Western Surgical Association

2019 ANNUAL SCIENTIFIC SESSION

November 2 – 5, 2019 Green Valley Ranch Resort & Spa Las Vegas, Nevada

The 127th Scientific Session of the Western Surgical Association

Western Surgical Association would like to thank the following organizations for their marketing support at the WSA Annual Meeting:

CSL Behring – Bronze Sponsor

Western Surgical Association would like to thank the following exhibiting companies for their generous support:

Allergan

BK Medical

Cook Medical

CSL Behring

Gore & Associates

Mallinckrodt Pharmaceuticals Microline Surgical, Inc.

Olympus America, Inc.

Pacira Biosciences

Pfizer

Takeda

The companies listed above generously supported our meeting as of the publication date of the Final Program. For a complete list of sponsors and exhibitors, please see signage outside the exhibit hall. Thank you to all the companies who have supported us.

MEETING OBJECTIVES

- 1. Delineate the importance of new diagnostic and therapeutic modalities in surgery.
- 2. Prioritize treatment of surgical diseases with new operative and non-operative technologies and treatment options.
- 3. Develop an increased knowledge of surgical disease and treatment.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American College of Surgeons and Western Surgical Association. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of <u>**16**</u> AMA PRA Category 1 CreditsTM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the AMA PRA Category 1 Credits^m listed above, a maximum of **<u>11.50</u>** credits meet the requirements for Self-Assessment.



AMERICAN COLLEGE OF SURGEONS Inspiring Quality: Highest Standards, Better Outcomes

100+years



AMERICAN COLLEGE OF SURGEONS DIVISION OF EDUCATION Accredited with Commendation by the Accreditation Council for Continuing Medical Education

DISCLOSURE STATEMENT

In compliance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. All reported conflicts are managed by a designated official to ensure a bias-free presentation. Please see the insert to this program for the complete disclosure list.



SATURDAY, NOVEMBER 2, 2019

5:30pm - 6:30pm	New Members Reception (by invitation), Opium Terrace
6:30pm - 8:30pm	Welcome Reception & Registration, Opium Terrace

SUNDAY NOVEMBER 3, 2019

6:30am - 11:20am	Registration Open, Estancia Foyer
6:30am - 11:20am	Exhibits Open, Estancia ABC
6:30am - 7:00am	Continental Breakfast & Exhibits, Estancia ABC
6:30am - 7:00am	Women In Surgery Breakfast, Estancia ABC
7:00am - 7:15am	Welcome & Opening Comments, Estancia DEFG
7:15am - 8:45am	Scientific Session 1, Estancia DEFG
8:00am - 10:00am	Spouse/Guest Breakfast, El Cielo
8:45am - 9:10am	Introduction of New Members & J. Bradley Aust Award, Estancia DEFG
9:10am - 9:20am	Morning Beverage Break, Estancia ABC
9:20am - 10:20am	Scientific Session 2, Estancia DEFG
10:20am - 11:20am	Presidential Address, Estancia DEFG
12:00pm - 6:00pm	WSA Golf Tournament, Red Rock Country Club Arroyo Course
12:00pm - 5:30pm	Optional Activity: Scooter Tour, Pickup outside of Main Lobby

MONDAY NOVEMBER 4, 2019

6:30am - 5:00pm	Registration Open, Estancia Foyer
6:30am - 2:50pm	Exhibits Open, Estancia ABC
7:00am - 8:00am	Continental Breakfast, Exhibits & ePoster Session 1, Estancia ABC
8:00am - 10:20am	Scientific Session 3, Estancia DEFG
8:00am - 10:00am	Spouse/Guest Breakfast, El Cielo
11:15am - 1:45pm	Optional Activity: High Tea at the Waldorf Astoria, Meet in Main Lobby
10:20am - 10:40am	Morning Beverage Break, Estancia ABC
10:40am - 12:20pm	Scientific Session 4, Estancia DEFG
12:20pm - 1:30pm	Lunch on Own
1:30pm - 2:30pm	Great Debates of the Western Surgical Association, Estancia DEFG
2:30pm - 2:50pm	Afternoon Beverage Break, Estancia ABC
2:50pm - 4:10pm	Scientific Session 5, Estancia DEFG
4:10pm - 4:40pm	Nonie Lowry Oration, Estancia DEFG
4:40pm - 5:30pm	Annual Business Meeting, Estancia DEFG
7:00pm - 8:00pm	President's Reception, El Cielo
8:00pm - 11:00pm	President's Dinner Dance - Casino Royale, Estancia Ballroom

TUESDAY, NOVEMBER 5, 2019

6:30am - 11:00am	Registration Open, Estancia Foyer
6:45am - 8:30am	Continental Breakfast & ePoster Session 2, Estancia Foyer
7:45am - 8:45am	Video Session, Estancia DEFG
8:45am - 10:25am	Scientific Session 6, Estancia DEFG
10:25am - 11:25am	Quickshot Session, Estancia DEFG

EXECUTIVE COMMITTEE

President 1st Vice President 2nd Vice President Secretary Treasurer Recorder Immediate Past President/Exec Chairman Past President Senior District Rep - 4th Year District Rep - 3rd Year District Rep - 2nd Year District Rep - 1st Year

SOCIETY REPRESENTATIVES

ACS Board of Governors ACS Advisory Council for General Surgery American Board of Surgery M Ashraf Mansour John Russell Steven De Jong Leigh Neumayer Margo Shoup Karen Brasel Mark Talamonti Kelly McMasters Anees Chagpar Tyler Hughes James Madura Mary Hawn

Charles Scoggins G. Edward Kimm Jr. David Farley

MEMBERSHIP COMMITTEE

Membership Chair Membership - 3rd Year Membership - 2nd Year Membership - 1st Year Senior District Rep - 4th Year District Rep - 3rd Year President Secretary Treasurer Jayer Chung Charles Scoggins Katharine Yao John Santaniello Anees Chagpar Tyler Hughes Ashraf Mansour Leigh Neumayer Margo Shoup

PROGRAM COMMITTEE

Program Chair Program - 3rd Year Program - 2nd Year Program - 1st Year District Rep - 2nd Year District Rep - 1st Year President Secretary Recorder

2019 Local Arrangements Chair

Charles St. Hill

Carmen Solorzano Jeffrey Lee Michael Ujiki Joseph Bellal James Madura Mary Hawn Ashraf Mansour Leigh Neumayer Karen Brasel

WELCOME NEW MEMBERS

Elected to Membership at the Annual Meeting in 2018

Amanda Kathleen Arrington MD | Tucson, AZ Farzaneh Banki MD | Houston, TX Cherisse Berry MD | New York, NY Carla Fisher MD | Indianapolis, IN Yuman Fong MD | Duarte, CA Marion Curtiss Wilson Henry MD, MPH | Tucson, AZ Haytham Kaafarani MD, MPH | Boston, MA Electron Kebebew MD | Stanford, CA Katherine Anne Kopkash MD | Evanston, IL Amit Kumar Mathur MD, MS | Phoenix, AZ Amit Merchea MD | Jacksonville, FL Ryan Merkow MD, MS | Chicago, IL Nitin Mishra MBBS, MS, MPH | Phoenix, AZ W. Shannon Orr MD | Jackson, MS Jasmeet S. Paul MD | Albuquerque, NM Catherine Pesce MD | Evanston, IL Arghavan Salles MD, PhD | St. Louis, MO Kulmeet Kaur Sandhu MD | Los Angeles, CA Vassiliki Liana Tsikitis MD, MCR | Portland, OR Ching-Wei David Tzeng MD | Houston, TX Kyle Barron Vincent MD | Wichita, KS

LECTURE: PRESIDENTIAL ADDRESS



Charting a New Path for Success

Sunday, November 3, 2019 10:20am – 11:20am

M. Ashraf Mansour MD, MBA Michigan State University - Spectrum Health

M Ashraf Mansour, MD, MBA, FACS is Chair of Surgery, Michigan State University and Academic Chair, Spectrum Health Medical Group Department of Surgical Specialties. He also specializes in vascular and endovascular surgery. Dr. Mansour earned his medical degree at Cairo University School of Medicine. He completed his surgical internship and residency at the University of Colorado Health Sciences Center in Denver. After serving in the United States Army as a major in the Medical Corps, he completed a fellowship in vascular and then endovascular surgery at the Southern Illinois University School of Medicine. Dr. Mansour has special interests in carotid disease, aortic aneurysm surgery (open and endovascular), and peripheral vascular and venous disease.

LECTURE: NONIE LOWRY ORATION

The Nonie Lowry Oration was established in 2016 to honor the WSA Executive Director, Nonie Lowry, who lost her battle with breast cancer. This lecture was named after Nonie Lowry for her energy, guidance, unwavering support and dedication to the Western Surgical Association.



Lean In and Fail Fast: Resiliency in Academic Surgery

Monday, November 4, 2019 4:10pm – 4:40pm

Mary T Hawn MD, MPH Stanford University

Dr. Mary T. Hawn is the Stanford Medicine Professor of Surgery and Chair of the Department of Surgery at Stanford University. Dr. Hawn, a native of Michigan, received her education and general surgical training at the University of Michigan. She completed her minimally invasive surgical fellowship at Oregon Health and Sciences University. Her clinical area of specialty is minimally invasive foregut surgery. Dr. Hawn is a funded health services researcher and her projects focus on quality measurement and policy in surgical populations. She is a Director for the American Board of Surgery and serves on the editorial board of Annals of Surgery, Journal of the American College of Surgeons, Journal of Gastrointestinal Surgery and the American Journal of Surgery. Dr. Hawn has held several additional leadership roles in American Surgery including Chair of the American College of Surgeons Scientific Forum Committee and as Treasurer and a Trustee for the Surgical Society of the Alimentary Tract. She is the co-Editor of the surgical textbook Operative Techniques in Surgery.

PRESIDENT	PLACE	YEAR
S.S. Todd*	Topeka	1891
Milo B. Ward*	Kansas City	1892
Milo B. Ward*	Des Moines	1893
Lewis Schooler*	Omaha	1894
John E. Summers, Jr.*	Kansas City	1895
Thomas J. Beattie*	Topeka	1896
Joseph Eastman*	Denver	1897
David S. Fairchild*	Omaha	1898
Homer C. Crowell*	Des Moines	1899
O. Beverly Campbell*	Minneapolis	1900
August F. Jonas*	Chicago	1901
James E. Moore*	St. Joseph	1902
Alexander H. Ferguson*	Denver	1903
Charles H. Mayo*	Milwaukee	1904
Harvey D. Niles*	Kansas City	1905
Malcolm L. Harris*	Salt Lake City	1906
Charles W. Oviatt*	St. Louis	1907
William W. Grant*	Minneapolis	1908
Arthur L. Wright*	Omaha	1909
John P. Lord*	Chicago	1910
Amos W. Abbott*	Kansas City	1911
Lewis L. McArthur*	Cincinnati	1912
Jabez N. Jackson*	St. Louis	1913
Bryon B. Davis*	Denver	1914
Joseph R. Eastman*	Des Moines	1915
Lawrence W. Littig*	St. Paul	1916
Leonard Freeman*	Omaha	1917
James F. Percy*	Chicago	1918
Roland Hill*	Kansas City	1919
Arthur T. Mann*	Los Angeles	1920
Charles D. Lockwood*	St. Louis	1921
Miles F. Porter*	Minneapolis	1922
Horace G. Wetherill*	Colorado Springs	1923
Donald Macrae, Jr.*	French Lick Springs	1924
Willard D. Haines*	Wichita	1925
Robert C. Coffey*	Duluth	1926

Lewis H. McKinnie*	Omaha	1927
Kellog Speed*	Chicago	1928
E. Starr Judd*	Del Monte	1929
Carl E. Black*	Kansas City	1930
Clarence G. Toland*	Denver	1931
Harry P. Ritchie*	Madison	1932
Samuel C. Plummer*	Cincinnati	1933
Frank R. Teachenor*	St. Louis	1934
Reginald H. Jackson*	Rochester	1935
Thomas G. Orr*	Kansas City	1936
Fred W. Bailey*	Indianapolis	1937
Casper F. Hegner*	Omaha	1938
Vernon C. David*	Los Angeles	1939
Alfred Brown*	Topeka	1940
Albert H. Montgomery*	St. Paul	1941
Willis C. Gatch*	No General Meeting	1942
Willis D. Gatch*	No General Meeting	1943
Willis D. Gatch*	Chicago	1944
James C. Masson*	Chicago	1945
Arthur R. Metz*	Memphis	1946
William M. Mills*	Colorado Springs	1947
Harry B. Zimmerman*	St. Louis	1948
Robert L. Sanders*	Santa Barbara	1949
Warren H. Cole*	Minneapolis	1950
Erwin R. Schmidt*	Colorado Springs	1951
George B. Packard*	Houston	1952
Lawrence Chaffin*	Chicago	1953
Herbert H. Davis*	Colorado Springs	1954
Michael L. Mason*	Seattle	1955
Charles G. Johnston*	Cincinnati	1956
Everett P. Coleman*	Salt Lake City	1957
James B. Brown*	Rochester	1958
James T. Priestley*	Colorado Springs	1959
Caleb S. Stone, Jr.*	Detroit	1960
John T. Reynolds*	San Francisco	1961
Jacob K. Berman*	St. Louis	1962
Charles W. Mayo*	Galveston	1963

Eugene A. Osius*	Colorado Springs 1	964
Arthur J. Hunnicutt*	Omaha	1965
Walter W. Carroll*	Phoenix	1966
O. Theron Claggett*	Los Angeles	1967
Merle M. Musselman*	Chicago	1968
Arthur C. Pattison*	Dallas	1969
Kenneth C. Sawyer*	Colorado Springs	1970
Raleigh R. White*	Portland	1971
Carl P. Schlicke*	Rochester	1972
Tom D. Throckmorton*	Houston	1973
Darrell A. Campbell*	San Francisco	1974
Chester B. McVay*	Colorado Springs	1975
William P. Mikkelsen*	Coronado	1976
Allen M. Boyden*	Las Vegas	1977
D. Emirick Szilagyi*	Scottsdale	1978
Harvey R. Butcher, Jr.*	Colorado Springs	1979
William H. ReMine*	Salt Lake City	1980
Paul E. Hodgson*	Albuquerque	1981
James J. Berens*	Kansas City	1982
Robert E. McCurdy*	Monterey	1983
George L. Jordan, Jr.*	Colorado Springs	1984
Martin A. Adson*	Rochester	1985
R. Dale Liechty*	Detroit	1986
Alexander J. Walt*	Dallas	1987
Melvin A. Block	Coronado	1988
J. Bradley Aust*	St. Louis	1989
David G. Ashbaugh	Scottsdale	1990
John L. Glover*	Colorado Springs	1991
Arthur J. Donovan	San Antonio	1992
George E. Block*	Seattle	1993
Basil A. Pruitt, Jr.*	Palm Desert	1994
Norman W. Thompson*	Chicago	1995
Jon A. van Heerden	Portland	1996
Jack R. Pickleman	Colorado Springs	1997
Jay L. Grosfeld*	Indianapolis	1998
Thomas V. Berne	Santa Fe	1999
Amilu S. Rothhammer	Dana Point	2000

J. David Richardson	San Antonio	2001
Claude H. Organ*	Vancouver, British Columbia	2002
Richard A. Prinz	Tucson	2003
Fabrizio Michelassi	Las Vegas	2004
Arthur S. McFee*	Rancho Mirage, CA	2005
Richard C. Thirlby	Los Cabos, México	2006
Merril T. Dayton	Colorado Springs, CO	2007
Bruce L. Gewertz	Santa Fe, NM	2008
Wayne H. Schwesinger	San Antonio, TX	2009
Michael B. Farnell	Chicago, IL	2010
Gregory J. Jurkovich	Tucson, AZ	2011
Raymond J. Joehl	Colorado Springs, CO	2012
Clive S. Grant	Salt Lake City, UT	2013
Steven C. Stain	Indian Wells, CA	2014
William C. Chapman	Napa, California	2015
R. James Valentine	Coronado, CA	2016
Kelly McMasters	Paradise Valley	2017
Mark S Talamonti	San Jose del Cabo, Mexico	2018

*Deceased





SATURDAY, NOVEMBER 2, 2019

5:30pm - 6:30pm **New Members Reception** (*by invitation*), Opium Terrace

6:30pm - 8:30pm **Welcome Reception,** Opium Terrace

SCIENTIFIC AGENDA SUNDAY NOVEMBER 3, 2019

Sunday, November 3, 2019

6:30am - 12:00pm Registration Open, Estancia Foyer

6:30am - 7:00am Continental Breakfast & Exhibits, Estancia ABC

6:30am - 7:00am **Women In Surgery Breakfast,** Estancia ABC

7:00am - 7:15am **Welcome & Opening Comments,** Estancia DEFG

7:15am - 8:45am **Scientific Session 1,** Estancia DEFG **Moderator**: President, M. Ashraf Mansour MD, MBA | Michigan State University – Spectrum Health

7:15am - 7:25am

QS 1. IMPLEMENTATION OF PRE-HABILITATION FOR MAJOR ABDOMINAL SURGERY AND HEAD AND NECK SURGERY: A SIMPLIFIED SEVEN DAY PROTOCOL

J Moore, P Tennet, J Fisher, P Philips, M Egger, CR Scoggins, RCG Martin University of Louisville **Presenter:** Robert CG Martin, II, MD, PhD

7:25am - 7:35am

QS 2. OUTCOME IMPLICATIONS OF VENOUS MANAGEMENT STRATEGY IN PATIENTS WITH CONCOMITANT ARTERIAL AND VENOUS FEMOROPOPLITEAL INJURIES

JC Webb, PG Teixeira, JJ DuBose, CV Brown, JB. Holcomb, J Sharpe, JJ Morrison, TM Scalea, D Skarupa, RD Catalano, J Kim, K Inaba, N Poulin, J Myers, JK. Bini, D Feliciano The University of Texas at Austin **Presenter:** Jack C Webb

7:35am - 7:45am

QS 3. INTERCOSTAL NERVE BLOCK WITH LIPOSOMAL BUPIVICAINE IS SUPERIOR TO EPIDURAL ANALGESIA FOR THE TREATMENT OF RIB FRACTURES

NW Sheets, JW Davis, RC Dirks, AW Pang, AM Kwok, MM Wolfe, LP Sue

UCSF Fresno

Presenter: Nicholas W Sheets MD, MPH

7:45am - 8:05am

1. PATIENT CARE MODEL (PCM) IMPACT ON RISK-ADJUSTED OUTCOMES IN EMERGENCY INTESTINAL RESECTIONS

KB To, NS Kamdar, P Patil, C Ring, SD Collins, E Seese, GL Krapohl, DA Campbell Jr, MJ Englesbe, MR Hemmila, LM Napolitano, the Michigan Surgical Quality Collaborative (MSQC) Emergency General Surgery Study Group and the MSQC Research Advisory Group University of Maryland **Presenter:** Kathleen To MD **Member Closer:** Jose Diaz MD **Invited Discussant:** John Fildes MD | University of Las Vegas Nevada



8:05am - 8:25am

2. EN BLOC CELIAC AXIS RESECTION FOR PANCREATIC CANCER: CLASSIFICATION SYSTEM OF ANATOMICAL VARIANTS BASED ON TUMOR EXTENT

MJ Truty, RL Smoot, DM Nagorney, BC Mendes, JJ Colglazier, RR deMartino, SP Cleary, TC Bower, ML Kendrick Mayo Clinic Rochester Presenter: Mark J Truty MD, MS Member Closer: Mark J Truty MD, MS Invited Discussant: Amanda Arrington MD | West Virginia University

8:25am - 8:45am

3. MORE OF LESS: THE GENERAL SURGERY RESIDENT EXPERIENCE IN BILIARY SURGERY

AR Cortez, JR Potts Accreditation Council for Graduate Medical Education (ACGME) Mayo Clinic Rochester **Presenter:** Alex R Cortez MD **Member Closer:** John R. Potts, III, MD **Invited Discussant:** David Nagorney MD | Mayo Clinic Rochester

8:00am - 10:00am **Spouse/Guest Breakfast,** El Cielo



8:45am - 9:10am

Introduction of New Members & J. Bradley Aust Award, Estancia DEFG

WSA Welcomes New Member Class of 2018 *Presentation of Certificates*

WSA Congratulates the 2018 J. Bradley Aust Awardee Valentine Nfonsam MD | University of Arizona INCREASING INCIDENCE OF COLON CANCER IN THE YOUNG; ASSESSING THE TUMOR BIOLOGY

9:10am - 9:20am Morning Beverage Break, Estancia ABC

9:20am - 10:20am Scientific Session 2, Estancia DEFG Moderator: First VP, John Russell MD | University of New Mexico

9:20am - 9:40am

4. CORRELATION OF PROPOSED SURGICAL VOLUME STANDARDS FOR COMPLEX CANCER SURGERY WITH ACTUAL HOSPITAL MORTALITY

N Wasif, D Etzioni, E Habermann, A Mathur, YH Chang Mayo Clinic Arizona Presenter: Nabil Wasif MD, MPH Member Closer: Nabil Wasif MD, MPH Invited Discussant: Margo Shoup MD | Nuvance Health 9:40am - 10:00am

5. UNDER-REPRESENTED MINORITIES IN GENERAL SURGERY RESIDENCY: ANALYSIS OF APPLICANTS SELECTED FOR INTERVIEW, RESIDENTS, AND CORE TEACHING FACULTY

BT Jarman, AJ Borgert, KJ Kallies, ART Joshi, DS Smink, GA Sarosi, L Chang, JM Green, JA Greenberg, ML Melcher, V Nfonsam, J Whiting Gundersen Health System Presenter: Benjamin T Jarman MD Member Closer: Benjamin T Jarman MD Invited Discussant: Karen Brasel MD | Oregon Health & Science University

10:00am - 10:20am

6. THE ROBOTIC APPROACH TO OUTPATIENT INGUINAL HERNIA REPAIR H Janjua, E Cousin-Peterson, MC Kuo, PC Kuo

University of South Florida **Presenter:** Haroon Janjua MS **Member Closer:** Haroon Janjua MS **Invited Discussant:** Rifat Latifi MD | Westchester Medical Center Health Network and New York Medical College

10:20am - 11:20am **Presidential Address,** Estancia DEFG Introduction: John Russell MD | University of New Mexico

Charting a New Path for Success

M. Ashraf Mansour MD, MBA | Michigan State University – Spectrum Health

Monday, November 4, 2019

MONDAY NOVEMBER 4, 2019

6:30am - 5:00pm **Registration Open,** Estancia Foyer

6:30am - 2:50pm **Exhibits Open**, Estancia ABC

7:00am - 8:00am

Continental Breakfast, Exhibits & ePoster Session 1, Estancia ABC For complete presentation details, reference the ePoster Listings section

Kiosk 1 Moderator: Carmen Solorzano MD | Vanderbilt University

Kiosk 2 Moderator: Mary T Hawn MD, MPH | Stanford University

Kiosk 3 Moderator: Michael Ujiki MD | NorthShore University HealthSystem

8:00am - 10:20am Scientific Session 3, Estancia DEFG Moderator: President, M. Ashraf Mansour MD, MBA | Michigan State University – Spectrum Health

8:00am - 8:20am 7. THE IMPACT OF ADDING WIRELESS PH STUDY TO THE INITIAL ENDOSCOPY FOR PATIENTS WITH SYMPTOMS OF GASTROESOPHAGEAL REFLUX DISEASE; DATA FROM HIGH VOLUME RURAL ANTIREFLUX CENTER

M Fanous, T Hughes Aspirus Iron River Hospital **Presenter:** Medhat Fanous MD **Member Closer:** Tyler Hughes MD **Invited Discussant:** Michael Ujiki MD | NorthShore University HealthSystem 8:20am - 8:40am



8. SAFETY OF ELECTIVE MAJOR ABDOMINAL OPERATIONS IN THE ELDERLY: A STUDY OF GERIATRIC-SPECIFIC DETERMINANTS OF HEALTH

AN Martin, FE Turrentine, DL Hoagland, RS Jones, VM Zaydfudim University of Virginia Presenter: Victor M Zaydfudim MD, MPH Member Closer: Victor M Zaydfudim MD, MPH Invited Discussant: Mary T Hawn MD, MPH | Stanford University

8:40am - 9:00am

9. DELAY IN SURGERY IS ASSOCIATED WITH AXILLARY UPSTAGING OF CLINICALLY NODE NEGATIVE BREAST CANCER PATIENTS

A Khader, SC Chang, J Santamaria, M Kledzik, A Scholer, M Goldfarb, J Grumley, T Fischer John Wayne Cancer Institute at Providence Saint John **Presenter:** Adam Khader MD, PhD **Member Closer:** Trevan Fischer MD **Invited Discussant:** Leigh Neumayer MD | The University of Arizona

9:00am - 9:20am

10. BLUNT CEREBROVASCULAR INJURY MANAGEMENT AND OUTCOMES IN THE ERA OF ENDOVASCULAR SURGERY. A REPORT FROM THE AAST PROSPECTIVE OBSERVATIONAL VASCULAR INJURY TRIAL (PROOVIT)

JC Webb, JJ DuBose, JB Holcomb, JP Sharpe, JJ Morrison, T Scalea, DJ Skarupa, RD Catalano, J KK Inaba, N Poulin, J Myers, JK. Bini, CV Brown, PG Teixeira The University of Texas at Austin **Presenter:** Jack C Webb **Member Closer:** Carlos V R Brown MD **Invited Discussant:** Sonlee West MD | University of New Mexico



Aust Award Candidate

9:20am - 9:40am

11. NEAR-INFRARED PHOTOIMMUNOTHERAPY IS EFFECTIVE TREATMENT FOR COLORECTAL CANCER IN NUDE MOUSE MODELS

HM Hollandsworth, S Amirfakhri, F Filemoni, S Razemjooie, D Stupack, RM Hoffman, P Yazaki, M Bouvet University of California, San Diego Presenter: Hannah Hollandsworth MD Member Closer: Michael Bouvet MD Invited Discussant: Vassiliki Tsikitis MD, MCR | Oregon Health & Science University

9:40am - 10:00am

12. EARLY VERSUS DELAYED DEFINITIVE COMPLEX ABDOMINAL WALL RECONSTRUCTION WITH BIOLOGIC MESH FOLLOWING DAMAGE CONTROL SURGERY

R Latifi, S Gogna, P Kartik, J Con, PL Anderson, DJ Samson, A Policastro Westchester Medical Center Presenter: Shekhar Gogna MD Member Closer: Rifat Latifi MD Invited Discussant: James Robbins MD | William Beaumont Hospital

10:00am - 10:20am

13. WHAT PREDICTS RECURRENT KIDNEY STONES AFTER PARATHYROIDECTOMY FOR PRIMARY HYPERPARATHYROIDISM?

AK Islam, SA Holt, J Reisch, F Nwariaku, N Maalouf UT Southwestern Medical Center Presenter: Ana K Islam MD Member Closer: Shelby Holt MD Invited Discussant: Melanie Golfarb MD, MSc | John Wayne Cancer Institute at Providence Saint John's Health Center

Monday, November 4, 2019

8:00am - 10:00am **Spouse/Guest Breakfast,** El Cielo

10:20am - 10:40am Morning Beverage Break, Estancia ABC

10:40am - 12:20pm Scientific Session 4, Estancia DEFG Moderator: Second VP, Steven De Jong MD | Loyola University Medical Center

10:40am - 11:00am

14. WHEN IS IT SAFE TO START VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS AFTER PELVIC FRACTURES? A PROSPECTIVE STUDY FROM A LEVEL I TRAUMA CENTER

M Schellenberg, E Benjamin, K Inaba, P Heindel, S Biswas, JL Mooney, D Demetriades LAC+USC Medical Center Presenter: Morgan Schellenberg MD, MPH Member Closer: Carlos V R Brown MD Invited Discussant: John Fildes MD | University of Nevada Las Vegas

11:00am - 11:20am

15. BREAST HETEROGENEITY: MODERN OBSTACLES TO UNIVERSAL BIOMARKERS

R Dirks, H Burney, M Anganappa, G Sanduski, Y Liu, C Schmidt, H Nakshatri Indiana University School of Medicine Presenter: Rebecca C Dirks MD Member Closer: C. Max Schmidt MD, PhD, MBA Invited Discussant: Kelly McMasters MD, PhD | University of Louisville 11:20am - 11:40am

16. LIVING DONOR LIVER TRANSPLANTATION FOR PERIHILAR-CHOLANGIOCARCINOMA - OUTCOMES AND COMPLICATIONS

EK Tan, CB Rosen, JK Heimbach, GJ Gores, D Zamora-Valdes, T Taner Mayo Clinic Rochester Presenter: Timucin Taner MD, PhD Member Closer: Charles Rosen MD Invited Discussant: MB Majella Doyle MD MBA | Washington University

11:40am - 12:00pm

17. MORE THAN ALIGNING PERCEPTIONS: MEDICAL STUDENT MISTREATMENT AND PSYCHOLOGICAL SAFETY ON THE SURGICAL CLERKSHIP

RL Williams-Karnesky, JC Russell, ML Wang University of New Mexico Presenter: Rebecca L Williams-Karnesky MD, PhD Member Closer: John Russell MD Invited Discussant: Benjamin T Jarman MD | Gundersen Health System

12:00pm - 12:20pm

18. HEPATIC ANGIOEMBOLIZATION FOR TRAUMA - WHERE IS THE BENEFIT?

JM Samuels, H Carmichael, A Kovar, S Urban, S Vega, C Velopulos, RC McIntyre University of Colorado, Denver Presenter: Jason M Samuels MD Member Closer: Robert McIntyre MD Invited Discussant: Carlos V. R. Brown MD | Dell Medical School, University of Texas at Austin

Monday, November 4, 2019

12:20pm - 1:30pm Lunch on Own

1:30pm - 2:30pm Great Debates of the Western Surgical Association, Estancia DEFG

Surgical Education Debate – The Generalist vs. The Sub-Specialist: Ben and Tim's Excellent Adventure

Moderator: Nabil Wasif MD | Mayo Clinic Arizona Participants: Benjamin Jarman MD | Gundersen Health System Timothy Nelson MD | University of New Mexico

Surgical vs. Medical Management of Acute Uncomplicated Appendicitis

Moderator: Carlos V. R. Brown MD | Dell Medical School, University of Texas at Austin Participants: Surgical: Bellal Joseph MD | University of Arizona Medical Management: Sonlee West MD | University of New Mexico

2:30pm - 2:50pm Afternoon Beverage Break, Estancia ABC

2:50pm - 4:10pm Scientific Session 5, Estancia DEFG Moderator: Charles Scoggins MD | University of Louisville

2:50pm - 3:10pm

19. PROSPECTIVE MOLECULAR STAGING OF PANCREATIC ADENOCARCINOMA WITH A CLINICALLY AVAILABLE KRAS MUTANT CELL-FREE DNA ASSAY

JL Leiting, AM Abdelrahman, BR Kipp, TE Grotz, DM Nagorney, ML Kendrick, SP Cleary, RL Smoot, MJ Truty Mayo Clinic Rochester Presenter: Jennifer L Leiting MD Member Closer: Mark J Truty MD, MS Invited Discussant: C. Max Schmidt MD, PhD, MBA | Indiana University

3:10pm - 3:30pm

20. THE IMPACT OF A COMPREHENSIVE MULTIDISCIPLINARY RIB FRACTURE TREATMENT PROTOCOL AT A LEVEL 1 TRAUMA CENTER: A PROPENSITY SCORE MATCHING ANALYSIS

AC Pfaff, CP Miller, A Ata, AE Stolarski, L Evans, M Johnson, A Bartscherer, C Rosati, SC Stain, M Tafen Wandji Albany Medical Center Presenter: Ashley C Pfaff MD Member Closer: Marcel Tafen-Wandji MD Invited Discussant: Ernest Moore MD | Denver Health Medical Center 3:30pm - 3:50pm

21. ASSOCIATION OF ANTERIOR INTEROSSEOUS AND MEDIAN NERVE NEUROPRAXIA WITH PINK PULSELESS HAND IN SUPRACONDYLAR HUMERUS FRACTURES IN CHILDREN

J Chung, H Elizondo, L Narvaez, B Naik-Mathuria, SB Rosenfeld, JL Mills Baylor College of Medicine Presenter: Hector Elizondo MD Member Closer: Jayer Chung MD, MSc Invited Discussant: M. Ashraf Mansour MD, MBA | Michigan State University – Spectrum Health

3:50pm - 4:10pm

22. PREDICTORS OF ANASTOMOTIC LEAK AFTER ESOPHAGECTOMY FOR CANCER: NOT ALL LEAKS INCREASE MORTALITY

A Grigorian, C Krasnoff, BR Smith, W Duong, NT Nguyen, S Daly, M Lekawa, J Nahmias University of California, Irvine Medical Center **Presenter:** Areg Grigorian MD **Member Closer:** Ninh Nguyen MD **Invited Discussant:** Nabil Wasif MD, MPH | Mayo Clinic Arizona

4:10pm - 4:40pm **Nonie Lowry Oration,** Estancia DEFG Introduction: M. Ashraf Mansour MD, MBA | Michigan State University – Spectrum Health

Lean In and Fail Fast: Resiliency in Academic Surgery Mary T. Hawn MD, MPH | Stanford University

Monday, November 4, 2019

4:40pm - 5:30pm **Annual Business Meeting,** Estancia DEFG *Members Only*

7:00pm - 8:00pm **President's Reception,** El Cielo

8:00pm - 11:00pm President's Dinner Dance - Casino Royale, Estancia Ballroom

SCIENTIFIC AGENDA TUESDAY, NOVEMBER 5, 2019

Tuesday, November 5, 2019

6:30am - 11:00am **Registration Open,** Estancia Foyer

6:45am - 8:30am Continental Breakfast & ePoster Session 2, Estancia Foyer For complete presentation details, reference the ePoster Listings section

Kiosk 1 Moderator: Charles St. Hill MD | University of Las Vegas Nevada

Kiosk 2 Moderator: James Madura MD | Mayo Clinic Arizona

Kiosk 3 Moderator: Bellal Joseph MD | University of Arizona

7:45am - 8:45am Video Session, Estancia DEFG Moderator: Carmen Solorzano MD | Vanderbilt University

7:45am - 7:55am

V 1. LAPAROSCOPIC EXCISION OF EXTRA-ADRENAL PHEOCHROMOCYTOMA (PARAGANGLIOMA) AT THE DISTAL AORTO-CAVAL REGION (ORGAN OF ZUCKERKANDL) IN A PREGNANT LADY

S Alsafran, D Schuitevoerder, T Vaghaiwalla, B Ruhle, X Keutgen, E Kaplan, P Angelos University of Chicago **Presenter:** Salman K Alsafran MBBCh 7:55am - 8:05am V 2. USE OF DISPOSABLE SELF RETAINING RETRACTOR FOR AXILLARY SENTINEL LYMPH NODE BIOPSY

N Ajkay, K McMasters University of Louisville **Presenter:** Nicolás Ajkay MD

8:05am - 8:15am

V 3. THORACOSCOPIC ENUCLEATION OF AN UPPER ESOPHAGEAL SUBMUCOSAL MASS

J Nguyen, S Daly, M Hinojosa, B Smith, NT Nguyen University of California, Irvine Medical Center **Presenter:** James Nguyen MD

8:15am - 8:25am V 4. ROBOTIC SPLENECTOMY IN A PATIENT WITH SPLENOMEGALY

R Wendt, T Kapoor, J Bingener Mayo Clinic Rochester **Presenter:** Robert Wendt MD

8:25am - 8:35am V 5. MULTIPLE GUNSHOT WOUNDS TO THE ABDOMEN: A TRAUMA LAPAROTOMY P Rhee Westchester Medical Center Presenter: Peter Rhee MD
8:35am - 8:45am

V 6. REOPERATIVE LAPAROSCOPIC REDUCTION OF RECURRENT TYPE III HIATAL HERNIA WITH TAKE DOWN AND RECONSTRUCTION OF TOUPET FUNDOPLICATION, AND REPAIR WITH MESH

T Cobb, F Banki The University of Texas Health Science Center at Houston **Presenter:** Tyler Cobb MD

8:45am - 10:25am Scientific Session 6, Estancia DEFG Moderator: President Elect (TBD)

8:45am - 9:05am

23. ELECTRIC SCOOTER INJURIES: VARIATIONS IN SOUTHERN CALIFORNIA TRAUMA CENTERS

NK Dhillon, EJ Ley, C Juillard, G Barmparas, DY Kim, D Turay, AR Seibold, S Kaminski, TK Duncan, G Diaz, S Saad, D Hanpeter, ER Benjamin, A Tillou, K Inaba Cedars-Sinai Medical Center **Presenter:** Navpreet K Dhillon MD **Member Closer:** Eric Ley MD **Invited Discussant:** Bellal Joseph MD | University of Arizona

9:05am - 9:25am

24. CONTINUITY VERSUS VOLUME IN EMERGENCY GENERAL SURGERY: DOES FRAGMENTATION OF CARE MATTER?

B Joseph, K Hanna, M Chehab, M Hamidi, A Northcutt, A Tang, N Kulvatunyou, L Castanon, M Ditillo University of Arizona Presenter: Kamil Hanna MD Member Closer: Bellal Joseph MD Invited Discussant: Krista Kaups MD, MSc | UCSF Fresno 9:25am - 9:45am

25. LACTATE LEVELS IN BRAIN DEAD ORGAN DONORS PREDICT ORGAN TRANSPLANTATION RATES AND GRAFT FUNCTION

M Sally, M Hutchens, E Swanson, R Nelson, N Jameson, T Groat, M Patel, K Ellis, C Niemann, D Malinoski VA Portland Health Care System Presenter: Mitchell Sally MD Member Closer: Karen Brasel MD Invited Discussant: T. Mark Earl MD | University of Mississippi Medical Center

9:45am - 10:05am

26. A QUANTITATIVE GLOBAL PROTEOMICS APPROACH IDENTIFIES CANDIDATE URINARY BIOMARKERS THAT CORRELATE WITH INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM DYSPLASIA

KF Flick, MT Yip-Schneider, RE Simpson, CM Sublette, M Soufi, EP Ceppa, JM Dewitt, AL Mosley, J Zhang, CM Schmidt Indiana University School of Medicine Presenter: Katelyn Flick MD Member Closer: C. Max Schmidt MD, PhD, MBA Invited Discussant: Mark Talamonti MD | NorthShore University Health System 10:05am - 10:25am

27. DO ONE, DO ONE, TEACH ONE: CHALLENGING THE DOGMA WITH SIMULATION-BASED TRAINING TO MAXIMIZE EFFICIENCY IN SURGICAL RESIDENT EDUCATION

SW Schimpke, BM Larson, BR Veenstra, JA Myers, JM Velasco Rush University Medical Center Presenter: Scott W Schimpke MD Member Closer: Jose Velasco MD Invited Discussant: Tim Nelson MD | University Of New Mexico

10:25am - 11:25am

Quickshot Session, Estancia DEFG

Moderator: Immediate Past President, Mark Talamonti MD | NorthShore University Health System

10:25am - 10:35am

QS 4. HEAD-TO-HEAD COMPARISON BETWEEN AMERICAN MEDICAL GRADUATES AND INTERNATIONAL MEDICAL GRADUATES AS GENERAL SURGERY INTERNS: A SINGLE-CENTER EXPERIENCE

A Rajesh, M Asaad, Y AlJamal, RU Azevedo, DR Farley Mayo Clinic Rochester **Presenter:** Aashish Rajesh MBBS

10:35am - 10:45am

QS 5. CENTRALIZATION OF ESOPHAGECTOMIES: WHO BENEFITS?

M Garland-Kledzik, SC Chang, A Khader, A Scholer, J Santamaria, M Goldfarb John Wayne Cancer Institute at Providence Saint John **Presenter:** Mary Garland-Kledzik MD 10:45am - 10:55am

QS 6. IS THERE AN UPPER AGE LIMIT FOR BARIATRIC SURGERY? LAPAROSCOPIC GASTRIC BYPASS OUTCOMES IN SEPTUAGENARIANS

JB Hammond, CJ Webb, VSKK Pulivarthi, DG Pearson, KL Harold, JA Madura II Mayo Clinic Arizona **Presenter:** Jacob B Hammond MD

10:55am - 11:05am

QS 7. CONFIDENCE AND COMPETENCE IN VOLUNTEER EXAMINERS OF THE AMERICAN BOARD OF SURGERY

KJ Brasel, J Kopp, J Buyske Oregon Health & Science University **Presenter:** Karen Brasel MD

11:05am - 11:15am

QS 8. FINDING MEANING IN COMMUNITY CHARACTERISTICS: IMPLICATIONS FOR RURAL SURGEON RECRUITMENT

D Hughes, J Mammen, TL Griebling, JV Brooks University of Kansas School of Medicine **Presenter:** Dorothy Hughes MHSA, PhD

11:15am - 11:25am

QS 9. STANDARDIZING THE USE OF INTRAOPERATIVE IMPEDANCE PLANIMETRY (ENDOFLIP) - LESSONS LEARNED FROM A SINGLE CENTER EXPERIENCE OF OVER 400 CASES

B Su, ZM Callahan, J Carbray, MB Ujiki University of Chicago, Evanston **Presenter:** Bailey Su MD

Meeting Concludes





1. PATIENT CARE MODEL (PCM) IMPACT ON RISK-ADJUSTED OUTCOMES IN EMERGENCY INTESTINAL RESECTIONS

KB To, NS Kamdar, P Patil, C Ring, SD Collins, E Seese, GL Krapohl, DA Campbell Jr, MJ Englesbe, MR Hemmila, LM Napolitano, the Michigan Surgical Quality Collaborative (MSQC) Emergency General Surgery Study Group and the MSQC Research Advisory Group University of Maryland

Background: Emergency General Surgery (EGS) cases comprise 11% of all surgeries, yet account for up to 47% of mortalities and 28% of complications. Using statewide Surgical Quality Collaborative (SQC) data, we previously confirmed that wide variations in EGS outcomes were unrelated to case volume/complexity. In our population, the Acute Care Surgery Service (ACS) model, compared to the General Surgery Service (GSS) model, was associated with a 31% mortality reduction which was driven by the Intestinal Resection (IR) cohort. We performed a comprehensive analysis of patient, hospital and patient care model (PCM) characteristics to develop a new risk adjustment model for EGS intestinal resection outcomes.

Methods: Thirty-four hospitals in our EGS Surgical Quality Collaborative provided data for PCM, resources, surgeon practice patterns and comprehensive SQC patient data (1/1/2008-12/31/2016) for general surgery cases (n=126,494; EGS=39,023; EGS-IR=10,431). PCMs were defined as ACS (dedicated EGS surgeons), GSS (general surgeons covering both elective general surgery and EGS patient care) and hybrid (EGS call is shared between the ACS and GSS surgeons within the same hospital). We used variables with LASSO selection based on patient characteristics, hospital demographics and surgeon practice pattern variables. Among them, we fit hierarchical logistic regression models for mortality and morbidity with hospital random effects to determine risk-adjusted outcomes.

Results: Overall EGS 30-day mortality in our SQC cohort was 4.1%; EGS-IR mortality was 11.6%. Emergent small bowel procedures (n=3951) had morbidity of 34.2% and a mortality of 9.4%. Emergent colectomy (n=5501) had a morbidity rate of 43.9% and a mortality rate of 13.1%. In bivariate analysis stratified by PCM, unadjusted odds ratios for mortality was lower in patients undergoing EGS-IR under the ACS model than under the GSS model (OR 0.59 [CI 0.42-0.85], P=0.004 for small bowel procedures; OR 0.67 [CI 0.51-0.90], P=0.008 for colectomies). Likewise, the unadjusted odds ratio for mortality was also lower in the ACS model than in the hybrid model (OR 0.53 [CI 0.35-0.80, P=0.003 for small bowel procedures; OR 0.61 [CI 0.43-0.86], P=0.006 for colectomies). The morbidity effect was not statistically significant between PCMs in our bivariate analysis. Covariates for risk adjustment for the mortality model included: advanced age, ASA>=3, congestive heart failure, disseminated cancer, peripheral vascular disease, dependent functional status, chronic comorbid conditions, wound classification, ascites, preop ventilator dependence, body mass index, and EGS surgeon's concurrent responsibilities (P < 0.05). Our morbidity model included all the same variables as for mortality, plus hypertension, but excluded ascites (P < 0.05). In the multivariable models, the PCM effect did not achieve statistical significance. However, Anesthesia coverage of EGS patients in the ICU was associated with decreased mortality (P=0.04).

Conclusion: Emergency Intestinal Resection (EGS-IR) patients had almost 3-fold higher mortality compared to the entire EGS patient cohort. Emergency colectomy patients had the highest mortality and morbidity rates in the EGS-IR cohort in this prospectively collected, research-quality EGS surgical Quality Collaborative database. We have confirmed that the ACS model is associated with a significant 33% mortality reduction in the EGS colectomy cohort, and identified a new risk-adjustment model for this high-risk patient population.

2. EN BLOC CELIAC AXIS RESECTION FOR PANCREATIC CANCER: CLASSIFICATION SYSTEM OF ANATOMICAL VARIANTS BASED ON TUMOR EXTENT

MJ Truty, RL Smoot, DM Nagorney, BC Mendes, JJ Colglazier, RR deMartino, SP Cleary, TC Bower, ML Kendrick Mayo Clinic Rochester

Background: En bloc celiac axis resection (CAR) for pancreatic cancer (PC) is a high-risk procedure increasingly considered in era of neoadjuvant chemotherapy (NAC). The term "Appleby" does not describe all potential anatomical/surgical variants as tumors can extend beyond celiac axis to involve proper hepatic artery (PHA) and/or superior mesenteric artery (SMA) requiring total pancreatectomy (TP) vs. distal pancreatectomy (DP), formal arterial revascularization (RV), and gastrectomy (TG) dependent on extent.

Methods: Retrospective review of CARs from single center (1994-2018). A 3-level CAR classification system was developed based on anatomical factors determining extent of arterial resection, type of pancreatectomy, and need for revascularization and/or gastric resection. Class 1A/B: 1A = DP, CAR, and no RV; 1B = DP, CAR, RV, and +/- TG. Class 2A/B: 2A = DP, CAR + PHA, RV, and TG, 2B = TP, CAR + PHA, RV, and TG. Class 3A/B: 3A = DP, CAR + SMA, RV, and +/-TG; 3B = TP, CAR + PHA + SMA, RV, and TG. Perioperative/oncologic outcomes were assessed.

Results: En bloc CAR was performed in 77 pts., with majority (89%) in modern era (post-2011). NAC was administered in 67(87%) pts. with 21(31%) requiring chemotherapeutic switch and 62(92%) also received chemoradiation. There were 35 Class 1 (1A = 30 pts.,1B = 5 pts.), 28 Class 2 (2A = 13 pts., 2B = 15 pts.), and 14 Class 3 (3A = 8 pts., 3B = 6 pts.) Formal hepatic and/or mesenteric arterial RV in 47(61%) pts. w/venous resection/reconstruction in 51(66%). Multivisceral resection (adrenalectomy, gastrectomy, colectomy) required in 45(58%). 90-day mortality markedly decreased (38% to 8.6%) in the modern era (p = 0.01); morbidity was 57% and unchanged. Preoperative hepatic artery embolization associated with worse complications/ mortality. Any hepatic/gastric ischemia occurred in 20(26%) patients with 15(19%) requiring re-operation for thrombohemorrhagic/infectious indications. Re-operations decreased (p = 0.02) over time with use of RV and/or TG in modern era. R0 resection rate was 87% and associated with chemoradiation (p = 0.009). Median overall survival was 36.3 months. The greatest predictor of improved survival was NAC (43.5 months vs. 13.5 months, p < 0.0001). Predictors of survival in NAC cohort included: major pathologic response (p = 0.0001) and extended duration chemotherapy (p=0.004). Extent of resection (Celiac Class) did not negatively influence morbidity, mortality, or survival.

Conclusion: CARs have increased dramatically in the modern NAC era, however the pervious literature and terminology inadequately describes all potential operative variants. Our proposed classification, based on the largest US series, accurately describes all resectional variations allowing for complex operative planning dependent on extent of arterial involvement, pancreatectomy type, need for revascularization, and associated gastrectomy. Operative mortality has improved dramatically, however morbidity remains significant. Oncologic outcomes are favorable only in patients with extended NAC with associated pathologic responses. Given these risks, CAR should only be considered in fit patients with objective responses. With anticipated increase in CAR at select centers with use of modern NAC, a classification system based on specific anatomical criteria will serve to improve perioperative and oncologic outcomes allowing for standardized reporting across institutions.

3. MORE OF LESS: THE GENERAL SURGERY RESIDENT EXPERIENCE IN BILIARY SURGERY

AR Cortez, JR Potts Accreditation Council for Graduate Medical Education (ACGME) Mayo Clinic Rochester

Background: Abdominal surgery is an essential content area of general surgery residency and biliary surgery comprises a key component of that operative domain. This analysis was undertaken to identify long-term trends in the biliary surgery experience of US general surgery residents.

Methods: Data was derived from 1990-2018 ACGME national resident case logs. Trends in operative volume for total major cases, total biliary cases and specific biliary operations were analyzed. Linear regression analysis of the means was performed with Excel Analysis ToolPakC. Statistical significance was set at p<0.05.

Results: From 1990 to 2018, the mean number of total major cases performed by residents increased from 873 to 1051 (R2=0.59; p<0.001), with a concurrent increase in the mean total number of biliary cases from 75 to 130 (R2=0.90; p<0.001). Consequently, biliary operations have increased as a proportion of the total number of major cases performed throughout residency from 8.5% to 12.3%. Within the biliary domain during this time period, the mean number of cholecystectomies performed increased from 57 to 126 (R2=0.89; p<0.001). However, there have been significant decreases in the number of common duct explorations (9.8 to 1.4, R2=0.83; p<0.001), choledochoenteric anastomoses (4.3 to 1.5, R2=0.98; p<0.001), cholecystostomies (1.5 to 0.3, R2=0.6; p<0.001), and sphincteroplasties (0.9 to 0.1, R2=0.72; p<0.001). ACGME case logs began to separately monitor laparoscopic cholecystectomy (LC) and open cholecystectomy (OC) in 1994. Since that time, the mean number of OCs has decreased from 35 to 8 (R2=0.80; p<0.001) while the mean number of LCs has increased from 42 to 117 (R2=0.92; p<0.001). This single operation, LC, now accounts for 91% of resident biliary experience and 11.2% of total resident operative experience. Over the study period, the mean total number of surgeon chief cases increased from 263 to 284 (R2=0.32; p<0.01) and the number of surgeon chief biliary cases increased from 20 to 38. Thus, the proportion of chief resident operative experience comprised of biliary surgery has increased from 7.7% to 13.3%. However, 88% of chief resident biliary cases are LCs, which now comprise 11.7% of the total chief resident operative experience.

Conclusion: The mean number of biliary operations performed by residents has significantly increased since 1990 but the diversity of resident biliary operations has greatly diminished. The increase in resident biliary operations is entirely attributable to LC, which now accounts for 91% of resident biliary operations, more than 11% of all major operations performed throughout surgical residency and more than 11% of all operations performed during the chief residency year. These data prompt several important questions regarding resident education, including experience in biliary other than LC and the appropriate composition of the operative experience of the chief residency year.

4. CORRELATION OF PROPOSED SURGICAL VOLUME STANDARDS FOR COMPLEX CANCER SURGERY WITH ACTUAL HOSPITAL MORTALITY

N Wasif, D Etzioni, E Habermann, A Mathur, YH Chang Mayo Clinic Arizona

Background: Minimum case volume thresholds for complex cancer surgery have been proposed by the Leapfrog group. These are based on studies of the volume-outcome association, with the implication that hospitals not meeting case volume numbers have worse mortality and should not be performing those operations. There has been no formal study of how these standards correlate with actual hospital mortality.

Methods: The National Cancer Database (NCDB) was used to identify patients undergoing curative intent surgery for non-metastatic esophageal, lung, pancreatic and rectal cancer between 2013-2015. For each organ resection recommended annual hospital case volume was used to divide hospitals into those meeting the threshold for case volume and those below it. Actual procedure specific reliability and case mix adjusted hospital mortality was calculated. Hospitals in the highest quartile were designated as poor performing hospitals (PPH). Sensitivity, specificity, negative (NPV) and positive predictive (PPV) values, as well as correlation plots were calculated of hospitals below and above volume thresholds and adjusted hospital mortality. A logistic regression model was fitted to identify the optimal volume thresholds to identify PPH.

Results: The proportion of hospitals meeting volume thresholds varied from 7% for esophagectomy to 27% for rectal operations. Proposed volume standards had a sensitivity of 69-93%, specificity of 7-27%, and area under the curve (AUC) of 0.59-0.65 for identifying PPH. Although the NPV, or proportion of hospitals meeting volume thresholds who were not PPH, varied between 72-79%, the PPV, or proportion of hospitals below volume thresholds that were actually PPH, was only 24-26%. This means that 3 in 4 hospitals falling below volume thresholds were not among the worst performing quartile with regards to mortality. Furthermore, 1 in 4 PPH met current volume standards. Optimal annual hospital case volume thresholds to identify PPH were lower than those currently proposed- esophagus 4 vs. 20, lung 21 vs. 40, pancreas 7 vs. 20 and rectum 8 vs. 16. Using these cut offs increases the proportion of hospitals meeting thresholds with a range of 43% for pancreatectomy to 55% for rectal operations. However, even under these idealized volume cut offs, the best performing procedure specific model (esophagus) had an AUC of 0.68.

Conclusion: The proportion of Commission on Cancer certified cancer centers meeting current proposed annual hospital case volume minimums for complex cancer surgery is low. These volume standards are reasonably good at identifying PPH, but also misclassify 3 out of 4 hospitals below volume thresholds as PPH and 1 out of 4 PPH as meeting volume thresholds. Although lower volume thresholds increase the proportion of centers meeting volume minimums, use of case volume cut-offs do not correlate well with actual hospital mortality.

5. UNDER-REPRESENTED MINORITIES IN GENERAL SURGERY RESIDENCY: ANALYSIS OF APPLICANTS SELECTED FOR INTERVIEW, RESIDENTS, AND CORE TEACHING FACULTY

BT Jarman, AJ Borgert, KJ Kallies, ART Joshi, DS Smink, GA Sarosi, L Chang, JM Green, JA Greenberg, ML Melcher, V Nfonsam, J Whiting Gundersen Health System

Background: The Accreditation Council for Graduate Medical Education (ACGME) recently proposed new common program requirements including verbiage requiring diversity in residency. We sought to study the self-identified racial/ethnic identification of general surgery applicants, general surgery residents, and core teaching faculty to better ascertain the current status of underrepresented minority (URM) representation in general surgery residency programs and to determine if higher representations of URMs among faculty or residents within current training programs was associated with a higher chance of interviewing or matching with URM applicants.

Methods: Program-specific data from the Electronic Residency Application Service (ERAS) was collated for 9 general surgery programs (5 independent and 4 university) for the 2018 medical student application cycle. Data were abstracted for interviewed applicants and those who matched at the respective programs. Characteristics of resident and core teaching faculty were obtained from each participaring program. Those who did not enter a self-identified race/ethnicity or for which the information was not known were excluded from analysis. URMs were defined as those identifying as Black/African American, Hispanic/Latino/of Spanish origin, American Indian/Alaskan Native/Native Hawaiian/Pacific Islander-Samoan. Statistical analyses were performed with descriptive statistics, chi-square tests, and a multivariate model.

Results: Nine surgery residency programs received applications from 3,021 unique applicants of whom 2,008 graduated from US medical schools. White, Asian, Hispanic/Latino, Black/ African American, American Indian and Other applicants constituted 50%, 25%, 11%, 9%, 1% and 4% of total applicants. 592 (20%) unique applicants were selected to interview. Forty-seven applicants matched to one of the studied programs and identified their race/ethnicity. White, Asian, Hispanic/Latino, Black/African American, American Indian and Other applicants represented 65%, 20%, 7%, 6%, 1% and 2% of those selected to interview and 74%, 6%, 11%, 6%, 0%, and 2% of those matched. The mean age of matched applicants was 27.6±2.2 years and 20 (43%) were female. Mean USMLE Step 1 scores for matched applicants were 237.8±15.2 and all matched applicants were from US medical schools. Among programs' core faculty and current residents, 7% and 15%, respectively, were identified as URMs. The effect of increasing faculty diversity on applicants' likelihood of being selected for an interview was not significantly different for URM (OR=1.01; 95% CI: 0.98-1.04) vs. non-URM applicants (OR=1.01; 95% CI: 0.99-1.02). Similarly, the effect of increased diversity among current resident complement on applicants' likelihood of being selected for an interview was not significantly different for URM (OR=1.02; 95% CI: 1.00-1.03) vs. non-URM applicants (OR=1.01; 95% CI:1.01-1.02).

Conclusion: URM applicants represented a disproportionately smaller percentage of applicants selected for interview and of those ultimately matched to categorical surgical positions at nine general surgery residency programs. There was no significant increase in URM selection to interview among programs with increased proportions of URM core teaching faculty or current resident complement. The recruitment of racially/ethnically diverse trainees will require program-level analysis to limit implicit bias and develop effective strategies to interview and match applicants who are overlooked by conventional screening tools.

6. THE ROBOTIC APPROACH TO OUTPATIENT INGUINAL HERNIA REPAIR

H Janjua, E Cousin-Peterson, MC Kuo, PC Kuo University of South Florida

Background: Robotics offers improved ergonomics, enhanced visualization, increased dexterity, instrument articulation, and tremor filtration. Disadvantages include costs for startup, maintenance and instruments, surgeon separation, and potential system breakdown. Paradoxically, robotics has been used in thyroidectomy, mastectomy, cholecystectomy and inguinal hernia repair. Surgeon education notwithstanding, we hypothesize that robotic inguinal hernia repair carries minimal advantages over the laparoscopic or open approach.

Methods: The 2009-2015 Healthcare Cost and Utilization Project-State Ambulatory Surgery and Services (HCUP-SASD) and American Hospital Association Annual Health (AHA) datasets from FL were queried for Open (7), Laparoscopic (10) and Robotic (3) inguinal hernia repair (unilateral or bilateral) ICD-9PR codes. Hospital and patient demographic, financial and comorbidity data (n= 25 total variables) were evaluated using Chi square, ANOVA and/or logistic regression. Data are presented as mean+/-SEM; p < 0.05 was considered significant.

Results: 103,183 cases (63,375 Open [8% bilateral], 38,886 Laparoscopic [36% bilateral], and 922 Robotic) were identified. Patient characteristics were: male, white, age 51-70, non-govt and non-profit hospital, grouped Charlson Comorbidity Category (CC)=0, private insurance coverage, median income quartile 3 (4=highest), and routine discharge disposition. (All p<0.05) Total charges were: \$18261+-38 (Open), \$25223+/-60 (Lap) and \$45830+/-1023 (Robot). (p<0.0001 Robot vs Open, Robot vs Lap and Lap vs Open) Top 5 factors (beta-coefficients; p<0.05) positively associated with: Open (AUC 0.784)= Hospital-investor owned for profit, self pay, Black, Latino, and Medicaid; Lap (AUC 0.769)= private insurance, median income quartile 4 (highest), median income quartile 2, and Hospital-non govt, not for profit; and Robotic (AUC 0.874)= median income quartile 2, female gender, median income quartile s, total volume of ourpatient surgeries, and total charges.

Conclusion: Indications and utilization of robotic surgery continue to evolve. With inguinal hernia repair, robotic surgery has significantly increased charges and tends to be performed in higher income, female patients in settings with high outpatient volume. The open approach is more apt to be performed in Black/Hispanic, self-pay patients and for profit hospitals. The surgical community must determine if it is rational to perform robotic inguinal hernia repair and address ethical considerations if performed solely for surgeon education.

7. THE IMPACT OF ADDING WIRELESS PH STUDY TO THE INITIAL ENDOSCOPY FOR PATIENTS WITH SYMPTOMS OF GASTROESOPHAGEAL REFLUX DISEASE; DATA FROM HIGH VOLUME RURAL ANTIREFLUX CENTER

M Fanous, T Hughes Aspirus Iron River Hospital

Background: Patients with putative symptoms of GERD are often given a trial of proton pump inhibitors (PPIs). When they respond, they usually continue PPI therapy. If this empiric treatment fails, esophagogastroduodenoscopy (EGD) is recommended despite its low diagnostic yield. When EGD findings are equivocal, pH study is warranted to confirm diagnosis. This requires repeated endoscopy with potential procedural risks and additional cost. We hypothesize that this algorithm results in prolonged empiric PPI therapy, repetition of EGDs, patient dissatisfaction and decreased utilization of antireflux procedures. This study evaluates the impact of placing pH probe at the time of the initial EGD for refractory and non-refractory GERD patients in rural setting.

Methods: IRB approval was obtained for retrospective chart review of patients who presented with GERD symptoms to a rural antireflux clinic between August 2015 and March 2019. Patients were included if they underwent EGD with concomitant placement of wireless pH probe. The probe was placed 6 cm proximal to the gastroesophageal junction. PPIs were discontinued for a week and during the 48 hours of testing. A DeMeester score ≥ 14.7 was considered a positive pH study.

Results: A total of 379 patients were evaluated. There were 260 females and 119 males. Average age was 56.7±14.2 years. Average BMI was 30.5±64. There were 253/379 (66.7%) patients who had previous EGDs and 56/253 (22.1%) of these patients had EGD within a year before presentation to our clinic. The average EGD/ patient was 2 (1-10).

The average GERD-Health Related Quality of life (HRQL), Reflux Symptom Index (RSI) and GERD Symptom Score (GERSS) were 32±18, 23±14 and 25±12 respectively. Health Satisfaction Survey showed that 250/379 (65.9%) patients were dissatisfied with the control of their GERD symptoms.

The average time interval between the clinic visit and performing EGD and pH study was 22 (0-174) days. PPI use was noted in 299/379 (78.8%) with average duration of 10.9±9.1 years. Daily PPI use was 221/299 (73.9%) and twice daily in 78/299 (26.1%) patients. There were 80/299 (26.7%) patients using PPI and H2-blockers. Testing off antisecretory medication was performed in 360/379 (94.9%) and on PPI 19/379 (5.1%). PH studies were positive in 282/379 (74.4%) and negative in 91/379 (24.0%) patients. Inconclusive results were noted in 6/379 (1.6%) patients due to probe misplacement, faulty probes and misunderstanding of instructions. Aspiration of pH probe occurred when one patient who was intubated and capsule was retrieved via bronchoscopy. Another probe was dislodged in the pyriform sinus and retrieved.

This rural GERD algorithm resulted in 203 antireflux interventions on 197/379 (51.9%) patients. We performed 80 endolumenal and 123 laparoscopic antireflux procedures.

Conclusion: The current GERD algorithm results in prolonged PPI therapy, repeated endoscopies and patients dissatisfaction. Algorithm modification by placing a pH probe at the time of initial endoscopy is safe in rural setting. Positive pH studies avoid repeating EGDs and increase utilization of endoscopic and laparoscopic antireflux procedures. Negative pH studies warrant a search for potential alternative diagnosis and can result in a decrease of inappropriate PPI utilization.

8. SAFETY OF ELECTIVE MAJOR ABDOMINAL OPERATIONS IN THE ELDERLY: A STUDY OF GERIATRIC-SPECIFIC DETERMINANTS OF HEALTH

AN Martin, FE Turrentine, DL Hoagland, RS Jones, VM Zaydfudim University of Virginia

Background: Burdens of surgical disease in the elderly continue to rise. Preoperative assessment of geriatric-specific variables may enhance the risk stratification among elderly patients prior to operation. This study aims to examine the effect of geriatric-specific variables on postoperative outcomes in patients after elective major abdominal operations.

Methods: The Coalition for Quality in Geriatric Surgery Project in conjunction with the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) introduced a pilot Geriatric Surgery Research File (GSRF) data collection program for geriatricspecific variables in 2014. All patients age 65 years and older who had elective pancreatic, liver, or colorectal operations and were included in the GSRF between 2014 and 2016 were linked to the ACS NSQIP Public Use File (PUF). Multivariable analyses were performed to evaluate associations between patient-specific geriatric variables and risk of death, morbidity, readmission, and impact on discharge destination.

Results: A total of 4,165 patients were included: 60% of patients were 65-74 years (n=2,466), 32% were 75-84 years (n=1,319), and 8% were 85 or older (n=339). Patients 85 years or older were more likely to die (n=18, 5%, p<0.001), more likely to experience significant postoperative morbidity (n=68, 20%, p=0.039) and more likely to be discharged to a facility (n=164, 48%, p<0.001) compared to younger patients. There was no difference in readmission between the three age groups (p=0.742). Patients 85 or older were more likely to utilize a mobility aid, to have a prior fall history, to have surgical consent signed by a surrogate, and to live alone at home prior to hospitalization compared to younger patients (all p<0.001). Seventy-eight patients (1.9%) died in the postoperative period. After adjustment for ACS NSQIP estimated probability of mortality, no geriatric-specific preoperative risk factors were significantly associated with increased risk of mortality for patients in any age group (all p>0.072). A total of 715 patients (17%) had NSQIPdefined morbidity. After adjustment for ACS NSQIP estimated probability of morbidity, only preoperative use of a mobility aid was significantly associated with postoperative morbidity (OR 1.26, 95% CI 1.01-1.56, p=0.042). Patients 85 or older were significantly more likely to be discharged to a destination other than home (OR 5.19, 95% CI 3.87-6.97, p<0.001) compared to younger patients. In addition, consent signed by a surrogate, preoperative fall history, and use of a preoperative mobility aid were all significantly associated with discharging to a destination other than home (all p<0.001).

Conclusion: After adjusting for appropriate patient-specific medical comorbid conditions, elderly patients, including patients 85 or older, selected for major pancreatic, liver, or colorectal operations are not at increased risk of postoperative mortality and morbidity compared to younger patients. Preoperative risk assessment of factors such as mental acuity, fall history, and use of mobility aids can be helpful in predicting patient's ability to return to home after index inpatient hospitalization for an elective major abdominal operation. These factors should be considered in addition to age when assessing the appropriateness of surgery among elderly patients.

9. DELAY IN SURGERY IS ASSOCIATED WITH AXILLARY UPSTAGING OF CLINICALLY NODE NEGATIVE BREAST CANCER PATIENTS

A Khader, SC Chang, J Santamaria, M Kledzik, A Scholer, M Goldfarb, J Grumley, T Fischer John Wayne Cancer Institute at Providence Saint John

Background: Many patients with breast cancer (BC) present with early disease and clinically negative lymph nodes (cN0). Timing of curative intent surgery for early stage disease is often a result of compromise between multiple logistical factors and varying degrees of urgency. Presence of nodal metastasis significantly alters stage of disease and may have significant implications in decisions made regarding adjuvant therapy. Timing of surgery influences pathologic axillary upstaging and should therefore be standardized.

Methods: Patients diagnosed with clinically node negative breast cancer undergoing surgery with sentinel lymph node biopsy as initial therapy between 2006-2014 were identified in the National Cancer Database. Patients were divided into four groups based on time intervals between diagnosis and initial surgical procedure (< 4 weeks, 4-8 weeks, 8-12 weeks, and >12 weeks). Regression analysis evaluated the independent impact of surgical timing on axillary upstaging.

Results: Of 364,080 patients with cN0 BC, 38.7% had definitive surgery within 4 weeks of diagnosis, 44.4% between 4-8 weeks, 11.3% between 8-12 weeks and 5.6% >12 weeks after initial diagnosis. Patients having surgery more than 4 weeks from diagnosis were generally younger (< 50 years old), Black or Hispanic, uninsured, and had more comorbidities. They were also more likely to present with larger tumors, have lobular or mixed histology, undergo surgery at moderate or high volume centers and/or an academic institution, and have a mastectomy. After controlling for demographic, tumor, and other treatment factors, a delay in surgery of 4-8 weeks was associated with a 6% increased risk of nodal positivity (OR 1.06; 95% CI 1.04-1.08), of 8-12 weeks an 18% increased risk of nodal positivity (OR 1.18; 95% CI 1.15-1.22), and a 22% increased risk of nodal positivity (OR 1.18; 95% CI 1.15-1.22), and a 22% increased risk of nodal positivity under than 12 weeks (OR 1.22; 95% CI 1.18-1.27) when compared to those who had surgery 1-4 weeks after diagnosis. Although this did not translate into a clinically meaningful survival difference, patients having surgery at later times were more likely to receive adjuvant chemotherapy (p <0.001).

Conclusion: Delay in BC surgery in cN0 patients of more than four weeks was associated with a time-dependent increased likelihood of axillary upstaging. This has meaningful implications for adjuvant therapy which can translate into potential increases in morbidity and cost.

10. BLUNT CEREBROVASCULAR INJURY MANAGEMENT AND OUTCOMES IN THE ERA OF ENDOVASCULAR SURGERY. A REPORT FROM THE AAST PROSPECTIVE OBSERVATIONAL VASCULAR INJURY TRIAL (PROOVIT)

JC Webb, JJ DuBose, JB Holcomb, JP Sharpe, JJ Morrison, T Scalea, DJ Skarupa, RD Catalano, J KK Inaba, N Poulin, J Myers, JK. Bini, CV Brown, PG Teixeira The University of Texas at Austin

Background: Blunt cerebrovascular injuries (BCVI) are uncommon and their optimal management, particularly the role of endovascular intervention, remains controversial. The aim of this study is to identify trends in BCVI management for patients enrolled in the multicenter PROOVIT registry.

Methods: All patients with BCVI in the PROOVIT database from 2013-2018 were included in the study. Patient demographics, physiologic status at presentation, injury severity scores, injury grade, management strategy and outcomes were abstracted. Patients who underwent endovascular treatment were compared to those treated nonoperatively using logistic regression analysis to adjust for differences in baseline patient characteristics.

Results: Over the 6-year study period, 918 patients with BCVI were admitted to 22 participating trauma centers and enrolled in the PROOVIT registry. A single vessel was injured in 95% of the patients, with the vertebral artery being the most commonly injured at 48%, followed by the internal carotid (42%) and common carotid (5%) arteries. Multiple vessels were injured in 5% of the patients. CT angiogram was the diagnostic imaging modality in 85% of the cases. Anti-thrombotic therapy was not used in 24.8% of the patients overall and 22.5% of the patients selected for nonoperative treatment. The primary treatment modality was non-operative management in 885 (96.4%) cases and endovascular repair in 30 (3.3%) patients. Only 3 (0.3%) patients underwent an open operation. Fifteen patients (1.7%) failed nonoperative treatment and required endovascular interventions had significantly higher rates of treatment failure (16.7% vs. 1.7%, Adjusted Odds Ratio[95% CI]: 11.5 [3.5-37.6], adjusted p<0.001) and stroke (6.1% ox. 33.3%, Adjusted Odds Ratio[95% CI]: 5.46 [2.2-13.8], adjusted p<0.001).

Conclusion: The overwhelming majority of patients with BCVI are safely managed nonoperatively. Endovascular interventions are reserved for a select group of patients and are associated with significant rates of treatment failure and stroke. Despite evidence demonstrating the role of anti-thrombotic therapy for stroke prevention after BCVI, one in four of the patients with these injuries in the PROOVIT database did not receive any documented anti-thrombotic agent.

11. NEAR-INFRARED PHOTOIMMUNOTHERAPY IS EFFECTIVE TREATMENT FOR COLORECTAL CANCER IN NUDE MOUSE MODELS

HM Hollandsworth, S Amirfakhri, F Filemoni, S Razemjooie, D Stupack, RM Hoffman, P Yazaki, M Bouvet University of California, San Diego

Background: The rate of recurrence of colorectal cancer after surgical resection remains relatively high, especially for rectal cancer in the small space the pelvis affords. Photoimmunotherapy (PIT) is an emerging therapy in oncology, which employs the use of a near-infrared (NIR) laser to promote cancer cell death when the laser contacts an NIR dye. The dye is conjugated to a tumor-specific antibody that allows the dye to be delivered and sequestered in the tumor. To date, there is no published data on the use of PIT in colorectal cancers, which could be useful as an adjunct to surgery to prevent local recurrence, or as a primary therapy for unresectable disease or metastases.

Methods: The humanized anti-CEA antibody (m5A) was conjugated to Li-COR IR700DX (700). To validate the efficacy of treatment of colon cancer, PIT was first performed on subcutaneous models of colon cancer cell line tumors (LS174T) in nude mice. Injection of 25 micrograms of m5A-700 was performed via the tail vein. 24 hours later, the right flank tumor was exposed to a 690nm laser at 150mW/cm2 for 30 minutes, delivering a total of 270J/cm2. Fluorescence imaging was performed prior to PIT, immediately after PIT and 24 hours after PIT and maximum fluorescence intensity was determined at each time point. Tumor size was measured prior to treatment, 24 hours, 5 days and 10 days after treatment. Orthotopic colon cancer models were then established by surgical implantation of LS174T tumor onto the cecum of 12 nude mice. Tumors were allowed to grow for three weeks. Two groups of 4 mice were administered 25 micrograms of m5A-700 and 4 control mice were administered PBS alone via tail vein injection. 24 hours later, tumors were surgically exposed and PIT was performed, with a total delivery of 270J/cm2. Repeat PIT was performed after 7 days in one group of four mice. Tumor size was measured weekly for three weeks, then mice were euthanized and laparotomy was performed to assess for toxicity of internal organs.

Results: After PIT of subcutaneous colon tumors, maximum fluorescence intensity decreased by an average of 48.7%. 24 hours after treatment, fluorescence intensity continued to decrease by an average of 42.9% and tumor growth was arrested for 10 days. In the orthotopic models, the control mice that underwent PIT without administration of m5A-700 demonstrated persistent tumor growth. The mice that underwent PIT one time after administration of m5A-700 had tumor growth arrested for 10 days. After 10 days, the tumor size began to increase at a slower rate than the control group. In the group that received repeated PIT exposure, tumor growth continued to be arrested at three weeks. No intra-abdominal organ toxicity was observed after laparotomy.

Conclusion: PIT arrests tumor growth in subcutaneous and orthotopic colon cancer nude-mouse models. Repeated PIT prolongs arrested tumor growth. PIT may be a useful therapy as an adjunct to surgical resection or as primary therapy to suppress tumor progression.

12. EARLY VERSUS DELAYED DEFINITIVE COMPLEX ABDOMINAL WALL RECONSTRUCTION WITH BIOLOGIC MESH FOLLOWING DAMAGE CONTROL SURGERY

R Latifi, S Gogna, P Kartik, J Con, PL Anderson, DJ Samson, A Policastro Westchester Medical Center

Background: Damage control surgery (DCS) for trauma and emergency surgery, while lifesaving, is associated with high rate of morbidity such as enterocutaneous fistula (ECF), entero-atmospheric fistula (EAF), repeated hospitalization, ventral hernia, and overall poor quality of life. Early complex abdominal reconstruction (ECAWR) should be attempted whenever possible in patients undergoing DCS. The aim of this study was to compare the results of patients undergoing ECAWR versus patients undergoing delayed complex abdominal wall reconstruction (DCAWR) following DCS.

Methods: A pooled analysis from the retrospective and prospectively maintained database of patients who underwent complex abdominal wall reconstruction (CAWR) with biological mesh from 2013 - 2019 at a tertiary medical center was conducted. We performed student ttest, chi-square test, and Fischer's exact test; p < 0.05 was considered significant.

Results: Of 208 patients who underwent CAWR with biological mesh during the study period, 74 had ECAWR following damage control surgery for trauma (N=13, 17.6 %) or intraabdominal catastrophe (N=61, 82.4 %) during the same hospital admission. There were 40 males (54.8 %) and 32 females (43.8%) in ECAWR group. On the DCAWR group, there were 71 males (53.4 %) and 62 females (46.6%). In this group, 15 (11.5 %) of patients had DCS for trauma and 119 (88.5%) for abdominal catastrophe. The mean age (p=0.00), BMI (p = 0.01) and Ventral Hernia Working Group (VHWG) grade III & IV (p<0.01) were higher in ECAWR group. Concomitant intestinal resection rate was similar (p=0.16), however, the mean mesh size was significantly lower in ECAWR group (p=0.03). Postoperatively, the incidence of surgical site occurrence (SSO) (infection, necrosis or fluid collection) (p=1.00) and reoperation rate (p=1.00) were similar. Cumulative hospital length of stay was significantly shorter in ECAWR group, (20.6 ± 19.2 days vs 27.1 ± 31.7 days, p = 0.01).

Conclusion: Early complex abdominal wall reconstruction (ECAWR) is safe and is associated with shorter cumulative hospital length of stay.

13. WHAT PREDICTS RECURRENT KIDNEY STONES AFTER PARATHYROIDECTOMY FOR PRIMARY HYPERPARATHYROIDISM?

AK Islam, SA Holt, J Reisch, F Nwariaku, N Maalouf UT Southwestern Medical Center

Background: Some, but not all, patients with primary hyperparathyroidism (PHPT) and kidney stone disease (KSD) are cured of their nephrolithiasis after parathyroidectomy. The goal of this study is to identify risk factors for recurrent KSD despite successful parathyroidectomy for PHPT.

Methods: We retrospectively reviewed charts of 69 patients presenting with KSD between 1/2008 and 7/2018 to a single Urology Clinic, who were diagnosed with concurrent PHPT and underwent definitive parathyroidectomy. Laboratory testing for serum calcium, PTH, phosphorus and 25-OH-vitamin D, and 24-hour urine studies for volume, pH, calcium, citrate, oxalate, uric acid, sodium, and creatinine was performed pre-parathyroidectomy and then postoperatively up to 3 years. Stone recurrence was determined on routine annual diagnostic imaging or based on symptomatic KSD.

Results: 31 of the 69 patients (45%) with a history of KSD and PHPT were male. Mean age at parathyroidectomy was 57±14years. Pre-parathyroidectomy, mean serum calcium, 24-hr urine calcium, and PTH were 10.6±0.5 mg/dL, 378±209 mg/day, and 114±97 pg/mL, respectively. 27/69 (39%) had multi-gland parathyroid disease. After parathyroidectomy, serum calcium and PTH levels normalized in 69/69 and 61/69 patients, respectively. However, 37/69 (54%) patients had persistent hypercalciuria (defined as 24-hour urine calcium > 250 mg/day for women and > 300 mg/day for men) post-operatively. 16/69 (23%) had recurrent KSD on average 2.0±1.6 years after parathyroidectomy; of these, 10/16 had calcium oxalate stones, 1 had calcium phosphate stones, and 5 did not undergo stone analysis. Patients with recurrent KSD postparathyroidectomy were significantly younger compared to patients without recurrent KSD (age at parathyroidectomy: 51 ± 15 vs 60 ± 13 years, p=0.022). Otherwise, the two groups were similar in gender, BMI, and pre-operative and post-operative serum and 24-hour urine studies. In a stepwise multi-linear logistic regression model that included age, gender, BMI, family history of KSD, baseline 24-hour urine studies, and persistent hypercalciuria post-parathyroidectomy, younger age at time of parathyroidectomy, higher BMI, higher pre-parathyroidectomy 24-hour urine pH, and lower pre-parathyroidectomy 24-hour urine oxalate were significant predictors of recurrent KSD post-parathyroidectomy.

Conclusion: 23% of PHPT patients with KSD who undergo successful parathyroidectomy present with recurrent KSD after successful parathyroidectomy. In a multi-linear logistic regression model, younger age, higher BMI, higher preoperative urine pH, and lower preoperative urine oxalate were significant risk factors for recurrent KSD post-parathyroidectomy. These patients may require closer monitoring for stone recurrence after successful parathyroidectomy. Further studies are needed to better identify the etiology of KSD post-parathyroidectomy.

14. WHEN IS IT SAFE TO START VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS AFTER PELVIC FRACTURES? A PROSPECTIVE STUDY FROM A LEVEL I TRAUMA CENTER

M Schellenberg, E Benjamin, K Inaba, P Heindel, S Biswas, JL Mooney, D Demetriades LAC+USC Medical Center

Background: The optimal time to initiate venous thromboembolism (VTE) prophylaxis after blunt pelvic fracture is a critical and controversial issue. Trauma patients with blunt pelvic fractures are at high risk for venous VTE. However, these patients present a competing risk of ongoing bleeding that may be exacerbated by early VTE prophylaxis. Retrospective data suggest that initiation ≤48h of hospital admission may be beneficial. The current study was designed to prospectively determine the safety and efficacy of early (≤48h) VTE prophylaxis initiation after blunt pelvic trauma.

Methods: Patients presenting to our Level I trauma center (12/01/16-11/30/17) with blunt pelvic fracture were prospectively screened. Exclusion criteria were ED death, immediate operative management, transfers, home anticoagulation, and pregnancy. Patients were dichotomized into groups based on VTE prophylaxis initiation time: ≤48h (Early Prophylaxis, EP) vs >48h (Late Prophylaxis; LP) after hospital admission. The decision to initiate VTE prophylaxis was at the discretion of the attending trauma surgeon. Routine screening for DVTs was not performed. Demographics, injury/clinical data, VTE prophylaxis type and initiation time, and outcomes were compared between EP and LP patients with univariate and multivariate analysis.

Results: After exclusion criteria, 187 patients were identified: 74 (40%) received EP and 113 (60%) received LP. There were no differences in ISS (14 [IQR 9-19] vs 13 [9-22], p=0.9362), AIS extremity score (2 [2-3] vs 2 [2-3], p=0.0910), or need for immediate angioembolization (n=6, 8% vs n=17, 15%; p=0.1585). On univariate analysis, there was no difference in need for post-prophylaxis blood transfusion between study groups (p>0.05). No patient in either group required delayed operative intervention/angioembolization for bleeding. VTE rates, mortality, and hospital length of stay were comparable between groups (p>0.05). On multivariate analysis, patients with EP were not less likely to develop VTE (OR 0.684, p=0.652). Angioembolization was independently predictive of VTE (OR 10.757, p=0.004), DVT (OR 7.509, p=0.049), and PE (OR 3.503, p=0.008).

Conclusion: Early initiation of VTE prophylaxis after blunt pelvic fracture is safe. Although early prophylaxis did not reduce the overall rate of VTE, these data identify angioembolization as an independent risk factor for VTE. This suggests that patients with blunt pelvic fracture who undergo angioembolization for pelvic bleeding are a high risk population for VTE who may benefit from aggressive early prophylaxis.

15. BREAST HETEROGENEITY: MODERN OBSTACLES TO UNIVERSAL BIOMARKERS

R Dirks, H Burney, M Anganappa, G Sanduski, Y Liu, C Schmidt, H Nakshatri Indiana University School of Medicine

Background: Parainflammation is a phenomenon in cancer where epithelial cells near malignancy express genes linked to inflammation and the immune system. Breast cancer induces many field defects in normal adjacent tissue (NAT) - non-malignant tissue found in the near vicinity of a tumor. Prior research has illustrated genetic ancestry dependent differences in these field defects, creating a possible avenue of investigation into breast cancer outcome disparities. Thus, exploration into breast cancer parainflammation can be enriched with ancestry-considerate analysis of normal adjacent tissue.

Methods: RNA sequencing was performed on healthy, normal adjacent, and tumor cells to determine genomic changes associated with normal adjacent tissue in breast cancer. Primary cells used were sorted by flow cytometry prior to sequencing to enrich for luminal progenitor cells. (CD49f+/EpCAM+), as most breast cancers originate from luminal progenitor cells. Ingenuity pathway analysis was employed to characterize the genomic changes present, then genes significantly overexpressed in NAT and Tumor samples were selected for further investigation. RNA sequencing results were validated in non-sorted cells via quantitative reverse transcription PCR (RT-qPCR). Immunohistochemistry (IHC) staining was performed on a tissue microarray (TMA) of normal, NAT, and breast cancer samples of women of different genetic ancestry.

Results: RNA sequencing of the normal, NAT, and tumor luminal progenitor cells from 12 breast tissue samples identified 26 genes significantly overexpressed in NAT versus healthy cells and further enriched in tumor cells. In ingenuity pathway analysis, these genes were part of an inflammatory network, supporting activation of parainflammation in the epithelial cells of NATs. Of these genes, matrix metalloproteinase-7 (MMP7) had by far the greatest expression in the tumor cells. RT-qPCR validated the upregulation of MMP7 in the matched NAT-Tumor samples used in RNA sequencing. IHC was then performed on a larger and more diverse collection of 67 tumor, 23 NAT, and 33 healthy breast tissue samples. MMP7 staining was statistically increased in flutmor samples compared to NAT (p = 0.0067), but the NAT tissue was only statistically different from normal in African American samples (p = 0.0126) with a trend opposite to the genomic differences in RNA sequencing and RT-qPCR. Further, when stratified by genetic ancestry and ER status, Tumor and NAT differences were significant only in estrogen receptor positive samples of European ancestry (p = 0.0245) and estrogen receptor negative samples of African American samples (p = 0.0245) and estrogen receptor samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African American ancestry (p = 0.0245) and estrogen receptor negative samples of African Americ

Conclusion: Genomic differences across healthy, normal adjacent, and tumor tissue in women with breast cancer demonstrate the presence of a parainflammatory network in breast cancer normal-adjacent tissue. MMP7 is genetically overexpressed in NAT and tumor cells, indicating importance in this inflammatory setting. Its expression in TMA analysis, however, is notably dependent on both estrogen receptor status and genetic ancestry, supporting the need to incorporate both in while dissecting the inflammatory milieu of breast cancer. The discordance between genomic and proteomic expression of MMP7 in normal adjacent tissue even further highlights the complexity in developing universally acceptable biomarkers, which can be missed by prior studies limited to genomic changes found by RNA-sequencing.

16. LIVING DONOR LIVER TRANSPLANTATION FOR PERIHILAR-CHOLANGIOCARCINOMA - OUTCOMES AND COMPLICATIONS

EK Tan, CB Rosen, JK Heimbach, GJ Gores, D Zamora-Valdes, T Taner Mayo Clinic Rochester

Background: Neoadjuvant therapy followed by liver transplantation is effective treatment for patients with unresectable perihilar-cholangiocarcinoma (pCCA) or pCCA arising in primary sclerosing cholangitis (PSC), but radiation is known to cause late hepatic artery (HA) and portal venous (PV) complications. Living donor liver transplantation (LDLT) enables more patients with pCCA to undergo transplantation and avoid prolonged waiting times, but LDLT is also associated with more technical complications. Our aim was to determine the incidences of vascular and biliary complications on patient survival.

Methods: We reviewed 247 consecutive LDLTs performed at our institution between 2000 and 2017. We determined relationships between variables and outcomes for patients with and without pCCA, with logistic regression models.

Results: 74 patients underwent LDLT for pCCA – 49 (66.2%) for PSC-pCCA and 25 for de novo-pCCA. 173 patients underwent LDLT for other indications. Right liver grafts were used in 62 (83.8%) pCCA patients and 153 (88.4%) non-pCCA patients. pCCA patients required nonstandard HA reconstruction more frequently (13.5% vs 2.9%, P=0.001). PV interposition grafts were necessary or used preferentially during LDLT for 66 (89.2%) pCCA patients compared to only 15 (8.7%) non-pCCA patients (P < 0.001). All pCCA patients had Roux-en-Y choledochojejunostomy compared to 76 (44%) non-pCCA patients (P < 0.001). There were no differences in early HA thrombosis (5.4% vs 7.6%, P=0.54). Late HA stenosis and/or thrombosis was more common in pCCA patients (18.9% vs 4.1%, P < 0.001). PV thrombosis or stenosis were more common in pCCA patients (37.8% vs 8.7%, P < 0.001). Anastomotic biliary complications were more common in non-pCCA patients (39.2% vs 54.1%, P=0.032) between the two groups. Multivariate analysis showed that 1) pCCA (HR 4.17, 95%CI 1.62-10.68) and non-standard arterial anastomoses (HR 3.35, 95%CI 1.08-10.40) were associated with late HA complications; 2) PV interposition grafts (HR 13.51, 95%CI 3.10-58.96) were associated with PV stenosis; 3) multiple donor bile ducts (HR 1.31, 95%CI 1.00-1.72) were associated with biliary complications; and 4) vascular and biliary complications did not affect patient survival. pCCA patient survival was inferior to non-pCCA patient survival at 1, 3, 5, and 10 years (84.9%, 69.9%, 66.5%, 55.6% vs. 93.6%, 88.9%, 87.3%, 79.5% P=0.007). Recurrent cancer arose in 12.3% of pCCA patients and was associated with detection of residual cancer in the explanted liver (p=0.009). PSC-pCCA patients had better survival than de novo-pCCA patients at 1, 3, 5, and 10 years (89.8%, 75.9%, 75.9% 73.2% vs. 75.0%, 58.0%, 47.5%, 35.2%, P=0.006). Residual cancer was the main negative prognostic factor for survival (HR 5.69, 95%CI 1.97-16.35) for both PSC-pCCA and de novopCCA patients.

Conclusion: Late HA and PV complications are more frequent after LDLT for patients with pCCA compared to those with other indications for transplantation but do not adversely affect long-term survival. The strongest predictor of long-term survival is absence of residual cancer in the explanted liver. PV interposition grafts are often necessary during LDLT for pCCA but may pose an additional increase in the risk of PV stenosis beyond that associated with neoadjuvant therapy.

17. MORE THAN ALIGNING PERCEPTIONS: MEDICAL STUDENT MISTREATMENT AND PSYCHOLOGICAL SAFETY ON THE SURGICAL CLERKSHIP

RL Williams-Karnesky, JC Russell, ML Wang University of New Mexico

Background: Despite decades of reporting, rates of medical student mistreatment on the surgical clerkship remain a national issue; our institution is no exception. In order to understand if misaligned perceptions about what constitutes mistreatment were leading to high rates of reported mistreatment at our institution, we implemented a well-studied video vignette-based intervention on our surgical clerkship. The intervention is designed to educate students about the unique challenges of surgical environment, and to build consensus around the definition of mistreatment. We combined this intervention with semi-structured focus groups to gain further insight into the unique experience of students at our institution.

Methods: Medical student volunteers were recruited from the surgery clerkship to participate in a two-hour session consisting of a one-hour semi-structured focus group followed by the video vignette-based curriculum, which was accompanied by a facilitated discussion of why the behaviors depicted did or did not constitute mistreatment. Focus groups and discussions were audio recorded, transcribed, and analyzed for thematic content. At the end of each clerkship block, students were asked to complete a questionnaire about their experiences during the clerkship.

Results: Over five clerkship blocks 76 students responded to the end-of-clerkship survey (83% response rate). 34 students identified themselves and having participate in the intervention, 32 identified themselves as non-participants, and 10 chose not to answer the question about participation. Based on the end-of-clerkship survey results, students were more likely to report experiencing mistreatment (24% vs 9%, p=0.096) or witnessing mistreatment (47% vs 6%, p<0.01) if they participated in the intervention. Students who participated in the intervention also reported experiencing neglect more frequently than non-participates ("Often" 15% vs 4%, p=0.05; "Never" 24% vs 57%, p=0.05). Analysis of focus group transcripts identified lack of psychological safety in the learning environment as a key contributor to an overall negative experience on the surgical clerkship. This was also found to be a driver of mistreatment reporting, as students were unsure of how else to characterize and report their negative experience. Student also cited lack of relatedness to the team and incivility between team members as more disruptive to learning than individual episodes of mistreatment.

Conclusion: Our study shows that educating medical students about what constitutes mistreatment does not decrease rates of mistreatment reporting, indicating that misaligned perceptions of what constitutes mistreatment is not the issue. Moreover, analysis of focus group data indicated that lack of psychological safety in the learning environment is a key factor contributing to medical student reporting of mistreatment. Since this study began, we have implemented changes to the clerkship as well as to the department of surgery to create a more positive learning environment; these interventions are already showing promising results. This study illustrates that education-based interventions alone are not sufficient to address psychological safety in the learning environment are critical to effecting real change.

18. HEPATIC ANGIOEMBOLIZATION FOR TRAUMA - WHERE IS THE BENEFIT?

JM Samuels, H Carmichael, A Kovar, S Urban, S Vega, C Velopulos, RC McIntyre University of Colorado, Denver

Background: Non-operative management of hepatic trauma has become standard of care in stable patients. Angioembolization (AE) is recommended in several guidelines in the setting of extravasation from liver injuries on CT. However, data supporting hepatic AE is limited to small retrospective series, which show that AE is associated with low mortality but carries a high complication rate (20-40%). Therefore, we aim to evaluate the mortality and morbidity associated with hepatic AE and hypothesize that hepatic AE is associated with increased complications without improving mortality in stable trauma patients.

Methods: We queried the 2016 Trauma Quality Improvement Project (TQIP) database for patients with grade2III liver injuries (abbreviated injury score or AIS23) and blunt mechanism. Stable patients with systolic blood pressure (SBP) \geq 90, and heart rate (HR) between 50 and 110 were included. Patients with concomitant intraabdominal or pelvic injuries (AIS \geq 3), patients who were taken to the operating room for laparotomy within six hours, and patients who underwent AE \geq 24 hours after arrival were excluded. Patients were matched 2:1 using a nearest neighbor method on age, sex, injury severity score (ISS), liver AIS, arrival SBP and HR, and need for blood products in the first four hours.

Results: 6775 patients were found to have liver injuries grade ≥3. 1939 met criteria, with 116 undergoing hepatic AE. Median time to embolization was 3.3 hours (range 0.2-17.7). The groups did not differ in rates of concomitant head injuries, chest injuries, or lower extremity injuries with AIS≥3. Prior to matching, the AE group was older (36 vs. 32 years, p=0.04), had higher grade liver injuries (p<0.01), and had a higher ISS (25 vs. 22, p<0.01). They were more likely to receive transfusions in the first 4 hours (31.0% vs. 7.0%, p<0.01) and between 4 and 24 hours (5.2% vs. 1.6%, p=0.02). The AE group had a higher rate of drain placement (12.9% vs. 0.8%, p<0.01), endoscopic intervention (2.6% vs. 0.5%, p=0.03) and hepatic resection (1.7% vs. 0.1%, p=0.01). Prior to matching, mortality was more than twice as high in the AE group, but this was not statistically significant (6.1% vs. 2.6%, p=0.051). All AE patients were successfully matched with non-AE patients. After matching, the two groups did not differ in mortality rate (5.4% vs. 3.2%, p= 0.5). Blood transfusions received between 4 and 24 hours was not different between groups (4.4% vs. 7.5%, p=0.4). There were no differences in rates of hepatic resection or endoscopic interventions, but the AE group had a higher rate of IR drainage (13.3% vs. 2.2%, p<0.01). The AE group had longer LOS (10 vs. 6 days, p<0.01), a trend toward greater number of ICU days (4 vs. 3, p=0.051), and were less likely to discharge to home without services (55.0% vs. 68.2%, p=0.04).

Conclusion: Hepatic AE does not appear to improve mortality while being associated with increased healthcare utilization and need for hepatic drainage. In the stable liver-injured patient, the risk of hepatic angioembolization may outweigh the benefits and should thus be used cautiously. This study highlights the need for a large, multi-center trial.

19. PROSPECTIVE MOLECULAR STAGING OF PANCREATIC ADENOCARCINOMA WITH A CLINICALLY AVAILABLE KRAS MUTANT CELL-FREE DNA ASSAY

JL Leiting, AM Abdelrahman, BR Kipp, TE Grotz, DM Nagorney, ML Kendrick, SP Cleary, RL Smoot, MJ Truty Mayo Clinic Rochester

Background: Pancreatic ductal adenocarcinoma (PDAC) is a devastating malignancy due to widespread dissemination in most patients at diagnosis, regardless of clinical staging. Identification of occult metastases is critically needed to determine which patients may benefit from operative intervention. Detection of KRAS mutant cell-free DNA (cfDNA) is a novel way to detect occult metastases as most tumors harbor such mutations. We explored the utility of a clinically available cfDNA assay for molecular staging of patients at initial presentation and during neoadjuvant treatment.

Methods: With IRB approval, patients with treatment naïve and presumed non-metastatic PDAC underwent KRAS droplet digital PCR (detects mutations on codons 12, 13, 61, and 146) of peripheral blood samples using a clinically available assay. Results report as negative (-KRAS) with no mutations detected, indeterminate (10 mutant copies/mL). Indeterminate/ Positive results were grouped together (+KRAS). All patients underwent concurrent institutional staging including imaging (CT/MRI/PET), CA19-9, and laparoscopy at diagnosis as well as after neoadjuvant chemotherapy (NAC) in those without metastases at diagnosis. Staging results and survival outcomes were assessed. Overall survival (OS) and progression free survival (PFS) calculated using Kaplan-Meier. Cox proportional hazard regression was used for multivariable analysis of OS/PFS.

Results: Between 1/2018 and 5/2019, 98 patients were evaluated. Of these, 73 (75%) were -KRAS, 5 (5%) were indeterminate, and 20 (20%) were positive. At initial staging, +KRAS patients had higher rates of metastatic disease than -KRAS patients (56% vs. 18%, p<0.01). The remaining non-metastatic patients (n=71) received NAC. On restaging, +KRAS patients had higher rates of metastatic disease development during NAC compared to –KRAS patients (64% vs. 18%, p<0.01). In total, metastatic disease was identified in 84% of +KRAS patients at initial staging or during NAC compared to 33% of –KRAS patients (p<0.01). Median OS for +KRAS patients was 11 months vs. unreached for the -KRAS patients (p=0.01). Median PFS for the 71 patients undergoing NAC was 9.8 months for +KRAS patients vs. not reached for the -KRAS patients (p<0.01). +KRAS status was the only independent predictor for worse OS and PFS (HR=3.39, p=0.03; HR 3.96, p= 0.02) respectively. +KRAS status was superior in predicting metastatic disease compared to CA19-9 elevation (PPV = 90 vs. 77). Furthermore, in combination, a non-elevated CA19-9 and -KRAS status had high NPV (91) and low negative likelihood ratio (0.24) for ruling out metastatic disease. Four patients converted from +KRAS to -KRAS after extended NAC with 2 undergoing resection, however, one patient developed rapid metastases post-operatively.

Conclusion: A currently available KRAS mutant cfDNA assay appears highly valuable in both identifying and ruling out occult metastases. +KRAS status is an overall poor prognostic indicator and exhaustive initial and restaging exams should be performed prior to consideration of surgical resection. Patients can convert to negative with effective NAC, however, long-term outcomes are unknown. Molecular staging for pancreatic cancer is feasible, currently clinically available, and offers significant utility in decision making. Further work is needed for validation and correlation to long-term outcomes.

20. THE IMPACT OF A COMPREHENSIVE MULTIDISCIPLINARY RIB FRACTURE TREATMENT PROTOCOL AT A LEVEL 1 TRAUMA CENTER: A PROPENSITY SCORE MATCHING ANALYSIS

AC Pfaff, CP Miller, A Ata, AE Stolarski, L Evans, M Johnson, A Bartscherer, C Rosati, SC Stain, M Tafen Wandji Albany Medical Center

Background: Rib fractures cause significant morbidity, mortality, and increased resource utilization. In this retrospective study we evaluated the effectiveness of a newly instituted Rib Fracture Treatment Protocol (RFTP) on outcomes.

Methods: Patients with rib fractures, admitted to a single Level 1 trauma center between January 2011 and October 2018 were selected from a pool of 21190 trauma admissions. The RFTP was launched as a CPOE order set on October 25, 2016 and included an escalating multimodal pain management, a standardized nursing assessment with interventions, and an atelectasis and mucus clearance regimen. Outcomes included mortality, length of stay (LOS), pulmonary complications, rapid responses, and elevation in level of care. Criteria used for propensity score matching included age, GCS, AIS Head and Neck, AIS chest, and ISS. Patients treated in the pre and post protocol periods were compared via Chi-square, t-tests, linear and logistic regression analysis.

Results: Overall, 3927 (18.5%) of trauma patients had rib fractures, with 2539 and 1388 patients treated in pre and post protocol time periods, respectively. Adherence to the RFTP was 50%. A total of total 192 patients who were treated in the post-protocol period could be paired by propensity score matching (1:1) to 192 patients in the pre-protocol period. There was no difference in mortality, pneumonia, overall pulmonary complications, and ICU LOS. However, Post-RFTP patients had fewer rapid responses (13.5% vs 24%, p< 0.009) and a significantly shorter hospital LOS 4.99 days (16.15±0.95 vs. 11.15±0.56, p<.001).

Conclusion: In propensity score matched rib fracture patients, application of a rib fracture protocol resulted in a significantly decreased (by 31%) length of stay, with significantly decreased number of rapid responses during their hospital course.

21. ASSOCIATION OF ANTERIOR INTEROSSEOUS AND MEDIAN NERVE NEUROPRAXIA WITH PINK PULSELESS HAND IN SUPRACONDYLAR HUMERUS FRACTURES IN CHILDREN

J Chung, H Elizondo, L Narvaez, B Naik-Mathuria, SB Rosenfeld, JL Mills Baylor College of Medicine

Background: Pink pulseless hands (PPH) are warm, well-perfused hands without a radial/ulnar pulse, and infrequently complicate pediatric supracondylar humerus fractures (SCHF). The optimal management of PPH remains controversial.

Methods: Single center retrospective cohort of patients with SCHF and PPH. Patient demographics, preoperative and postoperative data, as well as clinical outcomes were abstracted from the electronic medical record. Logistic regression was performed to identify predictors of complications at last follow-up.

Results: Between 2013 and 2016, 1,841 patients presented with SCHF (median age 5.9years; IQR 4.09, 6.96); 45.3% male), from which 127 children (6.9%) had radial/ulnar pulses described as either absent, but perfused (PPH; N=64; 3.5%) or reduced (N=62; 3.4%) at presentation. One patient (0.7%) presented with a pale pulseless hand. The remaining 1714 (93.1%) presented warm perfused hand with palpable radial and/or ulnar pulses. Most common mechanism of injury was fall (96%). Among those with PPH, 27 (42.2%) had motor dysfunction, while 14 (11.0%) had sensory dysfunction. All PPH patients underwent percutaneous pinning, and after reduction 12 (18.8%) recovered a palpable pulse. The remaining 52 continued to have PPH. Three (4.7%) PPH patients underwent vascular exploration which revealed two entrapped brachial arteries, and one occluded brachial artery due to focal dissection. One of the entrapped arteries was treated by release of the entrapping band, while the other required an interposition graft. The remaining occlusion underwent embolectomy. Length of stay was not prolonged by re-vascularization. Median follow up was 93.5 (IQR 56, 881) days. None of the re-vascularized patients had complications at LFU. At thirty days, the most frequent complication was neurologic dysfunction, occurring in 22 (34.4%). Sixteen of these involved the anterior interosseous nerve (AIN), with the remainder involving the median nerve. Similarly, the most frequent complication at last follow up was neurologic dysfunction, which occurred in 11 (17.0%) of PPH patients. All of these complications involved the median nerve (N=7) or the (N=4) AIN. All patients recovered normal pulse exams at last follow up, except for one patient (1.6%). Older age was protective (OR 0.43; 95% CI 0.25-0.75; p = 0.02); while preoperative motor (OR 4-8; 95% CI 1.1-20.2; p = 0.001); and sensory (OR 11.5; 95% CI 2.7-49.7) dysfunction were positively associated with neurologic dysfunction at last follow-up. Neither vascular status after reduction (p=0.94) nor at last follow-up (p=0.83) were associated with neurologic dysfunction at last follow up. No subjects had limb length discrepancy or ischemic contracture and last follow up.

Conclusion: This is one of the largest cohort studies analyzing PPH in the setting of SCHF. Conservative management safely restores pulses long-term in the setting of PPH. However, a significant minority of subjects suffer median nerve and anterior interosseous nerve neuropraxia postoperatively. Open surgical exploration may release an entrapped median and/or AIN and mitigate the frequency and severity of median and AIN neuropraxia at last follow up. Children with baseline neurologic dysfunction and younger age may derive the greatest benefit from repair of the entrapped median and/or AIN and brachial artery.

22. PREDICTORS OF ANASTOMOTIC LEAK AFTER ESOPHAGECTOMY FOR CANCER: NOT ALL LEAKS INCREASE MORTALITY

A Grigorian, C Krasnoff, BR Smith, W Duong, NT Nguyen, S Daly, M Lekawa, J Nahmias University of California, Irvine Medical Center

Background: Risk factors for anastomotic leak (AL) after esophagectomy in cancer have been identified in previous studies. However, the impact of preoperative chemotherapy/radiation and positive margins status on AL is unclear. Additionally, the correlation between extent of ALs (minimal to no intervention versus re-operation) and risk of mortality has not been well studied. We hypothesized preoperative chemotherapy/radiation and positive margins increases the risk for AL after esophagectomy for cancer. We also hypothesized less significant (requiring no intervention) ALs have a similar risk of mortality compared to those without AL.

Methods: The 2016-2017 American College of Surgeons National Surgical Quality Improvement Program Procedure-Targeted Esophagectomy database was queried for those that underwent any esophagectomy for cancer. A multivariable logistic regression analysis was performed. The model for risk of AL was adjusted for age, gender, dependent functional status, hypoalbuminemia, severe leukocytosis, final pathologic diagnosis and comorbidities. The model for risk of mortality was adjusted for age, dependent functional status and comorbidities.

Results: From 2,042 patients, 280 (13.7%) had AL. Compared to those without AL, patients with AL were of similar age (median, 65 vs. 64-years, p=0.21), had a longer operative duration (median, 395 vs. 352 minutes, p<0.001) and higher 30-day mortality rate (7.1% vs. 1.3%, p<0.001). After adjustment, independent risk factors for AL included operation duration > 5 hours (OR 1.72, 1.22-2.42, p=0.002), positive margins (OR 1.66, 1.04-2.67, p=0.035), diabetes (OR 1.74, 1.00-2.02, p=0.047), and hypertension (OR 1.53, 1.11-2.09, p=0.008). Age, gender, functional status and preoperative chemotherapy or radiation were not predictors of AL (all p>0.05). The most common intervention for AL was reoperation (41.4%) followed by treatment with interventional means (34.3%), treatment with non-interventional means (i.e. medical therapy) (16.8%) and no treatment (7.5%). All patients with AL requiring some form of intervention had an increased risk of mortality including those requiring reoperation (OR 7.46, 3.30-16.86, p<0.001), interventional-means (OR 6.00, 2.42-14.83, p<0.001), non-interventional means (OR 5.19, 1.43-18.81, p=0.012), compared to those without AL. Patients with AL requiring no treatment had similar risk of mortality to patients without AL (p=0.18).

Conclusion: Positive margins are associated with an increased risk of AL while preoperative chemotherapy or radiation do not contribute to risk of AL after esophagectomy for cancer. There is a stepwise increased risk of 30-day mortality for ALs requiring increased invasiveness of treatment with over a seven-fold increase in those requiring reoperation. Clinically insignificant ALs that may only be present on radiographic imaging do not increase risk of 30-day mortality.

23. ELECTRIC SCOOTER INJURIES: VARIATIONS IN SOUTHERN CALIFORNIA TRAUMA CENTERS

NK Dhillon, EJ Ley, C Juillard, G Barmparas, DY Kim, D Turay, AR Seibold, S Kaminski, TK Duncan, G Diaz, S Saad, D Hanpeter, ER Benjamin, A Tillou, K Inaba Cedars-Sinai Medical Center

Background: Electric scooters are popular devices for transportation in Southern California due to their ease of use, affordability, and availability. Patient admissions for electric scooter injuries have surged at some trauma centers due to their increased use. The objective of this study was to characterize how hospital admissions and outcomes varied due to electric scooter injuries among southern California trauma centers.

Results: During the one year study period, 87 patients were identified due to electric scooter related injuries that required trauma team care with a male majority of 71.3%, a mean age of 35.1 ± 17.0 years, mean injury severity score (ISS) of 7.2 ± 5.7 , a mean hospital length of stay of 3.5 ± 4.7 days, ICU admission of 20.7%, operative rate of 17.2%, and a mortality of 1.1%. When comparing injuries by body region, the head and face were most commonly injured, followed by the extremities. Helmet use was uncommon with 71.3% of patients recorded as not wearing a helmet. High variability in patient volume was noted among trauma centers, with two trauma centers considered high volume (74 patients) and seven centers considered low volume (13 patients). Patients admitted to high volume centers were less likely to wear a helmet (No Helmet 77% v. 38.5%, p<0.01) and had a lower rate of extremity fractures (17.6% v. 46.2%, p=0.03). The ISS, hospital stay, operative rate, and mortality rate were similar between high and low volume

Conclusion: Injuries due to an electric scooter crash are primarily to the head, face, and extremities with approximately one in five patients requiring ICU admission. There is a high variation in patient volume due to electric scooter injury among southern California trauma centers that could impact delivery of care with the abrupt introduction of this technology. Targeted public health interventions and policies might better address community utilization of the electric scooter.

24. CONTINUITY VERSUS VOLUME IN EMERGENCY GENERAL SURGERY: DOES FRAGMENTATION OF CARE MATTER?

B Joseph, K Hanna, M Chehab, M Hamidi, A Northcutt, A Tang, N Kulvatunyou, L Castanon, M Ditillo University of Arizona

Background: Readmission to a different hospital leads to fragmentation of care. Its impact on outcomes in emergency general surgery (EGS) is not well established. The aim of our study was twofold; to determine the rate of readmission to a different hospital after EGS and to compare outcomes between index and non-index hospital readmission.

Methods: The (2014) National Readmission Database was queried for all adult (age≥18y) patients who were readmitted after EGS (as per AAST definition). Patients who were readmitted after initial discharge were stratified according to readmission destination: index vs. non-index hospital. Outcome measures were failure-to-rescue (FTR), hospital length of stay, and healthcare costs. Multivariable logistic regression was performed to determine the predictors of non-index-readmission.

Results: A total of 206,270 underwent an EGS procedure, of which (18%) 37,128 were readmitted within 30 days (Index hospital:29,489, Non-index hospital:7,882) and included in the study. Mean age was 53±19y and 47% were male. Patients who were readmitted to a different hospital had higher rates of FTR (aOR 1.21 [1.11-1.32]; p<0.001), longer hospital LOS (=0.3 [0.15-0.44]; p<0.001), higher overall-costs (=\$5,000 [\$3,500-\$6,300]; p<0.001) and higher number of subsequent readmissions (=0.09 [0.06-0.12]; p=0.005). Predictors of readmission to a different hospital were major-post-operative-complications (OR 1.12[1.04-1.21]; p=0.02), discharge to facility vs. home (OR 2.84 [2.21-3.72]; p=0.027), leaving against medical advice (OR 2.4 [1.79-3.26]; p<0.001), being in the top quartile-household-income (OR 1.35[1.07-1.69]; p<0.001). On sub analysis, patients who were readmitted to a different hospital were stratified by center volume (low: < 100 cases/year; medium: 100-199 cases/year; high: ≥200 cases/year), no significant difference was found in FTR rates (low: 1.9%, medium: 1.9%, and high: 2%; p=0.912).

Conclusion: One out of every five readmissions after EGS procedure occurred at a different hospital. Non-index readmission carries potential health and economic disadvantage. Continuity of care is more important than hospital volume. Interventions to prevent fragmentation of care are needed.

25. LACTATE LEVELS IN BRAIN DEAD ORGAN DONORS PREDICT ORGAN TRANSPLANTATION RATES AND GRAFT FUNCTION

M Sally, M Hutchens, E Swanson, R Nelson, N Jameson, T Groat, M Patel, K Ellis, C Niemann, D Malinoski VA Portland Health Care System

Background: Adherence to donor management goals (DMG) can increase the quality and quantity of organs available for transplantation. However, further improvements in donor critical care are needed to meet the growing demand for transplantable organs. Lactate levels are used in critical care to assess microvascular perfusion, but donor management protocols are not currently guided by markers of end-organ perfusion. We sought to determine associations between serum lactate and organs transplanted per donor (OTPD), individual organ transplantation rates, and graft function after transplantation, hypothesizing that normal lactate levels would be predictors of more organs transplanted and improved graft function.

Methods: A prospective study was conducted on all donors after brain death (DBD) managed by 17 Organ Procurement Organizations from 2013-2018. Data were collected using the UNOS DMG Registry at three established time points during donor management: authorization for donation/start of case, organ allocation, and prior to organ recovery. Only DBDs with lactate levels at all three times were included in the final analysis. The primary outcome measure was \geq 4 OTPD. Secondary outcomes were individual organ transplantation rates, graft survival rates, and delayed graft function (DGF) for kidney transplants. A normal lactate level was defined as < 2 mmol/L. We determined the association between lactate levels, OTPD, organ transplantation rates, and organ function in univariate analysis and then performed logistic regression to determine independent predictors with a p < 0.05 for each measure.

Results: 11,514 DBDs were eligible for inclusion. The number of lactate values measured varied at each time point, with 3758 (33%) at authorization, 5197 (45%) at allocation, and 4931 (43%) prior to organ recovery/end of donor management. 2860 (25%) DBDs had lactate measured at all three time points. This group had 3.5 \pm 1.8 OTPD and 49% had \geq 4 OTPD. On univariate analysis, lower mean lactate levels and normal lactate levels at all three time points were associated with \geq 4 OTPD. Lower mean lactate levels were also associated with heart, pancreas, lung, and liver utilization, as well as reduced risk of kidney DGF in the recipient. In addition, normal lactate levels at the end of donor management were associated with increased heart, pancreas, liver, kidney and lung transplantation rates. Lactate values were not associated with graft survival. After controlling for confounding factors using multivariable analysis, a normal lactate at the ime of organ allocation was independently predictive of \geq 4 OTPD, and lower mean lactate values predicted reduced risk of DGF.

Conclusion: Lactate measurement is not currently consistently practiced as part of donor management. However, when measured, lower lactate levels in DBDs are associated with ≥ 4 OTPD, increased rates of transplantation of all organs, and reduced risk of DGF in transplanted kidneys. Consideration should be given to including lactate levels in DMG bundles.

26. A QUANTITATIVE GLOBAL PROTEOMICS APPROACH IDENTIFIES CANDIDATE URINARY BIOMARKERS THAT CORRELATE WITH INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM DYSPLASIA

KF Flick, MT Yip-Schneider, RE Simpson, CM Sublette, M Soufi, EP Ceppa, JM Dewitt, AL Mosley, J Zhang, CM Schmidt Indiana University School of Medicine

Background: Early detection of pancreatic cancer requires screening of high-risk individuals such as those with pre-operative diagnosis of intraductal papillary mucinous neoplasms (IPMNs). However, distinguishing between those with low/moderate-grade IPMN which can be safely monitored versus high-grade/invasive disease has proven to be challenging based on clinical and radiographic features alone. Biomarker analysis of pancreatic cyst fluid has shown promise but requires invasive sampling methods. Thus, a proteomic discovery study was performed to determine if urine possesses a unique biosignature that could form the basis for a non-invasive test able to predict IPMN dysplasia.

Methods: Urine was collected from 99 patients undergoing surgery for IPMN from 2004-2011 (72 low/moderate-grade, 27 high-grade/invasive). Quantitative mass-spectrometry based proteomics was performed using isobaric tandem mass tag (TMT) labelling. Proteins of interest for distinguishing low/moderate-grade from high-grade/invasive IPMN were identified by differential expression analysis followed by principal component analysis (PCA). Selected leading protein candidates were evaluated in a subset (n=25 or 36) of the same urine samples by enzymelinked immunoabsorbent assay (ELISA) and then correlated with IPMN dysplastic grade. Mann-Whitney U test and Pearson correlations were performed.

Results: Of the >4800 urinary proteins identified by proteomics, 4549 were quantified. Differential expression analysis revealed 188 proteins that could distinguish between low/ moderate-grade and high-grade/invasive IPMN (filtered for p<0.05). Following further analysis by PCA and visualization by heatmap, two proteins were selected for further evaluation -Vitamin D binding protein (DBP) and Apolipoprotein A1 (APOA1). The abundance of DBP by proteomics (median, [interquartile range]) was significantly higher for high-grade/invasive IPMN compared to low/moderate-grade IPMN (219735 [128882-269943] vs 112295 [77905-180773] normalized reporter ion intensity; p=0.0010). Similarly, APOA1 was more abundant in the highgrade/invasive than low/moderate groups (235420 [144933-371247] vs 150095 [103419-236591] normalized intensity; p=0.0007). Absolute concentrations determined by ELISA, as well those normalized to urinary creatinine, for a subset of IPMN urine samples demonstrated significant positive correlation with proteomic protein abundance (absolute concentration: DBP, r=0.7884, p<0.0001, n=36; APOA1, r=0.5873, p=0.0020, n=25).

Conclusion: In a surgical cohort of patients with IPMN, proteomic analysis identified elevated urinary levels of DBP and APOA1 associated with high-grade/invasive disease. These findings were verified by ELISA. Our data suggest that these and additional urinary biomarker candidates may provide a non-invasive means of predicting IPMN dysplastic grade.

27. DO ONE, DO ONE, TEACH ONE: CHALLENGING THE DOGMA WITH SIMULATION-BASED TRAINING TO MAXIMIZE EFFICIENCY IN SURGICAL RESIDENT EDUCATION

SW Schimpke, BM Larson, BR Veenstra, JA Myers, JM Velasco Rush University Medical Center

Background: It is established that graduating residents feel unprepared to practice independently. Prior studies suggest that simulation based education increases resident confidence and improves performance. We performed an institutional needs assessment, consisting of review of resident case logs and a survey of seven faculty members' confidence in resident ability to complete laparoscopic repair of ventral hernias (LVHR). Based on these results, we created a pilot study to augment resident surgical experience with a simulation-based training in LVHR.

Methods: The curriculum included a web-based cognitive component, two simulation sessions with a two-week interval for self-directed practice, and a self-confidence questionnaire, before and after each session. Faculty validated a low cost, inanimate abdominal cavity model with an incarcerated incisional ventral hernia. An attending rated each learner's procedure-specific skill "in-situ" by using a modified Objective Structured Assessment of Technical Skills (OSATS), and a Global Operative Assessment of Laparoscopic Skills (GOALS). All sessions were video recorded. Proficiency required a minimum of three on a Likert scale and a completion time twice that of the expert. A group of faculty, blinded to the learner, evaluated the video recordings for comparison with in-situ evaluations. Wilcoxon Signed-Rank Test with statistical significance of p<0.05 evaluated changes in individual performance metrics. Exact McNemar Test with statistical significance of p<0.05 measured learners' ability to meet proficiency and time goals.

Results: Thirteen junior residents, seven senior residents, and seven attendings, identified as novice, intermediate, and expert groups, respectively, completed the curriculum. Of thirteen novice learners, four achieved proficiency at their first session and an additional six reached it after the second session (p=0.031). Although time to completion improved as a group, there was no significant change in the number that met the time goal post-curriculum (p=0.005). Their median overall global performance did not change over the two-week curriculum (p=0.026). The LVHR task specific technical skills scores improved by a median of two points, but it was not statistically significant (p=0.077). Direction required for them to complete the procedure improved by a median of two Likert points (p=0.004). Novice learners' confidence in completing the procedure independently improved by a median of one Likert scale point (p<0.004). In-situ faculty evaluations of novice technical skills were significantly lower by a median of 4 (p=0.002) and 2 (p=0.03) points at 0 and 2 weeks, respectively compared to the blinded group evaluations. In the intermediate group, all achieved proficiency. Variability existed between the in situ and group evaluations but not in a consistent manner (p=0.085).

Conclusion: We demonstrated the feasibility of assessing the technical and global skills of surgical residents while performing a simulated LVHR and showed their proficiency and self-confidence improved over a two-week period. Expanding this study to include long-term retention and additional procedures will allow us to evaluate how to optimally augment resident surgical experience using simulation and prepare our residents for independent practice.



QUICK SHOT ABSTRACTS

QUICK SHOT ABSTRACTS

QS 1. IMPLEMENTATION OF PRE-HABILITATION FOR MAJOR ABDOMINAL SURGERY AND HEAD AND NECK SURGERY: A SIMPLIFIED SEVEN DAY PROTOCOL

J Moore, P Tennet, J Fisher, P Philips, M Egger, CR Scoggins, RCG Martin University of Louisville

Background: Prehabilitation prior to major surgery has increased in popularity over recent years and continues in its attempt to improve pre-operative conditioning of patients to enhance post-operative outcomes. The implementation of such protocols and the adoptability/ compliance has been established with conflicting results reported. This aim of this prospective trial was to assess the compliance and success of a prehabilitation protocol on post-operative outcome after major abdominal and head and neck surgery.

Methods: A single arm prospective interventional trial was approved by our local IRB for patients undergoing major abdominal and head&neck surgery from 8/2018 to 3/2019. This was a 7 day intervention trial at the time of pre-admission testing to assess compliance for pulmonary, nutritional, and physical activity prior to surgery. Compliance was set for at least 75% success with >1500 on Incentive Spirometer(IS)-5 times a day, Taking 7 days of advance recovery drinks three times a day, hibiclens-3x day before surgery, waking 7500 steps each day. Outcome characteristics included overall and pulmonary morbidity, length of stay (LOS), surgical site infections. These patients were then compared to a non-prehabilitation group during the same time.

Results: A total of 76 patients were enrolled in this trial with 58 GI patients and 18 H&N patients with median age of 64(28-90), 44 men and 32 women. Thirty-eight (50%) were Medicare, 26% Private, 18% Medicaid, and 6% Veteran, with 45% living in rural counties greater than 75 miles away from hospital. Compliance with 15 use was 85%, with a median of 2200(range 1500-2500), pre-operative nutritional drink(89.5%), and hibiclens use was 92%. Ambulation/Steps compliance was only 32 patients (44%), with a median steps of 7500(range 400-15,000). When compared to non-prehabilitation patients over the same time period we did see significant improvement in immediate post-operative mobility (OR 0.73 95% CI 0.46-0.97, p = 0.04) and improvement in prevention of pulmonary morbidity (OR 0.82 95% CI 0.23-1.18, p = 0.07) was observed in the prehabilitation group. No significant difference in overall infectious complications (18%vs22%), surgical site infections(14%vs22% , length of stay (median 6 days vs 6), or readmissions(18%vs22%).

Conclusion: A simple 7 day prehabilitation protocol at the time of pre-admission testing is feasible with a high degree of compliance regardless of a patients disease type, education, or socioeconomic background. This protocol can reduce overall and pulmonary morbidity following surgery and can be implemented and utilized routinely with minimal hospital costs.

QUICK SHOT ABSTRACTS

QS 2. OUTCOME IMPLICATIONS OF VENOUS MANAGEMENT STRATEGY IN PATIENTS WITH CONCOMITANT ARTERIAL AND VENOUS FEMOROPOPLITEAL INJURIES

JC Webb, PG Teixeira, JJ DuBose, CV Brown, JB. Holcomb, J Sharpe, JJ Morrison, TM Scalea, D Skarupa, RD Catalano, J Kim, K Inaba, N Poulin, J Myers, JK. Bini, D Feliciano The University of Texas at Austin

Background: Optimal management for associated venous injuries encountered during repair of arterial femoropopliteal injuries is controversial and it remains unclear whether potentially complex venous reconstructions are warranted. The aim of this study was to evaluate how the management of associated venous injuries impacted the outcome of patients with femoropopliteal arterial injuries using a multicenter prospective registry.

Methods: All patients with combined arterial and venous femoropopliteal injuries in the prospective registry (2013-2018) were identified and those with documentation of management of the venous injury severity scores, fluids and blood products utilization, use of systemic anticoagulation and antiplatelet therapy were abstracted. The population was stratified by venous management strategy (Vein Ligation [VL] versus Vein Repair [VR]), and compared with univariate analysis. The primary outcome was failure of the arterial repair. Secondary outcomes included amputation, need for reintervention, need for fasciotomy, and definitive fasciotomy closure.

Results: Over 6 years, 40 patients with combined arterial and venous femoropopliteal injuries and documented venous injury management strategy were admitted to participating 22 trauma centers. The associated venous injury was treated with ligation in 18 (45%) and repair in 22 (55%) patients. Patients in both groups were not significantly different (Table). Patient undergoing VR had higher arterial repair failure rates (18.2% vs 5.6%), need for reintervention (22.7% vs 11.1%) and amputation (18.2% vs 5.6%), but none of these differences were statistically significant. VL patients were more likely to undergo a prophylactic fasciotomy (55.6% vs. 18.2%, OR[95% CI]: 5.62[1.34-23.44], p=0.01), however significantly more patients in the VR group required a therapeutic fasciotomy, with the resulting total fasciotomy rates being comparable in both groups (88.9% vs 77.3%, OR[95% CI]: 2.35[0.39-13.90], p=0.42. Fasciotomy (osure was achieved 75.0% in the VL group compared to 64.7% in the VR group (p=0.70).

Conclusion: For patients with combined femoropopliteal arterial and venous injury, venous repair offered no outcome benefit compared to venous ligation. Patients undergoing venous ligation received more prophylactic fasciotomies, but the overall need for fasciotomy was not different due to more therapeutic fasciotomies being performed in the patients with a vein repair.

QUICK SHOT ABSTRACTS

QS 3. INTERCOSTAL NERVE BLOCK WITH LIPOSOMAL BUPIVICAINE IS SUPERIOR TO EPIDURAL ANALGESIA FOR THE TREATMENT OF RIB FRACTURES

NW Sheets, JW Davis, RC Dirks, AW Pang, AM Kwok, MM Wolfe, LP Sue UCSF Fresno

Background: Rib fractures are common among adult trauma patients and remain a risk factor for increased morbidity and mortality. Updated guidelines recommend epidural and multimodal analgesia for the treatment of traumatic rib fractures. Intercostal nerve block is a treatment modality that has proven beneficial but the duration of analgesia remains a limiting factor. Liposomal bupivacaine is a slow releasing anesthetic that has been used for regional analgesia for multiple procedures but has not been studied for the treatment of traumatic rib fractures. The aim of this study is to compare outcomes of intercostal nerve block using liposomal bupivacaine to epidural analgesia for the treatment of traumatic rib.

Methods: We performed a retrospective review at a level I trauma center from December 2014 to March 2019. Patient inclusion criteria included 18 years or older, blunt mechanism of injury, and use of intercostal nerve block using liposomal bupivacaine or epidural analgesia. Patients with a Glasgow Coma Score less than 14 on arrival were excluded. Patients were matched 1:1 on age, ISS, and number of rib fractures. Primary outcomes include intubation, mechanical ventilation days, intensive care unit (ICU) length of stay (LOS), hospital LOS, and mortality. Secondary outcomes included epidural analgesia catheter and intercostal nerve block complications. Epidural complications included catheter dislodgement, malfunction, malposition, or hypotension associated with placement. Intercostal block complications included pneumothorax, hemothorax, or injection related issues.

Results: During the study period, 11,694 blunt trauma patients \geq 18 years of age were admitted to the hospital. After applying inclusion criteria, 230 patients received intercostal nerve block with liposomal bupivacaine and 62 patients had epidural analgesia. After matching, 116 patients were included in the study with 58 patients in each group. Patients in both groups had a median of 8 rib fractures, a chest AIS of 3, and an ISS of 14. Patients receiving intercostal nerve blocks with liposomal bupivacaine were less likely to require intubation (3% vs. 17% p=0.015), had shorter hospital LOS (8 ± 6 vs. 11 ± 9, p=0.020), ICU LOS (2 ± 5 vs. 5 ± 6, p=0.007) and trended towards fewer days of mechanical ventilation (1±4 vs. 2±5 days, p = 0.083). There was no difference in mortality (3% vs. 2%, p=0.56). There were no cases of ventilator associated pneumonia and no difference in pulmonary embolism incidence (2% vs. 3%, p=0.56). Minor complications occurred in 26% of epidural analgesia patients and none in intercostal nerve block patients (p < 0.001).

Conclusion: This study found that patients with intercostal nerve blocks with liposomal bupivacaine for traumatic rib fracture required fewer intubations, had shorter ICU and hospital LOS, and experienced fewer complications when matched with patients treated with epidural analgesia. Intercostal nerve block with liposomal bupivacaine is safe, effective, and superior to epidural analgesia for the treatment of traumatic rib fractures.
QS 4. HEAD-TO-HEAD COMPARISON BETWEEN AMERICAN MEDICAL GRADUATES AND INTERNATIONAL MEDICAL GRADUATES AS GENERAL SURGERY INTERNS: A SINGLE-CENTER EXPERIENCE

A Rajesh, M Asaad, Y AlJamal, RU Azevedo, DR Farley Mayo Clinic Rochester

Background: International medical graduates (IMGs) often secure preliminary positions in general surgery (GS) and feel a great weight to prove themselves before advancing to categorical GS residency. Lack of familiarity with the training of an IMG, uncertainty as to how the candidate will perform in the US healthcare setting, English as a second language, and difficulties in obtaining a visa are a few reasons as to why IMGs are subject to strict scrutiny. We aimed to determine the comparative performance of IMGs versus American medical graduates (AMGs) at baseline and assess these trends over the course of their GS internship.

Methods: From 2013 to 2017 we identified all AMGs and IMGs who matched in to our categorical and preliminary GS residency. Our PD and associate PDs, were asked to evaluate the residents based on overall performance, technical skills, interpersonal communication, and medical knowledge using a 10-point Likert scale (0-weak and 10-stellar). Scores on the ABSITE©, a preparatory pre-ABSITE test, USMLE©, and performance during the biannual multi-station objective assessments (July and January of the internship year) were compared between the two resident groups.

Results: A total of 72 residents were included [28 (39%) IMG preliminary, 44 (61%) AMG categorical]. The AMG group had significantly higher median step 1 and step 2 scores compared to our IMG group (243 vs. 231, p=0.002, and 250 vs. 246, p=0.03, respectively). Although pre-ABSITE scores were higher in the IMG group [median (Interquartile range (IQR)) of 36 (33-40) among AMGs and 38 (34-45) among IMGs, p=0.002)], ABSITE scores were similar between the two groups [median(IQR) of 85 (57-94) for AMGs and 79 (56-89) for IMGs, p=0.43). Median evaluation scores for medical knowledge, interpersonal communication, technical skills, and overall performance were similar between the AMG group (7, 8, 7, 7) and the IMG group (7, 7, 7), respectively, (p=NS). IMGs scored significantly higher in both biannual multi-station objective assessments than AMGs [median (IQR) July: 59 (47-91) vs. 55(37-62), p=0.005, January: 103 (86-116) vs. 91 (87-104), p=0.03)].

Conclusion: Although AMGs entering our categorical GS residency have higher USMLE scores than corresponding IMG prelims, our IMGs perform as well or better than AMGs as evaluated by subjective and objective assessments during their intern year. While careful scrutiny and selection of incoming surgical trainees remains paramount, it is reassuring to confirm that no matter where they are from, great candidates can perform well in a general surgery training program.

QS 5. CENTRALIZATION OF ESOPHAGECTOMIES: WHO BENEFITS?

M Garland-Kledzik, SC Chang, A Khader, A Scholer, J Santamaria, M Goldfarb John Wayne Cancer Institute at Providence Saint John

Background: There has been a recent trend towards centralization of cancer care due to associations between high volume centers and outcomes. Esophageal cancer is one of several aggressive cancers that requires a multidisciplinary team including expert surgeons, medical oncologists, and radiation oncologists. However, the impact of traveling long distances as well as if the improved outcomes seen at high volume centers varies by disease stage has not been studied.

Methods: All patients >18 years of age with a diagnosis of stage I-III esophageal adenocarcinoma that had an esophagectomy for cure from 2004-2014 were identified in the National Cancer Database. The impact of travel distance (50-100 miles and >100 miles compared to 45 cases/year, low volume = < 25 cases/year) on overall survival (OS) was evaluated by stage using Cox proportional-hazards regression analyses.

Results: Of 17,698 patients, median travel distance for surgical care was 19.3 (7.70, 52.88) miles; 29.0% were Stage I, 32.0% stage II, 33.5% stage III, and 5.4% stage IV. Most patients were from metropolitan areas (78.1%) and were treated at an academic center (55.2%). Traveling a greater distance led to higher odds of accessing high volume centers (OR 4.92, 95%CI 4.41-5.50). After controlling for demographic, tumor, and other treatment factors, Stage I patients experienced the largest improvement in OS with travel for surgery [median survival (95% CI) of 100 miles: 8.19 (7.70, 8.97) years vs 10.74 (9.01, NA) years vs NA, p<0.001)]. Stage III patients also showed improvement but to a lesser degree (median survival (95% CI) of 100 miles: 2.53 (2.42, 2.66) years vs 2.29 (2.08, 2.69) years vs 2.28 (2.49, 3.44), p=0.04) whereas Stage II patients did not show any improvement in OS. Additionally, improved nodal dissections (>15 nodes) were seen in Stage I/III disease (Stage II OR 1.24, 95%CI 1.04-1.51; Stage III OR 1.24, 95%CI 1.03-1.48) with travel >100 miles, compared to < 50 miles, with no significant effect on margin status or rates of neoadjuvant chemoradiation.

Conclusion: Traveling >100 miles to higher volume centers for esophageal resection is associated with improved survival for Stage I. Traveling improved oncologic resections for stage II/III patients, without an improvement in OS. In these higher stage patients, further research is needed to elucidate if they may be able to avoid the burden of traveling.

QS 6. IS THERE AN UPPER AGE LIMIT FOR BARIATRIC SURGERY? LAPAROSCOPIC GASTRIC BYPASS OUTCOMES IN SEPTUAGENARIANS

JB Hammond, CJ Webb, VSKK Pulivarthi, DG Pearson, KL Harold, JA Madura II Mayo Clinic Arizona

Background: The upper age limit for bariatric surgery has been debated, due to the merits of increased complication rates in the elderly and questionable clinical benefits. The purpose of this study is to evaluate the safety and efficacy of bariatric surgery in patients 70 years of age and older.

Methods: A retrospective review was performed of patients 70 years of age or older who underwent laparoscopic Roux-en-Y gastric bypass (RNYGB) between 2001 and 2018 in a comprehensive bariatric surgery program. In addition to surgical evaluation, all patients attended pre-operative education, and medical & psychologic examinations. Primary endpoints were 30 day readmission, Clavien-Dindo grade III-V (CD III-IV) complications, and mortality. Secondary data included weight loss, long-term complications & death, hemoglobin A1C, and fasting serum lipid panels (which were correlated with American Association of Clinical Endocrinologists/American College of Endocrinology (AACE/ACE) 2017 guidelines). Statistical comparisons were performed using the Wilcoxon Signed-Rank test.

Results: A total of 32 patients were identified. Nine patients had revision of their previous gastric surgery and were excluded from analysis. The remaining 23 patients had an average preoperative age of 72 years (range 70-80 years), mean BMI of 43.3 (range 37.3-56.0), and an average Charleston Comorbidity Index score of 5 (range 3-8). All cases were completed laparoscopically. Average length of stay was 2.4 days (range 1-6 days), with the only acute complication being aspiration pneumonia in one patient during the immediate post-operative period. Median follow-up for all patients was 69.3 weeks (range 9-875 weeks). Only one patient was lost to one year follow-up. Following one year there were no mortalities, nor were there any serious adverse complications. Long-term outcomes included the death of two patients, one of unknown cause and the other from metastatic pancreatic cancer diagnosed approximately two years following surgery. One patient experienced failure to thrive, requiring gastrostomy tube placement 15 months after surgery; this patient recovered with tube removal at their 2 year follow-up. Average total weight loss at one year was 35.2 ±11.1 kg, with an average long-term total weight loss of 35.8 ±12.3 kg. Average percentage of excess weight loss (%EWL) at one year was 60.3%, and this was maintained with a %EWL of 61% at latest follow-up. Average preoperative hemoglobin A1C was 6.9 ±1.4%, improving to 5.6 ±1.3% at one year (p=0.001). Mean preoperative serum triglyceride levels dropped significantly one year following surgery (155 ± 49 mg/dL vs. 102 ±41 mg/dL, p=0.0003), and average preoperative high-density lipoprotein (HDL) levels rose significantly ($48 \pm 14 \text{ mg/dL vs. } 58 \pm 22 \text{ mg/dL}$, p=0.004).

Conclusion: Laparoscopic RNYGB is a safe and effective treatment for obesity and obesityrelated disorders in patients over 70 years of age.

QS 7. CONFIDENCE AND COMPETENCE IN VOLUNTEER EXAMINERS OF THE AMERICAN BOARD OF SURGERY

KJ Brasel, J Kopp, J Buyske Oregon Health & Science University

Background: Prior work has demonstrated the impact of gender on the relationship between confidence and competence, with women having less confidence and less self-perceived competence. Recent recruitment of associate examiners by the American Board of Surgery (ABS) allowed exploration of confidence and perceived competence.

Methods: 23,869 eligible board-certified surgeons (4,382 women) were solicited via email to serve as examiners for the ABS General Surgery Certifying Examination (GCE). Volunteers were asked about practice and comfort examining in the 14 GCE content areas. Regression models investigated the relationship between reported practice and confidence examining.

Results: 2,157 surgeons volunteered, of which 420 (19.5%) were female. Men reported practicing in a greater number of content areas than women (6.59 vs 5.36, p < .001) and selected more content areas in which they felt comfortable examining (7.69 vs 6.64, p < .001). Men were significantly more likely to report practicing in Appendix, Colorectal, Endocrine, Endoscopy, Gallbladder, HPB, Hernia, Skin and Soft Tissue, Trauma, Upper GI or Small Bowel, and Vascular, whereas women were significantly more likely to practice in Breast. On average, male surgeons selected a greater number of content areas (M = 7.69, SD = 2.98) that they felt more comfortable examining in than female surgeons (M = 6.64, SD = 3.49) (p < .001). Men were significantly more likely to be comfortable examining in Appendix, Colorectal, Critical Care or Burns, Endocrine, Endoscopy, Gallbladder, HPB, Hernia, Trauma, Upper GI or Small Bowel, and Vascular, whereas women were significantly more likely to be comfortable examining in Breast. The average male volunteer was comfortable examining in 0.70 more content areas than women, controlling for self-reported practice.

Conclusion: Men reported practicing more broadly and were more confident than women in their ability to examine across ABS CE content areas. However, the confidence of male surgeons was not restricted to those areas in which they reported practicing. These data have important implications for training and for conducting high-stakes examinations.

QS 8. FINDING MEANING IN COMMUNITY CHARACTERISTICS: IMPLICATIONS FOR RURAL SURGEON RECRUITMENT

D Hughes, J Mammen, TL Griebling, JV Brooks University of Kansas School of Medicine

Background: The rural general surgeon shortage needs a multi-pronged solution. By investigating why surgeons chose practice locations, we can advise rural communities on how to optimize recruitment processes. Previous research has identified rural upbringing, exposure to rural practices during surgical training, economic incentive programs, affinity for the outdoors, and spousal influence as some of the factors important in rural practice location decisions. There has been little qualitative investigation into the meaning surgeons associate with community characteristics such as degree of rurality, the social fabric of a place, and health care resources. By using an inductive, qualitative approach, we sought to determine which community characteristics are most meaningful to rural surgeons and why.

Methods: In-depth, semi-structured interviews were conducted with practicing general surgeons across the 12-state Midwest region, focusing on those in rural locations and using those in urban locations for comparison. Convenience and snowball sampling techniques were used to generate participants until code saturation was reached. Surgeons self-identified as either urban or rural, and self-identification was cross-referenced with Rural-Urban Continuum Codes. Interviews were digitally recorded and transcribed, then data were analyzed using grounded theory principles and thematic network analysis, facilitated by NVivo 12.

Results: Participants included 37 general surgeons, 22 self-identifying as rural and 15 as urban. Interviews totaled more than 52 hours of recorded time. 19 codes emerged during the initial analysis using grounded theory principles, 13 of which were applicable to this research question. Data from these 13 codes were organized into 3 thematic networks: 1) the nature of rural surgery, 2) finding meaning in one's environment, and 3) role overlap. Rural surgeons placed great importance on limited health resources' effects on their scope of practice, the tight-knit social fabric of smaller towns, and the effect of these dynamics on their practices and daily lives. Rural surgeons experienced a significant overlap of their personal and professional roles, with friends and neighbors often also being patients, which they expressed was both emotionally difficult and rewarding.

Conclusion: Rural surgeons associate deeper meaning with their communities' health resources than do their urban colleagues because of the effect of those resources on their scope of practice. Scope is tied closely to surgeons' professional roles, which often overlap with their personal roles in more rural areas. Rural communities should focus on available health resources during recruitments and, if possible, invest further in surgical infrastructure. Surgeons and health services researchers should continue working together to integrate discussions about and exposure to the rural social context into surgical training. Tools should be developed to help rural communities discuss the difficulties and benefits of personal/professional role overlap with surgeons being recruited.

QS 9. STANDARDIZING THE USE OF INTRAOPERATIVE IMPEDANCE PLANIMETRY (ENDOFLIP) - LESSONS LEARNED FROM A SINGLE CENTER EXPERIENCE OF OVER 400 CASES

B Su, ZM Callahan, J Carbray, MB Ujiki University of Chicago, Evanston

Background: Use of EndoflipTM to provide objective feedback regarding geometry (eg: distensibility, cross sectional area) of the upper and lower esophageal sphincters and pylorus has not been standardized. In addition, the impact of operative variables (eg: patient positioning, insufflation, catheter inflation volumes) on EndoflipTM measurements has not been thoroughly explored. The aim of this study is to provide the largest reported volume of intraoperative impedance planimetry data to help standardize the future use and interpretation of EndoflipTM measurements during foregut surgery.

Methods: A prospectively maintained quality database was queried for all cases utilizing the EndoflipTM impedance planimetry system. Minimum diameter (Dmin), intra-bag pressure, cross sectional area (CSA) and distensibility index (DI) were recorded at different timepoints throughout each operation, with varying volume fills, patient positions, and presence or absence of pneumoperitoneum when applicable. Linear mixed models were used to compare measurements by operative variables.

Results: Between February 2013 and June 2019, the EndoflipTM impedance planimetry system was utilized in 402 cases: 226 fundoplications, 94 peroral endoscopic myotomies (POEM), 15 peroral endoscopic pyloromyotomies (POP), 12 antireflux mucosectomies, 11 magnetic sphincter augmentations, 9 laparoscopic Heller myotomies, 8 pre-esophagectomy esophagogastroduodenoscopies (EGD), 8 diagnostic EGDs, 8 endoscopic cricopharyngeal myotomies, 5 post-POEM EGDs, 4 EGDs with dilations, and 2 transoral incisionless fundoplications. For fundoplications, all EndoflipTM measurements varied significantly with patient positioning when a 30 ml volume fill was used, but did not vary when a 40 ml volume fill was used (interaction p = 0.013). Regardless of patient positioning, there were no differences in Dmin, CSA or DI, but intra-bag pressure was about 1.5 mmHg higher in the reverse Trendelenberg position compared to the supine position (p=0.028). Additionally, insufflation resulted in 6.6 mmHg higher intra-balloon pressure (p < 0.0001), which therefore lowered DI by 1.1 mm2/mmHg (p < 0.0001); there was no effect on minimum diameter or CSA. For POEM, average initial DI at 30, 40 and 50 ml volumes were 1.41, 1.95 and 2.27 mm2/mmHg, respectively (p < 0.001). Average DI after myotomy at 30, 40 and 50 ml volumes were 4.86, 5.42 and 5.71 mm2/mmHg, respectively (p < 0.001). For POP, average initial and post-myotomy DI at 30, 40 and 50 ml volumes were 6.17, 8.68 and 4.59 mm2/mmHg and 8.45, 11.00 and 8.64 mm2/ mmHg, respectively.

Conclusion: This is the largest report of EndoflipTM use. In a foregut surgery practice, the EndoflipTM impedance planimetry system can be used intra-operatively for many procedures in several different anatomic locations. Patient positioning, catheter fill volumes and insufflation all affect EndoflipTM measurements. This data can be used to help standardize the use of EndoflipTM during laparoscopic fundoplication, pyloromyotomy and myotomies for esophageal motor diseases such as achalasia.



V 1. LAPAROSCOPIC EXCISION OF EXTRA-ADRENAL PHEOCHROMOCYTOMA (PARAGANGLIOMA) AT THE DISTAL AORTO-CAVAL REGION (ORGAN OF ZUCKERKANDL) IN A PREGNANT LADY

S Alsafran, D Schuitevoerder, T Vaghaiwalla, B Ruhle, X Keutgen, E Kaplan, P Angelos University of Chicago

Background: Pregnancies complicated by Pheochromocytoma or paraganglioma are very rare, with an estimated incidence of 0.2 per 10, 000 pregnancies. If unrecognized or untreated, they would pose serious risks with maternal mortality in 17 to 48% and fetal demise as high as 54% of the cases. The mortality rate of both the mother and the fetus are significantly improved with early detection, pharmacological blockade, and elective excision of the tumors. We presenting a case of laparoscopic excision of extra-adrenal pheochromocytoma (paraganglioma) at the distal Aortocaval region (organ of Zuckerkandl) in pregnant woman. To our knowledge this is the first reported case of successful laparoscopic excision extra-adrenal pheochromocytoma located at the organ of Zuckerkandl.

Methods: The patient is 34-year-old woman who initially presented with lower abdominal pain. Patient otherwise asymptomatic. Computer temography of the abdomen revealed 2.5 cm mas overlying distal aortocaval region (organ of Zukerkandl). Patient subsequently was found to be in 1st trimester of pregnancy. Biochemical workup was positive for elevated 24-hour Urine of Metanephrines 102 (39-143) and Normetanephrines 1250 (<393). Patient was started on alpha blockade (Doxazosin), and the surgery was delayed until 2nd trimester of pregnancy. Laparoscopic excision was performed under general anesthesia. Essential hemodynamic measurements including continuous intra-arterial blood pressure monitoring were utilized. The patient was place in the supine position.peri-operative fetal monitoring was performed showed viable fetus. 4 ports were used. Initial attempt to approach the tumor through the mesentery of the small bowel proved difficult, as a result right medial visceral rotation was performed to expose the tumor. Tumor was successfully excised after taking down small feeding vessels directly coming off the underlying aorta.

Results: we successfully completed the procedure laparoscopically. Postoperative course was uneventful. Postoperative fetal monitoring revealed viable fetus. Patient was discharged home postoperative day 2. Final Pathologic Diagnosis: 2 cm extra-adrenal pheochromocytoma Positive SDHB

Conclusion: Pheochromocytoma and paraganglioma are rare but an important cause of hypertension in pregnant patients, because of its high morbidity and mortality to both the mother and fetus. Surgical resection is recommended during the second trimester of pregnancy. Considering its benefits and expertise of the surgical team, laparoscopic surgery is safe the favored technique.

V 2. USE OF DISPOSABLE SELF RETAINING RETRACTOR FOR AXILLARY SENTINEL LYMPH NODE BIOPSY

N Ajkay, K McMasters University of Louisville

Background: Sentinel lymph node biopsy is the accepted standard of care for axillary evaluation in clinically node negative breast cancer patients. It has also been accepted as a staging procedure after neoadjuvant chemotherapy for node positive disease. Disposable self-retaining retractors have been used for abdominal surgery to improve exposure and decreased surgical site infection. Similar retractors have been used in breast surgery for lumpectomy or mastectomy, as well as cosmetic breast surgery. Application of a smaller disposable self-retaining retractor for axillary sentinel lymph node biopsy was evaluated and the following video describes the technique of sentinel lymph node biopsy with the use of a small disposable self-retaining retractor.

Conclusion: A self retaining disposable retractor allow for excellent exposure of the axillary contents without the use of 2 or more retractors that requires for a portion of the instrument to be in the wound, impeding adequate visualization and sometimes requiring an additional surgical assistant to hold retractors. The self retaining retractor can retract the entire axillary cavity with exposure of levels 1 and 2, creating a virtual cavity by simply retracting the ring away from the axilla. It improves exposure for identification and removal of the sentinel lymph nodes as well as for hemostasis through a 4 cm incision, while protecting the skin. It is also a great teaching tool as it allows excellent visualization of axillary structures without the need for several retractors.

V 3. THORACOSCOPIC ENUCLEATION OF AN UPPER ESOPHAGEAL SUBMUCOSAL MASS

J Nguyen, S Daly, M Hinojosa, B Smith, NT Nguyen University of California, Irvine Medical Center

Background: Our patient is a 55 year old female who underwent an EGD for GERD symptoms and was found to have a submucosal mass 25cm from the incisors. An EUS confirmed the mass and biopsy demonstrated spindle cells. A CT scan of the chest and neck showed a 6 x 3.2 x 2.2 cm mass. The patient was scheduled for a thoracoscopic enucleation.

Methods: The patient was taken to the operating room, placed in the left lateral decubitus position for entry into the right chest. The lung is mobilized medially to allow for exposure. The azygous vein is transected, and the mass is identified on the esophagus. The pleural is dissected free, and the mass is encleated using a combination of blunt and sharp dissection techniques, ensuring to not injure the esophageal mucosa. After the mass is removed, the myotomy is sutured over the mucosa. An endoscopic leak test was performed post operatively which was negative.

Results: Our patient did well post operatively UGI on post op day 1 showed no evidence of contrast extravasation or narrowing of the esophagus Pathology demonstrated a 5.9 cm leiomyoma. Our patient was discharged on post op day 2 on a liquid diet, and was doing well at her follow up visit.

Conclusion: Enucleation of an upper esophageal mass can be done safely and effectively using minimally invasive techniques.

V 4. ROBOTIC SPLENECTOMY IN A PATIENT WITH SPLENOMEGALY

R Wendt, T Kapoor, J Bingener Mayo Clinic Rochester

Background: Splenomegaly due to hematologic malignancy can pose operative challenges for open and laparoscopic approaches. We present a patient with splenomegaly with suspicion for lymphoma who underwent a robotic splenectomy.

Methods: Patient is a 71-year-old woman with new onset of fatigue, anemia, 50 pound weight loss due to early satiety and left upper guadrant abdominal pain. A CT scan and PET scan were obtained which showed splenomegaly and hilar lymphadenopathy. Lymph node biopsy and bone marrow biopsy were suspicious for lymphoma, but not diagnostic. Therefore, a splenectomy was recommended. The spleen measured 27 Cm craniocaudad, reaching almost to the level of the umbilicus, but not crossing the midline. Our plan was to perform a robotic splenectomy. The patient was taken to the operating room and initial intraabdominal access was established with a robotic trocar placed in Hasson technique in the supraumbilical position. Pneumoperitoneum was created. The robotic camera was inserted; a large, abnormal appearing spleen was visualized. Additional trocars were placed in a near linear fashion, with the camera now moved to the patients left. Our dissection was started using a vessel sealer to free the spleen from its retroperitoneal attachments. Care was taken to protect the splenic flexure and the transverse colon. Angulation of the robot instruments and significant instrument length allowed for mobilization of the superior pole, a maneuver that can be difficult laparoscopically. The short gastric vessels were then ligated, and the spleen was sufficiently mobilized to divide the hilum under vision. Given the hilar lymphadenopathy, this required several stapler adjustments, facilitated by the stepless instrument angulation. Using a robotic 60 mm white load stapler, the hilum was divided while hemostasis was ensured. The spleen was too large to be placed into an Endo-Catch bag, thus the periumbilical incision was extended, and the abnormal spleen was removed.

Results: The patient progressed well and was discharged on postoperative day 4. Final pathology demonstrated marginal cell lymphoma, weighing 1405 g.

Conclusion: Robotic splenectomy is an additional tool to treat patients with splenomegaly. Instrument length and angulation combined with 3-D vision facilitate some steps of the procedure. Specimen bag placement remains a challenge for very large spleens.

V 5. MULTIPLE GUNSHOT WOUNDS TO THE ABDOMEN: A TRAUMA LAPAROTOMY

P Rhee Westchester Medical Center

Conclusion: Trauma laparotomy for hemorrhage control for interest.

V 6. REOPERATIVE LAPAROSCOPIC REDUCTION OF RECURRENT TYPE III HIATAL HERNIA WITH TAKE DOWN AND RECONSTRUCTION OF TOUPET FUNDOPLICATION, AND REPAIR WITH MESH

T Cobb, F Banki The University of Texas Health Science Center at Houston

Background: Reoperative laparoscopic repair of recurrent hiatal hernia can be challenging. The aim was to present a case of laparoscopic repair of recurrent type III hiatal hernia with take down and reconstruction of Toupet fundoplication, and crural closure with mesh.

Methods: The procedure was performed with a trained surgical team. The postoperative care was provided by a trained team of thoracic nurses.

Results: The procedure was performed laparoscopically and without esophageal or gastric leak. The fundoplication was taken down and reconstructed. Acell Mesh was used to reinforce the crural closure. The procedure lasted 3 hours and 20 min, with minimal blood loss. The patient was discharged on POD#1.

Conclusion: Repair of recurrent type III hiatal hernia with take down and reconstruction of Toupet fundoplication can be safely performed laparoscopically. Careful attention should be paid to develop the plane between the esophagus and the stomach to prevent mucosal injury.



MONDAY NOVEMBER 4, 2019

ePoster Session 1, Kiosk 1

Moderator: Carmen Solorzano MD | Vanderbilt University

7:00am - 7:05am

P 1. INCIDENCE AND RISK FACTORS FOR ACUTE KIDNEY INJURY IN SEVERELY INJURED PATIENTS USING CURRENT KDIGO DEFINITIONS

BJ Emigh, SL Sahi, LN Teal, JC Blake, CH Heron, PG Teixeira, TB Coopwood, TC Cardenas, JD Aydelotte, S Ali, CVR Brown The University of Texas at Austin **Presenter:** Brent J Emigh MD

7:05am - 7:10am

P 2. RETENTION OF LAPAROSCOPIC SURGICAL SKILLS AMONG SURGICAL INTERNS AFTER A STANDARDIZED ASSESSMENT

RU de Azevedo, V Yeh, A Rajesh, J Lentz Carvalho, A Chandra, CM Backstrom, N Shaikh, MS Baloul, Anne Kamphausen, M Rivera, DR Farley Mayo Clinic Rochester **Presenter:** Rafael U De Azevedo MD

7:10am - 7:15am

P 3. PROPENSITY MATCHED ANALYSIS OF ROBOTIC COMPARED TO LAPAROSCOPIC ESOPHAGECTOMY

A Grigorian, S Gambhir, NT Nguyen, BR Smith, S Daly, M Lekawa, J Nahmias University of California, Irvine Medical Center **Presenter:** Areg Grigorian MD 7:15am- 7:20am

P 4. EVERY MINUTE COUNTS: THE IMPACT OF PRE-HOSPITAL RESPONSE TIME AND SCENE TIME ON MORTALITY OF PENETRATING TRAUMA PATIENTS

A Nasser, C Nederpelt, M El-Hechi, A Mendoza, N Saillant, M Rosenthal, P Fagenholz, D King, G Velmahos, H Kaafarani Massachusetts General Hospital **Presenter:** Ahmed A Nasser MD, MPH

7:20am - 7:25am P 5. CONTEMPORARY EPIDEMIOLOGY, MANAGEMENT AND OUTCOMES OF BRACHIAL ARTERY INJURIES

JC Webb, JJ DuBose, CVR Brown, JB Holcomb, J Sharpe, JJ Morrison, TM Scalea, D Skarupa, RD Catalano, J Kim, K Inaba, N Poulin, J Myers, JK Bini, PGR Teixeira The University of Texas at Austin **Presenter:** Jack C Webb

7:25am - 7:30am

P 6. IMPACT OF NEOADJUVANT CHEMOTHERAPY ON THE OUTCOMES OF CYTOREDUCTIVE SURGERY & HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY FOR COLORECTAL PERITONEAL METASTASES: A MULTI-INSTITUTIONAL RETROSPECTIVE REVIEW

LP Suarez-Kelly, EW Beal, CW Kimbrough, FM Johnston, J Greer, DE Abbott, C Pokrzywa, M Raoof, B Lee, T Grotz, J Leiting, K Fournier, AJ Lee, S Dineen, B Powers, J Veerapong, JM Baumgartner, C Clarke, TC Gamblin, C Staley, MY Zaidi, SH Patel, V Dhar, L Lam The Ohio State University Wexner Medical Center **Presenter:** Lorena P Suarez-Kelly MD 7:30am - 7:35am

P 7. SPLENECTOMY FOR BENIGN AND MALIGNANT HEMATOLOGIC PATHOLOGY: AN IMPORTANT DIAGNOSTIC AND THERAPEUTIC ADJUNCT

W Alobuia, K Perrone, DJ Iberri, RS Brar, DA Spain, JD Forrester Stanford University Presenter: Wilson Alobuia MD

7:35am - 7:40am

P 8. FRAILTY INCREASES HEALTHCARE UTILIZATION AFTER GENERAL AND VASCULAR SURGERY

A Kashikar, LA Graham, KA Rothenberg, EL George, CD Seib, M Kurella Tamura, TH Wagner, MT Hawn, S Arya Stanford University **Presenter:** Aditi Kashikar MBBS

7:40am - 7:45am

P 9. SLEEVE GASTRECTOMY AT THE TIME OF LIVER TRANSPLANT; EARLY EXPERIENCE AND RESULTS

E Calderon, K Harold, A Singer, D Pearson, AK Mathur, B Aqel, JA Madura Mayo Clinic Arizona **Presenter:** Esteban Calderon MD

ePoster Session 1, Kiosk 2

Moderator: Mary Hawn MD, MPH | Stanford University

7:00am - 7:05am

P 10. SURGICAL NUTRITIONAL ACCESS IN MALNOURISHED ELDERLY UNDERGOING SURGERY FOR ACUTE ABDOMEN: A MISSED OPPORTUNITY TO IMPROVE OUTCOMES

S Gogna, J Con, A Policastro, P Anderson, P Kartik, DJ Samson, R Latifi Westchester Medical Center Presenter: Shekhar Gogna MD

7:05am - 7:10am

P 11. TA CASES: HAS THE 2014 ACGME MANDATE MADE A DIFFERENCE? AN 18-YEAR COMMUNITY HOSPITAL VS NATIONAL EXPERIENCE

P Jayanthi, MB Patel, VK Mittal Providence Park Hospital and Medical Centers/Michigan State University **Presenter:** Prakash Jayanthi MD

7:10am - 7:15am

P 12. SHORTENING LENGTH OF STAY, REDUCING COST, AND IMPROVING OUTCOMES IN THE GERIATRIC TRAUMA PATIENT; A UNIQUE OPPORTUNITY IN A LEVEL 1 TRAUMA CENTER

C Decker, E Esposito, L DeFreest, C Rosati, A Ata, S Stain, L Duncan Albany Medical Center **Presenter:** Christopher Decker MD 7:15am- 7:20am

P 13. ANALYSIS OF FOUR DECADES OF MASS SHOOTINGS IN AMERICA: FATALITIES ARE ON THE RISE

J Avraham, N Shah, E Warnack, A Velez, C Berry, S Frangos, M Bukur, M Klein, C DiMaggio New York University School of Medicine **Presenter:** Jacob Avraham MD, MBA

7:20am - 7:25am

P 14. ENHANCING THE EDUCATIONAL VALUE AND FACULTY PARTICIPATION OF A GENERAL SURGERY MORBIDITY AND MORTALITY CONFERENCE

JM Abdelsattar, K Musgrove, L Shaffer, U Khan, JW Marsh, DC Borgstrom West Virginia University **Presenter:** Jad M Abdelsattar MD

7:25am - 7:30am

P 15. COMPARISON OF SURGICAL TREATMENT PATTERNS FOR STAGE I-III INVASIVE RECTAL ADENOCARCINOMA BETWEEN THE NATION AND THE MOUNTAIN REGION

D Cheng, O Bardakcioglu, M Al-Hamad, DM Kirgan, JL Baynosa, C Cross, SJ Williams, CR St. Hill University of Nevada, Las Vegas **Presenter:** Daniel Cheng MD, MPH

7:30am - 7:35am

P 16. SIMILAR OUTCOMES IN QUALITY OF LIFE BETWEEN MALE AND FEMALE PATIENTS UNDERGOING LAPAROSCOPIC INGUINAL HERNIA REPAIR

B Forester NorthShore University HealthSystem **Presenter:** Beau Forester BA 7:40am - 7:45am

P 18. AN ASSESSMENT OF GENERAL SURGEON CAREER SATISFACTION AND CHALLENGES IN THE 80-HOUR WORK WEEK ERA

JM Rasmussen, MM Najarian, JS Ties, AJ Borgert, KJ Kallies, BT Jarman Gundersen Health System

Presenter: Jessica M Rasmussen MD

ePoster Session 1, Kiosk 3

Moderator: Michael Ujiki MD | NorthShore University Health System

7:00am - 7:05am

P 19. OUTCOMES FOR GENERAL SURGERY PROCEDURES IN ADULTS WITH COMPLEX CONGENITAL HEART DISEASE

M Castillo-Angeles, B Farr, BU Okafor, N Patel, R Ramsis, AR Opotowsky, R Askari, A Salim, D Nehra, SE Rice-Townsend Brigham and Women's Hospital **Presenter:** Bethany Farr MD

7:05am - 7:10am

P 20. LONG-TERM FUNCTIONAL AND MENTAL HEALTH OUTCOMES AFTER EMERGENCY GENERAL SURGERY (EGS): A PILOT STUDY

M Castillo-Angeles, E Stanek, GS Corwin, SC Fat, JP Herrera-Escobar, R Askari, A Salim, D Nehra Brigham and Women's Hospital **Presenter:** Manuel Castillo-Angeles MD, MPH

7:15am- 7:20am

P 22. HYPONATREMIA AFTER ILEOSTOMY PROCEDURES: A COMMON COMPLICATION

S Sho, SC Lowe, AY Lin, K Kazanjian, MR Kwaan University of California, Los Angeles **Presenter:** Shonan Sho MD

7:20am - 7:25am

P 23. INCREASING EXPOSURE AND TRAINING IN RURAL SURGERY: 3-YEAR DATA OF THE MONTANA RURAL SURGICAL RESIDENCY YEAR

DM Lotakis, C Sulzbach, G Ramos, R Zuckerman, D Sheldon New York Medical College at Metropolitan Hospital **Presenter:** Dimitra M Lotakis MD

7:25am - 7:30am

P 24. FRAILTY MARKERS AS PREDICTORS OF OUTCOMES IN GERIATRIC TRAUMA PATIENTS

S Yu, A Karandikar, A Brandolino, RM Cerniglia, TP Webb, PA Codner Medical College of Wisconsin Presenter: Sherman Yu

7:30am - 7:35am P 25. CORE PRINCIPLES OF PALLIATIVE CARE CONSULTATION FOR SURGICAL ONCOLOGY PATIENTS

CP Scally, K Robinson, E Bruera, BD Badgwell The University of Texas MD Anderson Cancer Center **Presenter:** Christopher Scally MD

7:35am - 7:40am

P 26. USING AN ESCAPE ROOM TO INVESTIGATE TEAM COHESION

T Cohen, B Bancroft, S Francis, A Koka, E Lazzara, B Chaparro, J Keebler, B Gewertz Cedars-Sinai Medical Center **Presenter:** Tara Cohen PhD

7:40am - 7:45am

P 27. WHEN TO HIRE A NEW SURGEON: IDENTIFYING ACTIONABLE METRICS AT A HIGH-VOLUME CENTER

KP Allen, JB Fleming, DA Anaya H Lee Moffitt Cancer Center **Presenter:** Kristin Allen FACHE

Tuesday, November 5, 2019

TUESDAY, NOVEMBER 5, 2019

ePoster Session 2, Kiosk 1

Moderator: Charles St. Hill MD | University of Las Vegas Nevada

6:50am - 6:55am P 28. MASSIVE TRANSFUSION ACTIVATIONS IN NON-TRAUMA PATIENTS

NK Dhillon, I Abumuhor, C Hayes, J Ghoulian, M Asadi, TL Lin, G Barmparas, EJ Ley Cedars-Sinai Medical Center **Presenter:** Navpreet K Dhillon MD

6:55am - 7:00am

P 29. CAN A RIB FRACTURE PROTOCOL REDUCE PNEUMONIA RATES IN HOSPITALIZED TRAUMA PATIENTS?

T Russo, P Hope Beaumont Hospital Trenton **Presenter:** Pial Hope DO

7:00am - 7:05am

P 30. VALUE OF RESEARCH YEARS FOR INTERNATIONAL MEDICAL GRADUATES APPLYING TO GENERAL SURGERY RESIDENCY

A Rajesh, M Asaad, Y AlJamal, RU Azevedo, DR Farley Mayo Clinic Rochester **Presenter:** Aashish Rajesh MBBS 7:05am - 7:10am

P 31. CARTILAGE OLIGOMERIC MATRIX PROTEIN (COMP) SPLICE VARIANTS 1 AND 3 ARE DIFFERENTIALLY EXPRESSED IN COLON CANCER PATHOGENESIS AND ARE POTENTIAL TARGETS FOR BIOMARKER TESTING

VN Nfonsam, NP Omesiete, L Nfonsam, J Jandova, A Cruz University of Arizona **Presenter:** Valentine Nfonsam MD, MS

7:10am - 7:15am

P 32. ESTIMATING THE PREDICTORS OF MORTALITY AFTER EMERGENCY GENERAL SURGERY IN GERIATRIC POPULATION: ANALYSIS OF 40.188 PATIENTS

S Gogna, P Kartik, J Con, P Anderson, A Policastro, J Feeney, W Marshall, R Latifi Westchester Medical Center **Presenter:** Shekhar Gogna MD

7:15am - 7:20am

P 33. FULL BODY SCAN BEFORE DEFINITIVE PELVIC BLEEDING CONTROL: VECTOR OF INJURY IN MAJOR PELVIC FRACTURE CANNOT PREDICT DISTINCT INJURY PATTERNS

JR Coleman, EE Moore, DR Vintimilla, JT Nelson, JM Samuels, NG Vigneshwar, MG Bartley, J Parry, A Sauaia, MJ Cohen, C Mauffrey University of Colorado, Denver **Presenter:** Julia R Coleman MD, MPH 7:20am - 7:25am

P 34. PARATHYROIDECTOMY HAS BETTER OUTCOMES THAN PARATHYROID ABLATION IN PATIENTS WITH MAJOR COMORBIDITIES

AM Khokar, K Kuchta, TA Moo-Young, DJ Winchester, RA Prinz NorthShore University HealthSystem **Presenter:** Amna Khokar MD

7:25am - 7:30am

P 35. ONCOLOGIC VASCULAR RESECTION DURING PANCREATECTOMY - EVALUATION OF A MULTIDISCIPLINARY APPROACH

KA Kelly-Schuette, CJ Fernstrum, CM Jaggi, D Kohli, RN Saunders, MM Assifi, GP Wright, MH Chung, MA Mansour MSU - Spectrum Health **Presenter:** Kathrine A Kelly-Schuette DO

ePoster Session 2, Kiosk 2

Moderator: James Madura MD | Mayo Clinic Arizona

6:45am - 6:50am

P 36. PEDIATRIC CERVICAL SPINE INJURY IN THE UNITED STATES: DEFINING THE BURDEN OF INJURY, NEED FOR OPERATIVE INTERVENTION AND DISPARITIES IN IMAGING ACROSS TRAUMA CENTERS

W Kim, N Ahn, A Ata, M Adamo, M Edwards Albany Medical Center **Presenter:** Woihwan Kim MD

6:50am - 6:55am

P 37. AGE, TRAUMATIC RUPTURE OF THE AORTA AND TORSO FRACTURES: AN UNEXPECTED ASSOCIATION

F Bokhari, F Bryan, F Bajani, C Fu Stroger Hospital of Cook County **Presenter:** Francesca Bryan MD

6:55am - 7:00am

P 38. URGENT VS EMERGENT NEED FOR ORTHOPEDIC SURGEONS IN ORTHOPEDIC TRAUMA PATIENTS: AN NTDB ANALYSIS

F Bokhari, G Saadat, F Bajani, C Fu Stroger Hospital of Cook County **Presenter:** Ghulam Saadat MD

7:00am - 7:05am P 39. AIRWAY INJURY IN PENETRATING NECK WOUNDS: DOES BMI MATTER?

F Bokhari, F Bajani, C Fu Stroger Hospital of Cook County **Presenter:** Francesco Bajani MD

7:05am - 7:10am P 40. ANGIOEMBOLIZATION AND BLUNT PELVIC FRACTURES: DOES TIME TO PROCEDURE MATTER?

F Bryan, F Bokhari, F Bajani, C Fu Stroger Hospital of Cook County **Presenter:** Francesca Bryan MD

Tuesday, November 5, 2019

7:10am - 7:15am

P 41. INCIDENCE AND PREDICTORS OF BRAIN METASTASIS IN PATIENTS WITH COLORECTAL CANCER

V Nfonsam, E Thompson, A Muse, Z Alattar, M Hamidi University of Arizona Presenter: Eli Thompson MS

7:15am - 7:20am

P 42. USING MACHINE LEARNING TO PREDICT RESPIRATORY FAILURE IN PATIENTS ADMITTED WITH ACUTE PANCREATITIS

S Bolourani, MD Giangola NorthShore University HealthSystem **Presenter:** Siavash Bolourani MD

7:20am - 7:25am P 43. FATAL GASTROINTESTINAL BLEEDING IN A CASE OF COAT'S PLUS SYNDROME

V Armstrong, M Jeraq, G Klimovich, KA Rao, P Byers University of Miami Miller School of Medicine **Presenter:** Valerie Armstrong MS

7:25am - 7:30am **P 44. BILIARY DYSKINESIA AFTER LINX® PROCEDURE** *KJ Thompson, GE Kimm, E Speer, DK Davis-Merritt* Saint Joseph Hospital **Presenter:** Kyle Thompson

ePoster Session 2, Kiosk 3

Moderator: Bellal Joseph MD | University of Arizona

6:45am - 6:50am

P 45. ADHERENCE TO CURRENT GUIDELINES FOR ANTIBIOTIC DURATION IN ACUTE DIVERTICULITIS

CP Saclarides, CP Saclarides, R Jacobson, K Millikan Rush University Medical Center **Presenter:** Constantine P Saclarides MD

6:50am - 6:55am

P 46. ARE PATIENTS MANAGED NON-OPERATIVELY FOR APPENDICITIS AT RISK FOR MISSED MALIGNANCIES

LA Uribe, DJ Saltzman, MD Girgis, M Maggard-Gibbons, GJ Moran, A Krishnadasan, K Pathmarajah, Y Perez, R Padilla, DA Talan Olive View-UCLA Medical Center Education Research and Institute **Presenter:** Lisandra A Uribe BS

6:55am - 7:00am

P 47. NATIONWIDE TRENDS IN THE MANAGEMENT OF COMPLICATED APPENDICITIS

K Matsushima, AF Sabour, M Schellenberg, ET Alicuben, A Stromwasser, K Inaba, D Demetriades University of Southern California **Presenter:** Andrew Sabour MD

7:05am - 7:10am

P 49. DIFFUSE INFLAMMATION SECONDARY TO URACHAL CYST: A CLINICAL CHALLENGE

VL Armstrong, K Khazeni, A Rosenberg, MG Moller University of Miami Miller School of Medicine **Presenter:** Valerie Armstrong MS

7:10am - 7:15am

P 50. LIFE THREATENING RARE SECOND OCCURRENCE OF HELLP SYNDROME AND LIVER CAPSULE RUPTURE

K Curfman, D Dodson, M Antony, S Morrissey Accreditation Council for Graduate Medical Education (ACGME) **Presenter:** Karleigh R Curfman MD

7:15am - 7:20am

P 51. NECROTIZING FASCIITIS FOLLOWING PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG)

J Pang, R Miskimins University of New Mexico **Presenter:** Joyce H Pang MD

7:20am - 7:25am

P 52. LAPAROSCOPIC ADRENALECTOMY FOR GIANT RIGHT ADRENAL MASS

S Alsafran, T Vaghaiwalla, D Schuitevoerder, B Ruhle, P Angelos, E Kaplan, X Keutgen University of Chicago **Presenter:** Salman Alsafran MBBCh

7:25am - 7:30am P 53. THE "RUNNING SUTURE": A NEW TECHNIQUE FOR DELAYED PRIMARY CLOSURE OF LOWER EXTREMITY FASCIOTOMY INCISIONS

KJ Sharma, SEB Strot, MA Mansour, RF Cuff MSU - Spectrum Health **Presenter:** Kush J Sharma MD



P 1. INCIDENCE AND RISK FACTORS FOR ACUTE KIDNEY INJURY IN SEVERELY INJURED PATIENTS USING CURRENT KDIGO DEFINITIONS

BJ Emigh, SL Sahi, LN Teal, JC Blake, CH Heron, PG Teixeira, TB Coopwood, TC Cardenas, JD Aydelotte, S Ali, CVR Brown The University of Texas at Austin

Background: Acute Kidney Injury (AKI) is a significant cause of morbidity and mortality for critically injured trauma patients. The Kidney Disease Improving Global Outcomes (KDIGO) practice guideline is the most up-to-date classification for acute kidney injury (AKI), providing a uniform definition merging the traditional RIFLE and AKIN criteria. The specific aims of this study were to determine the incidence and risk factors for AKI in critically injured trauma patients using the current KDIGO definitions.

Methods: A prospective cohort study was performed at our academic, Level I trauma center from September 2017 to August 2018. All adult trauma patients admitted to the surgical ICU were included. General variables collected included demographics, comorbidities, admission physiology, injury severity score (ISS), and abbreviated injury scales (AIS) for each body region. AKI specific variables included transfusions, crush injury, rhabdomyolysis, radiocontrast, sepsis, nephrotoxic medications, and vasopressors. The primary outcome was the development of AKI defined as KDIGO Stage ≥1 (serum Cr increase ≥1.5 baseline or serum Cr increase ≥0.3 mg/dL or urine output < 0.5 ml/kg/hr for ≥6 hours). Secondary outcomes include mortality, ICU length of stay, and ventilator days. Univariate and multivariate analyses were performed to identify significant risk factors independently associated with AKI.

Results: A total of 466 patients were included in the analysis and 67% (n=314) developed AKI. Patients who developed AKI were more often hypotensive on admission (7% vs. 2%, p=0.02), had a higher ISS (19 vs. 13, p<0.0001), and more likely to have severe injuries (AIS \geq 3) to the chest (40% vs 24%, p=0.0005) and extremities (20% vs 6%, p<0.0001). Patients with AKI were more often transfused (41% vs. 21%, p<0.0001), sustained a crush injury (8% vs. 1%, p=0.002), developed rhabdomyolysis (7% vs. 0%, p=0.001), received a radiocontrast agent (75% vs. 47%, p<0.0001), nephrotoxic medications (74% vs. 60%, p=0.002) or vasopressors (15% vs. 3%, p=0.002). After multivariate analysis, risk factors independently associated with development of AKI include: age (OR[95% CI] 1.015[1.004, 1.026], p=0.006), extremity AIS \geq 3 (2.942[1.357, 6.379], p=0.006), ISS (1.030[1.006, 1.054], p=0.01), use of radiocontrast (2.059[1.295. 3.275], p=0.02), and need for vasopressors (2.836[1.060, 7.591], p=0.04). Those who developed AKI had longer ICU stays (8 vs. 5 days, p<0.0001), spent longer time on the ventilator (3.2 vs. 0.9 days, p<0.0001), and had higher mortality (9% vs 2%, p=0.005).

Conclusion: Under the current definitions, the incidence of AKI was found to be higher than previously reported. Older patients with more severe injuries to the extremities are the most at-risk. Modifiable risk factors, such as radiocontrast and vasopressors, should be used judiciously to minimize the incidence of AKI in the surgical ICU and require further study. AKI in severely injured patients is associated with worse outcomes including higher mortality.

P 2. RETENTION OF LAPAROSCOPIC SURGICAL SKILLS AMONG SURGICAL INTERNS AFTER A STANDARDIZED ASSESSMENT

RU de Azevedo, V Yeh, A Rajesh, J Lentz Carvalho, A Chandra, CM Backstrom, N Shaikh, MS Baloul, Anne Kamphausen, M Rivera, DR Farley Mayo Clinic Rochester

Background: Our "Surgical Olympics" evaluates General Surgery interns on basic surgical skills and knowledge. The 16 station assessment includes three Fundamental of Laparoscopic Skills (FLS) tests: intracorporeal knot tying (IKT), peg transfer (PT), and circle cut (CC). Interns are tested upon matriculation into the residency program in July and then re-tested in January to track performance. In between tests, surgical interns attend a regimented Friday Surgical Simulation Curriculum involving hands-on training sessions in which they are offered an opportunity to practice and learn under guidance of surgeon educators. In the January assessment (JA), surgical interns historically have shown at least a 40% increase in scores compared to their July performance. Despite such improvement, it is unknown what happens to their laparoscopic skills as the intern year concludes. There is a paucity of literature documenting the retention/ deterioration of laparoscopic skills with time. We aimed to investigate interns' ability to retain laparoscopic surgical skills in three different FLS stations (IKT, PT, and CC) from February to May of their intern year.

Methods: Interns were assessed with two unannounced FLS assessments between February and May of their intern year. These two retention tests were conducted at roughly 50 days and 100 days after JA. Of the initial 22 interns who participated in the JA, a total of 21 and 19 participated in the first and second retention tests, respectively.

Results: For IKT, the mean time taken to complete the task increased over time from JA to the first retention test 133.7s vs. 138.9s (n = 21; p = 0.5905) and from JA to the second retention test 110.5s vs. 140.0s (n = 19; p-value 0.0224). For PT, the mean time taken to complete the task during the first retention test dccreased since the JA (65.9s vs 70.5s [n = 21]; p-value=0.1378) and further decreased to 54.8s on the second retention test compared to 64.8s on JA (n = 19; p-value=0.0232). For CC, the mean time taken for task completion increased during the first retention test compared to the JA (115.8s vs. 108.5s [n = 21]; p-value=0.6746). However, the speed was found to be better during the second retention test (86.8s vs. 108.5s on JA [n = 19]; p-value = 0.0008).

Conclusion: The retention of laparoscopic PT and CC skills were better compared to IKT. While the performance on PT and CC continued to improve from JA to the second retention test, speed on the more complex IKT skill declined significantly. Continuous training should be encouraged to maintain these acquired skills, especially for IKT. Future studies are needed to identify the optimal practice schedule and predictors of better retention of laparoscopic skills.

P 3. PROPENSITY MATCHED ANALYSIS OF ROBOTIC COMPARED TO LAPAROSCOPIC ESOPHAGECTOMY

A Grigorian, S Gambhir, NT Nguyen, BR Smith, S Daly, M Lekawa, J Nahmias University of California, Irvine Medical Center

Background: Minimally invasive esophagectomy has been shown to have similar perioperative outcomes as well as oncologic survival compared to open surgery. Robotic esophagectomy is an emerging operation. We hypothesized that robotic esophagectomy (RE) and laparoscopic esophagectomy (LE) would have similar oncologic and perioperative outcomes including anastomotic leak, length of stay (LOS) and 30-day readmission rate.

Methods: The 2016-2017 American College of Surgeons National Surgical Quality Improvement Program Procedure-Targeted Esophagectomy database was queried for those that underwent RE or LE. Propensity scores were calculated to match patients in a 1:1 ratio based on age, comorbidities, preoperative tumor staging, and preoperative chemotherapy/radiation. Patients with open-assist or conversion to open procedure were excluded.

Results: A total of 97 patients undergoing RE were matched to 97 patients undergoing LE. There was no difference in matched characteristics including age (median, 63 vs. 64-years, p=0.57), comorbidities (p>0.05), pre-operative chemotherapy (66.0% vs. 70.1%, p=0.53) or radiation (64.9% vs. 68.0%, p=0.57). Both groups had similar preoperative staging with most being T3 (RE 50.5%, LE 47.4%, p=0.63), N0 (RE 29.9%, LE 38.1%, p=0.16) and M0/Mx (RE 64.9%, LE 54.6%, p=0.18). Compared to LE, patients undergoing RE had a higher rate of post-surgical pathologic complete response (17.5% vs. 14.4%, p=0.044) and lower rate of adenocarcinoma subtype (59.8% vs. 76.3%, p=0.044). Both groups had similar rates of positive margins (RE 6.2%, LE 7.2%, p=0.68), anastomotic leak (RE 15.5%, LE 16.5%, p=0.84), 30-day readmission (RE 16.5%, LE 11.3%, p=0.30), pneumonia (RE 7.2%, LE 3.1%, p=0.31), pulmonary embolism (RE 4.1%, LE 2.1%, p=0.41) and 30-day mortality (RE 0%, LE 3.1%, p=0.31), pulmonary staging with most being T3 (RE 21.6%, LE 36.1%, p=0.31), N0 (RE 53.6%, LE 4.5%, p=0.59) and M0/Mx (RE 63.9%, LE 54.6%, p=0.45). Patients undergoing RE had a digment and decreased mean LOS (10.3 vs. 12.0 days, p=0.001).

Conclusion: In a propensity matched cohort analysis, those undergoing robotic and laparoscopic esophagectomy have similar rates of anastomotic leak, complications, re-admission and 30-day mortality. Robotic esophagectomy was associated with a decreased length of stay. Oncologic pathologic staging and rates of positive margins are similar between both groups.

P 4. EVERY MINUTE COUNTS: THE IMPACT OF PRE-HOSPITAL RESPONSE TIME AND SCENE TIME ON MORTALITY OF PENETRATING TRAUMA PATIENTS

A Nasser, C Nederpelt, M El-Hechi, A Mendoza, N Saillant, M Rosenthal, P Fagenholz, D King, G Velmahos, H Kaafarani Massachusetts General Hospital

Background: Prompt surgical control of hemorrhage is crucial in penetrating trauma patients. We aimed to study the specific impact of prehospital response time (PreRespT) and scene time (SceneT) on hospital mortality.

Methods: Using the Trauma Quality Improvement Program (TQIP) 2010-2016 nationwide database, we identified all patients older than 16 who sustained a penetrating injury. We defined PreRespT as time from the EMS dispatch to scene arrival, and SceneT as time from ambulance scene arrival to departure. Univariate then multivariable logistic regression analyses were performed to study the independent correlation between PreRespT and SceneT on hospital mortality, adjusting for demographics (e.g. age, gender, race/ethnicity), comorbidities (e.g. renal failure, alcoholism, cirrhosis), Injury Severity Score, heart rate and systolic blood pressure on scene, transport mode/time, and the US region where the injury occurred.

Results: Out of a total of 1,403,470 patients, 43,467 patients were included; 6,729 patients died during the hospitalization (15.48%), 83% of which within the first 48 hours. The mean PreRespT and SceneT were 6.2 and 7.1 minutes, respectively. Multivariable analyses suggested that: 1) every minute increase in PreRespT independently correlates with a 2% increase in mortality (OR 1.02, 95% CI 1.01-1.03, p<0.0001), and 2) every minute increase in SceneT independently correlates with a 1% increase in mortality (OR 1.01, 95% CI 1.003-1.01, p=0.001). The Area Under the Curve of the model was 0.90.

Conclusion: In the penetrating injury trauma patient, every additional prehospital minute counts and independently correlates with hospital mortality. This data suggests that a faster response time and a "scoop and run" strategy would be more appropriate in this patient population.

P 5. CONTEMPORARY EPIDEMIOLOGY, MANAGEMENT AND OUTCOMES OF BRACHIAL ARTERY INJURIES

JC Webb, JJ DuBose, CVR Brown, JB Holcomb, J Sharpe, JJ Morrison, TM Scalea, D Skarupa, RD Catalano, J Kim, K Inaba, N Poulin, J Myers, JK Bini, PGR Teixeira The University of Texas at Austin

Background: Ongoing progress and dissemination of endovascular techniques have brought this treatment modality to the trauma setting, with endovascular approach now being used to treat injuries in a variety of arterial locations. The aim of this study was to use a multicenter AAST prospective registry to provide a contemporary assessment of the epidemiology of brachial artery injuries and identify management trends and current outcomes.

Methods: All patients with a brachial artery injury in the registry (2013-2018) were identified. Patients with other associated arterial injuries in the upper extremities were excluded. Variables collected included demographics, presentation vital signs and GCS, injury severity scores, fluids and blood products utilization, use of systemic anticoagulation and antiplatelet therapy, management strategy (nonoperative, open repair and endovascular repair). Outcomes included mortality, amputation, need for reoperation, fasciotomy.

Results: During a 6-year period, 233 patients with a brachial injury were admitted to the 22 trauma centers contributing with data for the registry. Patients were on average 32±8 years old, mostly males (79%), sustaining a penetrating mechanism (73%). At presentation 11% were hypotensive and 12% had a GCS <=8. Hard signs of vascular injury were present in 75% of the patients. Associated fracture was present in 31% of the cases. The brachial artery injury was diagnosed on surgical exploration in 76% of the cases. Imaging modalities used for those who required diagnostic confirmation included CT angiogram (74%), duplex ultrasound (14%) and angiogram (12%). Most injuries were a complete transection (70%), followed by occlusion (18%), flow limiting defect (10%) and pseudoaneurysm (2%). Open repair was the treatment of choice in 93% of the patients (65% had an interposition graft using autogenous vein, 31% were primarily repaired and 2% had an interposition with synthetic graft). Procedural systemic anticoagulation was used in 60% of the cases. Only 5 patients (2%) underwent endovascular repair with an endostent graft. Overall, 18% underwent a fasciotomy (40% prophylactic, 58% therapeutic at the initial operation, and 2% therapeutic at a subsequent operation). Definitive closure was achieved in 68% of the fasciotomies. Mortality was 5% and amputation rate 2%. Ten percent of the patients required reintervention.

Conclusion: Despite advances in endovascular techniques, the management of brachial artery injuries remains primarily operative, with most patients requiring an interposition graft.
P 6. IMPACT OF NEOADJUVANT CHEMOTHERAPY ON THE OUTCOMES OF CYTOREDUCTIVE SURGERY & HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY FOR COLORECTAL PERITONEAL METASTASES: A MULTI-INSTITUTIONAL RETROSPECTIVE REVIEW

LP Suarez-Kelly, EW Beal, CW Kimbrough, FM Johnston, J Greer, DE Abbott, C Pokrzywa, M Raoof, B Lee, T Grotz, J Leiting, K Fournier, AJ Lee, S Dineen, B Powers, J Veerapong, JM Baumgartner, C Clarke, TC Gamblin, C Staley, MY Zaidi, SH Patel, V Dhar, L Lam The Ohio State University Wexner Medical Center

Background: Cytoreductive surgery (CRS) with or without hyperthermic intraperitoneal chemotherapy (HIPEC) is associated with improved survival outcomes for patients with colorectal peritoneal metastases (CR-PM). The role of neoadjuvant chemotherapy (NAC) prior to surgery for resectable metastatic colorectal cancer (e.g. liver metastases) is currently debated and the impact of NAC on the outcomes of patients with CR-PM undergoing CRS-HIPEC is poorly understood.

Methods: A retrospective review of adult patients with CR-PM who underwent CRS +/-HIPEC at 12 U.S institutions from 2000-2017 was performed. After excluding those with extraperitoneal disease, the short- and long-term outcomes of patients who did and did not receive NAC were directly compared.

Results: Among 298 patients with isolated CR-PM who underwent CRS-HIPEC, 196 (65.8%) received NAC while 102 (34.2%) did not. Chemotherapy regimens varied but 54.1% included bevacizumab. For the entire cohort, the median age was 56.5 years and 54% were female. There was no significant difference between the two groups with regards to age, gender, ASA class, performance status, synchronous vs. metachronous disease, tumor grade, history of prior CRS, or receipt of adjuvant chemotherapy. Patients who received NAC had lower peritoneal cancer index (PCI) score (12.1+7.9 vs. 14.3+8.5, p=0.034), shorter operative time (7.7+2.9 vs. 8.7+2.7 hours, p=0.013), and higher completeness of cytoreduction (CCR)-0 rate (74.0% vs 65.7%, p=0.14) compared to those who did not receive NAC. There was no significant difference in 30-day overall complication rates (60.7% vs. 59.8%, p=0.672), grade III/IV complication rates (22.4% vs. 16.7%, p=0.650), readmission rates (32.3% vs. 23.5%, p=0.114), or mortality rates (1.5% vs 2.9%, p=0.411) between the NAC and no NAC groups, respectively. Patients who underwent NAC prior to CRS +/- HIPEC experienced a longer overall survival (OS) (median 32.7 vs. 22.0 months, p=0.044) but similar recurrence-free survival (RFS) (median 13.8 vs. 13.0 months, p=0.456) compared to those who did not receive NAC. After controlling for confounding factors, NAC was not independently associated with improved OS (OR 0.80, 95% CI 0.54-1.17) or RFS (OR 1.04, 95% CI 0.74-1.47). On multivariate Cox regression analysis increasing PCI score (OR 1.05, 95% CI 1.03-1.08) and CCR score (CCR-1: OR 2.18, 95% CI 131-3.63; CCR-2/3: OR 2.37, 95% CI 1.31-5.00), and synchronous CR-PM (OR 0.63, 95%CI 0.42-0.94) were significantly associated with OS.

Conclusion: Among patients who underwent CRS +/- HIPEC for CR-PM, the use of NAC was associated with improved OS though this did not persist after multivariate correction. The ability of NAC to downstage disease burden (ie PCI) and facilitate complete cytoreduction (CC0) warrants further investigation via randomized controlled trials. NAC followed by CRS +/- HIPEC is a safe and feasible strategy for CR-PM, which may aid in the appropriate selection of patients for aggressive cytoreductive surgery.

P 7. SPLENECTOMY FOR BENIGN AND MALIGNANT HEMATOLOGIC PATHOLOGY: AN IMPORTANT DIAGNOSTIC AND THERAPEUTIC ADJUNCT

W Alobuia, K Perrone, DJ Iberri, RS Brar, DA Spain, JD Forrester Stanford University

Background: Medical therapies are increasingly used as first- and second-line therapy for patients with benign or malignant hematologic splenic pathology. Despite the acceleration and availability of these therapies, surgery may be required for diagnosis, recalcitrant disease, or complications such as splenic rupture. Physician and patient perceptions of peri-operative and long-term risks associated with splenectomy may dissuade them from pursuing surgical intervention. We describe the modern morbidity, mortality, and long-term outcomes associated with splenectomy for benign and malignant hematologic conditions.

Methods: We performed a retrospective analysis of all non-trauma splenectomies performed for benign or malignant hematologic pathology from January 1, 2009-September 15, 2018. Variables assessed included: demographics, pre-existing co-morbidities and laboratory results, intra- and post-operative features, and long-term follow-up. Outcomes of interest included post-operative complications, 30-day mortality, and overall mortality. Fisher's Exact and Mann Whitney U-test were used for univariate analysis where appropriate. Multivariate logistic regression was used to assess predictors of post-operative complication and mortality. Stata 12.0 (StataCorp, College Station, TX) was used for statistical analyses.

Results: We identified 161 patients who underwent splenectomy for hematologic disorders from 2009-2018. Median age was 54 years (range 19-94) and 78 (48%) were male. Ninety-five (59%) splenectomies were performed for benign conditions, with idiopathic thrombocytopenic purpura responsible for 60 splenectomies (63% of benign causes). Sixty-six (41%) splenectomies were performed for malignant conditions, the most frequent was marginal zone lymphoma (n=13, 20% of malignant causes). Most splenectomies were laparoscopic (n=122, 76%), followed by laparoscopic hand-assisted (n=18, 11%), open (n=12, 8%), and laparoscopic converted to open (n=9, 6%). Median follow-up was 761 days (range 2-3560). Complications included: 9 (6%) portal (PVT), mesenteric (MVT), or splenic vein thrombosis (SVT); 5 (3%) each - post-operative bleed requiring transfusion, deep vein thrombosis (DVT) or pulmonary embolism (PE), and surgical site infection; 4 (2%) sepsis; 3 (2%) pneumonias; 2 (1%) pancreatic leaks; and 1 (1%) each - acute kidney injury, overwhelming post-splenectomy sepsis and reoperation for bleeding. Use of postoperative DVT chemoprophylaxis was not associated with prevention of clotting pathologies (P=0.8), nor was chemoprophylaxis associated with increased risk of bleeding (P=0.2). On multivariate analysis, no pre- or intra-operative variables were predictive of postoperative complications. Three (2%) patients died within 30 days. Fifteen (9%) patients died more than 30 days after their operation, none from surgical complications, with a median time to death of 447 days (range 44-2477). Among malignant cases only preoperative thrombocytopenia was predictive of death (odds ratio [OR]=5.8, 95% confidence interval [CI]=1.1-31.8, P=0.04). For benign cases, increasing age was associated with inferior survival (OR=2.3, 95%CI=1.0-5.1, P=0.05).

Conclusion: Splenectomy remains an important adjunct to the care of patients with benign and malignant hematologic pathology and can be performed with a low rate of complications. Use of perioperative DVT chemoprophylaxis was not associated with reduced clotting frequency, nor was its use associated with increased bleeding. Despite a considerable burden of co-morbid disease in these patients, early post-operative mortality was uncommon.

P 8. FRAILTY INCREASES HEALTHCARE UTILIZATION AFTER GENERAL AND VASCULAR SURGERY

A Kashikar, LA Graham, KA Rothenberg, EL George, CD Seib, M Kurella Tamura, TH Wagner, MT Hawn, S Arya Stanford University

Background: Frailty is associated with postoperative readmissions. However, less is known about the association of frailty with long-term healthcare utilization. The objective of this study is to examine the impact of frailty on healthcare utilization up to 2 years after surgery.

Methods: We identified Veterans who underwent general and vascular surgeries with a postoperative length of stay between 2 to 30 days utilizing the Veterans Affairs (VA) Corporate Data Warehouse (CDW) and VA Surgical Quality Improvement Program (VASQIP) database [2007-14]. Frailty was measured by the Risk Analysis Index (RAI) and categorized into: < 20 (Robust), 20-29 (Pre-Frail), 30-39 (Frail), >=40 (Very Frail). Patients were followed for 2 years after surgical discharge. Outcomes studied were inpatient admissions, outpatient visits and emergency department (ED) visits. Bivariate differences were assessed with chi-square tests and analysis of variance. Cox proportional hazards regression with competing risks was used to estimate the hazard of healthcare utilization in the 2 years after surgery. Piecewise regression modeling was used to explore variation in hazards over time for healthcare utilization by frailty categories.

Results: We identified 135,738 inpatients with 68.4% undergoing general surgery and 31.6% undergoing vascular surgery. The mean RAI at surgery was 24.0 (SD 7.4) with the following categorical distribution: RAI < 20: 25.3%; RAI 20-29: 57.1%; RAI 30-39: 13.9% and RAI >= 40: 3.7%. Patients were a mean age of 64 years (SD 11.5) [Female: 5.3%; Caucasian: 77.8%] with 6.5% admitted not from home. Overall 1-year mortality was 7.9%, which increased with frailty (Frail: 18.1%, Very Frail: 41.5%). In the 2 years after surgery, patients had an average of 1.5 inpatient visits (SD 2.4) with an average of 14.2 total inpatient days (SD 45.7). Over 2 years, they averaged 72.9 outpatient visits (SD 5.4) and 2.4 ED visits (SD 3.8). Frailty was associated with increased utilization across all outcomes in unadjusted analyses. After adjustment and accounting for the competing risk of death, RAI>=30 was associated with increased inpatient readmissions [Frail: Hazard Ratio (HR)=1.07; 95% Confidence Interval (CI)1.05-1.09 and Very-Frail: HR 1.08(1.04-1.12) vs. Robust category]. Frailty status was also associated with increased outpatient visits [Frail: HR 1.14(1.13-1.14) and Very Frail: HR 1.14 (1.13-1.16) vs. Robust category]. However, frailty was associated with fewer ED visits (Pre-frail: HR 0.82 (0.81-0.83); Frail: HR 0.94 (0.92-0.95); Very Frail: HR 0.92 (0.89-0.95) vs. Robust category. Using piecewise regression modeling, the increased risk of all healthcare utilization was the highest in first 6 months after surgery and remained significant up to 2 years for inpatient admissions for Frail and Very-Frail patients.

Conclusion: Frailty is a significant risk factor for increased healthcare utilization up to 2 years after surgery including inpatient admissions and outpatient visits but with reduced ED visits, probably due to competing risk of inpatient and outpatient visits, or non-VA healthcare utilization. Further research is necessary to include non-VA data and to understand ramifications of increased long-term healthcare utilization in frail surgical patients, especially in terms of cost and quality of life. Preoperative frailty screening can be useful to health care systems to identify high-need patients.

P 9. SLEEVE GASTRECTOMY AT THE TIME OF LIVER TRANSPLANT; EARLY EXPERIENCE AND RESULTS

E Calderon, K Harold, A Singer, D Pearson, AK Mathur, B Aqel, JA Madura Mayo Clinic Arizona

Background: Obesity is an epidemic in the United States with prevalence in some areas as high as 40%. At least one third of these patients develop nonalcoholic steatohepatitis (NASH), which is the second most common indication for liver transplantation. Unfortunately, management of obese patients with decompensated liver disease is challenging at best and prohibitively risky in most. This vulnerable population does not qualify for transplant listing with little chance of meaningful weight loss to enable listing. The aim of our study is to present our initial experience and bariatric outcomes of patients undergoing simultaneous liver transplantation and sleeve gastrectomy (SLTSG).

Methods: A prospectively-collected and maintained database of patients undergoing bariatric surgery at an MBSAQIP-accredited single institution was retrospectively queried to include all patients who underwent SLTSG. Weight loss, metabolic and surgical outcomes were analyzed.

Results: Seven SLTSG patients were identified. Mean age was 48.5 years with an average initial excess weight of 73.2 kg +/-21.8 and BMI of 44.4 +/-3.9. NASH-related cirrhosis was the cause of liver failure in all patients. Median MELD score was 19 (IQR 8-32) at the time of surgery. Median wait time was 72 days (IQR 16-189). Four patients received deceased after brain death (DBD) livers and three deceased after cardiac death (DCD) livers. Mean cold ischemia time was 5.72 hours +/-1.96. Median LOS was 9 days (IQR 8-12) and median follow-up was 12 months (IQR 3-17). Bariatric outcomes included a mean initial excess weight loss (IEWL) of 66.4% +/-29.3%. Hypertension resolved in one of two patients. None of the patients had preexisting diabetes mellitus. No patient experienced early sleeve-related complications, but one patient required conversion to Roux-en-Y gastric bypass due to reflux at 12 months. Transplant outcomes included early re-exploration in four patients, one graft loss requiring re-transplant, and biliary complications requiring early ERCP (n=2, POD 8 and POD 21). One-year patient and graft survival was 100% and 85.7%, respectively.

Conclusion: Simultaneous liver transplantation and sleeve gastrectomy is a feasible strategy for obese patients with advanced liver disease. It provides two simultaneous lifesaving procedures, neither of which would be performed independent of the other. Furthermore, this approach allowed for the treatment of the underlying disease of chronic obesity which had driven these patients to develop liver failure. The majority of patients experienced complications, all of which were transplant related; possibly related to donor liver quality and early postoperative coagulopathy. Sleeve gastrectomy enabled the performance of ERCP in the early transplant period and should be the bariatric operation of choice in this scenario for this reason.

P 10. SURGICAL NUTRITIONAL ACCESS IN MALNOURISHED ELDERLY UNDERGOING SURGERY FOR ACUTE ABDOMEN: A MISSED OPPORTUNITY TO IMPROVE OUTCOMES

S Gogna, J Con, A Policastro, P Anderson, P Kartik, DJ Samson, R Latifi Westchester Medical Center

Background: Nearly 50% of elderly (≥65 year old) undergoing emergency abdominal surgery are malnourished. The role of timely surgical nutritional access in this group of patients in unknown. The aim of this study was to assess the survival advantage of obtaining surgical nutritional access (feeding gastrostomy or jejunostomy) in elderly malnourished patients undergoing major surgery for acute abdomen.

Methods: The Nationwide Inpatient Sample (NIS) database from 2009 -2015 of malnourished patients ≥65 years old who underwent major surgery for acute abdomen (SAA) within first 2 days of hospital admission were analyzed. The propensity score matching was used to control for confounders.

Results: Of 3,246,721 patients analyzed, 4,311 patients met the criteria. Of these, only 507 (11.8%) patients had surgical nutritional access as an adjunct to SAA during same hospital admission (Group I), while 3,804 patients (88.2%) did not receive surgical nutritional access alongwith SAA (Group II). In the propensity-score-matched population there were 482 patients in each group. The mortality rate and post-operative gastrointestinal complications (paralytic ileus, anastomotic dehiscence and intestinal fistulae) in group I decreased by 38% (p value= 0.007) and 36% (p value = 0.006) respectively.

Conclusion: Only small number of patients undergoing major surgery for acute abdomen receive surgical nutritional access. Those who receive surgical nutritional access have lower rates of gastro-intestinal complications and mortality.

P 11. TA CASES: HAS THE 2014 ACGME MANDATE MADE A DIFFERENCE? AN 18-YEAR COMMUNITY HOSPITAL VS NATIONAL EXPERIENCE

P Jayanthi, MB Patel, VK Mittal Providence Park Hospital and Medical Centers/Michigan State University

Background: Teaching Assistant cases are a mainstay of surgical training, especially for the benefit of graduating residents. Since 2014, the ABS has required a 25 TA case minimum. Our program only counts intraoperative experience towards TA cases. Herein, we analyse our institution's 18 year experience compared to the national average and the ACGME requirement, both in overall numbers and breakdown by case type.

Methods: ACGME case log data was obtained from 2001-2018. We compared our program's average Teaching Assistant cases against national average and 50th percentile, before and after the institution of the required minimum in 2014 (2001-2014, 2014-2018). We compared our average number of TA cases against national percentiles and averages. The cases were also broken down by type, to evaluate which cases were being logged as Teaching Assistant cases; as well as a comparison before- and after- 2014.

Results: In 18 years, our program has graduated 52 of the 18,221 residents nationally. We noted an average 29.7 TA cases/year, with the average national 50th percentile of 28.1 from 2001-2018. A significant increase in case numbers was noted both for our program TA cases: 24.6 (2001-2014), 46.1 (2014-2018); and the national 50th percentile cases: 24.4 and 40.3, respectively. Our average percentile was 46.4 (pre-2014), and 61.5 (post-2014). The case-types logged were predominantly 'Biliary', 'Large Intestine', and 'Hernia' comprising 59.6% of the TA cases (2001-2018). Of those, laparoscopic cholecystectomy, laparoscopic appendectomy, inguinal hernia repair, and umbilical hernia repair were the most prevalent. No significant difference in case types were noted before and after 2014.

Conclusion: Teaching assistant cases are an invaluable educational resource for both junior and senior residents - fostering increased autonomy and comfort as the transition is made to attending status. Since the institution of the 2014 ACGME mandate, a marked increase is noted both in our program and nationally. The majority of our TA case-types involved intraoperative cases, of "bread-and-butter" general surgery - involving laparoscopic cholecystectomy, laparoscopic appendectomy, and both umbilical and inguinal hernia repairs. Unequivocally, we show that the 2014 TA case minimum requirement has made a difference. Hopefully this will continue to stimulate increased case numbers overall; thereby leading to more comfortable and capable graduating General Surgeons. However, wide variability is noted among programs in the types of cases that should count, with further clarification needed by the ACGME.

P 12. SHORTENING LENGTH OF STAY, REDUCING COST, AND IMPROVING OUTCOMES IN THE GERIATRIC TRAUMA PATIENT; A UNIQUE OPPORTUNITY IN A LEVEL 1 TRAUMA CENTER

C Decker, E Esposito, L DeFreest, C Rosati, A Ata, S Stain, L Duncan Albany Medical Center

Background: The management of geriatric trauma patients is fraught with challenges to not only hospital and healthcare system but to the admitting service as well. Overall frailty combined with mechanism of injury, associated medical comorbidities can often lead to extended hospital stays, quickly increasing the cost of healthcare in this population. This study was designed to evaluate the differences in outcomes among geriatric patients managed by a dedicated trauma service compared to the hospitalist service and its impact on hospital length of stay (LOS), cost, and complications.

Methods: This observational cohort study used the New York State Trauma Registry was used to evaluate the management and outcomes among geriatric trauma patients admitted to a single Level I trauma center. An institutional wide protocol to admit all trauma patients to a dedicated trauma service was instituted March 1st 2017. Patients one year leading up to this date (Preintervention) were compared with those admitted one year following this date (post-intervention) excluding a three month window to allow for a transition period. T-test and Chi-Squared analysis were used to compare the length of stay, the cost, and in hospital complications observed between the two groups. The institution's trauma database was used to determine the incidence of specific morbidities that occurred during hospital admission (Pulmonary Embolism, Acute Kidney Injury, Pneumonia, Myocardial Infraction, etc.).

Results: 1282 patients were included in the pre-intervention and compared to 1373 in the post-intervention group. There was a reduction in the average LOS between the control and post-intervention groups of 0.85 days (p=0.002) Controlling for injury severity there was a marked reduction in LOS for the ISS 10-15 category on the trauma service (2.03 days, p=0.004). Mortality was not significantly different between time periods. The average overall cost per patient was decreased by \$1174 (p=.17) in the post-intervention group which was approaching significance. However, in the group with ISS of 10-15, a mean difference of \$4391.00 per patient was observed (p<0.001)). The cost of the ICU patients had also demonstrated a significant reduction of average cost \$10391.00 (p=0.005). No specific complication demonstrated a significant tate of complications from 81 to 53 (P= 0.004)

Conclusion: Undergoing an institutional admission policy to coincide the American College of Surgeons accreditation standards for a Level I trauma center offered insight into caring for the geriatric patient population. Admitting these complex patients to a dedicated trauma surgery service not only shortened the length of stay but reduced the total cost as well. Moreover, the rate of complications often seen in these admitted patients were significantly reduced as well.

P 13. ANALYSIS OF FOUR DECADES OF MASS SHOOTINGS IN AMERICA: FATALITIES ARE ON THE RISE

J Avraham, N Shah, E Warnack, A Velez, C Berry, S Frangos, M Bukur, M Klein, C DiMaggio New York University School of Medicine

Background: Mass shootings have plagued the United States (US) for decades. Despite their regularity, scarce long-term descriptive epidemiological data exist. We analyze four decades of mass shootings.

Methods: Based on media reports, mass shooting data from 1982 to 2017 were obtained from three well-documented, independent, and open-source sets of data. Analyses were restricted to incidents confirmed by at least two sources, in which there were 4 or more fatalities (exclusive of the shooter) and not associated with motives such as gang violence or robbery. We analyzed the descriptive epidemiology and performed a linear regression to examine trends over time.

Results: Between 1982 and 2017, 78 mass shootings resulted in 714 deaths among 1,886 total victims (case-fatality ratio of 37.9%). The median number of mass-shooting victims per incident was 11, IQR [7, 19.75]. The majority of shooters were male (96%), Caucasian (60%), with a history of mental illness (66%). The median shooter age was 35y, IQR [23.75, 43.2]; 7.7% were under 18y and 17.9% under 21y. The incidence of mass shootings increased over time (p=0.001, R2=.278), as did the number of fatalities related to those shootings (p<0.001, R2=.307). 19.2% of incidents occurred in schools, and 79.4% of firearms were obtained legally—the largest cohort purchased at gun stores (32.1%).

Conclusion: Over four decades, mass-casualty shootings and their associated fatalities have increased. Most perpetrators were Caucasian men with a history of mental illness who obtained firearms legally. The descriptive epidemiology of mass shootings in the US presents opportunities for intervention and control.

P 14. ENHANCING THE EDUCATIONAL VALUE AND FACULTY PARTICIPATION OF A GENERAL SURGERY MORBIDITY AND MORTALITY CONFERENCE

JM Abdelsattar, K Musgrove, L Shaffer, U Khan, JW Marsh, DC Borgstrom West Virginia University

Background: Morbidity and Mortality conference (M&MC) is an integral component of resident education. However, there exists significant variation in the approach to and execution of M&MC. Furthermore, faculty attendance remains a working challenge. We sought to change our department's M&MC and hypothesized improved educational value and faculty participation.

Methods: All complications were submitted weekly in Clavien-Dindo format. A designated M&CMC moderator chose 3 complications or deaths to be presented the following week. A teaching point (TP) was assigned to each complication intended to be the focus of discussion, but not necessarily directly related to the complication. Presentations followed a structured 6-slide PowerPoint template (PPT). A Web-based tool using Google Forms was developed and distributed as an "App" for faculty and resident sign-in and tracking of attendance. An anonymous online survey was created and distributed to residents and faculty to elucidate perception of M&MC following the intervention.

Results: 46/63 surveys were returned (response rate 73%). 24 faculty (52%) and 22 residents (81%) responded. A predetermined TP was viewed as the most favorable change made by both faculty and residents. 67% of faculty and residents acknowledged improved educational value, 62% found a single moderator to help streamline M&XM presentations and 69% felt that a standard PPT improved quality of presentations. Residents (91%) were more likely than faculty (50%) to perceive that a predetermined TP improved the learning experience of M&MC (p = 0.003). Similarly, residents (90%) were more likely than faculty (62%) to believe the TP improved medical knowledge during preparation for M&MC (p = 0.02). The majority of residents and staff believed changes did not increase identification of quality improvement issues. However, more residents (82%) believed that changes to the department's M&M format allowed better identification of system factors (SFs) compared to faculty (33%), p = 0.0009. Faculty participation increased from 60% before changes to 80% after changes to M&C format (p = 0.03).

Conclusion: Both residents and faculty saw benefits to M&MC changes and a web-based signin "App" demonstrated improved faculty engagement. Residents were more likely to perceive improved medical knowledge, a better learning experience, and benefits to SF identification, perhaps because of their day-to-day close involvement in the hospital system.

P 15. COMPARISON OF SURGICAL TREATMENT PATTERNS FOR STAGE I-III INVASIVE RECTAL ADENOCARCINOMA BETWEEN THE NATION AND THE MOUNTAIN REGION

D Cheng, O Bardakcioglu, M Al-Hamad, DM Kirgan, JL Baynosa, C Cross, SJ Williams, CR St. Hill University of Nevada, Las Vegas

Background: Treatment patterns for invasive rectal adenocarcinoma vary across the nation. Nationwide, the use anterior resection (AR) over abdominoperineal resection (APR) has increased. There is currently no literature looking specifically at the Mountain Region (MR). In our region, we suspect the adoption of AR over APR has not been as pronounced. Additionally, we hope to explore the patterns of minimally invasive surgery (MIS) and robotic techniques.

Methods: Utilizing the National Cancer Database (NCDB), we identified 171,060 cases of Stage 1-III (AJCC 6th Edition) invasive rectal adenocarcinoma from 2004 to 2015 and divided them into two cohorts based on region, MR (AZ, CO, ID, MT, NM, NV, UT, WY; n=7,512) and National (all other states; n=163,548). Using logistical regression analysis, we compared surgical treatment patterns across several demographic and clinical strata. A subgroup analysis was performed within those receiving anterior resections and those receiving minimally invasive anterior resections.

Results: A greater proportion of patients in the MR (72.8%) received APR as their surgical treatment compared to National (71.1%, p=0.016). After controlling for differences between the MR and National, the odds of APR were 1.10 times higher in the Mountain Region compared to National (p<0.01). On subgroup analysis of anterior resections, the odds of receiving MIS versus open surgery was not significantly different between the National and Mountain regions (p=0.23). The odds of MIS was progressively higher with increasing income quartiles (p<0.01)and in those with any insurance compared to those with no insurance (p<0.01). Odds of MIS was 1.69, 1.75, and 1.76 times higher in Comprehensive Community Cancer Programs, Academic/ Research Programs, Integrated Network Cancer Programs, respectively, compared to Community Cancer Programs (p<0.01). On further subgroup analysis of those receiving minimally invasive AR, the odds of receiving robotic versus laparoscopic surgery was not significantly different between the National and Mountain regions (p=0.450). The odds of receiving robotic surgery was 1.76, 1.99, and 1.70 times higher in those with private insurance, Medicaid, and Medicare, respectively, compared to no insurance (p<0.01). Odds of robotic surgery was 1.96, 2.31, and 2.12 times higher in Comprehensive Community Cancer Programs, Academic/Research Programs, and Integrated Network Cancer Programs, respectively, compared to Community Cancer Programs (p<0.01).

Conclusion: Although National and MR patient populations were found to be different, when controlling for the differences, living in the MR had an increased odds of APR versus AR for treatment of Stage I-III invasive rectal adenocarcinoma. This suggests that adoption of AR over APR in the MR has not been as pronounced. The data also suggests that higher incomes, being insured, and treatment at Comprehensive Community Cancer Programs, Academic/Research Programs, and Integrated Network Cancer Programs increased the chances of a minimally invasive approach and a robotic approach. Further research will need to be conducted to investigate the effect of these differences in treatment patterns on peri-operative outcomes and survival.

P 16. SIMILAR OUTCOMES IN QUALITY OF LIFE BETWEEN MALE AND FEMALE PATIENTS UNDERGOING LAPAROSCOPIC INGUINAL HERNIA REPAIR

B Forester NorthShore University HealthSystem

Background: It has been speculated that female gender has unfavorable postoperative outcomes following hernia repair. Currently there has been minimal research comparing male and female outcomes following laparoscopic inguinal hernia repair (LIHR). The purpose of this study is to identify quality of life outcomes between male and female patients following LIHR. We hypothesize that there will be no difference in outcomes between male and female patients.

Methods: Male (n= 1,188) and female (n= 100) patients who underwent LIHR between 2009 - 2019 (n= 1,288) at a single institution were identified from a prospectively maintained quality database. All surgeries were performed by four board certified surgeons, using either total extraperitoneal (TEP) approach or trans-abdominal preperitoneal inguinal hernia repair (TAPP) approach . Quality of life was measured using the Surgical Outcomes Measurement System (SOMS) and Carolinas Comfort Scale (CCS) surveys that were given pre-operatively and at 3 weeks, 6 months, 1 year, and 2 years post-operatively. Comparisons were made between male and female patients using the Wilcoxon rank-sum test.

Results: At 1 year postoperatively there was no statistically significant difference between genders when looking at SOMS Pain Impact (p = 0.235), Pain VAS (p = 0.761), and Pain Quality (p = 0.663). At 2 years postoperatively there was no statistically significant difference between genders when looking at SOMS Pain Impact (p = 0.383), Pain VAS (p = 0.761), and Pain Quality (p = 0.663). There was also no statistical difference between male and female CCS scores at 1 year (p = 0.189) and 2 years (p = 0.869). There was no statistically significant difference between male (2.7%) and female (2.0%) recurrence rate (p = 0.678).

Conclusion: Female gender was not found to have decreased quality of life following laparoscopic repair of inguinal hernias.

P 18. AN ASSESSMENT OF GENERAL SURGEON CAREER SATISFACTION AND CHALLENGES IN THE 80-HOUR WORK WEEK ERA

JM Rasmussen, MM Najarian, JS Ties, AJ Borgert, KJ Kallies, BT Jarman Gundersen Health System

Background: The objective of this study was to identify factors and patterns of career and life satisfaction among general surgery residency graduates who completed all of their training after the implementation of duty hour restrictions.

Methods: An electronic survey was distributed to 2008-2018 graduates of 29 university and independent ACGME-accredited surgery residencies. The 91-point survey assessed experiences during medical school, residency, current surgical practice and work-life balance. The survey was distributed by program directors or administrators. Statistical analysis included chi-square and Cochran-Armitage trend tests.

Results: 335 surgeons completed the survey; (response rate=21%). 42% (n=141) were female. 79% (n=81) of female surgeons and 92% (n=138) of male surgeons reported overall career satisfaction (P=0.004). 97% and 94% of all respondents reported feeling competent to practice surgery and operate independently at the conclusion of their training. 72% (n=101) of female surgeons were counseled as medical students not to pursue general surgery as a specialty vs. 48% (n=94) of men (P < 0.001). 34% (n=48) of women experienced gender bias or discrimination while on their medical school surgery rotation, compared to 6% (n=12) of men (P < 0.001). This bias most frequently originated from patients (76%), attendings (75%), and nurses (71%), and the source of bias included men and women (87%). 62% (n=63) of female surgeons reported gender bias in their practice, compared to 4% (n=6) of men (P < 0.001). The source of this bias was most often patients (67%) and nurses (58%). 25% (n=26) of female surgeons and 13% (n=20) of male surgeons think surgical practice is worse than they expected as residents; whereas 39% (n=40) of women and 44% (n=66) of men think it is better than expected (P=0.05). 58% (n=59) of women and 69% (n=104) of men reported satisfaction with their work-life balance (P=0.12). Women were more likely than men to cite physical health as a primary need to achieve better work-life balance (53% vs 40%; P=0.02). Of respondents with children, female surgeons were more likely to think having a child negatively affected their career advancement (20% of mothers, vs 3% of fathers (P=0.004), and 18% of female surgeons and 9% of male surgeons do not think having a family is supported by their practice (P=0.02). If given the opportunity to choose a career again, 21% of female surgeons and 13% of male surgeons would choose a different profession (P=0.13), and 12% of female surgeons and 15% of male surgeons would become doctors but would choose a specialty other than general surgery (P=0.42).

Conclusion: General surgeons who completed the totality of their training after implementation of duty hour regulations are confident in their preparation for general surgery practice. Female surgeons were less likely to be satisfied with their career and report significantly more bias during all phases of their professional development and career. Work-life balance challenges were similar among men and women and a concerning number of respondents would choose a different career if given the opportunity. Efforts are necessary to reduce gender bias across the spectrum of general surgeon training/career and to promote well-being among surgeons in practice.

P 19. OUTCOMES FOR GENERAL SURGERY PROCEDURES IN ADULTS WITH COMPLEX CONGENITAL HEART DISEASE

M Castillo-Angeles, B Farr, BU Okafor, N Patel, R Ramsis, AR Opotowsky, R Askari, A Salim, D Nehra, SE Rice-Townsend Brigham and Women's Hospital

Background: Advances in medical and surgical care have resulted in an increasing number of patients with congenital heart disease (CHD) surviving to adulthood. Many of these adult patients undergo general surgery procedures however our understanding of the perioperative risk and associated outcomes is limited. We aimed to describe our institutional experience with adult survivors of complex CHD who undergo general surgical procedures.

Methods: This is a retrospective cohort study of adult patients (18 years or older) with a diagnosis of complex CHD who underwent general surgical procedures from 2007 to 2017 at one of two tertiary referral centers. Complex congenital heart disease was defined as structural heart disease requiring operative repair, excluding PDA, PFO, ASD. Primary outcome measures were in-hospital mortality and length of stay (LOS). Demographics and clinical characteristics were collected.

Results: 239 adult survivors of complex CHD underwent a general surgical procedure in the study period. Median age was 40 years (IQR 30–58) and 49% were female. Most common CHD diagnoses were pulmonary valve stenosis (14.6%) and Tetralogy of Fallot (13.8%). Most common surgical procedures were hernia repair (21.3%) and laparoscopic cholecystectomy (19.7%). Median age at the time of procedure was 32 years (IQR 18–50). Median LOS was 2 days (IQR 1–6). In-hospital mortality was 2.2%.

Conclusion: Adult survivors of complex congenital heart disease had an in-hospital mortality of 2.2% after general surgical procedures. As this population continues to grow, further work will be needed to better risk-stratify patients based on specific cardiac and non-cardiac characteristics.

P 20. LONG-TERM FUNCTIONAL AND MENTAL HEALTH OUTCOMES AFTER EMERGENCY GENERAL SURGERY (EGS): A PILOT STUDY

M Castillo-Angeles, E Stanek, GS Corwin, SC Fat, JP Herrera-Escobar, R Askari, A Salim, D Nehra Brigham and Women's Hospital

Background: EGS is associated with increased morbidity and mortality. Work is being done to better understand the causative factors of this increase, but there remains a gap in our understanding of long-term patient outcomes after hospital discharge. Herein our goal was to study the long-term functional and mental health outcomes of EGS patients.

Methods: This is a pilot study of adult patients who underwent any of the following EGS procedures: partial colectomy, small-bowel resection, operative management of peptic ulcer disease, lysis of peritoneal adhesions, and laparotomy. Patients were contacted 6-12 months after the EGS operation and asked to complete a telephone survey. This included screening for anxiety (GAD-7), depression (PHQ-8), post-traumatic stress disorder (PC-PCL-5), resilience (BRCS) as well as chronic pain, return to work and functional outcomes.

Results: 73 patients were contacted and 20 agreed to participate on the study. Mean age was 60 years (SD16.5), and 55% were male. 65% reported new physical limitations and 45% reported newly needing help with at least one activity of daily living. 5/20 (25%) of patients who were working prior to their operation had not yet returned to work. 10% screened positive for post-traumatic stress disorder (PTSD), 50% for mild-moderate depression and 15% for mild-moderate anxiety. 5 patients (25%) were determined to have low resilience.

Conclusion: The physical and mental health burden after undergoing an emergency general surgery procedure is not insignificant. Further work is needed to determine risk factors for poor outcomes so that early intervention strategies can be developed for the highest risk patients.

P 22. HYPONATREMIA AFTER ILEOSTOMY PROCEDURES: A COMMON COMPLICATION

S Sho, SC Lowe, AY Lin, K Kazanjian, MR Kwaan University of California, Los Angeles

Background: Acute kidney injury (AKI) in patients who have had an ileostomy created can occur in up to 15% of cases and is commonly attributed to volume depletion. Hyponatremia can also be caused by hypovolemia, and can contribute to symptoms such as nausea and poor appetite. The association of hyponatremia and ileostomy procedures has not been specifically studied. Our study hypothesis was that postoperative hyponatremia is common among ileostomy patients and associated with readmissions and prolonged length of stay (LOS). Hyponatremia is stratified as mild (serum sodium 130-134 mEq/L), moderate (120-129 mEq/L), and severe (less than 120 mEq/L).

Methods: Patients over 18 years who underwent ileostomy alone or as part of a colorectal resection between 3/2013 and 8/2018 were identified using CPT codes and retrospectively reviewed. The primary study outcome was postoperative hyponatremia in the 90 day postoperative period. The secondary outcomes were AKI, using the Kidney Disease: Improving Global Outcomes (KDIGO) definition, postoperative ileus/small bowel obstruction (SBO), infectious complications, prolonged LOS (longer than 10 days) and hospital readmission. Exclusions were preoperative AKI or dialysis or preoperative hyponatremia, or in-hospital death. Medical record retrospective review was performed. Multivariable analysis was performed using variables associated with outcomes on univariate analysis at the p<0.1 level. IRB approval was obtained.

Results: Of the 174 patients (49% female), 44% had procedures for cancer, and 39% for IBD, 15% for perforation and 13% for obstruction. Postoperative hyponatremia occurred in 48%. Moderate or severe hyponatremia was observed in 18 patients (10%); mild hyponatremia was observed in 65 (37%). AKI occurred postoperatively in 32 patients (18%). While 72% of hyponatremic patients did not meet criteria for AKI, patients with moderate/severe hyponatremia were more likely to have AKI than those with mild hyponatremia (56% vs 20%;p= 0.006). Older patients (60.7 vs 50 years;p=0.007), blacks (moderate/severe 28% vs mild 8% vs none 3%;p=0.002), and non-cancer diagnosis (moderate/severe 33% vs mild 32% vs none 55%;p=0.01) were associated with hyponatremia, but not sex, other races, IBD, perforation, obstruction, preoperative chemotherapy, antihypertensives, steroids, diuretics, or biologics. Readmission occurred in 17%. Hyponatremia was associated with readmission (moderate/severe 44% vs mild 23% vs none 8%;p=0.002), prolonged LOS (moderate/severe 50% vs mild 43% vs none 14%;p<0.0001), ileus/SBO (p=0.014), and infectious complications (p=0.0017). On multivariable analysis, post op AKI [Odds Ratio 3.0 (95%CI: 1.1-8.4)]; hyponatremia [OR 2.2 (95%CI: 1.1-4.4)], infectious complications [OR 4.7 (95%CI: 1.7-12.2)] were associated with readmission. Hyponatremia was not associated with prolonged LOS on multivariable analysis.

Conclusion: Postoperative hyponatremia is a separate event from postoperative AKI and is common in ileostomy patients. The development of hyponatremia is associated with multiple poor postoperative outcomes, and is a predictor for readmission, independent of postoperative AKI. This may contribute to high readmission rates after ileostomy procedures. Hyponatremia is likely related to hypovolemia and can contribute to postoperative symptoms which further limit oral intake, and therefore is an important outcome to monitor and treat in the postoperative period. However, it is possible that postoperative ileus and infections may cause hyponatremia rather than the ileostomy procedure itself.

P 23. INCREASING EXPOSURE AND TRAINING IN RURAL SURGERY: 3-YEAR DATA OF THE MONTANA RURAL SURGICAL RESIDENCY YEAR

DM Lotakis, C Sulzbach, G Ramos, R Zuckerman, D Sheldon New York Medical College at Metropolitan Hospital

Background: A total shortage of 41,000 general surgeons is anticipated by the year 2025, encompassing both the rural and urban setting. In a 2009 review by the American College of Surgeons it was found that roughly 9.5 million Americans live in counties that are not staffed by a general surgeon, 95% of which were in the rural setting. Multiple residency programs have sought to determine factors influencing graduates' choices to remain in general practice, particularly in a rural setting. This work has shown residents are more likely to take appointments in locations serving populations of less than 50,000 after receiving exposure to rural practice during their medical training. Our goal is to demonstrate the efficacy of a one-year rural training program.

Methods: A 12-month clinical experience completed following the third year of residency in lieu of research. A total of six months are spent in rural locations working with single and dual surgeon general practices in towns with populations less than 10,000. The remaining six months are comprised of subspecialty rotations, specifically Obstetrics & Gynecology, Gastroenterology, Plastic Surgery, Interventional Radiology, Urology, Neurosurgery, and Otolaryngology. Special focus is maintained on specific procedures during these rotations which have previously been identified in the literature as being prominent in rural practice.

Results: Three residents have currently completed the 12-month program. A two-fold increase in case load was seen from the first to second year after the program was created, a pace which is being maintained in the third year. A total of 351 and 797 cases were completed in the first and second year respectively; approximately forty-five percent in the rural setting. On average thirty-eight percent was comprised of colonoscopy and endoscopy. Subspecialty procedures that were deemed important to rural practice played a prominent role throughout the year comprising twenty-eight percent of the total volume. The inaugural fellow is currently applying for rural general surgery attending positions.

Conclusion: General surgeons are the lifeblood of critical access hospitals, increasing revenue for not only the hospital itself but also the community as a whole. Multiple institutions report greater than one million dollars of income are generated from the practice of a single surgeon. When critical access hospitals lose the presence of a surgeon, a ripple effect ensues potentially resulting in significant socioeconomic impact throughout the community. As the deficit of rural general surgeons rises throughout the United States so does the necessity for development of training opportunities to prepare residents for rural practice. Though solving the persistently unmet need for rural surgeons will require a multifaceted approach, we believe a major component is the creation of programs to expose residents to rural careers and lifestyle. In our experience, a one-year 'fellowship' program is a sustainable and successful model for increasing interest and preparing residents for rural practice.

P 24. FRAILTY MARKERS AS PREDICTORS OF OUTCOMES IN GERIATRIC TRAUMA PATIENTS

S Yu, A Karandikar, A Brandolino, RM Cerniglia, TP Webb, PA Codner Medical College of Wisconsin

Background: In recent literature, Frailty has emerged as a topic of increased importance in the management of geriatric healthcare. Frailty is a syndrome characterized by a decrease in physiologic reserve and reduced resilience to external stressors that predisposes patients to adverse outcomes. Due to the multitude of co-morbidities and decline in physiological function, clinical decision making has become a challenge in treating this population. The objective of this study is to evaluate the predictive capability of frailty markers –including the modified Edmonton Frail Scale (EFS), grip strength, and psoas muscle density (PMD) – on outcomes in geriatric trauma patients 65 years or older.

Methods: Patients aged 65 years or older who were admitted to our trauma surgery service were assessed for markers of frailty as part of standard of care. CT scans, which were available for a subset of these patients, were used to measure PMD in Hounsfield Units. The relationship of the previously stated frailty markers with patient outcomes including the number of complications, discharge disposition, and death were investigated. Data analysis was conducted with the use of SPSS.

Results: 180 patients were included in this study, with a mean age of 77 years. Of 180 patients, 78 had CT scans analyzed for PMD. Upon discharge, 93 patients were deemed to have favorable discharge disposition occurred in 87 patients (i.e. discharged to a facility. Unfavorable discharge disposition occurred in 87 patients sample t-test, patients with favorable discharge dispositions, on average, were found to have lower EFS scores (3.92 vs. 4.32, p=0.327), increased grip strength (49.91lbs vs. 39.94lbs, p=0.007), and larger PMD (47.53HU vs. 42.97HU, p=.040). No statistical significance was found between the number of complications and EFS (r=0.083, p=0.269), grip strength (r=-0.062, p=0.405) or PMD (r=-0.81, p=0.479). Mortality was not analyzed as only 5 deaths occurred within 30 days of discharge in this study.

Conclusion: In patients who were identified to have lower grip strength and PMD, there was an increased incidence of unfavorable discharge disposition. However, the same association was not seen when EFS was used as a marker of frailty. Likewise, a correlation between severity of frailty and the number of complications was not established. Further research is necessary to validate the efficacy of the modified EFS, grip strength and PMD as reliable measures of frailty. Development of feasible, reliable and valid assessments of frailty can help physicians identify patients at-risk for poor health outcomes and tailor therapeutic interventions accordingly.

P 25. CORE PRINCIPLES OF PALLIATIVE CARE CONSULTATION FOR SURGICAL ONCOLOGY PATIENTS

CP Scally, K Robinson, E Bruera, BD Badgwell The University of Texas MD Anderson Cancer Center

Background: Palliative medicine is an important component of care for patients with advanced cancer. Previous studies demonstrated that surgeons tend to underuse palliative care in comparison with medical services. Furthermore, little is known about the specific indications for use of palliative care services among surgeons, nor about the specific palliative care needs of patients undergoing surgical intervention. Therefore, we designed and performed the present study to evaluate the use of palliative care in cancer patients undergoing surgery.

Methods: A single-institution retrospective review of consecutive palliative care consultations within a large National Cancer Institute-designated comprehensive cancer center in 2016-2017 was conducted. Indications for palliative care consultation and palliative care service recommendations were compared between surgical and medical patients. Patient performance status and patient reported symptoms were assessed and compared using previously validated symptom indices.

Results: We analyzed 120 patients (60 surgical and 60 medical). Patient demographics in the two groups were similar. The surgical oncology patients were more likely to undergo consultation for end-of-life and advanced care planning issues (32% vs. 13%; p = 0.02). Medical oncology patients were more likely to undergo consultation for pain and other symptom management (97% vs. 62%; p < 0.001). Symptom assessment scores for the medical patients demonstrated higher and more common reports of dyspnea and malignancy-related pain than in the surgical patients. In addition, palliative care recommendations and interventions for the inpatient palliative care unit. For medical oncology patients, recommendations more often included changes in pain and bowel regimen medications and code status change to "do-not-resuscitate".

Conclusion: Surgical oncology patients were less likely to undergo palliative care consultation for assistance with symptom management and more likely to undergo consultation for assistance with end-of-life/advanced care planning discussions than were medical oncology patients. Surgeons may benefit from increased education regarding the breadth of services offered by palliative care consultation. Given the frequency of consultation for advanced care planning, initiating and discussing these issues with patients should be an area of focus in palliative care education for surgeons.

P 26. USING AN ESCAPE ROOM TO INVESTIGATE TEAM COHESION

T Cohen, B Bancroft, S Francis, A Koka, E Lazzara, B Chaparro, J Keebler, B Gewertz Cedars-Sinai Medical Center

Background: The "OR360 Escape Room' was developed to study team behavior and enhance team cohesion. In this standardized exercise, teams of 4-6 people work together to solve challenging problems for clues which allow them to "escape" the room as quickly as possible. To succeed, participants must demonstrate mutual performance monitoring, effective communication including closed-loop communication, implicit coordination strategies, and task-related assertiveness. The purpose of this study was to investigate the value of this exercise for team building in the health care environment

Methods: 16 teams were studied (n=70 participants, 53 females,17 males) with an interrupted time-series design incorporating detailed pre- and post-experience questionnaires. We collected detailed demographics along with scaled measures of Team Role type, Team Effectiveness, Group Cohesion and Motivation. Team Performance (as measured by time required to escape and number of hints used), and satisfaction with the experience were also assessed.

Results: Only 6 teams (33%) successfully "escaped" in the allotted 45 minutes. Irrespective of the success in "escaping," clear improvements in most indices of teamwork were seen. Group cohesion scores significantly increased from 6.16 (pre) to 6.56 (post) t(69) = 3.623 p < .05. Motivation scores also increased from 6.23 (pre) to 6.65 (post), t(69) = 4.190 p < .05, while Team effectiveness scores increased from 28.01 (pre) to 29.49 (post) t(69) = 3.048 p < .05. The average score for overall satisfaction with the experience was 26.49 (SD = 2.20) out of a possible score of 28.

Conclusion: This study adds to the existing knowledge on the determinants of teamwork while providing evidence for the utility of escape rooms for such studies. Following participation in the escape room, individuals felt a stronger sense of group cohesion and perceived team effectiveness. This exercise can also test how team composition (including gender, role type, and personality) impacts team performance.

P 27. WHEN TO HIRE A NEW SURGEON: IDENTIFYING ACTIONABLE METRICS AT A HIGH-VOLUME CENTER

KP Allen, JB Fleming, DA Anaya H Lee Moffitt Cancer Center

Background: Academic medical centers commonly employ work Relative Value Units (wRVU) as a single benchmark the compare activity across general and gastrointestinal surgeons. In this model wRVU requirements usually increase annually to reflect a surgeon's growing practice and efficiency. This approach does not account for the vast differences in the delivery of surgical care across modern surgical disease sites and rate-limiting factors like operating room time availability. The strategic consequence of this approach is a poor understanding of when capacity has been met and hiring a new surgeon would add growth. We sought to develop and implement a data-driven method to estimate the demand and resources necessary to trigger a new surgeon hire at a high-volume center.

Methods: We first categorized surgical practices in our gastrointestinal surgical oncology department as focusing on one of five disease site categories: hepatobiliary, colorectal, pancreas, gastroesophageal, and peritoneal malignancies. Using historical data collected at our institution, we estimated the wRVU per case by disease site category as follows: liver (59), gastroesophageal (51), pancreas (44), peritoneal (36), and colorectal (23). This data was then annualized to determine the expected a case numbers and wRVU for a 100% clinical effort (cFTE) surgeon. When accounting for resources like operating room availability, we estimated that a full-time hepatobiliary, gastroesphageal and pancreas surgeon would need to complete 100, 110 and 120 cases annually to achieve wRVU/case, would need 250 cases to achieve a similar wRVU (5928), and a peritoneal surgeon would need 100 cases to reach 3,830 wRVU.

Results: With these benchmarks, we then calculated the expected activity for individual surgeons in our Department based upon cFTE. Actual surgeon case numbers and wRVU data were then expressed as a % (actual/expected). In so doing, activity is comparable across surgical disease sites, and we identified the highest actual/expected % within the hepatobiliary (139%), gastroesophageal (136%), and peritoneal (108%) disease sites, while this same ratio was lower in the pancreas (100%) and colorectal (104%) disease sites. Based upon this analysis, we have successfully recruited a hepatobiliary surgeon and are in preparation to add surgeons with a focus in gastroesophageal and peritoneal malignancy to follow.

Conclusion: Here we describe an unbiased method to determine expected surgical activity within specialty GI surgery disease sites and have applied real-world data to demonstrate how this can be used to prioritize the addition of surgeons in a high-volume, focused practice setting.

P 28. MASSIVE TRANSFUSION ACTIVATIONS IN NON-TRAUMA PATIENTS

NK Dhillon, I Abumuhor, C Hayes, J Ghoulian, M Asadi, TL Lin, G Barmparas, EJ Ley Cedars-Sinai Medical Center

Background: Massive transfusion activations (MTA) are commonly used in the care of the trauma patient. However, MTA for trauma only constitutes a small fraction of MTA at our institution. Given the need to obtain effective resource utilization, the aim of this study was to characterize MTA in non-trauma patients to better understand how this strategy is employed at a larger tertiary hospital.

Methods: All MTA involving non-trauma patients from January 2017 to December 2017 were reviewed. Data collected included patient demographics, reason for MTA, transfusion ratios, use of adjunctive antifibrinolytics, use of viscoelastic testing, and vasopressor administration at the time of MTA. Patients with unclear indications for MTA were excluded.

Results: Over the one-year study period, there were 118 patients that were identified. The mean age was 53.2 years and 44.1% were male. Patients were most commonly under the care of a medical service (38.1%), while 31.4% were obstetric patients and 30.5% were surgical patients. Nearly one-third (34.0%) of patients who received at least one unit of blood patients were transfused in a 1:1:1 ratio. Concomitant vasopressor use was high (66.9%), while antifibrinolytic agents (12.7%) and viscoelastic testing (22.8%) were used less commonly. The overall mortality of the study population was 44.9%.

Conclusion: MTA are more frequently used in non-surgical patients than in surgical patients. There was a low rate of adherence to 1:1:1 transfusion ratios as well as utilization of medications and tools that could allow for targeted resuscitation. Understanding practice patterns relating to MTA may allow for an opportunity for improvement.

P 29. CAN A RIB FRACTURE PROTOCOL REDUCE PNEUMONIA RATES IN HOSPITALIZED TRAUMA PATIENTS?

T Russo, P Hope Beaumont Hospital Trenton

Background: Rib fractures commonly occur in blunt thoracic trauma and may contribute to the development of pneumonia. Pneumonia is a significant cause of morbidity and mortality in trauma. It occurs in the setting of pain with breathing, hypoventilation and ineffective cough. Prevention strategies include: analgesia, surgical fixation, and pulmonary hygiene. National clinical practice guidelines have not been established to guide this management. In 2011, we started a quality improvement project to develop a treatment protocol to decrease our rate of pneumonia in trauma patients with rib fractures. Our QI project led to a significant decrease in our pneumonia rates. This study is a review of our recent patient population to verify that our protocol is the reason for our pneumonia rate that is now consistently lower than the national benchmark.

Methods: We collected data prospectively from October 2012 to December 2018 in the trauma registry of our ACS-verified level 2 trauma center. The protocol includes 3 interventions in any hospitalized trauma patient with two or more rib fractures: use of an oscillating positive expiratory pressure therapy system (OPEP), insertion of a paravertebral catheter-based analgesic pump (PP), and application of non-invasive positive pressure ventilation (BiPAP) at night. The protocol included all three components, but not each patient received all three therapies.

Results: 250 patients with rib fractures were admitted during the study time period and received at least one part of the three-part protocol to be included in this review. 54.4% of patients were male. The median injury severity score (ISS) was 10.0 (range 4.0-45.0). 72.8% of patients received OPEP therapy; 72.8% of patients had a pain pump inserted; 39.6% of patients received BiPAP at night. Reasons for omission of any part was due to patient refusal and/or trauma surgeon discretion. 3 patients [1.2%; 95% CI: (0.4%, 3.5%)] developed pneumonia. All cases occurred in the OPEP + PP group, which was also the largest group in terms of patients. 4.8%, 16.4%, 46.4%, and 32.4% of patients received o, 1, 2, or 3 parts of the protocol respectively. Five unique sets of therapy combinations were noted with associated outcome differences; however, none of the pairwise differences achieved statistical significance.

Conclusion: This study demonstrates that our initial effort to reduce pneumonia in patients with rib fractures is sustainable. The study does not demonstrate the protocol has been the reason for this improvement. Our protocol was successful in our organization, but there was no statistical difference in the different groups of treatments. We hypothesize that it is not the protocol. Rather, the additional attention paid to patients with rib fractures led to improvement in pneumonia rates. We recommend a standardized management algorithm, including increased surveillance, to reduce morbidity, and rates of pneumonia in trauma patients with rib fractures.

P 30. VALUE OF RESEARCH YEARS FOR INTERNATIONAL MEDICAL GRADUATES APPLYING TO GENERAL SURGERY RESIDENCY

A Rajesh, M Asaad, Y AlJamal, RU Azevedo, DR Farley Mayo Clinic

Background: While dedicated research time offers an opportunity for international medical graduates (IMGs) to gain exposure to the US healthcare system, network at conferences, and publish scientific articles to boost a residency application, it can lengthen time away from clinical activity. We aimed to determine the value of dedicated/protected research time for an IMG applying to general surgery residency from the eyes of both program directors (PDs) and IMG applicants.

Methods: Two separate surveys were emailed to all IMG applicants to our GS residency program (2015-2018) and all US GS PDs. Surveys to the applicants focused on whether they spent dedicated research time in the US prior to residency, the type, specialty and duration of research activity, numbers of first author podium and poster presentations, accepted/published manuscripts, and their views about the importance of dedicated research time for IMGs applying to GS residency. All applicants reported their match outcomes.

Surveys to the PDs focused on the importance of an IMG applicant's research experience from the PD standpoint, the value they placed on the quality and quantity of publications and their views on the usefulness of dedicated research time for an IMG applying to GS residency.

Results: Applicant Data:

320 applicants responded to the survey. A total of 148 (46%) applicants spent dedicated research time in the US prior to residency. Among the research group, the median (Inter Quartile Range [IQR]) number of first author podium and poster presentations from the dedicated research time were 1 (0-4) and 2 (1-5), respectively. At the time of application for the match, the median (IQR) number of published manuscripts among the research group was higher than that among the group of applicants who did not pursue dedicated research time [5(2-12) vs. 1(0-2), p<0.0001]. 73% of the applicants from the research group reported adequate support from their research mentor and 79 % of them considered dedicated research time "important" for applicants to GS residency. Dedicated research time and/or the duration of the research did not affect the match rate of IMG applicants into GS, surgical and non-surgical specialties (p>0.05). Program Director Data:

Seventy-six out of 259 PDs responded to our survey. A median (IQR) of 2.5 (2-3) publications, and 2 (2-3) presentations per year of dedicated research time were considered 'productive' by PDs. The quality of the journal of publication and the type of publication received the highest rating followed by the number of publications (medians 4 and 3 respectively). 63% of the PDs did not recommend IMGs take time off to engage in research; only 54% attributed some importance to an IMG's research experience.

Conclusion: Dedicated research time does not seem to be associated with better outcomes for IMGs targeting GS residency. Most PDs advocate against taking time off after graduation to engage in research activity.

P 31. CARTILAGE OLIGOMERIC MATRIX PROTEIN (COMP) SPLICE VARIANTS 1 AND 3 ARE DIFFERENTIALLY EXPRESSED IN COLON CANCER PATHOGENESIS AND ARE POTENTIAL TARGETS FOR BIOMARKER TESTING

VN Nfonsam, NP Omesiete, L Nfonsam, J Jandova, A Cruz University of Arizona

Background: Colon Cancer (CC) is the third most commonly diagnosed cancer in the United States and the second leading cause of cancer related deaths. Although there has been a decrease in the overall incidence of CC in the last several decades, there has been a significant increase in the incidence of sporadic, more aggressive CC in young patients, age < 50. In our previous next generation sequencing study, we showed that early onset colon cancer (EOCC) is a biologically distinct disease with unique gene expression pattern. One of the genes uniquely upregulated in EOCC was (COMP). We showed that is upregulation confers tumor aggressiveness, metastasis and recurrence. COMP has been determined to have four potential splice variants. However, it is not clear which COMP transcript is expressed in the colon and therefore disrupted during cancer pathogenesis. We investigate the alternate splice variants of COMP in colon tissue and their role in colon cancer tumorigenesis.

Methods: Complementary DNAs prepared from normal healthy colon tissues (non-Cancer Patients) were evaluated by Polymerase chain reaction. COMP Splice variant 1 and 3 where detected as the only variants expressed in colon. We then investigated the relative quantification of the detected isoforms in the 10 EOCC and 10 late onset colon cancer (LOCC) tumors and their matching normal adjacent samples (40 total samples) and compared to matched normal healthy tissues.

Results: We detected transcript isoforms 1 and 3 in normal colon tissue and found both isoforms differentially expressed in most tumor samples. Overexpression of splice variant 1 and 3 was seen in 65% of the colon cancer tissues with the most significant upregulation seen in the EOCC. Sixty five percent of the adjacent normal tissue had splice variant 1 and 3 downregulated with the majority from LOCC patients. There was no significant correlation between the splice variant 1 and 3 and stage of disease

Conclusion: The detection of COMP transcripts 1 and 3 in normal colon directly implicates them in COMP disease pathogenesis. The upregulations observed in tumor samples particularly in the EOCC is consistent with our previous report. These results suggest that differential expression of COMP in colon cancer is driven by transcripts 1 and 3 and highlights these transcripts as potential targets for the testing of COMP as a candidate biomarker.

P 32. ESTIMATING THE PREDICTORS OF MORTALITY AFTER EMERGENCY GENERAL SURGERY IN GERIATRIC POPULATION: ANALYSIS OF 40.188 PATIENTS

S Gogna, P Kartik, J Con, P Anderson, A Policastro, J Feeney, W Marshall, R Latifi Westchester Medical Center

Background: Outcomes of geriatric patients undergoing abdominal surgery for acute abdomen (SAAG) are suboptimal. With the increasing elderly population, the number of SAAG will continue to increase. The aim of this study was to identify predictors of outcomes in the elderly undergoing SAAG.

Methods: Data from Nationwide Inpatient Sample from 2008 – 2014 were analyzed. Univariable and multivariable analyses were used to identify predictors of mortality after SAAG. We also examined the age-adjusted nationwide incidence of emergency general surgery diagnosis in elderly by joinpoint regression tool to asses the burden of the disease.

Results: There were 7,351,888 patients analyzed of which 40,188 (0.005 %) were \geq 65 years or older. Mean age was 76.65 \pm 7.76 years. Females outnumbered males and had better outcomes (OR 0.78). Most common diagnoses were related to HPB pathology (14%) and colorectal procedures were the most common SAAG performed in elderly (31.2%). On multivariable analysis coagulopathy (OR 2.5), metastatic disease (OR 1.3), congestive heart failure (OR1.8), liver disease (OR 1.5), chronic renal failure (OR 1.4), fluid and electrolyte imbalance (OR 1.9) and weight loss (OR 1.5), diagnosis of acute intestinal obstruction (OR 1.3), C. diff coliris (OR 2.2), development of post-operative shock (OR 4.6), bleeding (OR 1.4) and cardiac complications (OR 1.5) were associated with high mortality (OR 1.2). Moreover, the hospitalization rate increases significantly with every 5-year gain in the age of patients \geq aged 65 years.

Conclusion: In this large sample of patients we have identified a number of conditions and diagnosis associated with high mortality following major abdominal surgery for acute abdomen in elderly patients. We also ascertained the development of specific complication after SAAG.

P 33. FULL BODY SCAN BEFORE DEFINITIVE PELVIC BLEEDING CONTROL: VECTOR OF INJURY IN MAJOR PELVIC FRACTURE CANNOT PREDICT DISTINCT INJURY PATTERNS

JR Coleman, EE Moore, DR Vintimilla, JT Nelson, JM Samuels, NG Vigneshwar, MG Bartley, J Parry, A Sauaia, MJ Cohen, C Mauffrey University of Colorado, Denver

Background: The Young-Burgess (YB) classification system of pelvic ring fractures was created as a mechanistic classification based on vector of impact for orthopedic description of the severity of pelvic fractures. While this classification system has been examined as a predictor of clinical outcomes, concomitant associated injury complexes requiring urgent interventions have yet to be defined. The advent of resuscitative endovascular balloon occlusion of the aorta (REBOA) permits temporary pelvic vascular control potentially facilitating body computed tomography (CT) scanning before definite pelvic bleeding control. We hypothesize that vector of injury reflects specific patterns of associated injuries which should guide initial trauma care.

Methods: A retrospective review of all severely injured (ISS>15) adult patients with pelvic fracture from 2015-2017 was performed. YB classification was determined by an orthopedic surgeon based on radiologic assessment. Associated injuries were determined by Abbreviated Injury Scale (AIS) system, as well as individual ICD-9/10 codes obtained from trauma registry. A cluster analysis was performed to identify the injury patterns and their association with the YB classifications.

Results: Overall, 135 blunt trauma patients (61% male, median age 39.1 years) were included. The median NISS was 29, initial SBP 108mmHg and 24% presented in shock (SBP < 90mmHg). Overall, 72% of patients presented with lateral compression (LC; 38% LC1, 24% LC2, 10% LC3), 11% with anterior posterior compression (APC; all but one were APC3), 6% with vertical shear (VS) and 10% with combined patterns. Patients with LC fractures had a higher chest AIS (3 versus 1 in VS and 0 in APC and Combined, p<0.0001) and more commonly presented with concomitant rib fractures (44% in LC, 50% in VS, 25% in APC, 38% in Combined, p=0.03). Lumbar spine fractures were more common in VS (88% vs 31% in LC, 27% APC, 36% Combined, p=0.01). Patients with APC fractures had a higher extremity AIS (median 4 versus 3 in LC and 4 in VS and Combined, p=0.006). Pancreatic injuries were more common in Combined fractures (18% vs 2% in LC and 0% in APC and Combined, p=0.04). While common concomitant injuries were identified with each YB class, none of these mandated immediate intervention; in contrast, procedures requiring immediate intervention (specifically head injuries or abdominal vascular or visceral injury) were common across all YB classes. Subdural hemorrhage requiring neurosurgical intervention was present in a significant percent of patients, and abdominal visceral injury (hepatic, splenic, renal, or bowel) or major vascular injury requiring exploratory laparotomy was present in up to a quarter of pelvic fractures patients regardless of class (exploratory laparotomy performed in 23% LC, 50% VS, 6% APC, and 15% Combined). Upon cluster analysis, there were no distinct injury complexes regardless of requirement for immediate intervention.

Conclusion: In pelvic fracture patients, vector of injury, as categorized in the YB system, cannot predict specific patterns of non-orthopedic injuries requiring intervention. With the availability of REBOA, in all patients with major pelvic fractures, Zone 3 REBOA placement should be considered, followed by full body CT scanning before definite control of pelvic bleeding for prioritized operative planning.

P 34. PARATHYROIDECTOMY HAS BETTER OUTCOMES THAN PARATHYROID ABLATION IN PATIENTS WITH MAJOR COMORBIDITIES

AM Khokar, K Kuchta, TA Moo-Young, DJ Winchester, RA Prinz NorthShore University HealthSystem

Background: Major medical comorbidities in patients with primary hyperparathyroidism have been described as an indication for parathyroid ablation. In this study, we reviewed outcomes of patients having parathyroid ablation and then compared these outcomes with matched patients having parathyroidectomy with similar Charlson Comorbidity Index (CCI).

Methods: From 2011 to 2018, patients with primary hyperparathyroidism who had parathyroid ablation were retrospectively reviewed. These patients were then matched to those who had parathyroidectomy during the same time period using age, gender, ethnicity, pre-procedure calcium and parathyroid hormone (PTH) levels, and CCI. Patients were excluded if they had previous neck procedures or if the ablation was not completed. Outcomes including 1-month post-procedure, and complications were evaluated. Ablation was performed with alcohol or cryotherapy. Statistical analysis was performed using Wilcoxon rank-sum or Fisher's exact test.

Results: 15 patients had parathyroid ablation. The mean age for these patients was 71.6 years (range 39-87 years). Eighty percent were female and 93% were Caucasian. The mean CCI was 5.2 (range 0-9). Six patients had previous neck procedures. Nine patients had alcohol ablation and 5 patients had cryoablation. There were no significant differences in outcomes between the two types of ablation. The mean pre-procedure serum calcium was 10.7 mg/dL (range 9.5-12.1 mg/dL) and the mean pre-procedure serum PTH was 150 pg/mL (range 40-308 pg/mL). The mean post-procedure calcium was 10.6 mg/dL (range 9.2-16.1 mg/dL) and PTH was 85.5 pg/ mL (range 31-1153 pg/mL). Eight patients had improvement in their serum calcium and PTH after the procedure. The mean long-term calcium was 10.2 mg/dL (range 8.2-13.6 mg/dL) with a median follow up of 28 months. Two patients had complications with temporary nerve injury (1) and pneumothorax (1). After excluding patients that had had previous neck procedures (5) or nonvisualization at the time of procedure (1), the 9 patients with parathyroid ablation were matched to 9 who had parathyroidectomy from a database of 485 patients. Median follow up was 24 months for ablation and 48 months for parathyroidectomy. There was no statistical difference between patients who had ablation compared to parathyroidectomy in mean age (77.3+/-7.8 vs. 77.3+/-7.2 years, p=0.93), gender (female 80% vs. 78%, p=0.75), CCI (5.7+/-2.2 vs. 5.7+/-2.2, p=1.0), mean pre-procedure calcium (10.6+/-0.7 vs. 10.5+/-0.2 mg/dL, p=0.59), and mean pre-procedure PTH (98.6+/-37.5 vs. 94.3+/-39.6 pg/mL, p=0.79). Patients treated with parathyroidectomy had lower mean post-procedure serum calcium levels (9.5+/-0.4 vs. 10.1+/-0.5 mg/dL, p=0.02) and PTH levels (35.8+/-15.9 vs. 85.5+/-48.3 pg/mL, p=0.02). In addition, there was greater decrease in post-procedure serum calcium levels (-1.0+/-0.3 vs. -0.6+/-0.7 mg/dL, p=0.02) and post-procedure PTH levels (-58.6+/-31.2 vs. -14.6+/-28.6 pg/mL, p<0.01). Mean long-term serum calcium levels was also lower (9.3+/-0.7 vs. 10.2+/-0.5 mg/dL, p=0.01). All parathyroidectomy patients achieved long-term normocalcemia compared to only 3 of 9 ablation patients.

Conclusion: Parathyroidectomy patients had better short- and long-term outcomes than ablation. Comorbidities should not be an absolute contraindication to surgical consultation and potential curative surgical intervention in patients with primary hyperparathyroidism.

P 35. ONCOLOGIC VASCULAR RESECTION DURING PANCREATECTOMY - EVALUATION OF A MULTIDISCIPLINARY APPROACH

KA Kelly-Schuette, CJ Fernstrum, CM Jaggi, D Kohli, RN Saunders, MM Assifi, GP Wright, MH Chung, MA Mansour MSU – Spectrum Health

Background: Surgical resection including vascular resection and reconstruction combined with multimodal neoadjuvant and/or adjuvant therapy remains the best chance for cure in borderline resectable pancreatic malignancies. There is a wide variation in the reported rates of postoperative complications, patency, and margin status in patients undergoing vascular reconstruction during major pancreatic resection in the literature.

Methods: This study is a retrospective review of consecutive patients undergoing pancreatic resection with concurrent vascular resection and reconstruction at a university-affiliated hospital from 1/1/2005 through 12/31/2018. Minor resections including "side bites" of the portal vein that were performed by the Surgical Oncology team with simple closure were not included. The primary objective is to report our long-term experience with a multidisciplinary approach to pancreatic resections involving both fellowship-trained surgical oncologists and vascular surgeons. Secondary outcomes include rates of postoperative complications, operative blood loss, margin status, and patency rates.

Results: A total of 56 patients underwent vascular resection and reconstruction during pancreatectomy for oncologic indications. The majority involved intra-operative consultation (82.1%) while 17.9 % received elective pre-operative planning with vascular surgery. The most common indication for surgery was pancreatic ductal adenocarcinoma (n=44, 78.6%). Procedure types included 46 patients (82.1%) undergoing pancreaticoduodenectomy, 4 distal pancreatectomies (7.1%), and 5 total pancreatectomies (8.9%). The most common reconstruction procedure performed was autologous vein patch, interposition or graft (26, 47.3%), followed by primary repair (19, 34.5%), and end-to-end anastomosis (5, 9.1%). The mean surgical duration was 418 min (+/-112) and median EBL was 700 ml (range 200 – 9000 mL). Pathology demonstrated R0 margins in 55.6 % of cases. A major postoperative complication was identified in 21 patients (37.5%) and 9 patients (16.1%) required reoperation. There was one perioperative mortality (1.8%). Patency was confirmed on imaging in 73% of patients at a median of 316 days with median follow up of 13 months.

Conclusion: Vascular reconstruction performed with concurrent pancreatic resection is safe when approached by a multidisciplinary team and is associated with low perioperative mortality. Preoperative planning is essential to identify patients that will benefit from vascular reconstruction and may ultimately help to improve perioperative morbidity and oncologic outcomes.

P 36. PEDIATRIC CERVICAL SPINE INJURY IN THE UNITED STATES: DEFINING THE BURDEN OF INJURY, NEED FOR OPERATIVE INTERVENTION AND DISPARITIES IN IMAGING ACROSS TRAUMA CENTERS

W Kim, N Ahn, A Ata, M Adamo, M Edwards Albany Medical Center

Background: Clinical and radiographic screening for cervical spine injury in children is challenging, in part due to the low propensity for injury. Recent studies estimate this risk to be between 0.5%-2%. What is not known is how many of these injuries mandate urgent identification for intervention, as some only require analgesics and collar support. Negative cervical spine imaging rates for patients presenting to trauma centers are also not known. Given the improved granularity of recently implemented ICD-10 codes, we sought to determine incidence of pediatric c-spine injury, operative intervention and imaging rates in United States trauma centers. We then investigated the impact of ACS trauma center accreditation status, as well as the impact of preverbal age (< 4 years) of the patient.

Methods: The National Trauma Data Bank 2016 data set was queried for patients under 15 years of age with cervical spine injury. Soft tissue sprains, strains and penetrating injuries were excluded. Rates of cervical spine injury and operative interventions were analyzed by preverbal (< 4 years) vs. verbal patient age, and ACS accreditation status. Imaging rates for were similarly analyzed by modality and accreditation status.

Results: Out of 84,568 children, 741 (0.88%) had a cervical spine injury. Preverbal patients were significantly less likely to have C-spine injury (0.55% vs. 0.98%, RR 0.56, p < 0.001) than older patients. Of all children in the cohort, 152 (0.18%) sustained a C-spine injury requiring an intervention. Among the 741 who had C-spine injury 152 (20%) had an intervention. If injured, preverbal patients were significantly more likely to require an intervention than their older counterparts (RR 1.5, 95% CI 1.1 to 2.1, p=0.02). In general, injury and intervention rates did not vary significantly by ACS accreditation status. Of all children without a cervical spine injury 12.8% were imaged, with 9.3% undergoing CT scan, 1.5% MRI, and 3.1% plain X-rays. Designated stand-alone pediatric trauma centers were significantly less likely than other trauma centers to image patients, stand-alone pediatric trauma centers were significantly less likely than otherts to utilize CT scan (52% vs. 80% p<0.001) and significantly more likely to utilize plain films (45% vs. 14% p<0.001).

Conclusion: Cervical spine injury requiring intervention in pediatric patients under age 15 years is exceedingly uncommon. However, imaging rates for uninjured patients are significant. One hundred children in this cohort without injury were imaged to detect one injury requiring intervention. Stand-alone pediatric trauma centers display significantly lower rates of unnecessary imaging overall, and higher utilization of modalities with lower radiation exposure. Increased utilization of plain X-rays for screening and implementation of clinical decision rules to guide imaging could significantly decrease radiation exposure and improve resource utilization in a population at very low risk for cervical spine injury.

P 37. AGE, TRAUMATIC RUPTURE OF THE AORTA AND TORSO FRACTURES: AN UNEXPECTED ASSOCIATION

F Bokhari, F Bryan, F Bajani, C Fu Stroger Hospital of Cook County

Background: Traumatic rupture of the aorta (TRA) is rare but a lethal disease. We attempted to describe the risk factors associated with TRAs.

Methods: The National Trauma Data bank was queried for the years 2008 – 2015. Inclusion criteria are patients who suffered a traumatic rupture of the aorta (TRA), patients in a motor vehicle accident (occupant of a vehicle, pedestrian struck by car, cyclist struck by car, motorcycle related collision) and patients with scapula, clavicle, rib, or sternal fractures. Each type of bone fracture was given a score of one e.g. single or multiple rib fractures were both given a score of one, unilateral or bilateral scapular fractures were also given a score of one. Patients with head trauma and long bone fractures were excluded. The patients were divided into three categories: pediatric ages 1-18, adult ages 19 – 65, and geriatric >65 years of age. Variables studied were gender, Glasgow Coma Score (GCS), injury severity score (ISSAIS), systolic blood pressure (SBP) and the total number of fracture types.

Results: 4813 out of 150,878 patients had a diagnosis of TRA. 317 (1.3 %) cases of TRAs were found in ages 1 -18 (average age 15), 3858 in ages 19 – 65 (average age 39) (3.1 %) and 638 (3.6 %) occurred in patients over the age of 65 (average age 76). The pediatric population had the highest mean ISS (44.2) and mean systolic BP (95 mmHg) of all the age groups. Patients older than 65 had the lowest mean ISS (40.8) and mean systolic blood pressure (86 mmHg) of all three groups. On multivariate logistic regression, TRAs are 1.6 times more likely with any number of rib fractures and 1.4 times more likely with a sternal fracture. The odds of a TRA are 17 percent less likely with a clavicular fracture and 32 percent less likely with a scapular fracture. For one unit increase in ISS or age the odds of having a TRA increase by 7 percent and 1 percent respectively. Patients older than 65 with TRAs had a higher rate of fractures 89.4% (570) compared to the pediatric population who had a fracture rate of 58.3 % (185).

Conclusion: A very small number (0.3%) of TRAs occurred under the age of 4.5. Among patients who sustained a TRA the rate of TRA and the frequency of torso fractures was highest in the oldest group compared to the youngest. TRA injury mirrors bone fragility in the elderly.

P 38. URGENT VS EMERGENT NEED FOR ORTHOPEDIC SURGEONS IN ORTHOPEDIC TRAUMA PATIENTS: AN NTDB ANALYSIS

F Bokhari, G Saadat, F Bajani, C Fu Stroger Hospital of Cook County

Background: Trauma is the leading cause of mortality in younger patients. Although early orthopedic intervention is beneficial, we hypothesized that outcomes in trauma patients are not affected by emergent orthopedic surgery.

Methods: The National Trauma Data Bank (NTDB) was queried for patients admitted in 2015. Only patients with specific ICD-9 codes for pelvic fractures, humerus fractures, radius/ulna fractures, femur fractures, tibia/fibula fractures, shoulder dislocations, elbow dislocations and hip dislocations were included in the study. The data was analyzed for outcomes based on time to orthopedic operation.

Results: 119652 out of 289747 patients with above fractures or dislocations received an orthopedic procedure. Overall, mortality was 1.1% (1308). Complications included pulmonary embolism (PE) 0.4% (466), compartment syndrome 0.3% (371), infection 0.73% (876) and deep vein thrombosis (DVT) 0.54% (652). While most orthopedic procedures (67.34%, 80585) occurred before 48 hours, only 0.46% (556) of patients were operated upon in less than one hour. On a univariate analysis, survivors and non-survivors received an operation at a mean time of 29.2 and 41.1 hours respectively. On a multivariate analysis, although time to orthopedic procedure was not an independent risk factor for mortality, it's significant for complication. We also found that injury severity score (ISS) is a significant factor for both complication and mortality. Except compartment syndrome, PE, DVT and infection rate increased gradually by time to operate. Surprisingly, patients who received orthopedic procedures within the first hour had higher DVT and infection rate. The reason should be that these patients were more sever, hence they received early operation but had more complications.

Conclusion: While non-survivors and patients with complication had a longer time to orthopedic procedure, time to procedure was not a significant risk factor for mortality. Patients who received procedure after 48 hours had significantly more pulmonary embolism, deep vein thrombosis and infections.

P 39. AIRWAY INJURY IN PENETRATING NECK WOUNDS: DOES BMI MATTER?

F Bokhari, F Bajani, C Fu Stroger Hospital of Cook County

Background: Penetrating airway injury can cause high morbidity and mortality. Difficult airways are more common in obese individuals. We decided to examine the relationship between obesity and airway damage in penetrating neck trauma.

Methods: The National Trauma Data Bank (NTDB) was queried for the years 2013 – 2015. The inclusion criteria were stab injuries to the neck and torso with damage to the blood vessels, pharynx, larynx, trachea, bronchus, esophagus or thyroid. Patients who committed suicide, Body Mass Index (BMI) outside of 15 – 70 and missing values were excluded.

Results: 880 patients with penetrating injuries to the neck were studied. 10% sustained airway damage. 80% were males. 9,4% were hypotensive with an average Glasgow Coma Scale (GCS) of 13.77. Complication rate was 27.0% and comorbidities were present in 51.9% of the patients. Overall, mortality was 1.4% among individuals who did not have airway damage. All patients with airway damage survived. Patients with airway damage had a lower GCS (p<0.001), lower systolic blood pressure in emergency department (p<0.033), higher ISS (p<0.01), increased length of stay (p<0.02) and increased ventilator days (p<0.009). Multivariate regression analysis showed that BMI (p=0.02) and GCS (p=0.002) were inversely related to airway damage and ISS (p=0.05) was directly related to airway damage. Airway injury was not independently related to race or gender.

Conclusion: Mortality is low in patients with penetrating neck trauma. Injury to the airway in penetrating neck trauma is inversely related to BMI.

P 40. ANGIOEMBOLIZATION AND BLUNT PELVIC FRACTURES: DOES TIME TO PROCEDURE MATTER?

F Bryan, F Bokhari, F Bajani, C Fu Stroger Hospital of Cook County

Background: Angio-embolization is an accepted therapy used to control hemorrhage in patients who suffer blunt pelvic trauma. A retrospective analysis was performed to examine the timing and outcomes of angio-embolization for pelvic fractures.

Methods: Trauma Quality Improvement Program (TQIP) was queried for the years 2013 – 2016. Inclusion criteria were patients with blunt pelvic fractures who received angiography with embolization. Patients with only angiography (and no embolization), operative hemorrhage control, head injury and missing data were excluded. Time to procedure, gender, systolic blood pressure in the emergency room (SBP), shock (SBP < 90 mmHg), respiratory rate, Glasgow coma scale (GCS), hospital length of stay (HLOS), ICU length of stay, ventilator days and injury severity score (ISS), transfused packed red blood cells (pRBC) were also studied.

Results: 820 patients were included in the study and all received pelvic angio-embolization. Average age was 52.2, 67% were males, 26.7% were in shock and had an average GCS of 12. Average mortality was 20.6% with a hospital length of stay and ICU length of stay of 19 and 10 days respectively. Mean ventilator days were 9 with an ISS of 31. Survivors were younger (average age 51 versus 56.7 years) with a higher GCS (12.4 vs. 8.5) and a lower ISS (28.9 vs. 37.9). Survivors received less transfused pRBC at 4 and 24 hours (4.4 vs. 7.9 and 5.9 vs. 11.1). Multivariate logistic regression showed that age, ISS, and the number of pRBCs transfused between 4 and 24 hours were associated with higher odds of death. Time to angiography and embolization were not associated with survival.

Conclusion: In this selected group of patients with blunt pelvic fractures who underwent angioembolization for pelvic bleeding and did not require operative hemorrhage control for any organs, time to angio-embolization did not affect mortality.

P 41. INCIDENCE AND PREDICTORS OF BRAIN METASTASIS IN PATIENTS WITH COLORECTAL CANCER

V Nfonsam, E Thompson, A Muse, Z Alattar, M Hamidi University of Arizona

Background: Brain metastasis (BM) in colorectal cancer patients is extremely rare and is associated with dismal outcomes. The incidence of BM in the literature has been reported to be increasing over time. The aim of this study is to evaluate the incidence and predictors of BM in patients with colorectal cancer.

Methods: We performed a retrospective analysis (1975-2016) of the Surveillance, Epidemiology, and End Results Program (SEER) and included all adult patients (age >=18 year) with the primary diagnosis of colorectal cancer. Patients were stratified into two groups based on the presence or absence of BM (BM vs. No-BM). Outcome measures were incidence and predictors of BM in colorectal cancer patients. Multivariate logistic regression analysis was performed to control for available confounding variables in the SEER database.

Results: A total of 840,378 patients diagnosed with CRC were analyzed. Mean age at diagnosis was 68 +/- 14 years, 51% were males, 81% were whites, and 8% were Hispanics. Only 0.093% (n=779) of the patients were found to have BM with a steady incidence rate over the study period. The mean time to BM from initial diagnosis was 6.6 years for males and 7.2 years for females. Colon Cancer was the most common source of BM (82.4%) followed by rectal (9%) and rectosigmoid junction cancers (8.6%). Patients with BM were more likely to be males (p<0.01), whites (p<0.01), above the age of 50 years (p<0.01) and have tumors with higher grade (grade >2, p<0.01). On multivariate logistics regression, male sex (OR: 1.30 [1.13-1.50], p<0.01), age >50 years (OR: 1.86 [1.36-2.56], p<0.01), and grade >2 (OR: 19.77 [10.24-38.17], p<0.01) were independent predictors of brain metatasis. On the other hand, Black race was found to be associated with BM.

Conclusion: Our study supports the low incidence of brain metastasis in patients with colorectal cancer, however, a steady incidence rate was noticed over the study period. BM was mostly from colon cancer patients. Higher incidence of BM was associated with male gender, white race and higher tumor grade. Black race was protective for BM. Further studies are required to better elucidate the causes of these findings.

P 42. USING MACHINE LEARNING TO PREDICT RESPIRATORY FAILURE IN PATIENTS ADMITTED WITH ACUTE PANCREATITIS

S Bolourani, MD Giangola NorthShore University HealthSystem

Background: Respiratory compromise due to acute pancreatitis represents a severe clinical challenge and system-wide burden. Multiple studies have shown that respiratory failure (RF) is the main contributing factor to mortality during the early phase of severe acute pancreatitis. Predicting RF in acute pancreatitis could initiate transfer to intensive care units to facilitate early detection and intervention. Individual predictors of RF have been studied but only poor predictive models have been produced due to small sample sizes. We therefore, identified the risk factors from NIS database using routine data mining techniques, and developed a model using machine learning tools to predict RF with high accuracy and sensitivity.

Methods: The first three-quarters of National (Nationwide) Inpatient Sample (NIS) database for the year 2015 was used to establish our model. Using R programming language and SQLite to extract data for inpatients with acute pancreatitis, we identified 67,227 patients, 3,225 of which developed RF. We identified the most common diagnosis that occurred with RF using routine algorithmic techniques. These diagnoses were ranked using Support Vector Machines and Random Forests and a predictive model was built to predict RF. Given that the data was unbalanced (~5% develop RF), Synthetic Minority Over-sampling was used to increase the sensitivity of the predictive model.

Results: Our model identified over 80 diagnostic and comorbid variables that had a significant correlation with RF (p<0.001 was considered significant). We identified that patients who developed respiratory failure had longer LOS (mean of 15.98 days vs. 4.70 days, p<0.0001), and had higher risk of death (RR 34.5). This model also predicted discharge to a nursing facility or the need for home health aid (RR 4.41; 2.03 respectively). The first run of the model had accuracy of >95%, sensitivity of >60% and specificity of >99%. To best capture every RF patient at the cost increasing false positives, we identified another model using minority oversampling, increasing the sensitivity to >97% and negative predictive value of >99%, but decreasing specificity to >70%. "Variable importance", defined as absolute value of regression coefficients corresponding the the tuned model were calculated.

Conclusion: The novelty and power of using these machine learning approach in predicting clinical outcome is clear when simple regression models fall short in their predictive abilities. An advantage of these techniques is that the predicting ability of the model increases with the size of the learning sample (e.g. including more years), and its granularity.

P 43. FATAL GASTROINTESTINAL BLEEDING IN A CASE OF COAT'S PLUS SYNDROME

V Armstrong, M Jeraq, G Klimovich, KA Rao, P Byers University of Miami Miller School of Medicine

Background: Coat's plus syndrome is an extremely rare genetic syndrome that leads to a variety of symptoms. We are reporting a case of Coat's plus syndrome that had persistent GI bleeding and review of current literature.

Methods: 4 Independent literature searches were done using a single database by 4 authors. 126 articles were found, of which 7 were relevant to this case report. Information from the literature search was used for the introduction as well as the discussion.

Results: The patient is a 41-year-old female with a past medical history of coat's disease and end stage renal failure on dialysis. The etiology of the renal failure was not discovered, and the patient was being worked up for a kidney transplant. The patient required admission after deterioration of nutritional status with a BMI of 14.3. During admission the patient initially had intermittent GI bleeding requiring weekly blood transfusions. On work up of the GI bleed, no etiology was identified either. As a result persistent negative GI bleed work up, we pursued alternative diagnoses. The history of Coat's disease prompted us to work up the patient for Coat's plus syndrome. A genetic test confirmed the presence of CTC-1 gene mutation, which results in Coat's plus syndrome. With no treatment available as of yet, the patient continued to deteriorate into multi-organ failure.

Conclusion: We present an example of GI bleeding in Coat's plus syndrome, only identified thru genetic testing, that is very tare and complex in nature. Despite numerous workups, no specific etiology was identified for the GI bleeding. Previous reports have not investigated cause of GI bleeding, since it is extremely rare in the literature. Further investigation is warranted to understand cause and effects of GI bleeding in this rare genetic disease.
P 44. BILIARY DYSKINESIA AFTER LINX® PROCEDURE

KJ Thompson, GE Kimm, E Speer, DK Davis-Merritt Saint Joseph Hospital

Background: Magnetic sphincter augmentation (LINX*) is a newer surgical alternative to fundoplication intended for the treatment of gastroesophageal reflux disease (GERD). Five year efficacy of the device has been validated in multiple trials, and it has been found to yield similar GERD control as fundoplication. Longer-term complications and adverse events, although rare, are increasingly being documented. We present a case report of sudden onset symptomatic biliary dyskinesia status post uneventful LINX* implantation.

Methods: We present a case report describing the placement of a LINX* device for the treatment of medically refractory GERD in a patient with non-dysplastic Barrett's esophagus. Preoperatively, the patient experienced typical GERD symptoms of heartburn and reflux. He also reported intermittent right upper quadrant pain that was not postprandial and appeared to be musculoskeletal in nature. He underwent a right upper quadrant ultrasound and hepatobiliary iminodiacetic acid (HIDA) scan to rule out biliary pathology. Both radiographic studies were unremarkable without evidence of cholelithiasis and revealed an ejection fraction of 74%. The patient underwent outpatient elective placement of the LINX* device. Intraoperatively, both vagus nerves were identified and preserved. The hepatic branch of the vagus nerve was diminutive and was sacrificed in standard fashion.

Results: The patient presented to the emergency department approximately one month postoperatively with severe right upper quadrant pain, nausea, and vomiting exacerbated by oral intake. Workup included computed tomography of the chest, abdomen, and pelvis which did not demonstrate any evidence of a postoperative complication. An upper gastrointestinal fluoroscopy series confirmed appropriate positioning of the LINX* device and demonstrated a barium tablet passing through the device without evidence of obstruction or reflux. The patient required readmission for dehydration and underwent an upper endoscopy. The endoscope was able to be passed into the stomach without resistance, and appropriate positioning of the LINX* device at the gastroesophageal junction was again confirmed. A right upper quadrant ultrasound was performed which was unremarkable; however, a HIDA scan was significant for an ejection fraction of 0%. Laparoscopic cholecystectomy was performed and the patient's symptoms resolved.

Conclusion: This case documents the first published report of the development of symptomatic gallbladder dyskinesia after surgical implantation of a LINX* device. This unique case demonstrates a clear reduction in gallbladder ejection fraction associated with sudden onset of typical biliary colic symptoms, which required readmission and additional invasive procedures. Overall, the safety profile of the LINX* device is similar to that of traditional fundoplication. However, gallbladder dyskinesia is not a known side effect of either magnetic sphincter augmentation or fundoplication. The exact role that the hepatic branch of the anterior vagus nerve plays in gallbladder motility is currently unknown. Additional studies are required to quantify the incidence of this complication along with factors that put patients at risk for development of gallbladder dyskinesia.

P 45. ADHERENCE TO CURRENT GUIDELINES FOR ANTIBIOTIC DURATION IN ACUTE DIVERTICULITIS

CP Saclarides, CP Saclarides, R Jacobson, K Millikan Rush University Medical Center

Background: The duration of antibiotic treatment for diverticulitis is a controversial topic. For patients with uncomplicated (Hinchey 1) diverticulitis, the Surgical Infection Society guidelines for intraabdominal infections recommend 5-7 days' duration of antibiotics. For patients with Hinchey 2, 3, or 4 diverticulitis, we have learned from the STOP IT Trial (May, 2015) that there is no benefit to antibiotic duration >4 days following source control procedures with either surgical or percutaneous intervention. Despite these recommendations, there remains variability amongst surgeons and their medical counterparts in antibiotic duration. Here we describe trends in antibiotic duration for diverticulitis within our hospital system.

Methods: This is a retrospective review of patients cared for between (2010-2018) at an academic institution and an affiliated community hospital. We examined basic demographics, Hinchey grade, length of stay, provider specialty (medical practitioner (MP), acute care surgery (ACS), colorectal surgery (CRS)), intervention (percutaneous, surgery, or none), total duration of antibiotics, duration of antibiotics after intervention, and antibiotics upon discharge.

Results: We reviewed 96 patients who were admitted for treatment of diverticulitis. The mean age was 55 and 45% were male. 47.9% (46) had Hinchey 1, 32.3% (31) had Hinchey 2, and 19.8% (19) had Hinchey 3 or 4 disease. Regardless of Hinchey class, the mean duration of antibiotics for all providers was 14.9 days. Overall, patients admitted to surgical services had a higher duration of antibiotic treatment (17 days) compared to medical services (13 days) (p<0.05 Student's t-test, Figure A). When controlling for disease severity, patients with Hinchey 1 diverticulitis admitted to surgical services (12 days) (p<0.05 Student's t-test, Figure B). While MP prescribing practices did not demonstrate a change over time, surgical services significantly decreased the overall duration of the STOP-IT trial.

Conclusion: Since publication of the STOP IT trial and SIS guidelines, there has been a statistically significant decrease in prescribed antibiotic duration for treatment of diverticulitis amongst surgeons at our institution, but not medical doctors. Despite this trend, surgeons still tend to give longer duration of antibiotics compared to medical practitioners. This may be secondary to perceived higher acuity of disease. Institutions should individually monitor trends in their own antibiotic regimens so that we may collectively trend toward evidence-based antibiotic guidelines.

P 46. ARE PATIENTS MANAGED NON-OPERATIVELY FOR APPENDICITIS AT RISK FOR MISSED MALIGNANCIES

LA Uribe, DJ Saltzman, MD Girgis, M Maggard-Gibbons, GJ Moran, A Krishnadasan, K Pathmarajah, Y Perez, R Padilla, DA Talan Olive View-UCLA Medical Center Education Research and Institute

Background: Non-operative management (NOM) of uncomplicated appendicitis (UA) has gained acceptance based on beneficial outcomes in recent randomized trials. However, there is concern that concurrent malignancies could be missed. It is imperative that the incidence, and risk factors, for appendiceal neoplasms in these patients are known.

Methods: We performed a systematic review of thirty-two trials (through 2018) comparing patients undergoing operative management (OM) versus NOM of UA for primary outcome of appendiceal neoplasm at initial or subsequent surgery (defined as crossovers from NOM to OM). Significance was determined by chi square analysis.

Results: A total of 1,844 patients with UA (follow-up range 6-60 months) were analyzed. Of 802 patients who received urgent appendectomy, nine (1.1%) had neoplasm: 3 neuroendocrine tumors, 3 unspecified appendiceal tumors, 2 unspecified appendiceal or colon malignancies and 1 adenoma polyp. Of 1042 NOM patients, 400 had appendectomy secondary to lack of symptom improvement or recurrent UA; six (1.5%) had appendiceal neoplasm: 4 unspecified appendiceal masses, 1 malignant appendiceal tumor and 1 mucinous cystadenoma. Cancer incidence (1.2%) between operatively versus non-operative managed patients was not significantly different (difference; -0.4%, 95% CI, [-1.9%, 0.9%)].

Conclusion: Patients requiring surgery following initial NOM of uncomplicated appendicitis do not appear to have a higher rate of missed appendiceal neoplasms as compared to those who underwent surgical management at their index presentation. Future work is warranted to identify patient factors associated with these malignancies, so they can be targeted earlier in their presentation. This will allow for optimizing care even further for this important population of patients.

P 47. NATIONWIDE TRENDS IN THE MANAGEMENT OF COMPLICATED APPENDICITIS

K Matsushima, AF Sabour, M Schellenberg, ET Alicuben, A Stromwasser, K Inaba, D Demetriades University of Southern California

Background: With controversy over whether a trial of non-operative management (NOM) or immediate operation (IO) should be considered for complicated appendicitis,scarce data exists regarding recent practice trends. The aim of this study was to analyze nationwide trends in the management of complicated appendicitis.

Methods: This is a retrospective cohort study using the National Inpatient Sample data(2003-2014). Patients (≥18 years) with complicated appendicitis were identified using ICD-9 CM codes. IO was identified as surgical procedures within 24 hours of admission. A failure of NOM was defined as surgical procedures performed after 24 hours. We analyzed the data to examine annual trends in: 1) the rate of NOM failure, and 2) the rate of laparoscopic procedures (vs. open) in the IO group. We also compared hospital length of stay (HLOS) between the NOM and IO group.

Results: A total of 738,831 patients were included. The median age was 49 (interquartile range: 28),and 56.2% were male. We observed significant trends toward less likelihood of NOM failure (OR: 0.965, 95%CI: 0.959-0.971) and more frequent use of laparoscopic procedures in the IO group (OR: 1.232, 95%CI: 1.223-1.240), all p<0.001. HLOS was significantly longer in the NOM group (6.54 vs. 4.65 days, p<0.001).

Conclusion: Over the last decade, patients with complicated appendicitis have been managed non-operatively with improving success rates. In immediate operations, laparoscopic procedures are more commonly performed.

P 49. DIFFUSE INFLAMMATION SECONDARY TO URACHAL CYST: A CLINICAL CHALLENGE

VL Armstrong, K Khazeni, A Rosenberg, MG Moller University of Miami Miller School of Medicine

Background: Inflammatory myofibroblastic tumors (IMFTs) or pseudotumors originating from urachal cyst remnants are difficult to differentiate from urachal carcinoma or bladder cancers; including urothelial carcinoma, squamous cell carcinoma, or adenocarcinoma. Inflammatory pseudotumors, though non-neoplastic, can grow rapidly mimicking malignant neoplastic processes. Even with current technology, biopsies from cystoscopy or percutaneous intervention may fail to provide a diagnosis. This become a management conundrum, especially in large symptomatic masses with components of inflammation and invasion into surrounding structures. Amongst cases which require resection; surgical management varies greatly.

Methods: A 37-year-old female presented with symptoms of abdominal pain and was found to have a large intraabdominal mass extending from the bladder to the abdominal wall with possible involvement of the ovaries and uterus. The patient underwent initial needle biopsy which demonstrated inflammation; however, as the tumor continued to grow significantly and patient became increasingly symptomatic including hematuria, additional core biopsies were performed which provided diagnosis of benign chronic inflammation. Cystoscopy demonstrated an ulcerated friable tumor into bladder dome. Biopsies again failed to provide diagnosis. Multidisciplinary team agreed to proceed with surgical resection for diagnosis and relief of symptoms. Tumor was found to involve abdominal wall and extend from the umbilicus along midline down to the pelvis, right ovary, dome of bladder and around urethra. En-block resection was performed including partial ophoprectomy and partial cystectomy with preservation of urethra. Intraoperative frozen section could not confirm malignancy, but demonstrated low grade spindle cell with concerns for neoplastic process. Final pathology revealed reactive fibrous tissue with acute and chronic inflammation invading bladder, abdominal wall, and ovary more consistent with a urachal cyst.

Results: Although benign, IMFTs can cause significant morbidity due secondary to mass effect and invasion. Management should involve surgical resection of the tumor, as well as potential post-operative chemotherapy or NSAIDs based on clinical picture. Urachal cyst management includes observation for asymptomatic cases and surgical resection for cases that are either symptomatic or infected. The importance of diagnosis in these inflammatory masses is demonstrated in the variable management of different pathologies.

Conclusion: This case highlights the difficulty in diagnosis of inflammatory masses associated with urachal cyst remnants, as different management options are available for the varies pathologic entities which can arise from the bladder. These should be managed in a multidisciplinary team approach.

P 50. LIFE THREATENING RARE SECOND OCCURRENCE OF HELLP SYNDROME AND LIVER CAPSULE RUPTURE

K Curfman, D Dodson, M Antony, S Morrissey Accreditation Council for Graduate Medical Education (ACGME)

Background: Hemolysis, elevated liver enzymes, and low platelet count make up the rare entity known as HELLP Syndrome (HELLP). This entity complicates an exceedingly scant amount of pregnancies, and due to its infrequency diagnosis can be delayed, leading to potentially fatal complications. One of these serious complications is the development of subcapsular liver hematoma, which can rupture and result in significant hemorrhage. The case herein describes a 38-year-old female in her 29th week of gestation, with history of HELLP, liver hematoma, and rupture in a previous pregnancy, who developed recurrence of all three entities in her subsequent pregnancy. This resulted in emergent surgical intervention for near exsanguination and multiple returns to the operating room. Our case illustrates the life threatening morbidities that can occur in HELLP patients complicated by hepatic hematoma with rupture, and emphasizes the necessity of a high index of suspicion for the diagnosis. This case is exceptionally unique in that the patient developed recurrence previously described only once before.

Results: The patient presented is a 38 year old female with history of HELLP syndrome diagnosis, subcapsular liver hematoma formation, and rupture in a previous pregnancy who at her 29th week of gestation presented with abdominal pain. She was found to be severely hypertensive on admission, followed by sudden, abrupt significant hypotension and fetal distress, that prompted emergent Cesarean section. Upon entry into the abdomen, peritoneal cavity was filled with blood and Acute Care Surgery was immediately called. The blood was evacuated, abdomen packed, and two large liver capsule tears were noted and bleeding. The massive transfusion protocol was started, hemostasis was achieved with Argon Beam and packing, then a temporary abdominal closure was placed. Over the next eleven days the patient required multiple returns to the operating room and transfusion of over twenty blood products in order to ultimately save the lives of both her and her newborn.

Conclusion: The patient presented herein is unique and necessitates presentation for multiple reasons. She had an initial diagnosis of HELLP syndrome followed by a recurrence in her subsequent pregnancy. More uniquely, she developed a subcapsular hematoma and hepatic rupture in her previous pregnancy, and an additional recurrence in her following pregnancy. The diagnosis of HELLP Syndrome is known to be rare and effects < 1% of pregnancies. Its recurrence is also exceedingly uncommon and has been documented to effect 3% - 27% of pregnancies; however, the most significant finding in this case was the recurrence of subcapsular hepatic hematoma and rupture, which can only be found once elsewhere in the literature. $^{4.7}$ Given the substantial morbidity and mortality associated with these diagnoses, which occurred simultaneously in this patient, we feel that emergent surgical intervention was warranted at presentation and was the only possible intervention that allowed for survival of both mother and fetus.

P 51. NECROTIZING FASCIITIS FOLLOWING PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG)

J Pang, R Miskimins University of New Mexico

Background: Percutaneous endoscopic gastrostomy (PEG) tube placement is a common procedure used to establish long-term enteral feeding access in patients who are unable to meet their nutritional needs with oral intake. The most common complications associated with the procedure are superficial wound infection, clogged tube and peristomal wound leakage. Other more severe complications that have been described are bowel injury, gastrointestinal hemorrhage, tube dislodgement resulting in feeding the peritoneal cavity and buried bumper syndrome. Here we describe a rare case of necrotizing fasciitis of the abdominal wall that developed following PEG tube placement.

Results: A 53-year-old male presented to the Emergency Department at a large academic center with a 4-month history of fullness in his neck, worsening dyspnea, dysphagia to solid foods and a 9-pound weight loss in the last 2 months. His past medical history was significant for alcohol use disorder, untreated hypertension, 6 pack-year history of smoking and protein calorie malnutrition. Computed tomography (CT) imaging of the neck demonstrated a left 2.9cm hypopharyngeal and supraglottic mass with associated cervical lymphadenopathy. On flexible laryngoscopy, a supraglottic mass was visualized to be obstructing the airway with impending airway collapse. He was taken to the operating room for biopsy, tracheostomy and PEG tube placement. Four days following PEG tube placement, the patient developed an increasing leukocytosis to 23,000, and erythema and purulent drainage at the PEG tube site. A CT scan was obtained which demonstrated the PEG tube was appropriately positioned in the stomach with subcutaneous gas surrounding the tube and no drainable fluid collection. A surgical site infection was diagnosed and broad spectrum antibiotics were started. There was subsequent resolution of his leukocytosis and improvement in the appearance of the wound. On postoperative day 7, the patient developed leukocytosis to 17,200 with increased pain, induration, and erythema of the abdominal wall around the PEG tube site. He was taken to the operating room for wound exploration where he was found to have necrotizing fasciitis of the left anterior abdominal wall and anterior chest wall requiring extensive debridement totaling 3,000 square centimeters. Necrotizing soft tissue infection was confirmed on pathology, and cultures taken at the time of surgery grew Streptococcus anginosus and mixed anaerobes. The patient required multiple debridements and complex wound care. The wound was eventually closed with split thickness skin grafting one month after his initial debridement.

Conclusion: Necrotizing fasciitis is a known but extremely rare complication of PEG tube placement with only a few cases reported in the literature. In the majority of these cases the infection resulted from a dislodged tube or a buried bumper. Risk factors for development of necrotizing fasciitis include diabetes mellitus, chronic renal failure, malnutrition, alcoholism, obesity and malignancy – three of these were present in our patient. Necrotizing fasciitis is associated with a 21% mortality and a significant morbidity related to surgical debridement. This case illustrates the need for early recognition and intervention on this rare, but severe complication following PEG tube placement.

P 52. LAPAROSCOPIC ADRENALECTOMY FOR GIANT RIGHT ADRENAL MASS

S Alsafran, T Vaghaiwalla, D Schuitevoerder, B Ruhle, P Angelos, E Kaplan, X Keutgen University of Chicago

Background: Laparoscopic adrenalectomy is an effective approach for removal of adrenal masses. Pheochromocytoma measuring less than 6 cm are amenable to laparoscopic approach. However, the management of masses larger 6 cm is debated. As the size of the tumor increases, the technical difficulties and risks increase. Additionally, larger tumors represent an increased risk of malignancy, posing a risk of retroperitoneal and port-site seeding. We report our experience of laparoscopic adrenalectomy for large (11 cm) right adrenal pheochromocytoma with displacement of right renal hilum, inferior vena cava, and duodenum.

Methods: The patient is a 70-year old male presented to emergency department with right upper quadrant pain. patient otherwise had no symptoms. Imaging with Computer Tomography showed 11 x 8 x 9 cm Multiloculated, partially cystic mass Biochemical workup was only positive for serum Metanephrine 18 (< 0.5 nmol/L) and serum Normetanephrines 30 (< 0.9 nmol/L) Patient was started on alpha blockade (Doxazosin) prior to surgery. Laparoscopic adrenalectomy was performed under general anesthesia. The patient was rolled-up to a full-flank position on a beanbag with right side up. Essential hemodynamic measurements including continuous intraarterial blood pressure monitoring were utilized. 4 ports were used for the procedure. The case was difficult for several reasons. First, tumor was closely adherent to the liver making medial mobilization to expose the IVC and adrenal vein not possible. second, the right renal vein and artery where densely adherent to the tumor. Third, the size of the tumor.

Results: successfully completed procedure laparoscopically. The post operative course was uneventful. Patient was discharge home post operative day 1. FINAL PATHOLOGIC DIAGNOSIS: Right adrenal gland; Pheochromocytoma (10.7 cm) Ki67 index < 1% No capsular invasion

2 weeks follow up Lab: Serum Metanephrine 0.2 (< 0.5 nmol/L) Serum Normetanephrines 0.56 (< 0.9 nmol/L)

Conclusion: Laparoscopic trans-abdominal adrenalectomy is safe approach for resecting large adrenal pheochromocytoma.

P 53. THE "RUNNING SUTURE": A NEW TECHNIQUE FOR DELAYED PRIMARY CLOSURE OF LOWER EXTREMITY FASCIOTOMY INCISIONS

KJ Sharma, SEB Strot, MA Mansour, RF Cuff MSU - Spectrum Health

Background: Acute lower extremity compartment syndrome is a vascular surgical emergency requiring a fasciotomy to prevent permanent deficits and limb loss. This is commonly seen after revascularization for acute limb ischemia due to post-ischemic edema and muscle swelling. Muscle swelling can prevent primary wound closure, which has led to the development of delayed primary closure techniques. Wet-to-dry dressings are an option, however other commonly observed methods include the vessel loop "shoelace" technique and negative pressure wound therapy (NPWT). Unfortunately, these methods may require multiple operating room trips and added patient costs. With this in mind, we share a new approach to delayed primary closure of lower extremity fasciotomy wounds.

Methods: After performing the lower extremity fasciotomy, a #1 prolene or PDS suture is tied loosely at the apex of the fasciotomy wound. The suture is run to the opposite end of the fasciotomy wound and exits at the apex. The suture is passed through a one-way stopcock and secured with tension onto an adhesive dressing. A wet 4 x 4 dressing is placed over the wound if skin approximation is not possible or xeroform is used if the skin is approximated. The lower extremity is wrapped with a Kerlix/ACE wrap. As muscle swelling improves, a suture removal kit can be used to place tension on each individual running loop from the secured apex until the end of the wound. When tightening, 1% lidocaine can be used for local anesthesia. This allows for gradual skin approximation while using the stop cock to keep the suture taut. Prior to discharge, the suture can be secured at the skin edge by tying it upon itself or using two medium hemoclips at the skin tayles can be applied between the loops of suture and the suture may be removed prior to discharge.

Results: Preliminary results of the "running suture" technique has been promising. Wound evaluation at follow-up appointments has demonstrated complete skin approximation without any evidence of infection or superficial wound dehiscence.

Conclusion: The most common techniques for delayed primary closure of lower extremity fasciotomy wounds are the "shoelace" technique and NPWT. The "shoelace" technique has a faster wound closure time and is a financially beneficial option compared to NPWT. However, the "shoelace" method is more expensive than the "running suture" because it may require definitive wound closure in the operating room. An additional benefit of the "running suture" is the ability to simply release the stopcock and lossen the suture if increased muscle swelling occurs postoperatively. For that reason, it is important to leave a long tail end of the suture. Overall, this method is quicker, easier, and less expensive than a trip to the operating room required to replace the "shoelace" or VAC dressing. Early use has been safe, virtually painless, and cost effective for delayed primary closure of fasciotomy wounds. Future work can compare long term outcomes on patients to other options for delayed primary closure.

WSA MEMBER DIRECTORY

Available Online



Please login to the WSA Members Only section to view and access the member directory. For assistance, please email wsa@lp-etc.com.





AND

emorials



Basil A. Pruitt Jr., MD WSA Past President | 1994

We are deeply saddened to announce that Basil A. Pruitt, Jr., MD died March 17, 2019. Dr. Pruitt had a major and sustained international impact on the fields of surgery, burn care, trauma and critical care. His contributions in these fields were transformational and directly led to dramatic improvements in patient care

marked by improved survival, decreased complications and improved health.

Dr. Pruitt graduated from Harvard College (1952) followed by Medical School at Tufts (1957). He completed his initial surgical training at the Boston City Hospital under the tutelage of C. Gardner Childs (1957-1962). From there he completed his surgical residency at Brooke General Hospital in San Antonio (1964).

From 1967-1968 Dr. Pruitt served as Chief of Surgery and Chief of Professional Services at the busiest evacuation hospital in Vietnam (400 to 500 major operations a month) and then Chief of the Trauma Research Team, where he studied the cardiopulmonary responses to injury in combat casualties. Dr. Pruitt became the Commander and Director of the U.S. Army Institute of Surgical Research where he served for the next 27 years. He went on to literally change history by revolutionizing the management of trauma, burn and critically ill or injured patients worldwide.

Dr. Pruitt retired from the US Army Medical Corps in 1995 and accepted a faculty position as Professor of Surgery at UT Health San Antonio, where he held the Dr. Ferdinand P. Herff Chair in Surgery. In his role at UT Health San Antonio, Dr. Pruitt has been a cherished, respected and loved

mentor and colleague. He has supported the development of hundreds of residents, students, faculty, staff and leaders at UT Health San Antonio. As a faculty member at UT Health San Antonio, Dr. Pruitt remained an active contributor to the US Army Institute for Surgical Research (USA ISR), and also served as the Editor-in-Chief of the Journal of Trauma for 17 years.

Dr. Pruitt's work as a leader, surgeon and scientist with the USA ISR forged a model where rigorous scientific inquiry was followed by a dogged translation of this science into dramatic care improvements. This is the gem crafted by Dr. Basil A. Pruitt, Jr. This work transformed the fields of burn care, trauma and surgical critical care.

Cumulative Innovative Achievements

Although Dr. Pruitt's research had a military beginning, the fruits of his labor have been assimilated into civilian medical practice worldwide with associated dramatic reductions in both death and complication rates.

Dr. Pruitt has been internationally recognized with appointments to the NIH study sections, the Veterans Administration Merit Review Board for Surgery, and the Shriners Hospitals Research Advisory Board and Clinical Outcomes Studies Advisory Board. He has also served as a reviewer for the Hong Kong Research Grants Council, the BC Health Research Foundation and Alberta Heritage Foundation, and the NIH for which he has functioned as a special panel member. Over the course of his career he authored over 470 peer reviewed publications, 181 textbook chapters and 15 books and monographs.

Perhaps Dr. Pruitt's most enduring legacy is his mentorship of a cadre of physicians and scientists who have become international leaders in Medicine. Among that group are 46 directors of burn centers and units in the United States and abroad, 23 department chairs (including departments of surgery, urology, anesthesiology, plastic surgery, pediatric surgery and medicine),

11 past presidents of the American Burn Association, 2 past presidents of the International Society for Burn Injury, past Presidents of the American Association for the Surgery of Trauma, the past Chair of the American College of Surgeons Committee on Trauma and at least six academic chairs in the Japanese fields of Acute Care Medicine and Surgery.

Dr. Pruitt served for twenty years as the Associate Editor of the *Journal of Trauma*. Following this he became the Editor-in-Chief of the Journal of Trauma for the next 17 years. Additionally, Dr. Pruitt served as a member of the Editorial Board of 13 other journals, including two published in China and one published in Turkey. He has served as an ad hoc reviewer for an additional 26 journals.

One measure of his stature as an innovator is the recognition by his peers. He was elected as the president of 12 surgical societies:

- 1. American Burn Association
- 2. American Association for the Surgery of Trauma
- 3. Southern Surgical Association
- 4. American Surgical Association
- 5. Halsted Society
- 6. Surgical Infection Society
- 7. American Trauma Society
- 8. North American Burn Society
- 9. Western Surgical Association
- 10. International Society for Burn Injuries
- 11. Surgeons Travel Club
- 12. Shock Society

His awards include 11 honorary memberships, the Metcalfe Award, the Curtis P.Artz Memorial Award, the Harvey Stuart Allen Distinguished Service Award, the Baron Dominique Larrey Award for Surgical Excellence, the National Safety Council's Surgeons' Award for Distinguished Service

to Safety, an International Honorary Professorship of Surgery at the Third Military Medical College People's Republic of China, the Danis Award from the Société Internationale de Chirurgie, and the American Surgical Association's Medallion for Scientific Achievement. In 2000, Dr. Pruitt was recognized with the Distinguished Investigator Award from the American College of Critical Care Medicine along with the G. Whitaker International Burns Prize. The Tanner-Vandeput-Boswick Burn Prize was awarded to him in 2006. In 2007, he accepted the Roswell Park Medal and received a lifetime achievement award from the Society of University Surgeons. As a co-winner of the King Faisal International Prize in Medicine in 2008, Dr. Pruitt was honored in Riyadh, Saudi Arabia. In 2010, he received the Lifetime Achievement Award of the American Burn Association: later that same year, he was inducted as the first foreign honorary member of the Japanese Association for Acute Medicine. In 2015 Dr. Pruitt received the Association of Military Surgeons of the United States Lifetime Achievement Award. In 2017 he was selected as the 2nd Vice President of the American College of Surgeons and later in the same year, he was honored as an Icon in Surgery by the American College of Surgeons. In 2018 Dr. Pruitt received the BioMed SA Lifetime Achievement Award.

Of burn care peer reviewed articles over the past 55 years, Dr. Pruitt has had the largest number of top cited articles.

Over the past half century, Dr. Basil A. Pruitt, Jr., a great citizen, surgeon, innovator, mentor, and leader, transformed our world through his dogged commitment to science and his service to humanity. Dr. Pruitt's contributions live on through the work of surgeons, physicians, scientists and organizations he shaped and inspired. We are forever grateful.

Ronald M. Stewart, MD Professor and Chair of Surgery Dr. Witten B. Russ Chair in Surgery

NOTES

NOTES

NOTES



Western Surgical Association t: 913-402-7102

t: 913-402-7102 wsa@lp-etc.com www.westernsurg.org