facet of performance improvement is the review of adverse or unexpected outcomes in the Morbidity and Mortality (M&M) Conference. Audience Response System (ARS) technology, an anonymous form of audience participation using wireless keypads, has been shown to promote more active participation, truthful responses, and improved retention of material. At our trauma center, the ARS is integrated in the monthly trauma conferences to provide immediate and anonymous outcome assessments from attending surgeons, surgical residents, nurses and medical students. This study examined the different outcome assessments provided by Morbidity and Mortality Conference participants.

Methods: A prospective study of outcome assessments by attending surgeons, surgery residents, nurses and students at the monthly Trauma Morbidity and Mortality conference was performed, over a two year period. ARS keypads were distributed according to category of participant, and responses were entered anonymously. Morbidity outcome assessments were graded as follows: Grade I (“alteration from course, non-life threatening, temporary”), Grade II (potentially life-threatening, no residual disability) or Grade III (“persistent disability, organ resection, persistence of life-threatening condition”). Mortality outcome assessments were categorized as preventable, potentially preventable or non-preventable death. All groups entered their opinions simultaneously after narrative presentation of each case and exhaustive discussion.

Results: We had a total of 695 audience responses for complications (100 attending surgeon, 279 resident, 142 nurse and 174 student responses), and 936 responses for deaths (134 attending surgeon, 348 resident, 188 nurse and 306 student responses). Residents scored Grade I complications approximately half as often as any other group (18% versus 32%, $p = 0.01$). Residents were significantly more likely to score complications as a Grade III complication than the other groups, with the greatest discrepancy noted between residents and attending surgeons (25% versus 14%, $p = 0.03$). There were no significant differences in scoring of deaths, with approximately 65% being non-preventable, 34% being potentially preventable and 1% preventable.

Conclusion: Surgery residents viewed adverse outcomes in trauma more critically, and judged a higher scale of residual disability, when compared with assessments by attending surgeons, nurses and medical students. On the other hand, the opinions of preventability of fatal outcomes were remarkably similar between a diverse group of healthcare workers.



15. Venous Thromboembolic Events and Risk Stratification: Evaluation of Prolonged Prophylaxis in High Risk Bariatric Patients

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Background: The risk of a venous thromboembolic event (VTE) after bariatric surgery remains a significant source of morbidity and mortality. A survey of ASBS members showed the incidence of DVT/PE after open bariatric surgery to be 2.63% and 0.95% respectively. Reviews of the laparoscopic literature demonstrate a risk of symptomatic VTE to be 0.8 - 2.4%. The purpose of this study is to identify a baseline risk profile for VTE and evaluate a standard prophylaxis protocol.

Methods: A retrospective database was maintained and reviewed. Patients undergoing laparoscopic gastric bypass, laparoscopic gastric sleeve and revisional procedures were included. We stratified the patients into two groups: Low risk patients were age <50 and BMI <50. High risk patients were age >50 or BMI >50. All patients received postoperative low molecular weight heparin (LMWH) (enoxaparin) 40 mg Q12 hours beginning 8 hours after surgery. All underwent treatment with compression devices. High risk patients maintained the LMWH therapy for 10 days postoperatively. All patients underwent a lower extremity venous Doppler preoperatively and at 2 weeks postoperatively.

Results: Three hundred ninety patients met criteria to be included in the study. The "low risk" group included 147 patients (123 female, 24 male) with an average length of stay (LOS) of 1.15 days (range 1-3) and an average 2.1 doses of LMWH. There were no VTE or significant bleeding events noted. The "high risk" group included 243 patients (180 female, 63 male) with an average LOS of 1.32 days (range 1-15) and an average 14 doses of LMWH. Three patients had a VTE. Two patients had a DVT and 1 patient had a DVT and nonfatal PE. There were two significant bleeding complications (2 unit pRBC transfusion). Incidence of DVT/PE was 0.77% and 0.26% overall and 1.23% and 0.41% in the high risk group.

Conclusion: We demonstrate that this protocol can be followed for bariatric patients with a significant decrease in VTE and without a significant increase in bleeding complications. The duration of pharmaceutical prophylaxis in a bariatric population remains controversial. This study shows that a short course of LMWH (average 2 doses) during hospitalization is an effective VTE prophylaxis regimen for low risk patients (age < 50 years, BMI < 50). A longer course of LMWH seems appropriate for higher risk bariatric patients (age > 50 years, BMI > 50).

16. The Use of Intraoperative PTH Assay and Predictive Factors for Postoperative Calcium Replacement

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Background: Surgery remains the most effective treatment for primary hyperparathyroidism. The use of intraoperative PTH assay (IOPTH) has been shown to increase the success of parathyroid surgery. Postop hypocalcemia continues to be a source of morbidity in parathyroid surgery. A readily available perioperative method to identify patients at risk for developing postop hypocalcaemia would be



beneficial. The purpose of this study is to identify which patients are at risk for postop hypocalcemia.

Methods: A retrospective chart review over a two-year period was performed for all parathyroid surgeries from a single institution using a rapid IOPTH assay. Normal serum calcium is 8.4 to 10.2 and ionized calcium 1.13 to 1.32 in our laboratory. The data was analyzed for patient demographics, preop PTH and calcium levels, IOPTH levels, and postop calcium levels. Patients who had either an immediate postop or any postop in-hospital hypocalcemic value were subdivided out and analyzed for trends regarding preop calcium levels, IOPTH levels and percent drop, and for postop supplementation.

Results: 110 patients were analyzed. There were 86 females and 24 males with an age range of 17 to 87 years old. Preop PTH ranged from 36 to 7876 and the preop calcium ranged from 8.8 to 15.6. 80 patients had unilateral exploration and only 30 had bilateral exploration. Immediate postop calcium was drawn in the PACU on 47 patients. Overall, 10 patients had immediate postop calcium values that were below normal. 3 of the 10 had calcium levels normalized by the next morning. Of those patients with immediately low postop calcium, the average 5 minute percent drop in rapid PTH was 77% (range 20-99%) and the average 10 minute percent drop in rapid IOPTH was 82% (range of 40-99%). Of the 2 patients with unilateral exploration but immediate postop hypocalcemia, significant drops in rapid IOPTH of 91% drop and a 99% drop at 5 minutes was seen. Normal preop calcium was noted in 8 of 10 patients with immediate postop hypocalcemia.

Conclusions: Our results suggest that having normal preop calcium is a risk factor for immediate postop hypocalcemia after parathyroid surgery. Furthermore, a drop in rapid PTH of > 90% with a unilateral gland excision or bilateral neck exploration are also risk factors for postop hypocalcemia. Hopefully this knowledge can be applied towards developing an algorithm for predicting which patients may need calcium supplementation after parathyroid surgery.

17. Parathyroidectomy with Image Guidance Alone Leads to Higher Failure Rates: Making the Case for Intraoperative Parathyroid Hormone Monitoring

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Introduction: Directed parathyroidectomy (DP), defined as a limited exploration guided by preoperative imaging studies with confirmation of cure using intraoperative parathyroid hormone monitoring (IOPTH), is feasible in many patients with primary hyperparathyroidism (PHPT). However, IOPTH is not available at all institutions, and it may add time and cost to the procedure. These considerations plus the improved accuracy of imaging studies for parathyroid localization have led some investigators to question the need for IOPTH.

Hypothesis: Image guided parathyroidectomy (IGP) without IOPTH leads to higher failure rates compared to the acceptable standard of <3% reported in the literature.

Methods: Retrospective review of 248 patients with previously untreated, sporadic PHPT who underwent preoperative localization with sestamibi scanning and ultrasonography and subsequent parathyroidectomy at an academic medical center.



Results: Of the 248 patients, DP was successfully completed in 194 (78%). Bilateral neck exploration (BNE) was required in the remaining 54 (22%), as the initial approach in 22 (41%) and following intraoperative conversion from attempted DP in 32 (59%). All patients were eucalcemic in follow up (4 months to 3 years). Reasons for intraoperative conversion to BNE from attempted DP included persistent elevation in IOPTH (15, 14 of which proved to have multigland disease), incorrect localization (7), inadequate exposure (9), and concomitant thyroid disease requiring thyroidectomy (1). In the study group overall, single gland disease was detected in 224 (90%) and multigland disease in the remaining 24 (10%). In the 24 patients with multigland disease, imaging studies were suggestive of single gland disease in 17 (71%). If IGP alone had been performed in these 17 patients, the incidence of persistent disease in the study group overall would be 7% compared to the actual finding of zero.

Conclusions: IOPTH should be used when attempting a limited exploration in patients with PHPT; IGP alone yields an unacceptable failure rate.

18. Pancreatoduodenectomy with or without Pyloric Preservation: A Clinical Outcomes Comparison

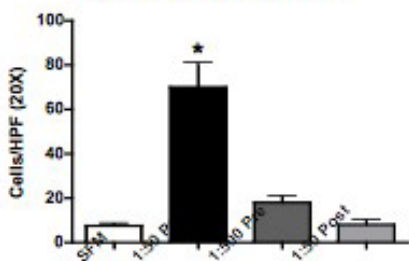
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Introduction: Pyloric preservation (PP) can frequently be performed at the time of pancreatoduodenectomy (PD), although some reports have linked it to inferior outcomes such as delayed gastric emptying.

Methods: We reviewed clinical records of all patients undergoing PD in a single-surgeon practice to assess outcomes after PD with or without PP. PPPD was performed whenever deemed safe and feasible, based on intraoperative pyloric mobility assessment, absence of suspicious perigastric lymph nodes, and if the pyloric vagal innervation could be preserved.

Stored Platelets Contain Factors Promoting Tumor Invasion



The supernatant of stored platelets was taken either before (Pre) or after washing with PBS (Post). Using a modified Boyden invasion assay, a significantly greater number of MiaPaca2 cells migrate when stimulated with the prewashed extract. This effect is reduced with serial dilutions of the prewashed platelets or in the postwashed group.

Results: Between 1997 and 2007, 129 of 180 pancreatic resections involved a DP (72%), total pancreatectomies excluded. There were 75 women (58%) and 54 men (42%), with a median age of 66 years (range: 38-87). Resection indications included 108 malignant processes (84%) and 21 benign disorders (16%). PPPDs (n=64) and PDs without PP (n=65) were numerically balanced. The only clinicopathologic differences between the PPPD and PD groups were a slight variation in cancer diagnosis distribution (pancreatic: 56 vs 71%,

ampullary: 26 vs 11%, others: 18% in both; p=NS) and the mean tumor size (2.8 vs. 3.5 cm, p=0.01). However, there were operative differences between PPPD and PD groups regarding OR time (5.8 vs 7 hours, p<0.0001), estimated blood loss (432 vs



613 ml, $p=0.006$), IV fluid (6794 vs 7882 ml, $p=0.02$), and blood transfusion rate (14 vs 32%, $p=0.01$). Postoperative morbidity rate (38 vs 39%), morbidity grade (grade 3+: 14 vs 13%), and lethal events ($n=2$ vs $n=4$) demonstrated no group differences. Postoperative NG tube duration (median: 2 vs 1 days) and NGT reinsertion rate (19%) were similar, as was the length of stay (median: 10 days). Delayed gastric emptying was observed in one patient after PPPD, and in three patients past PD. Median actuarial survival among cancer patients was greater after PPPD (26 months) than after PD (16 months, $p=0.09$), but there was no difference among patients with pancreatic cancer (14 vs 15 months, $p=NS$). PP had no impact in multivariate survival models.

Conclusion: There are no obvious detrimental outcomes associated with pyloric preservation during PD in this series. Greater intraoperative ease and superior survival in the PPPD group are due to underlying confounding, tumor-related variables in this nonrandomized comparison. Based on these findings, we intend to continue the use of pyloric preservation with our technique in patients who meet the stated criteria.

19. "Subclinical" Cushing's Syndrome is not Subclinical: Improvements Following Adrenalectomy

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Background: A subgroup of patients with adrenal cortisol hypersecretion fails to meet biochemical criteria for Cushing's syndrome. Appropriate therapy for this entity, Subclinical Cushing's syndrome (subclinical CS), is unclear. We examined outcomes for patients who underwent unilateral adrenalectomy for subclinical CS.

Methods: Between 2003-06, all patients who underwent adrenalectomy for cortisol hypersecretion due to an adrenal mass were examined. We analyzed biochemical, metabolic, and clinical outcomes.

Results: 24 patients underwent adrenalectomy for adrenal cortisol hypersecretion, of which 9 were diagnosed with subclinical CS. Median serum cortisol was 2.0 $\mu\text{g}/\text{dl}$ [range 1.1-6.1] after 1 mg overnight dexamethasone suppression testing. Urine free cortisol was normal in all but one patient. Subtle clinical findings on preoperative examination included skin bruising, unexplained weight gain, proximal muscle weakness, abnormal fat pads, skin thinning, fatigue, and facial plethora. During a median follow up period of 5 months (range 1 - 30 months), all 8 patients with easy bruising noted resolution post operatively. Fatigue improved in 4 of 5 patients, muscle weakness in 6 of 8 patients, and weight in 7 of 9 patients, with a median BMI change of -2.0 kg/m^2 (range -7.1 to +0.5 kg/m^2). Finally, several patients noted improvements in hypertension and diabetes control.

Conclusion: Patients with modest biochemical evidence of adrenal cortisol hypersecretion may show mild clinical signs attributable to this excess without displaying florid Cushing's syndrome. Adrenalectomy improves clinical and metabolic parameters for many patients with this "subclinical" Cushing's syndrome.



20. Genomic and Proteomic Analysis of High Risk Cancer Patients

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Introduction: Molecular profiling with gene and/or protein expression signatures has shown evidence of prognostic utility and response-predictive potential in patients with cancer. Identification of key 'highly-connected' proteins acting as routing hubs in cancer networks may present new opportunities for therapeutic intervention. The purpose of this study was a feasibility study of 24 high risk patients for potential targeted molecular therapy.

Method: Malignant and benign tissue was snap frozen in liquid nitrogen with subsequent laser microdissection to achieve cancer cell density greater than 80%. 2-Dimensional Difference In-Gel Electrophoresis (2D-DIGE) coupled with mass spectrometry was then performed to determine differential quantitative protein and oligonucleotide microarray (Affymetric U 133) to determine co-expressed mRNA expression.

Results: Initial diagnoses included melanoma (n=4), colorectal cancer (n=4), lung cancer (n=10), breast cancer (n=2), prostate cancer (n=1), pancreas cancer (n=1), sarcoma (n=1), and CLL (n=1). Proteomic analysis identified 15-25 up-regulated proteins (2-fold) when compared to the comparator benign tissue for each patient. Using as criteria connectivity analysis, high orthology, and network inference engine analysis we identified ANXA2, RACK1, GSN, STMN1, HM23A, and HSP27 as possible therapeutic targets. Microarray analysis confirmed mRNA over-expression. Recognition of key pathway proteins allowed for selective administration of existing molecular-specific therapy in 6 patients based on molecular pathway information. Eligibility for targeted therapy using existing agents would have been possible in 19/24 patients assuming optimal survival and protocol eligibility.

Conclusions: The identification of key individualized tumor targets in high-risk cancer patients may provide important opportunities for adjuvant therapy with a greater therapeutic index than currently achieved. Close surgical-pathological-oncologic collaboration using established techniques will be important for successful tumor harvest and eventual implementation of a targeted molecular strategy.

21. The Acellular Fraction of Stored Platelets Promotes Cancer Invasion

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Intro: Transfusion of blood products is a potentially life saving treatment to correct deficits of volume and oxygen delivery. However, it has increasingly been recognized that transfusions also transmit multiple immunomodulating factors. Transfusions have been shown to have a negative effect on outcomes in patients with cancer. As platelets are ubiquitous in transfused blood products and contain immunologically active agents, we hypothesize that the acellular fraction of stored platelets could promote cancer invasion.

Methods: Platelets were acquired from a stored source and identified by number and time of storage. After centrifugation, the supernatant was taken and considered



the prewashed acellular portion. The cells were resuspended in PBS and centrifuged again. This supernatant is considered the washed extract. In vitro transwell invasion assays were performed using a modified Boyden format. Inserts were coated with a basement membrane extract for one hour at 37°C. 10,000 cells were loaded on the top of the insert and incubated overnight. Cells were stimulated with either serum free media (SFM) or SFM containing serial dilutions of pre- or post-washed platelet extract. Inserts were stained with Diff-Quick and counted per high power field. All experiments were done in duplicate. Additionally, pre- and post-washed extracts from four patients were electrophoresed on an SDS-PAGE gel and western blot analysis was performed for the presence of VEGF. Statistical significance is determined by $p < 0.05$.

Results: Invasion assays using the Pan02 murine pancreatic cancer cell line demonstrate that prewashed platelet extract induces a significant increase in invasion compared to SFM (40.8 vs 7.4 cells/hpf, $p < 0.001$). This effect is negated at a higher dilution (1:500) of the prewashed platelet extract. This was replicated using extract from three different patients. Also, the MiaPaca2 human pancreatic cancer cell line was used and again we demonstrate a similar increase when exposed to prewashed extract (SFM 7.2 cells/hpf, 1:50 dilution prewashed 69.75 cells/hpf; $p < 0.001$). Finally, to assess if this phenomenon was applicable to other types of cancer, a human breast cancer cell line (MDA-MB-231) was used and shows a similar trend (SFM 8.2 cells/hpf, 1:50 dilution of prewashed 145 cells/hpf; $p < 0.001$).

Western blot analysis of prewashed platelet extract demonstrated elevated VEGF expression in pre-washed extract compared to a negligible amount of VEGF in the washed samples.

Conclusion: We have demonstrated that the components in stored platelets can promote the invasion of multiple cancer cell lines in vitro. Elevated levels of VEGF in prewashed platelet extract may contribute to these findings. These results indicate that platelet transfusion may be deleterious in terms of cancer recurrence.

22. Feasibility of the Nitric Oxide Donor (Deta/NONOate) as a Radiosensitizing Agent

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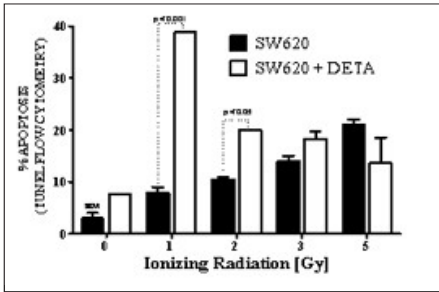
Introduction: Metastatic colon cancer cells SW620 are resistant to ionizing radiation (IR)-mediated apoptosis. Nitric oxide (NO) is a ubiquitous molecule with the ability to overcome tumor cell resistance to chemotherapeutic drugs via its chemosensitizing activity. DETA/NONOate (DETA) is an NO donor, which mimics sustained release of NO for over 20 hours. Because of its chemosensitizing properties, we hypothesized that NO may result in radiosensitization of metastatic colon cancer cells.

Methods: SW620 cells were pre-treated with DETA (1000 μ g X 24 h) or left untreated. They were then subjected to IR treatment at 0, 1, 2, 3, and 5 Gy. Apoptosis was determined by TUNEL and measured by flow cytometry. SW620 cells untreated and pre-treated with DETA (1000 μ g X 24 h) were subjected to immunohistochemistry with antibodies specific for Smac/DIABLO and Apoptosis-inducing factor (AIF)

Results: Pre-treatment of SW620 cells with DETA resulted in a 4.8-fold increase in apoptosis at 1 Gy (8.0 \pm 1.0 vs. 38.8 \pm 0.2, $p < 0.001$) and a 2.0-fold increase at 2 Gy (10.5 \pm 1.0 vs. 18.3 \pm 1.4, $p < 0.05$). There were no significant differences at high doses of IR (3 and 5 Gy). DETA showed no substantial increase in the cells positive for



Smac/DIABLO in cells treated with DETA. A substantial number of cells positive for AIF were observed in cells treated with DETA..



Conclusions: DETA sensitizes metastatic cancer cells to IR-induced apoptosis and may provide a therapeutic modality for patients with rectal cancer who fail to respond to IR. The mechanism resulting in NO-radiosensitization may be mediated by AIF and/or Smac/DIABLO. The NIK/B anti-apoptotic pathway following DETA pre-treatment will be addressed in IR-induced apoptosis.

23. Oxygenated Perfusion of Donor Hearts Reduces Ischemic Damage during Preservation

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Purpose: It is well documented that ischemic cold storage of hearts during transplantation procedures can cause damage to the organ at the cellular level. The damage manifests itself as structural changes in both the tissue and subcellular organelles, and limits the time the heart can be stored to a few short hours. Recently, a number of groups have proposed perfusion of the hearts during storage to supply oxygen and other nutrient during the storage process as a means of combating ischemic damage. However, concerns have been raised that the use of crystalloid solutions will lead to edema of the organ and further damage to tissue and cells. The objective of the present study was to compare heart tissue at the cellular and subcellular levels from cadaver hearts that had been stored using a traditional cold, static method versus a new organ preservation system (LifeCradle, Organ Transport Systems; Frisco, TX) which perfuses an oxygenated solution through the organ while maintaining the temperature at 5 C.

Methods and Materials: Twenty-six cadaver hearts were extracted from swine donors within 5 minutes of euthanasia in a slaughter facility. The hearts were flushed with heparinized cardioplegic solution and weighed prior to storage. The hearts were then stored in using either the standard ice-slurry methodology (n=9; SIS) for 4-8 hrs or in the new preservation device (n=17; LC) for times of 4-14 hrs. At the end of the storage time the hearts were weighed again to establish weight gain and tissue samples collected for ultrastructural analysis using TEM.

Results: Results indicated no significant increased weight gain in the LC as compared to SIS (12.9 gm vs. 12.3 gm respectively; P=.954) even after 3X longer is storage. Further, ultrastructural damage was minimal in hearts from the LC as compared to the control as assessed by a pathologist blinded to tissue source.

Conclusions: These data suggest the LC may be a superior storage environment over SIS and suggest further transplant studies are warranted.



24. Partial Cholecystectomy in the Setting of Severe Inflammation is an Acceptable Consideration with few Long-Term Sequelae

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Background: Though once the standard of care, open cholecystectomy is now infrequently performed. For the general surgeon open cholecystectomy is typically performed when a great degree of inflammation precludes safe laparoscopic removal. In those instances, the degree of inflammation can also lead to unacceptable risk of common bile duct injury during the dissection of the Triangle of Calot. In this situation the extent of dissection and amount of resection is not well established. We investigated whether the incomplete removal of a severely inflamed gall bladder can be an acceptable operation to relieve illness and symptoms, with minimal complications.

Methods: We undertook a retrospective review and follow-up telephone questionnaire of all partial cholecystectomies (PC) performed between Oct 1, 2005 and April 30, 2007. Partial cholecystectomy was defined as some portion of the gall bladder left in continuity with the cystic duct and not resected. Data on gender, age, co-morbid conditions, preoperative physical exam findings, radiologic findings, laboratory tests, preoperative antibiotics, pathology, post-surgical complications and symptoms were reviewed.

Results: A total of 828 cholecystectomies were performed by 6 attendings over the 19 months of the study period. Of these, PC was performed in 26 cases. Twenty-one of the 26 PCs performed were begun laparoscopically and converted to open cholecystectomy. Four patients had PC during planned open cases, and 1 was done by laparoscopy. The portion of the gall bladder left unresected in these was a portion of the neck in 13 (50%), the infundibulum in 10 (38%), and the hepatic surface in 3 (12%). Postoperative complications occurred in 7 (27%) patients, with 3 (12%) experiencing more than one complication. These were retained stones within the common bile duct in 4 (15%), bile leak in 3(12%), sub-hepatic abscess in 3 (12%), and wound infection in 2 (8%). There were no common bile duct injuries and no deaths. With one exception, all complications were addressed on the initial hospitalization without re-operation. Average length of hospital stay was 6 days (range 3-14 days). Telephone interviews were conducted with 19 (73%) of the 26 patients. Average length of follow-up was 314 days (range 3-666 days). At the time of last contact, mild non-interfering pain was the only ongoing complaint from one patient.

Conclusions: Severe inflammation can preclude safe laparoscopic removal of the entire gall bladder. In these instances, the risk of common bile duct injury and the long term consequences associated with such an injury do not justify complete dissection of the Triangle of Calot. Our data suggest that PC in the setting of severe inflammation is a reasonable operation with few long-term sequelae, good clinical results and satisfactory symptom relief.



Interesting Cases Abstracts

25. Omental Patches Reduce the Clinical Leak Rate Following Distal Pancreatectomy

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Omental Patches Reduce the Clinical Leak Rate Following Distal Pancreatectomy

Leakage from the pancreatic stump closure following distal pancreatectomy is the major morbidity following this operation. Major centers of excellence have reported leakage rates of 10 - 15 %, though much higher leak rates of up to 25 - 30% have been reported in other series. This paper summarizes a single surgeon's experience with three different methods of pancreatic stump closure following distal pancreatectomy.

A total of 48 distal pancreatectomies were performed from 1996 through 2007. Indications for surgery are listed here:

Disease Type	Number
Mucinous cystadenoma	12
Pancreatic adenocarcinoma	8
Chronic pancreatitis / pseudocyst	8
Serous cystadenoma	6
Islet cell tumor	4
IPMN	2
Solid / pseudopapillary tumor	2
Mucinous cystadenocarcinoma	2
Other	4

Pancreatic closures were divided into 3 groups:

Group A: Simple suture closure of pancreatic stump (N=12)

Group B: Bury pancreatic stump into retroperitoneum or cover with omentum (N=20)

Group C: Omental graham patch closure of pancreatic stump (N=16)

Patients were followed post-operatively for leak rates, re-admission rates, and complication rates requiring intervention. Leak rates were divided into clinical leaks requiring intervention, and chemical leaks simply requiring longer drainage times.

Results	Group A (12)	Group B (20)	Group C (16)
Stump leak (overall)	7 (58)*	7 (35)	2 (12)
Clinical leak	5 (42)	3 (15)	1 (6)
Chemical leak	2 (17)	4 (20)	1 (6)
Intervention	4 (33)	3 (15)	0
Re-Admission	5 (42)	3 (15)	1 (6)
Re-Operation	1 (8)	0	1 (6)

* Numbers in parentheses denote percentages

In conclusion, the pancreatic stump leakage rate is reduced by re-enforcing the suture line with a second layer of closure. An omental graham patch is more effective than simply covering the end of the pancreas with omentum or retroperitoneal tissue.



26. Laparoscopic Identification and Management of Gallbladder Duplication: A Case Report

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Background: Duplication of the gallbladder is a rarely encountered congenital anomaly. It presents a clinical diagnostic and surgical challenge.

Methods: In this case study, we present a young female patient with acute cholecystitis.

Results: A young female patient with acute cholecystitis was found to have gallbladder duplication during laparoscopic cholecystectomy. This anatomy was not suggested by either the ultrasound or computed tomography of the abdomen performed prior to surgery. We were able to perform laparoscopic removal of both gallbladders and perform an intraoperative cholangiogram, which demonstrated the two cystic ducts of the respective gallbladders fusing to form a common cystic duct prior to joining the common bile duct.

Conclusion: Among the published reports of gallbladder duplication, there have been reports of successful laparoscopic removal; but in most of these cases the existence of two gallbladders was established pre-operatively. We present this relatively unique case of gallbladder duplication that was diagnosed intraoperatively and safely managed laparoscopically

27. Visceral Organ Resections Combined with Synchronous Major Hepatectomy: Feasibility and Outcomes

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Introduction: Major hepatectomies are rarely combined with other extensive visceral resections, and data on feasibility and clinical outcome remain sparse.

Methods: All patients undergoing simultaneous hepatic and visceral resection by a single surgeon in a tertiary care cancer center setting between 1999 and 2006 were analyzed for indications, operative treatment, and postoperative outcomes.

Results: Eleven women and three men were identified, with a median age of 61 years (range: 42-83). Visceral resections were performed for colorectal cancer (n=8), renal cell cancer (n=2), pancreatic islet cell tumor (n=1), ovarian cancer (n=1), hepatocellular cancer (n=1), and gastric carcinoid (n=1); in 12 patients, there was discontinuous metastatic disease, in 2 direct primary tumor extension.

Extrahepatic procedures included hemicolectomy (n=5), segmental colectomy with pelvic mass resection (n=2), nephrectomy (n=2), partial gastrectomy (n=2), pancreatoduodenectomy (n=1), small bowel resection (n=1), and pulmonary lobectomy (n=1). The hepatectomy extent included lobar (n=4), extended lobar (n=1), sectoral (n=1), or segmental resections (n=8). The amount of liver tissue resected ranged from 1 to greater than 5 segments (median: 2). All but one operation led to a R0 resection. The median blood loss was 650 mL; median red blood cell transfusion requirement was 2 units (0-14). There were one postoperative death and two other complications (morbidity 21%), and the median hospital stay was 9 days (6-20). Eight



patients are alive 12 to 73 months postoperatively (median: 27 months), including three with recurrent disease. Four of 6 patients died of recurrent disease occurring after a median of 9.4 months (5.3-19).

Conclusion: Major hepatic resections can be safely accompanied by other visceral resections in highly selected patients. Clinical and experimental parameters for this selection primarily involve patient co-morbidity, oncologic failure and long-term survival considerations, loss of resectability in case of disease progression, incisional access, potential for hepatic regeneration, expertise to perform each procedure safely, availability of adjuvant treatment options, and patient consent. Based on the experience presented, a highly individualized and selective approach to simultaneous resections can be supported, as long as all listed requirements are satisfied.

28. Simple Cystectomy for Side Branch IPMN

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Introduction: Appropriate management of indeterminate cystic lesions of the pancreas represents an ever-increasing problem. Worrisome lesions include mucinous cystic neoplasms (MCN) and intraductal papillary mucinous neoplasms (IPMN) which carry a high risk of malignancy or malignant transformation. IPMN lesions can be classified into three categories: main-duct, side-branch, and combined lesions. Main-duct and combined lesions are thought to have higher rates of malignant transformation than side-branch lesions. Here, we present the case of a 60-year old woman with chronic abdominal pain who had a 1.9 cm by 0.5 cm side branch IPMN treated by simple cystectomy.

Case Presentation: A 60-year old female presented with an extensive past history of ill-defined, abdominal pain and narcotic abuse. During an episode of paroxysmal nausea and vomiting the patient had a CT scan revealing a tubular, low density lesion at the neck of the pancreas. EUS and FNA of the lesion were non-diagnostic and serum tumor markers were negative. Due to persistent nausea and vomiting, the patient was explored. After extensive adhesiolysis, and intraoperative ultrasonography, no pancreatic lesion was identified. A cholecystectomy was performed due to palpable gallstones and it was felt that the pancreatic lesion represented a small pseudocyst due to cholelithiasis that had resolved. Symptom free, a 3 month follow-up CT showed no pancreatic lesion. Nine months later the patient re-presented with complaints of pain and vomiting. Repeat imaging showed a tubular, hypodense lesion at the neck of the pancreas. EUS aspiration revealed an amylase of 3300 and a CEA of 1030 indicating a side branch IPMN. At exploration, the patient was found to have a discrete lesion protruding caudally from the neck of the pancreas. Ultrasound guided dissection to the main pancreatic duct showed a normal appearing side branch duct with marked ectatic changes distally. A cystectomy was performed at the junction of the side branch and main pancreatic duct. Frozen section showed no evidence of malignancy. Final diagnosis was a PANIN 1b indicating further resection was not necessary

Discussion: The natural history of side-branch IPMN is unclear. Many, but not all studies have shown side branch lesions are less aggressive. Because of the difficulty differentiating the type of cystic tumor, resection is generally recommended if a mass



has features suggestive of malignancy including: main-duct greater than 10mm, cyst size greater than 30mm, mural nodules, or elevated CEA in the cystic fluid. Unfortunately, the morbidity of formal pancreatectomy can outweigh the benefit of resection. In this case we were able by cystectomy to remove the symptomatic lesion, obtain a diagnosis and avoid major complication. This strategy may prove useful in dealing with side-branch IPMN lesions.

29. Circulating Tumor Cells in Patients Undergoing Surgery for Hepatic Metastases from Colorectal Cancer

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Background: Patients with colorectal liver metastases are at risk for intrahepatic and extrahepatic recurrent disease following the surgical treatment of their disease. CTCs have been detected in patients with a variety of metastatic cancers, including colorectal. The detection of CTCs may be a significant prognostic variable in patients with liver metastases.

Methods: Patients undergoing surgical excision or ablation of liver metastases from a colon or rectal primary tumor were prospectively enrolled in this trial. Four 7.5 cc vials of peripheral blood were drawn pre-operatively (PreOp) and at 2 weeks post-operatively (PostOp). An additional 30 cc blood draw was obtained during mobilization of the liver or at the beginning of radiofrequency ablation. The CellSearch (Veridex, LLC) system was used to identify circulating epithelial cells. Data was collected on other prognostic factors including morbidity, carcinoembryonic antigen (CEA) level and the Fong preoperative risk assessment score.

Results: 20 patients were enrolled in the trial. There were 13 males and 7 females. Mean preoperative Fong criteria score was 1.25 (range 0 to 3). Eighteen patients were treated with preoperative systemic chemotherapy. Patients underwent hepatic ablation (n=5, 25%), hepatic resection (n=7, 35%), or resection and ablation (n=8, 40%). Fourteen patients (70%) had peripheral CTCs identified preoperatively. The mean number of CTCs per 30cc blood preoperatively was 3.9 (range 0-56). Postoperative levels were drawn in 18 patients and 8 had identifiable CTCs (44%). Mean postoperative CTCs was 1.0 (range 0-9). Six patients with PreOp CTCs had no CTCs PostOp. Sixteen patients (80%) had CTCs identified in peripheral blood during liver or tumor manipulation with a mean value of 28.2 (range 0-315). At a median follow up of 7 months (range 2-19), three patients (15%) are dead of disease, six patients (30%) show no evidence of disease and eleven patients (55%) are alive with disease. Of the patients who are free of disease, two of the six had PostOp CTCs (range 0-1).

Conclusions: Circulating tumor cells are present and quantifiable in many patients with colorectal hepatic metastases. Peripheral CTCs are present in greater quantity during intraoperative liver manipulation. The significance of CTCs on the risk of recurrence is uncertain. Further study on the prognostic significance and molecular characterization of CTCs is ongoing.



30. Aortic Dissection in a Pregnant Woman

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Background: Stanford type B dissection is extremely rare in young women. It is primarily a disease of the elderly, with peak incidence in men and women aged 65-74 and 75-84 years, respectively. To date only nine cases have been reported in pregnant women aged <40 years all of whom have had either hypertension, connective tissue disease, or Turner's syndrome. Here we report a Stanford type B dissection in an otherwise pregnant woman with no predisposing factors.

Case Report: A 25-year-old primigravida at 38 weeks of normal gestation presented with symptoms of epigastric pain radiating to the back associated with nausea and vomiting. Physical examination and laboratory work up showed no evidence of preeclampsia, blood pressure 145/85, biliary, peptic or pancreatic disease. CT scan showed a dissecting aorta from the origin of the left subclavian artery to the common iliacs. There were no signs of end organ ischemia. Medical management was used to maintain a systolic blood pressure <110 mmHg and a caesarian section was used to deliver a 2.7 kg infant with Apgar scores of 6 and 8 at 1 and 5 minutes, respectively. Following an uneventful postoperative recovery, she was discharged home. Thus far, outpatient follow up has showed a stable, chronic aortic dissection.

Discussion: The exact cause(s) of this aneurysm occurring in an otherwise healthy young female is not known. Recent studies suggest a role for hormonal changes in pregnancy leading to cystic medial degeneration. A high index of suspicion should be maintained in a patient with chest/abdominal pain who is otherwise found to have a normal medical workup. Medical management should be optimized as maternal and/or fetal mortality rates can exceed 25%. Surgical intervention is indicated if complications arise such as end organ ischemia, leakage or rupture. Continued pain or extension of the dissection on full medical treatment is a relative indication for endovascular or open intervention. Very close cooperation between OB/GYN and vascular surgery is paramount to screen the well being of the unborn as well as the mother.



Oncology Panel Abstracts

31. ZeroLeak and Mortality Rate for a Two Year Review of a Minimally Invasive Oncologic Approach to Esophagectomy in a High Volume Tertiary Referral Center

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Introduction: The use of minimally invasive approach to esophageal surgery is being examined as a sound oncologic approach to the treatment of malignant and benign esophageal disease. We hypothesize that this approach is oncologically sound, with advantages over open esophagectomy, and is associated with a decrease in morbidity and mortality.

Methods: This is a retrospective study at a high volume teaching institution, same surgeons (dedicated team consisting of a gastroenterologist, thoracic, and HPB/Foregut surgeons), on the safety outcomes of the last 2 years (11/2005-2007) of 19 consecutive combined thoracoscopic and laparoscopic esophagectomy with cervical esophagogastrostomy. Operative time, blood loss, ICU stay, leak rates, nodal counts, margin status, cell type, 30 day mortality, BMI, and use of a gastric conduit was evaluated. These results were then compared to historical open 3-field esophagectomy and laparoscopic esophagectomy data.

Results: Of the 37 esophagectomies, 19 were considered minimally invasive (13m/6f). Average age and BMI were 61 and 27.2%. Median operative time and blood loss were 352 minutes and 300 cc. Median ICU stays of 2 days. Anastomotic leak rate was 0%. Gastric conduit, cervical esophagogastrostomy, and pyloroplasty was used in all patients without preoperative gastric conditioning. One positive margin. 64.7% adenocarcinoma, 11.8% squamous cell carcinoma, 11.8% Barrett's with high-grade dysplasia, 11.8% with achalasia. Median number of nodes was 10 (87.5% were N0). Mortality rate of 0%.

Conclusion: This retrospective review suggests that the combined thoracoscopic and laparoscopic esophagectomy with cervical esophagogastrostomy approach by a dedicated surgical team at a high volume teaching institution is clinically safe and follows time honored oncologic principles. It was associated with improvements in leak and mortality rates and is comparable, and at time, exceeds historical criteria for safety.

32. Initial Experience with Laparoscopic Liver Resection at a Single Center

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Introduction: Minimally Invasive Liver resection (MILR) has been shown to be safe and beneficial to patients at few selected centers in the US. It is considered a growing field within liver surgery and more series are needed to confirm these results. In this study we present our initial single center experience with the MILR versus the open approach.



Methods: A retrospective chart/database review was performed of all the liver resections performed by our team between 1/2005 and 11/2007. The MILR group was compared to the open group. Variables included diagnosis, type of resection, presence of cirrhosis, LOS, EBL and transfusion requirements. Anova and t-tests were used for statistical analysis.

	MILR group (N=39)	OPEN group (N=40)	P
Length of stay (days) Mean	3.3	5.6	<0.001
EBL (cc) Mean	284	510	0.003
OR time (min)	203	212	NS
Mean Age (yrs)	50.3	51.9	NS
Cirrhosis (%)	28	17	NS

Results: In the study period 79 liver resections were performed : 39 (49%) were MILR and 40 (51%) were open. The hand assisted technique was used in 85% of the cases in the MILR group and pure laparoscopic was used for smaller lesions. Overall, 60% of the lesions were benign and 40% were malignant. The vast

majority of lesions (75%) in the MILR group were on the R side of the liver. The type of laparoscopic resections included bisegmentectomies (48%), lobectomies (28%) and segmentectomies (24%). Cirrhosis was present in 28% and 17% of patients in the MILR and open groups, respectively. Conversion rate to open was 6 % (2):1 due to tumor rupture and 1 due to hepatic venous injury without adverse effects to patient outcome. Group variable comparison is shown on table.

Conclusions: Our initial experience with the MILR approach has resulted in significantly shorter lengths of stay and operative blood loss for our patient population. By using a hand-assisted approach in most of our cases, the transition to laparoscopic liver parenchymal transection has been kept within a safety margin. Cirrhotic patients have also benefited from this approach and presented no mortality and acceptable morbidity.

33. Laparoscopic Non-Touch Technique for Colon Cancer. Is it Better Than Open Technique?

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We report a case of laparoscopic colon resection and non-touch technique performed laparoscopically with intracorporeal suture and removal of the specimen at the end of the operation.

Case Report: This is a 74-year-old woman who presented with change in bowel movements and blood per rectum. She was admitted to the hospital and during the evaluation, a colonoscopy found that she had a mass of the cecum which was biopsied and came back as duodenal carcinoma, moderately differentiated. The patient had multiple comorbidities including high blood pressure. She was worked up and taken to the operating room and she had a three port approach for a total laparoscopic procedure. LigaSure was used for dissection of the omentum of the intestine. The right colic vessels were then dissected with LigaSure. All of the omentum and mesentery was dissected first. After this, a blue 60mm staple was used to dissect both the ileum and the transverse colon close to the right hepatic flexure.



The specimen was left in the abdomen. The anastomosis between the intestine and the colon was performed with double staple procedure. Mesentery was closed with running suture of nonabsorbable stitches. The specimen was removed by enlarging one of the incisions.

The pathology report showed a T3, N1, N0. Prior to operation, the abdomen was explored for potential other metastatic areas. The patient was started on clear liquids on postoperative day one and was discharged from the hospital on postoperative day two.

Discussion: This is a classical case in which a potential of laparoscopic approach for colon resection could be beneficial given the early discharge of the patient. This 74-year-old woman was discharged in two days without much pain, which is considered a benefit. The question that remains is when to approach the colon tumor with laparoscopic versus open procedure. We think that in case the tumor is easily dissectible laparoscopically, the laparoscopic procedure should be evaluated.



Oral Poster Session Abstracts

101. Retroperitoneal Paraganglioma Requiring Partial Vena Caval Resection

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Introduction: Retroperitoneal paragangliomas are rare tumors arising from neural crest derived chromaffin cells. They may be non-functional or functional and may present as multicentric tumors. As many as 50% may be malignant in nature- this is defined by the presence of invasion or metastases. Up to 50% may be associated with hereditary germ-line mutations.

Case report: We report the case of a 37 year old male who presented with right flank pain radiating to the groin. His initial evaluation included CT scan imaging of



the abdomen which revealed a 4.7 cm retroperitoneal tumor. He underwent endoscopic ultrasonography with biopsies which were non-diagnostic. The patient was then referred for further evaluation. He had no symptoms related to sympathetic hyperfunction. He had no significant medical history, however, his family history was notable for his father and paternal grandmother both having been diagnosed with paragangliomas. On examination

he had a normal blood pressure. No abdominal mass could be palpated. Biochemical analysis revealed elevated serum and urinary normetanephrines (6.64 nmol/L and 2354 $\mu\text{g}/24\text{hrs}$ respectively, normal range < 0.90 nmol/L and 111-419 $\mu\text{g}/24\text{hrs}$ respectively), and elevated urinary norepinephrine and dopamine (172 $\mu\text{g}/24\text{hrs}$ and 545 $\mu\text{g}/24\text{hrs}$ respectively, normal range 15-80 $\mu\text{g}/24\text{hrs}$ and 65-400 $\mu\text{g}/24\text{hrs}$ respectively). Further evaluation of the proximity to vascular structures was obtained with CT angiography. The patient was initiated on alpha-blockade and a high salt diet. Abdominal exploration revealed a 6 cm tumor closely adherent to the 3rd portion of the duodenum, anterolateral wall of the abdominal aorta at the level of the inferior mesenteric artery and the anterior wall of the inferior vena cava. A cuff of inferior vena cava was resected with the specimen to ensure a clear margin. The IVC was repaired primarily. Final pathology confirmed paraganglioma with negative margins and without evidence of invasion. The patient recovered well and was discharged on post-operative day 6.

Conclusion: Retroperitoneal paragangliomas are rare tumors that may require a high index of suspicion for diagnosis. Treatment may require careful coordination between multiple specialties to ensure appropriate pre-operative care and operative planning. In addition careful consideration must be given to genetic testing and counseling. With adequate preparation these tumors can be resected successfully with minimal morbidity.



102. Asynchronous Independent Lung Ventilation Using High Frequency Oscillator in the Management of Tracheal Injury

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Background: Independent or separate lung ventilation has been described in lung transplantation, ARDS, severe unilateral pulmonary contusion and any other asymmetric lung diseases. In essence, both lungs are physiologically treated as single homogenous units thereby permitting ventilatory settings more appropriate for each lung. High frequency oscillatory ventilator (HFOV) uses tidal volumes close to anatomic dead space, high respiratory rates and low mean airway pressure. It is therefore an ideal ventilatory setting when treating massive air leaks. To our knowledge, using asynchronous independent lung ventilation with conventional ventilator to the normal lung and high frequency oscillatory ventilator for the tracheal injury has, to our knowledge not previously been described.

Case Report: 59-year-old woman with hypertension, smoking, mild COPD and long standing history of gastric reflux was diagnosed with early gastroesophageal adenocarcinoma and was taken to the operating room for a transhiatal esophagectomy with a planned gastric pull up. During the procedure, the patient was ventilated with a left bronchial double lumen endotracheal tube. During the blunt esophageal dissection, a large air leak was noted in to the mediastinum. The air leak was only evident when the ventilation was performed through the distal tracheal opening. Although the leak was not identified at that point, it was postulated to be in the distal trachea or proximal left bronchus. At this time, a decision was made not to perform a thoracotomy for repair but use the gastric pull up as a buttress to the injury and take the patient to the intensive care for asynchronous, independent lung ventilation. In the intensive care unit, the patient was placed on conventional ventilation to the left lung using volume ventilation with tidal volumes of 450 mL, FiO₂ of 100% initially, PEEP of 5 and respiratory rate of 18. The right lung was placed on high frequency oscillatory ventilator at 3 Hz, inspiratory time of 35%, mean airway pressure of 20 cm of H₂O and FiO₂ of 100%. No air leak was noted from left and right sided pleural chest tubes or a drain located in the mediastinum and good gas exchange was noted. A bronchoscopy was performed and verified a small distal tracheal injury in the membranous portion of the trachea approximately 2 cm above the carina. The patient was continued on this ventilatory mode for 48 hours. At that time, the double lumen tube was changed to a single lumen tube placed just above the injury. The patient continued to improve without any further sign of air leak.

Discussion: Injury to the large airways, especially left main stem bronchus and distal trachea are infrequent but well known complications of transhiatal esophagectomy. These injuries have conventionally been treated with a right sided thoracotomy and primary repair. With or without immediate primary repair, these injuries remain a challenge postoperatively on a ventilatory dependent patient. High output bronchopleural fistulas are routinely treated with modified conventional ventilatory modes using low peak pressures and low PEEP in addition to low tidal volumes and high frequency. High frequency oscillatory ventilators have been recommended for bronchial injuries since this mode uses very low mean pressures, high frequency and tidal volumes almost equal to the dead space. Asynchronous independent lung ventilation used in conventional ventilatory modes has been described thereby ventilating the normal lung using classic settings and lung with the bronchopleural fistula using the above modifications. This combination of using high frequency oscillating ventilator for the injured tracheobronchial area and conventional ventilator for the unaffected lung has to our knowledge, not previously been described.



103. Predicting Normocalcemia After Total Thyroidectomy Using Post Operative Intact Parathyroid Hormone Level

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Background: Hypocalcemia is a known risk to total thyroidectomy due to removal or injury to the parathyroid glands. iPTH levels may be useful predicting hypocalcemia or normocalcemia.

Methods: A retrospective analysis was done of a community hospital's total thyroidectomies and completion thyroidectomies that had an iPTH level and calcium level measured. Charts were reviewed for iPTH, serum calcium, ionic calcium, and symptoms of hypocalcemia.

Results: 20 patients were reviewed. The iPTH varied from <7 to 48.5. Calcium levels were measured as serum calcium and/or ionic calcium levels. Serum calcium levels varied from 7.3-9 and ionic calcium levels varied from 0.96-1.21. 12 patients had at least one postoperative low calcium recorded, and their postoperative iPTH average was 17.1 (range 7 – 41). 8 patients had all normal calcium levels and their postoperative iPTH average was 29.3 (range of 6 - 50.7). 9 patients were discharged with a low final calcium measurement and their average iPTH was 10.8 (range 7 - 19.4). 11 patients were discharged with a normal final calcium measurement and their average iPTH was 31.4 (range 6 - 50.7). One patient with low calcium was symptomatic, manifested by mental status changes which was complicated by sepsis unrelated to his thyroidectomy and thyrotoxicosis from which he was recovering after the thyroidectomy. The other 19 patients were asymptomatic during their hospitalization and had a length of stay of 1 or 2 days.

Conclusions: Postoperative iPTH may correlate to the development of hypocalcemia. A larger sample size collected in prospective fashion may offer evidence of a postoperative iPTH level in which normocalcemia can be accurately predicted.

104. Tuberculosis Abscesses in the Central Nervous System. Presentation of a Case Report

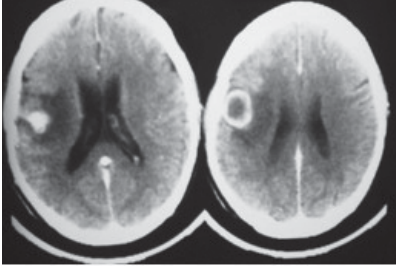
LA Ruano MD, V Hernandez MS
University Juarez of Durango, Faculty of Medicine — Durango, Mexico

Background: Involvement of the central nervous system TB usually manifested as meningitis can also be found tuberculomas, cerebritis abscesses and tuberculosis. Tuberculosis brain abscesses are the most unusual presentation may be single or multiple affecting mainly the frontal and parietal lobes. Factors like HIV infection, low socio-economic status are responsible for such high incidence. Virtually all organs in body are affected. CNS tuberculosis presents mainly as tuberculoma or meningitis. Their presentation is acute; often in 3rd or 4th decade. Tubercular brain abscesses are highly uncommon, occurs commonly in patients with abnormal cell mediated immunity and are mostly focal.

Case Report: A man of 39 years, native and resident of Durango, diagnosed with HIV in February 2005 (CD4 count 0.09, viral load 16,000 cp/mL). It integrates diagnosis of lymph node TB, refer to making node biopsy submaxillary the July 15, 2005 and subsequent histopathology study positive for tuberculosis, controlled treatment (isoniazid, rifampicin, pyrazinamide and ethambutol). He began on 08 August 2005

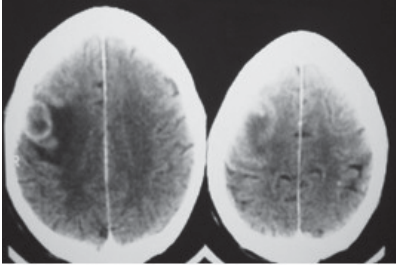


with motor partial seizures in hemiface right, secondarily generalized received treatment with phenytoin and oxcarbazepine which later was changed to topiramate.

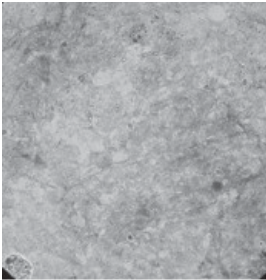


Within its diagnostic studies reported an CSF glucose 44, protein 66, 360 erythrocytes (100% burr cells), no leukocytes. A head CT revealed in the right frontal lobe injury rounded, with extensive perilesional edema that extends to ipsilateral temporal lobe.

Physical examination encounters vital signs of 127/80 mmHg TA , pulse of 102 per minute, respiratory rate 26 per minute, temperature of 37 ° C, cachectic (40 kg), pale, conscious, oriented. Neurologic exploration was normal.



Discussion: The increasing prevalence of tuberculosis in both immunocompetent and immunocompromised individuals in recent years makes this disease a topic of universal concern. The differential diagnosis for parenchymal abscesses includes other granulomatous infections (eg, cysticercosis) and fungal lesions as well as primary or metastatic neoplasms.



The neuroimaging study is usually nonspecific, and histopathologic examination/fix is the only definite. There is no consensus on the standard treatment of TB brain abscess. Some perform surgical excision in addition to chemotherapy.

105. Residual Tumor in Re-Excision Specimens: Correlation Between Time Interval and Degree of Inflammation

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Introduction: Recent studies indicate that increasing time interval to re-excision decreases the finding of residual tumor in patients undergoing breast conserving therapy (BCT) for cancer. Inflammation in the lumpectomy cavity is the proposed mechanism for the elimination of tumor cells. There has been no histological comparison to evaluate the degree of inflammation in re-excision specimens during similar time intervals.

Methods: A retrospective review of 302 patients undergoing BCT at a large county hospital was performed. 50 patients were identified who initially underwent wire-



localized BCT for breast cancer and had at least one re-excision. Data collected included demographics, pathology, and time interval to re-excision. Analysis of re-excision specimens was performed by a single breast pathologist. Amount of inflammation was graded with a score of 0 (none), 1+ (mild), 2+ (moderate), or 3+ (severe) for each of the following histologic features: lymphocyte response, multinucleated giant cell reaction, hemosiderin-laden macrophage infiltrates, fat necrosis, and fibroblast proliferation. Numbers in each category were combined for a final score, reflecting the degree of inflammation. Results: The finding of residual tumor in re-excision specimens decreased with increasing time interval (Table). Histologic scores of re-excised specimens revealed increased inflammation in the specimens containing residual tumor.

Days between surgeries (n)	Residual Tumor + (%)	Inflammatory score with tumor	Inflammatory score without tumor
21-33 (13)	61	11	3
34-60 (30)	40	8	5
60-150 (7)	14	10	5

Conclusion: This data supports prompt re-excision after lumpectomy to facilitate accurate staging. Further studies are needed to identify whether these findings are due to difficulty with pathologic assessment or potential immune mediated tumor elimination.

106. Intravascular Rewarming for Accidental Hypothermia Associated with Traumatic Injury

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Introduction: Hypothermia, defined by a core temperature of less than 35 degrees Celsius (°C), is a significant contributor to mortality in severely injured trauma patients. Heat loss due to environmental exposure, hemorrhagic shock, reduced physiologic production, and a cold hospital environment all promote and prolong hypothermia. Vasoconstriction, metabolic dysfunction, and coagulopathy are among the consequences, and cannot be corrected by administration of medications or blood products. Due to the cold hospital environment, rewarming is an enormous challenge in the patient who requires operative or angiographic intervention to control hemorrhage and / or contamination. In addition to routine use of external warming measures and inline intravenous fluid warmers, extracorporeal blood warming circuits have become the standard technique, replacing more invasive body cavity lavage. The purpose of this presentation is to introduce and analyze our experience with a minimally-invasive, continuous, automated, and portable intravascular rewarming technique.

Methods: The records of 11 hypothermic critically injured patients presenting to our level 1 trauma center over a 6 month period were reviewed. Demographic information, injury patterns and severity, initial laboratory and physiologic findings, rewarming data, and outcomes were evaluated. Technical information regarding the function, safety, and utility of the particular system employed was also evaluated.



Results: The 11 patients' mean age was 39, 7 were male, and 7 had blunt mechanisms of injury. Mean Injury Severity Score was 40, and mean initial systolic blood pressure was 91. Mean core temperature at the initiation of rewarming was 33.5 +/- 1.0 °C, and mean rewarming rate was 1.6 +/- 0.9 (range 0.76 to 4.00)°C/h, often occurring in a cold hospital environment. Six of the 11 patients died (55%), 2 of acute exsanguination and 4 rapidly died of unsurvivable traumatic brain injuries. One patient developed a deep vein thrombosis at the femoral catheter insertion site, but did not experience pulmonary embolus.

Conclusions: Our experience demonstrates that intravascular rewarming represents a more practical, automated technique for the immediate and continuous treatment of hypothermia in all phases of the acute care of trauma patients. Efficacy and safety appear equal to or better than other more complicated techniques, but require verification by more extensive investigation, along with patient selection, physiologic effects, survival, and cost-effectiveness, in prospective fashion.

107. Smac Mimetic JP1201 has Potent Anti-Tumor Activity in a Preclinical Orthotopic Model of Pancreatic Cancer

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Intro: Pancreatic cancer continues to carry a dismal prognosis with a 5-year survival of approximately 5%, underscoring the need for improved chemotherapeutic options. One of the hallmarks of cancer is the ability of neoplastic cells to evade normal apoptotic signaling. SMAC, a mitochondrial protein released into the cytosol during apoptosis, binds to, and inhibits IAPs (inhibitors of apoptosis proteins). The subsequent increase in caspase activity results in apoptosis. JP-1201 is a SMAC mimetic which binds to IAPs and sensitizes cancer cells to death receptor signaling.

Methods: Orthotopic MiaPaca-2 or Pan02 tumors were established in nude or C57Bl/6 mice respectively. Treatment was initiated either 7 days or 28 days after tumor cell injection (TCI). Therapy was given by i.v (JP-1201) or i.p. injection three times weekly. At the time of sacrifice, tumor burden was determined by weighing the pancreas and tumor en bloc. Histology was performed on formalin-fixed sections.

Results: No animals in either scenario developed any notable JP-1201-related side effects. We demonstrate that JP in combination with TRAIL is effective at preventing pancreatic tumor growth at doses of 6 mg/kg and 2 mg/kg (0.46 g saline, 0.24g JP-1201 6 mg/kg + TRAIL; $p < 0.05$). Additionally, none of the JP-1201 (6 mg/kg) animals developed metastasis compared to 33% of saline control. Histologic (H&E) analysis revealed more residual normal pancreas in the treatment group compared to control. In the intervention trial, tumor weight was reduced significantly in the JP-1201 + TRAIL group (0.27 g treatment vs. 1.39 g control, $p < 0.001$) and the combination significantly reduced metastasis (0.28 per animal JP-1201 + TRAIL vs. 3.75 per animal control, $p < 0.05$). Additionally, in this model, JP-1201 showed efficacy in combination with GEM (pancreas weight, 0.26 g, $p < 0.01$). Furthermore, tumors from a cohort of mice were evaluated by TUNEL analysis 24 hours after the first dose of therapy. These studies indicate that treatment with JP-1201 + GEM results in significant acute apoptosis. At the end of therapy, apoptosis was also increased significantly in the JP-1201 + TRAIL group compared to saline control. Finally, we show in an intervention model



that treatment with JP-1201 + GEM is effective in a syngeneic model (0.43 g control, 0.16 g JP + GEM, $p < 0.01$).

Conclusion: These results demonstrate the effectiveness of JP-1201 at preventing the development of pancreatic tumor growth and at arresting tumor growth in previously established tumors. The efficacy of the combination of JP-1201 with GEM, the current standard of care for pancreatic cancer, indicates the potential usefulness of this strategy for the treatment of pancreatic cancer.

108. Is There Any Benefit to Multi-Disciplinary Rounds in an “Open” Trauma Intensive Care Unit Regarding Ventilator Associated Pneumonia?

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Introduction: Multi-disciplinary rounds (MDR's) have been instituted as a team approach to patient care in our hospital since June 2005. Prior to June 2005, all care in our intensive care units, which are open ICU's, was provided by individual, private practitioners. Our daily MDR's are led by a surgical intensivist and include a clinical pharmacist, a surgical resident, the patient's nurse, the case manager, a Chaplain, a nutritionist, and the respiratory therapist. The goal of this team approach is to cooperatively ensure the utilization of “best practices.” One of the goals of “best practices” is reducing ventilator associated pneumonia (VAP). The purpose of our study was to examine the effect of MDR's on VAP in trauma patients in our open ICU's.

Methods: We performed a retrospective review of VAP over a four-year period divided into two groups. Group 1 included patients from June 2003 to May 2005 prior to the implementation of MDR's, and Group 2 included patients after the institution of MDR's from June 2005 to May 2007. Variables examined included blunt versus penetrating trauma, mean injury severity score (ISS), and mean abbreviated injury severity (AIS) score for chest and for head and neck. Using Chi squared statistical analysis, the number of pneumonia infections per one-thousand ventilator days was calculated.

Results: In Group 1 there were 83 VAP's during 2414 total ventilator days. The ratio of blunt to penetrating trauma was 92.9:7.1, and the mean ISS was 30.0 with mean AIS for chest of 3.0 and mean AIS for head and neck of 4.3. In Group 2 there were 49 VAP's during 2094 total ventilator days. The ratio of blunt to penetrating trauma in this group was 93.9:6.1, and the mean ISS was 30.7 with a mean chest AIS of 3.1, and mean head and neck AIS of 4.5.

The ratio of VAP's per one-thousand ventilator days decreased from 34.4 in Group 1 to 23.4 in Group 2 after the institution of MDR's ($p=0.04$).

Conclusion: When comparing trauma patients in our open ICU with similar mean ISS and mean AIS for chest and for head and neck, implementing MDR's significantly decreased our incidence of VAP. This study demonstrates the improvement in ventilator care by a surgical care team making daily rounds in lieu of individual practitioners.



109. A Computer Based Trauma Alcohol/Drug Intervention Program

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Background: According to the 2000 American College of Surgeons (ACS) Committee on Trauma (COT) Trauma Prevention Series, alcohol is involved in nearly 50% of trauma-related injuries. As a result, the ACS COT mandates that all level one and level two trauma centers have a screening tool and/or protocol in place to identify high risk alcohol and/or drug (AOD) users. Having identified these patients, little information exists on how to maximize our resources in the community.

Objective: We wanted to identify specific zip codes in the Dallas/Fort Worth (DFW) area at greatest risk of AOD use, and subsequently direct interventions (i.e. partner with coalitions, develop educational awareness classes, and/or signage), thus maximizing our resources.

Methods: Our institution developed a computer-based program that allowed zip code identification of high risk drinkers within our trauma patient population, using the Alcohol Use Disorder Identification Test (AUDIT). A brief intervention was conducted on all trauma patients noted to have a positive AUDIT screening. The computer system tracked the zip code, age, and mechanism of injury (MOI) of each patient. We then looked at the most frequent zip codes identified in order to find community services most suitable for partnership.

Results: From January 2006 to January 2007, we identified 250 patients that meet inclusion criteria defined by an AUDIT score of eight or greater. These patients underwent Brief Intervention (BI) and were entered into our computer-based alcohol intervention program. The program identified patients from 107 different zip codes, of which 10 were excluded due to being outside the state of Texas. Of the 97 included, seven specific zip codes (75052, 75216, 75232, 75211, 75050, 75115, and 75208) compromised greater than sixty-five percent of our screened patients. Targeting the above seven specific zip codes, we have developed partnerships with Mothers Against Drunk Driving (MADD), Drug Prevention Resources (DPR), and Alcohol Addiction and Abuse (AAA) New Creations. We have also established weekly and monthly classes at our institution with alcoholic anonymous (AA), MADD, and Minors in Possession (MIP). These meetings focus on participation of individuals residing in these seven zip codes.

Conclusions: Our computer-based alcohol intervention program has allowed us to identify specific zip codes recognized as high risk of AOD use. The program has been paramount in the decision to partner with local and national coalitions, implement further community strategies, disseminate educational awareness, and act as a vehicle for legislative changes.



Posters for Display Only Abstracts

110. Nineteen Consecutive Laparoscopic Esophagectomies without Gastric Conditioning: Zero Leak, Necrosis, or Mortality.

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Introduction: Esophagogastric anastomosis ischemic events have a reported incidence of 3.2% resulting in leaks and necrosis. Gastric Conditioning (GC) has been proposed to reduce such morbidity. Unfortunately (sp??) this exposes a debilitated patient to 2 operative procedures and is carried out 2-3 weeks prior to esophagectomy. We propose that with meticulous laparoscopic dissection, GC is not needed, saving time, money, and decreasing patient morbidity.

Method: A retrospective study of 19 consecutive laparoscopic esophagectomies (LE)(13m/6f) done at a single setting without preoperative GC. Leak rates, conduit necrosis, and 30 day mortality rates were evaluated. Leaks were evaluated with either an esophagram or CT scan on post operative day 6. Each esophagectomy was carried out via the 3 field technique (neck dissection, thoroscopic mobilization and node dissection, and laparoscopic conduit mobilization) and the non-tubularized stomach was used as a conduit in all 19 cases. The left gastric artery (LGA) was ligated during the primary and final procedure. Cervical esophogogastrotomy was constructed using a partially stapled technique.

Results: The leak rate was 0%, the necrosis of the gastric conduit was 0%, and the 30 day mortality was 0%. There were no neck wound infections. All 19 patients were discharged home on oral intake.

Conclusion: The use of GC does not appear to influence the leak rate, conduit necrosis, or mortality rate for minimally invasive esophagectomy. It offers debilitated patients status post neoadjuvant therapy the opportunity to have a minimally invasive approach to esophageal resection as a one stage procedure. This has resulted in decrease exposure of the patient to possibly increased morbidity. This study suggests that GC is not necessary in minimally invasive esophagectomy. Excellent gastric conduit viability can be achieved with a one step esophagectomy, even in patients that have received neoadjuvant radiation therapy.

111. A Novel use of On Q Pain Pumps during Pancreaticoduodenectomy: Celiac Ganglia Placement

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Methodist Dallas Medical Center — Dallas, TX

Background: Pain control after pancreaticoduodenectomy (PD) is a continuing challenge. Use of regional techniques, such as pre-operative epidural anesthesia, can be beneficial, but delays the start of deep venous thrombosis prophylaxis in these high risk patients and is associated with patient pain and anxiety. We present, for the 1st time in the literature, a new technique of placement of On Q pain pump catheters adjacent to the celiac ganglia, the major plexus responsible for pancreatic pain.



Methods: Patients operated on for benign and malignant diseases of the head of the pancreas were examined. At the completion of the PD, 5cc of 0.2% ropivacaine was injected into the left and right celiac ganglia via intra-abdominal approach. Standard landmarks were used to identify these structures on the left (to the left of the aorta at the level of the celiac axis) and right (between the vena cava and aorta at the same level). Two (1 each side) 1-inch antimicrobial soaker catheters were placed transabdominal approximately 3-5cm into the retroperitoneum at the same location as our injections. This was done prior to closure of the abdomen and primed with 2 ml. of ropivacaine each.

Results: Celiac blocks and transabdominal intra-celiac catheters were placed in 15 patients. Injection of the ganglia intra-operatively resulted in a 10-20 mmHg gradual drop in blood pressure at approximately 10 minutes post-injection, suggesting precise placement of agent. Catheters were removed (48-72 hours post-operatively) at the bedside, safely and intact. Patients achieved early ambulation and early anticoagulation on post-operative day 1, along with excellent pain control.

Conclusion: This novel technique of intra-operative transabdominal celiac ganglia placement of On Q pain catheters after PD is logical, feasible, and safe. Patients can benefit from excellent pain control, initiation of early anticoagulation therapy, and the avoidance of the pain and anxiety associated with pre-operative epidural placement. Future studies are in the works and will randomize patients to placebo versus transabdominal celiac ganglia catheter placement.

112. The Whip-Stow Procedure: An innovative modification to the Whipple Procedure.

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Methodist Dallas Medical Center — Dallas, TX

Background: Pancreaticoduodenectomy (PD) is the standard of care in the treatment of benign and malignant diseases of the head of the pancreas. The most studied aspect of this procedure is the method of anastomosis with the pancreatic remnant. Many techniques have been described. This work describes, for the first time, a safe and easy new technique for pancreatic anastomosis after PD.

Methods: Seven patients underwent the Whip-Stow Procedure for the management of the pancreatic remnant. The Whip-Stow- PD combined with a Puestow (LP-lateral pancreaticojejunostomy), was completed using a single layer, 3-0 running prolene suture in a duct-to-mucosa technique championed by Puestow and Gillesby. Drains were monitored and pulled on day 5 if <20cc of amylase poor fluid over 24 hours. The PD performed included standard and pylorus preserving PD. The mortality, leak, and postoperative bleeding rates were evaluated, as well as the skill level required to perform this modification. This was compared to historical data of the PD and LP procedures.

Results: Leak rates were compared among historical data of PD with respect to end to side, end to end, invagination via pancreaticojejunostomy (PJ), and pancreaticogastrostomy (PG). PJ historical leak rates are reported to be 11%, and the leak rate for the PG is reported to be 12%. Mortality, leak, and post operative bleed rates were 0% in all 7 Whip-Stow patients. The Whip-Stow can easily be complete with neither loops nor microscope, while still achieving a desired duct-to-mucosa anastomosis. The ability to complete the anastomosis with a heavier 3-0 non-absorbable, single layer, running suture, allowed for a decrease in complexity and time



needed to complete the anastomosis. Average time needed was 12-15 minutes, as compared to the traditional, 5-0 or 6-0, interrupted, multilayered, anastomosis, taking an average 40-50 minutes. The presence of a dilated pancreatic duct and fibrotic parenchyma facilitated the use of the Whip-Stow, though normal pancreatic remnants with ducts as small as 3 mm were used. Other benefits included a long segment duct-to-mucosa PJ decreasing the possibility of strictures, no need for stenting, resulting in no stent retention or migration, and a wide anastomosis enabling access to the entire duct via endoscopy for surveillance of IPMN.

Conclusion: In the hands of skilled pancreatic surgeons, the Whip-Stow procedure has shown promise in being a simpler, safer, and more effective approach to the challenging pancreatic anastomosis during a PD. In the age of increasing IPMN tumor resection, this technique emphasizes the basic principles of using a large anastomosis combined with complete intraoperative ductal evaluation, with future benefits of duct surveillance.

113. A Novel use of the Harmonic ACE During Pancreaticoduodenectomy with No Post-Operative Bleeding

CA Galanopoulos MD, A Vo RN, DR Jeyarajah MD

Methodist Dallas Medical Center — Dallas, TX

Background: Dissection of the uncinate process off the superior mesenteric artery and vein (SMA/SMV) can be the most tedious and time consuming part of a pancreaticoduodenectomy (PD). New technology has allowed for a more anatomic and less bloody surgery. The use of thermal energy adjacent to the SMA to acquire negative uncinate margins has raised concern regarding post-operative pseudoaneurysm formation or bleeding from the SMA. This work examines the safety of using the Harmonic ACE (HA) near the SMA during a PD and it's effects on postoperative bleeding.

Methods: During the study period, 76 PD's were performed for malignant and benign disease by a single surgeon over a 2 year period. The HA was used in the following order during surgery in all patients. Firstly, the mobilization of the proximal jejunal mesentery to its mesenteric root, followed by taking down of the 3rd and 4th portion of the duodenum and ligament of treitz. Subsequently the posterior pancreatic fascia at the SMA margin was incised followed by the dissection of the uncinate off the SMV and SMA by medial retraction of the SMV and within millimeters of the SMA. Reconstruction was performed using pylorus preserving (PPPD) or standard techniques (SPD) depending on the patient and type of tumor. Blood loss, operative time, and postoperative bleeding complications were reviewed.

Results: All 76 PD's were successfully completed with the HA. Mean operative time was 240 minutes, mean blood loss was 350 ml, and postoperative bleeding rate was 0%. PPPD and SPD were performed in 28 and 48 patients respectively. Pathology specimens were found to have a more uniform and reliable SMA margin than our historical controls, in which standard clamp and tie technique was used. The SMA margin was found to contain less tissue adjacent to the artery in situ, resulting in a more comprehensive oncologic surgery. Stable post operative hematocrits supported that no bleeding had occurred acutely and several postoperative CT scans during surveillance failed to reveal the presence of SMA pseudoaneurysms.

Conclusion: During our 76 PD's, the use of the HA on the jejunal mesentery, ligament of treitz, and uncinate margin is safe and effective. Specifically, concerns regarding



post-operative bleeding from pancreaticoduodenal vessels are not borne out in this study, as there were no bleeding events from the SMA margin during the early and late post-operative periods. The use of the HA decreased our operative time by simplifying 3 critical steps during PD. Most importantly, it also solidified one of the bedrocks of oncologic surgery for pancreatic head cancers, that being leaving less tissue on the uncinate/SMA margin.

114. Year 2: An Update of a High Volume Non-University Referral Center Pancreaticoduodenectomy Feasibility Study

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Background: In recent years, multiple studies have concluded that outcomes for pancreaticoduodenectomy (PD) are better at high volume University Pancreas Centers (UPC). But recent data have challenged this assumption by supporting the idea that high volume pancreatic centers in Non-University Community Medical Centers (NUMC) can produce patient outcomes equaling those of University based pancreatic centers (UPC).

Method: Our retrospective review of 76 consecutive PD's done at high volume NUMC by a single surgeon over a 2-year period (2005-2007). Data on the number of PD's, morbidity, mortality, pathology, length of stay (LOS), blood loss (EBL), and operative times (OPT) were accumulated and analyzed. These data were then compared to our 1st 45 PD done in the year 1 as well as acceptable historical data. High volume was defined by Leapfrog Group criteria (11 pancreatic resections). The designated pancreas team consists of gastroenterologist, surgeons, nursing staff, operating room team, and floor nursing. Charts were reviewed and data was gathered by an oncology nurse. The analysis was completed and reviewed by the attending surgeon and the HPB/GI Surgery fellow.

Results: Morbidity rates (number of patients who suffered some type of complication) dropped to 38% from 53% after 2 years. Mortality rates remain similar at 2.6% (2patients), compared to 2.2% during the 1st 45 PD's done in year 1. Pylorus preserving PD (PPPD) and standard PD were 28 and 48 respectively. Pancreatic fistula rates dropped from 6.6% down to 5.3% at 2 years. Changes in mean operative times (240 minutes), mean blood loss (350 ml.), and mean length of stay (10 days) were minimally impacted with increased experience. There were 56 malignant tumors and 11 benign tumors. Nine patients had pancreatitis. Seven patients underwent a combined PD and Puestow (Whip-Stow).

Conclusion: There is consensus that increased surgeon volumes are correlated with improved patient outcomes, but this is one factor of a complex multifactorial problem. The multidisciplinary approach to each patient's care has made it possible for a NUMC to achieve university level outcomes. The improved abilities of the operating room staff, pre- and post- operative nursing care, and intra-operative anesthesia care has help continue the trend towards minimizing patient morbidity and mortality. This study reports that a NUMC considered high volume can achieved a standard of care equal to a UPC's, as long as future technologies are embraced and there is a multidisciplinary approach to patient care.



115. Diffuse Biliary Papillomatosis

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Introduction: Biliary papillomatosis (BP) is a rare disease, with only 140 published cases since first reported in 1894. Papillomatosis can be localized but is more often diffuse and may occur at any level of the biliary tract. Initial reports showed the risk of malignancy at approximately 10%, however this risk has been shown to be markedly increased in recent reports. Here we present the case of a 37-year-old male with biliary papillomatosis, treated using a multimodal approach.

Case Presentation: A 37-year-old male presented with 5 years of intermittent jaundice and abdominal pain. Axial imaging showed dilated extra hepatic ducts. Subsequent ERCP revealed multiple small filling defects within the common bile duct and biopsy of these lesions confirmed benign adenomas. A common bile duct stent was placed and provided temporary relief of symptoms; however the patient's jaundice rapidly worsened with associated pruritis. Therefore, bile duct excision with hepaticojejunostomy was planned. Intraoperative choledochoscopy identified a previously unidentified papillomas within the intrapancreatic portion of the distal common bile duct as well as large papillomas just distal to the right and left hepatic ducts. Due to the diffuse nature of the disease and progressive course it was felt that pancreaticoduodenectomy was not indicated. The patient underwent cholecystectomy and common bile duct resection with Roux-en-Y hepaticojejunostomy. A duodenojejunostomy to the Roux limb also was created to facilitate future endoscopic screening and decompressive stenting if necessary. Final pathology of the common bile duct specimen revealed carcinoma in situ. At this time the patient will receive hilar plate radiation therapy with concurrent chemotherapy.

Discussion: Biliary papillomatosis is a rare disease, characterized by multiple intra- and extrahepatic adenomas, but may also involve the gallbladder, or pancreatic duct. Etiology of this disease remains relatively unknown; however, chronic infection, choledochal cysts and hepatolithiasis have been implicated and pigmented biliary stones have been found in up to 36% of patients. The major morbidity and mortality of BP arises from frequent complications of malignant degeneration, biliary cirrhosis, and sepsis. Surgery is recommended primarily because of the need for decompression. Additional palliative intervention may be achieved with radiation or endoluminal electrocauterization and stenting. Transplant may be the only means of curative treatment in bilateral intrahepatic involvement or the development of biliary cirrhosis but is not indicated for cases of established carcinoma or in case where associated pancreaticoduodenectomy would be necessary to clear all known disease.

116. Extensive Portal Venous Gas and Pneumatosis Intestinalis in the Absence of Bowel Ischemia

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Introduction: Portal venous gas and pneumatosis intestinalis are usually associated the transmural small bowel or large bowel ischemia and/or infarction and have until recently been associated with high morbidity and mortality. Other more benign etiologies of these alarming radiographic signs have been described and many of



these cases have been successfully treated nonoperatively. We present a case of an idiopathic finding of hepatic and portal venous gas (HPVG) and pneumatosis intestinalis (PI). Explorative laparotomy revealed massive pneumatosis but no etiology and the patient recovered uneventfully without further intervention.

Case Report: A 66-year-old male with multiple medical problems including hypertension, diabetes, coronary artery disease, and advanced COPD presented to the ER with sudden onset, moderate to severe, abdominal pain. Vital signs were stable and on physical exam, he was found to have diffusely tender abdomen. White blood cell count was elevated but other laboratory results were negative. CT scan of the abdomen showed extensive pneumatosis intestinalis and hepatic and portal venous gas but no other pathology. The patient was thought to have mesenteric ischemia and was taken to the operating room for an exploration. During surgery, a diffuse pneumatosis was noted throughout the small intestine but no sign of bowel ischemia, infarction, or perforation. Colon, liver and gallbladder were normal. The patient's postoperative course was uneventful and a repeat CT scan showed the resolution of the portal venous gas and pneumatosis. Patient was discharged in good condition and has done well on follow up.

Discussion: The presence of gas in the portal mesenteric venous circulation is not a dramatic radiographic finding and has until recently, been felt to be associated with life threatening intraabdominal disease process. The mechanism of this pathology is poorly defined but three factors are felt to be important: 1) mucosal injury, permitting gas to access the bowel wall and thereby the portal vein, 2) bowel distention which can be the primary initiating factor or contributing factor and 3) submucosal invasion of the intestinal wall and portal vein by gas forming anaerobic bacteria. Recent studies have documented several etiologies besides bowel ischemia and approximately 10-15% are considered to be idiopathic. When HPVG occurs in association with pneumatosis, the diagnosis and clinical course are more likely to be life threatening although several reports of patients with this combination treated conservatively have documented favorable outcome. Currently, the presence of HPVG even with pneumatosis should therefore not be regarded as a direct predictor of mortality. Surgeons faced with the findings of portal vein gas with or without pneumatosis intestinalis have to use the overall clinical picture to determine the diagnosis and whether surgical intervention or conservative treatment is appropriate. Those patients with other signs of mesenteric ischemia including acidosis, high white blood cell count, overall toxicity and peritonitis should be treated aggressively while patients with more benign clinical pictures can be closely observed.

117. Acute Gastric Dilation and Ischemia Secondary to Small Bowel Obstruction: A Case Report

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Background: Acute gastric dilation leading to ischemia of the stomach is an under diagnosed and potentially fatal event. Without proper and timely diagnosis and treatment, gastric perforation, hemorrhage, and other serious complications can occur.

Methods: A case of acute gastric dilation secondary to a small bowel adhesive obstruction is presented.



Results: A seventy-one year old man presented with a one day history of diffuse unrelenting abdominal pain associated with emesis and abdominal distention. An abdominal radiograph showed dilated small bowel loops with a diffuse opacity in the left upper quadrant. The patient was resuscitated with intravenous fluids and taken emergently to the operating room where a midline laparotomy was performed. A single adhesion in the right lower quadrant causing torsion of the small bowel was released, but no other points of obstruction were found. Approximately five liters of brown gastric contents was suctioned from the NGT in the operating room. The arterial blood flow to the stomach was intact based on intraoperative findings and radiographic tests. Two more "second look" procedures were undertaken at which time the mucosa looked viable with some residual sloughing. This patient was managed without gastric tissue resection.

Conclusion: The importance of early diagnosis and appropriate management of acute gastric necrosis is demonstrated.

118. Temperature Regulation of Donor Heart During Preservation Period Reduces Damage

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The practice of heart transplantation is approaching forty years old. While many changes have taken place in surgical technique, cardioplegic solutions, and patient support therapy, the methods used to store and transport the organ ex vivo have undergone few changes. In general, hearts are still placed in ice-slurries for preservation and transport and as the procedure has been used successfully for four decades, few have questioned if storage limitations might be due, at least in part, to the result of tissue damage due to extreme temperature conditions (freezing). The purpose of this study was to examine the temperatures reached by hearts during normal storage periods and determine if a new organ transport system (LifeCradle, Organ Transport Systems, Inc., Frisco, TX) that can maintain temperature at 5 C improved organ quality for transplantation. Twelve cadaver hearts were extracted from swine donors within 5 minutes of euthanasia in a slaughter facility. The hearts were flushed with heparinized cardioplegic solution and stored by using either the standard ice-slurry methodology or in the new preservation device (LC). The hearts were then monitored for temperature, pO₂, pCO₂, and pH levels at 30 minute intervals for 4-8 hrs. Further, at completion of the study tissue samples were taken for TEM and lipid peroxidation studies. The major observed difference was in heart temperatures over time (P < .001). While hearts stored in the new LC device maintained temperature at 5 C + 1.2 for the duration of the studies, hearts stored using a traditional ice-slurry showed a continuous drop until reaching temperatures of 1.1C + 1.0. Further, these temperatures were seen after only 3-4 hours in storage and some organs did reach temperatures below 0 C over the course of the study. These extreme temperatures did appear to effect oxygen utilization and other physiological parameters, and suggest that improved temperature control during ex vivo storage might play an important role in successful heart transplantation.



119. Importance of Perfusion Solution Selection for Continuous Perfusion of Donor Hearts during Preservation

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For most organ systems, ischemic storage of organs on ice slurries during ex vivo transport is the gold standard for transplant medicine. No where is this considered more routine than in heart transplantation. However, recent technological advances suggest it might be possible to perfuse hearts with oxygen-rich solutions during the preservation/transport process and prevent ischemic damage. Yet little is known about the changes that take place in the standard cardioplegic solutions when they are saturated with oxygen and continuously perfused through the myocardium. The object of the current study was to compare the usefulness of various standard cardioplegic solutions in maintaining heart function for extended periods using a new organ preservation system (LifeCradle, Organ Transport Systems; Frisco, TX), which perfuses oxygen through the organ while maintaining the temperature at 5 C. A series of 32 cadaver hearts were stored using one of four cardioplegic solutions (UW, UW-MPS, HTK, Celsior) and stored using either a standard ice-slurry methodology (SIS) or in the new preservation device (LC). The hearts were monitored for temperature, pO₂, pCO₂, and pH levels at 30 minute intervals for 4-8 hrs. Further, at completion of the study tissue samples were collected for TEM and lipid peroxidation activity free radical levels. Resulting data were then subjected to statistical analysis where appropriate. As expected, differences were seen in both pO₂ and pCO₂ levels in hearts stored in the new LC vs SIS (P < .001). However, while starting O₂ levels were fairly standard across the four solutions when used in the LC, there were significant differences in pH (P < .001), which increased over time, in some solutions and appeared to result in almost immediate damage to the stored organs. These data would suggest that care should be taken in selection of solution as we advance to perfusion of hearts ex vivo. These data would suggest that care should be taken in selection of solution as we advance to perfusion of hearts ex vivo.

120. Extended Left-Sided Pancreatectomy with Splenic Vessel Resection, but Spleen-Preservation

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Introduction: Left-sided or distal pancreatectomy (DP) is frequently performed in conjunction with splenectomy, although splenectomy can be linked to various untoward effects, and sparing of the main splenic vessels (SV) is not necessary for successful spleen preservation (SP).

Methods: We reviewed clinical records of all patients undergoing DP in a single-surgeon practice to assess feasibility and outcomes of SP.

Results: Between 1997 and 2007, 41 of 177 pancreatic resections involved a DP (23%). There were 14 men (34%) and 27 women (66%), with a median age of 60 years (range: 34-86). Resection indications included 26 solid masses, 10 cysts, 4 combinations thereof, and one diffuse process. Four procedures were en bloc resections, 2 total pancreatectomies, while 8 of the remaining 35 DPs were



performed laparoscopically. SP was accomplished in 33 of 34 possible cases (spleen preservation rate 97%), despite SV resection in 27 of these (82%). The postoperative complication rate was 24%, and there was no postoperative death. The median length of stay was 6 days (4-24). Pancreatic fistulae occurred in 2 patients (5% of patients at risk), and one SPDP led to a splenic infarct. At a median follow-up of 16 months (2.5-89), no other clinically relevant problems specific to SP have become apparent. One patient after DP with splenectomy expired from an acute overwhelming febrile illness consistent with postsplenectomy sepsis.

Conclusion: Despite the high splenic vessel resection rate paired with spleen preservation, pancreatic fistula rate and other outcomes in this small DP experience compare favorably to many other DP series. Few spleen-specific complications and the radicality of resection support the liberal use of SP with SV resection, irrespective of an open or laparoscopic approach.

121. Should Patient Volume be a Determinant for Trauma Center Level Designation?

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Background: Current literature has not precisely defined the number of admissions per institution necessary to generate a difference in trauma patient outcome. Is patient volume a significant variable for survival in trauma centers? Should the ACS COT continue to use the current volume criteria (> 1,200 admissions/yr) for verification of Level I trauma centers?

Method: Data provided by the National Trauma Data Bank (NTDB) was used in a retrospective analysis of all patients age 24-65 years who were admitted to Level I and II hospitals during a 5-year period (2000-04). Data elements included: age, ISS, mechanism of injury, gender, volume of patients, level designation, ICU average length of stay, hospital average length of stay and mortality rate. Three multivariable logistic regression models were created to analyze the relationship of multiple independent variables to survival outcome using mortality rate as the dependent variable.

Results: The average number of patients with an ISS > 15 per Level I trauma center was 1743.3 in contrast to 963.4 patients per Level II center for the five year period. The mortality rate for a Level I center was 27% compared to 30% for a Level II. Notably, the difference in mortality rate was found only among the younger patient population as geriatric trauma patients showed equal survival probabilities at both types of centers. Regression analysis demonstrated that as the volume increased by 10%, there was a decrease of 4.5% in mortality rate. ($p < 0.05$)

Conclusion: Aggregate data analysis has shown a decrease in the mortality rate as the number of admissions per year increases. The difference in outcomes however was specific to mortality rates for a younger patient cohort only. Ideally, institution specific data with adjusted ratios would more precisely predict trauma patient outcomes in an institution and as such would be a more appropriate determinant of a trauma center's level designation.



122. The Use of High Frequency Oscillatory Ventilation as First Line Therapy for Severe Inhalation Injury

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Introduction: Burn patients with concurrent inhalation injuries have significantly increased mortality and morbidity. The use of mandatory bronchoscopy to confirm the clinical diagnosis of inhalation injury is not routine procedure at all burn centers. Optimal ventilator management of patients with severe inhalation injury also remains controversial.

Methods: We have developed an evidence-based protocol for patients with severe inhalation injury, which includes diagnostic bronchoscopy with early initiation of high frequency oscillatory ventilation (HFOV). We present a case that highlights this approach, and discuss the current evidence base for the treatment of inhalation injury.

Case history: A 45-year old man sustained severe inhalation injury during a house fire. He arrived intubated with carbonaceous sputum, and elevated carboxyhemoglobin. The initial bronchoscopy revealed severe thermal injury as well as copious debris. Following bronchoalveolar lavage, he was initiated on high frequency oscillatory ventilation at initial settings of a frequency of 5 Hertz (Hz), mean airway pressure of 55 cmH₂O (mPaw), pressure amplitude of oscillation (ΔP) of 5, and a percentage inspiratory time of 33 percent. Further bronchoscopy and bronchoalveolar lavage were performed on post-burn days 1 and 2. The mPaw and FIO₂ were gradually lowered. On post-burn day number six he was extubated. He had an uneventful course and was discharged home on post-burn day number 9.

Conclusion: High frequency ventilation should no longer be limited to only salvage or rescue therapy, but may be beneficial as part of a protocol for first-line treatment in inhalation injury. Further research to clarify the optimum ventilatory management in this patient population is indicated.

123. Traumatic Portal Vein Injuries: Report on a Series of Cases

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Introduction: Traumatic portal vein injuries are rare, difficult to manage, and result in very high mortality rates of up to 70%. Only a few combined and individual case series reports exist in the literature. The purpose of this investigation is to analyze our institutional experience and review the recommended management techniques of this devastating injury, as described in the literature.

Methods: An 8-year retrospective search and review of traumatic portal vein injuries treated at a level 1 trauma center was performed. Demographic information, initial physiologic and laboratory findings, injury patterns, surgical findings, and treatment outcomes were evaluated.

Results: Eleven portal vein injuries were encountered in 21,424 trauma patients received over the 8 year period (0.05% incidence), resulting from a mixture of blunt and penetrating trauma. Mean Injury Severity Score for the 5 blunt injury mechanisms was 46, and mean Penetrating Abdominal Trauma Index Score for the 6 penetrating



injuries was 53. Four patients (36%) survived initial repair (all by venorrhaphy) and resuscitation, the remainder dying acutely of exsanguination. Mean estimated operative blood loss was over 8 liters. The presence of shock on arrival to the hospital and the number of associated vascular injuries correlated with mortality. All survivors experienced significant post-operative complications.

Conclusions: Our review supports other authors' findings that portal vein injuries are rare and complex to manage, with most resulting in exsanguination. Small, simple injuries are best treated by lateral venorrhaphy; however, despite the physiologic consequences, early decision to ligate the portal vein or its tributaries for complex injuries, major associated vascular injuries, or for patients in intra-operative shock is believed to be the best strategy to improve survival.

124. Incidence and Factors Associated with Child Abuse in a Large Pediatric Burn Population

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Background: Burns are a well recognized form of child abuse, and factors that increase the likelihood of a non-accidental burn injury have been described. Our burn center utilizes a multidisciplinary care conference with specific guidelines to determine if pediatric burns are a result of child abuse. We examined the factors associated with child abuse among a large pediatric burn population in the US Southwest.

Methods: We performed a retrospective cohort study of all pediatric burns admitted to a regional burn center covering West Texas and Eastern New Mexico between 2001-2006. We collected data from the burn registry on patient age, sex, mechanism, location and size of burn, as well as determinations of possibility of abuse at admit and discharge. Outcome measures included total and intensive care unit (ICU) length of stay, disposition upon discharge, and mortality. Registry data were verified by burn unit nursing documentation for accuracy. Multivariate logistic regression was used to identify factors associated with child abuse.

Results: A total of 556 pediatric burns were identified. Most of the patients were Hispanic (57%), and male (68%). The mean age of our patients was 4.8 years (range 0.1 – 17). The majority (522, 94%) were thermal injuries, of which 253 (45.5%) were scald burns. A much smaller proportion (32, 6%) were electrical or chemical injuries. Upon admission, 25.5% of all burns were suspicious for abuse. Following the care conference, 18.8% were determined to be abuse or neglect. Younger age (mean 2 years, $p=0.0001$), male sex ($p=0.007$), longer length of stay in the intensive care unit ($p=0.042$) and upper extremity burns ($p=0.054$) were risk factors for child abuse. Size or type of burn, total length of stay and death were not significantly associated with abuse in our series.

Conclusion: Within our pediatric burn population, younger age, male sex and upper extremity (hand) burns were positively correlated with child abuse.



125. Rising Incidence of Fatal Motorcycle Crashes Since Amendment of the Helmet Use Law

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Introduction: The state of Texas amended the universal helmet law in 1997, removing the mandatory requirement for riders over age 21 to wear a motorcycle helmet. We hypothesized that this relaxation of safety requirements would result in an increase in motorcycle crash fatalities.

Materials and Methods: We reviewed records of all motorcycle crashes occurring in the state of Texas between 1996 and 2004, utilizing the Centers for Disease Control, National Center for Injury Prevention and Control WISQARS database. Our primary outcome measure was annual age-adjusted death rate per 100,000 population before and after amendment of the helmet law. Secondary outcomes measures included documented helmet use among all motorcycle riders, and years of potential life lost in motorcycle crashes, compared to other causes of death.

Outcome	Value
Age-Adjusted Death Rate (2000 Standard)	1996: 0.57 1998: 0.71 2004: 1.34
Years of Potential Life Lost (YPLL)	1996: 3,460 1998: 4,197 2004: 8,295
Helmet Usage (% of riders using helmets)	May 1997: 97% Nov 1997: 77% May 1998: 66%

Results: Our primary and secondary outcome measures are shown in Table 1 below. The adjusted fatality rate doubled between 1996 and 2004 ($p = 0.0001$). This was associated with a concurrent decrease in helmet use. Years of potential life lost from motorcycle crashes had fallen to a level similar to other causes and rose sharply after amendment of the law in 1997 (Figure 1).

Conclusion: Relaxation of the helmet law has resulted in a notable increase in

fatal crashes and a high toll of years of potential life lost. We believe that mandatory helmet use for all motorcycle riders would help reduce the burden of trauma deaths in Texas.

126. Unique Case of Abdominal Aortic Aneurysm in a Young Patient with Turner Syndrome and Goodpasture Disease

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Background: Thoracic aortic aneurysm occurs in 1-2% of Turner Syndrome cases. To date, only one previous case of isolated abdominal aortic aneurysm (AAA) has been reported in Turner syndrome. This is a first reported case of a patient with Turner syndrome and Goodpasture disease presenting with AAA.

Case Report: An 18 year old female with Turner syndrome, genotype (45 X0), Goodpasture and end stage renal disease was found to have an infrarenal AAA during work up for hypertension. Surgical repair was undertaken electively at age 21 when the aneurysm was 5 cm in diameter. A 12 mm by 6mm bifurcated Thrombosheild® graft was anastomosed proximally to the aorta and distally to the external iliac arteries.



Microscopic evaluation of the excised aorta showed fibrous tissue with atherosclerotic calcification, degeneration, necrosis, disruption of the media and hemorrhage consistent with aortic dissection. Richardson-Trichrome stain of the tissue showed media of the vessel with elastin disarray and rupture, also consistent with chronic dissection. The patient made an uneventful postoperative recovery and to date there have been no complications.

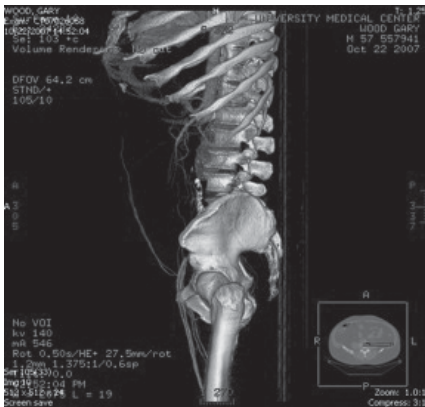
Discussion: The risk of aortic aneurysm is increased in Turner patients with hypertension, bicuspid aortic valve and coarctation of the aorta. Our patient had these risk factors but manifested AAA and not the usual thoracic aortic aneurysm. This case emphasizes the importance of screening for aortic aneurysm in patients with Turner syndrome. The fact that there was microscopic evidence of aortic dissection further emphasizes the need for aggressive management and close follow up, as rupture could potentially be catastrophic because of the congenital and cardiovascular abnormalities associated with Turner syndrome. Surgical intervention should be considered earlier than in the general population since underlying congenital cardiovascular abnormalities often make these patients very high surgical risk later when they age. Life time surveillance is recommended.

127. Complete Abdominal Aortic Occlusion: The Importance of Natural Collaterals for Survival

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Introduction: Complete occlusion of the abdominal aorta is a rare disease. It is even rarer to present in a patient with only mild symptoms. We present the case of a young male with intermittent claudication who was found to have complete infrarenal aortic occlusion. Computed tomogram angiography (CTA) dramatically documented the importance of normal anatomical arterial collaterals as a means to prevent life or limb threatening ischemia.



Results: A 57 year-old male presented the emergency department with intermittent claudication with symptoms progressing to rest pain over the previous two months. Physical exam revealed nonpalpable femoral, popliteal, dorsalis pedis and posterior tibial pulses bilaterally. There were no skin changes or ulceration of the legs and feet. Noninvasive vascular tests revealed monophasic Doppler signals from the groin to the feet on both sides. A computed tomographic angiogram showed complete occlusion of the aorta from just below the origin of the renal arteries, with refilling of the common femoral arteries through collaterals of the

inferior epigastric and mesenteric arteries. The patient was treated with aortobifemoral bypass grafting. He subsequently recovered and was discharged home with no further claudication symptoms.



Conclusion: Complete abdominal aortic occlusion is usually a catastrophic event resulting in severe lower extremity ischemia and often intraabdominal symptoms including acute renal failure, mesenteric ischemia and liver failure. Occasionally, as in this case, the symptoms are mild and the blood flow is sustained through collaterals, most importantly, the internal thoracic artery through the inferior epigastric artery, lumbar and mesenteric arteries restoring flow to the iliac system. A thorough history and physical exam followed by appropriate vascular work up should lead to the diagnosis in all cases. When this entity reaches the chronic state, the outcome from an aortic bifemoral bypass graft usually has excellent outcome. We present a very rare case of a total occlusion of the abdominal aorta presenting as chronic arterial occlusive disease.

128. A New Concept in HPB and Foregut Training

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Background: With the changes in resident work hours and the emphasis on early subspecialization, we explore the emerging concept of a dedicated foregut fellowship program that bridges the gap between transplant and surgical oncology.

Model: A dedicated HPB/ Foregut fellowship program was developed at a major tertiary referral hospital focusing on the following points: 1) organ specific approach 2) inclusion of both malignant and benign conditions 3) involvement of gastroenterology and transplant rotations 4) inclusion of multidisciplinary cancer conferences and programs 5) performance of clinical research.

Data was gathered from the experience of two fellows over a, 18 month period.

Results: The fellowship program was very popular and recruited fellow applicants from major general surgery programs in the USA and abroad. The use of the matching process for this years applicants drew applicants that would normally have applied for surgical oncology or transplant, but saw a gap in each of these training methods. Clinical experience of the fellows resulted in a minimum of 50 pancreatic resective procedures, 30 liver procedures, 15 bile related procedures, and 15 esophagectomies, 20 liver procedures related to transplantation. Other procedures included portal decompression, small bowel, gastric and GI resective and bypass procedures. Rotations on GI and transplant were included in the rotation schedule.

Conclusion: A model of surgical subspecialty training that bridges the gap between transplant and surgical oncology can be developed with a dedicated team approach. Changes in resident training will necessitate additional training of those surgeons who want to perform complex upper GI procedures, and fellowship training models such as this will be important.



129. Breast Cancer Draining to a Contralateral Axillary Sentinel Lymph Node

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Background: Sentinel lymph node biopsy is a minimally invasive technique employed to evaluate the axilla for breast cancer staging. Three techniques are commonly used to identify the lymphatic drainage of a breast tumor: preoperative lymphoscintigraphy, radiotracer injection followed by localization with a gamma probe, and visualization of lymphatics following injection of blue dye. We report the rare case of tumor basin draining to a contralateral axillary lymph node.

Case report: The patient was a 47 year old female with 1.2 cm tumor at the posterior aspect of the right breast at the three o'clock position. Histologically the tumor was identified as invasive ductal carcinoma. Prior to surgery lymphoscintigraphy was performed with technetium-99m injected to the right breast. Lymph nodes were noted trailing to the right axilla and surprisingly also to the contralateral left axilla. During surgery the right sentinel axillary lymph node was identified by visually following blue dye in a lymphatic channel. No increased signal was noted from the gamma probe in the right axilla. The contralateral left axillary sentinel node was identified with both visualization of blue dye and increased signal from the gamma probe. Both nodes were resected surgically and on pathological examination were negative for malignancy.

Discussion: Recent literature has suggested that lymphoscintigraphy may be redundant in identification of sentinel lymph nodes and that localization with a gamma probe following radiotracer injection combined with blue dye visualization may be sufficient. This case highlights that although rare it is important to consider the possibility of aberrant lymphatic drainage during breast conservation surgery. The contralateral axilla is not routinely explored surgically and in this case had lymphoscintigraphy not been used the lymphatic drainage to the contralateral axilla would have certainly been missed. For this reason, we recommend the continued routine use of all three methods for sentinel lymph node identification. If lymphoscintigraphy is not used we recommend thorough evaluation of the contralateral axilla with the gamma probe to identify the rare case of contralateral axillary lymphatic drainage as a potential site for metastasis.



Notes



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