

MIRA



5TH INTERNATIONAL CONGRESS

January 27-30, 2010

**San Diego, California
Manchester Grand Hyatt**



UC San Diego
SCHOOL OF MEDICINE

“LATEST TRENDS IN ROBOTIC SURGERY”

PROGRAM CHAIR: Santiago Horgan, MD
COURSE CHAIR: Sonia Ramamoorthy, MD

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Welcome Colleagues!



Welcome to MIRA 2010 in beautiful San Diego, California. MIRA is the oldest and most prestigious international robotic society. We are excited to see that you have been able to attend the 5th International Congress. This year's program promises to be an exciting agenda with an emphasis on new robotic applications such as orthopedics, vascular surgery, cardiology and robotic simulation. New in 2010 is the MIRA Hands-On Robotic Master Courses in Urology, Gynecology and Colorectal. You are among the first to see cutting edge and emerging robotic technologies. In our scientific sessions for Urology, Gynecology, Cardiothoracic Surgery and Colorectal/General Surgery you will interact with colleagues from around the world who are performing robotic surgery. You will learn ways in which to enhance your robotic program and gain practical tips to take back to your hospital/institution. Some of the highlights of MIRA 2010 include:

- Keynote speaker Tod Loofbourrow, President of iRobot's healthcare sector, talks about the future of robotics in the healthcare industry
- The Presidential Panel including the current and past presidents of ASCRS, SLS and SAGES as they discuss the impact of robotics on the practice of surgery
- Hands-on robotic courses for Urology, Gynecology and Colorectal taught by world class robotic surgeons
- Unveiling of new surgical robotic technology from industry and academia
- Catheter-based robotic technology used for cardiac ablative procedures
- Robotic simulators for teaching and instruction
- Scientific and video session on cutting edge robotic surgery
- Warm sunny beaches, golf and world class hotels and restaurants

We welcome you to sunny Southern California for this premiere robotics conference. This meeting will provide you with a rare opportunity where clinicians, industry, engineers and academia converge to share ideas and strategize the future of robotics in healthcare. We are looking forward to a great meeting!

Sincerely,
Santiago Horgan, MD, MIRA Program Chair
Sonia Ramamoorthy MD, MIRA Program Co-Chair

GENERAL INFORMATION

OFFICIAL CONFERENCE HOTEL

Manchester Grand Hyatt

One Market Place
San Diego, California, USA 92101

PHONE: +1 619.232.1234

FAX: +1 619.233.6464

REGISTRATION *(Douglas Pavilion Foyer West)*

& SPEAKER PREP HOURS *(Gregory A)*

Tuesday, January 26, 2010	2:00pm - 6:00pm
<i>Speaker Prep Only</i>	
Wednesday, January 27, 2010	6:30am - 5:00pm
Thursday, January 28, 2010	6:30am - 5:00pm
Friday, January 29, 2010	6:30am - 5:00pm
Saturday, January 30, 2010	6:30am - 12:00pm

EXHIBIT HALL HOURS *(Douglas Pavilion A)*

Thursday, January 28, 2010 **9:30am - 3:30pm**

Reception in Exhibit Hall (Exhibits Open) 5:30pm - 7:00pm

Friday, January 29, 2010 **9:30am - 3:30pm**

COURSE DESCRIPTION

The 5th International Congress will feature state of the art lectures, hands-on cadaver and porcine labs, and internationally renowned faculty. This CME activity will offer an extensive update on the advancements within minimally invasive robotic surgery and provide a great opportunity to discuss the future and impact of these procedures.

TARGET AUDIENCE

The target audience for this activity includes: surgeons, internists, radiologists, engineers and computer scientists who are interested in robotics, telerobotics, telepresences, teleconferencing and telementoring.



GENERAL INFORMATION

OBJECTIVES

At the conclusion of this activity, participants should be able to:

- Identify the latest trends in robotics focusing on pediatrics, general surgery, cardio-thoracic, colorectal, urology and gynecology
- Describe how robotics is playing a role in SILS
- Identify new applications and technologies in robotics
- Describe how robotics is playing a role in helping treat Ovarian, Endometrial and Cervical Cancer
- List new trends in robotics in head and neck surgery
- Describe how robotics surgery will interact with NOTES

NEEDS ASSESSMENT

The mission of the Minimally Invasive Robotic Association (MIRA) is to raise the level of robotic surgery care in the world. This year's program committee started by identifying the educational needs of the target audience. By using expert opinions and past evaluations, a program was developed to increase awareness of robotics and the significant changes taking place. Faculty has been invited based on their expertise from around the world to present the most updated information. With a combination of hands-on courses, post-graduate courses and a three day scientific session, this congress will help to encourage minimally invasive robotics research and enable the broadcasting of its results.

ACCREDITATION STATEMENT

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the University of California, San Diego School of Medicine and the Minimally Invasive Robotics Association. The University of California, San Diego School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

The University of California, San Diego School of Medicine designates this educational activity for a maximum of **24.25 AMA PRA Category 1 Credits™**. Physicians should only claim credit commensurate with the extent of their participation in the activity.

CULTURAL & LINGUISTIC COMPETENCY

California Assembly Bill 1195 requires continuing medical education activities with patient care components to include curriculum in the subjects of cultural and linguistic competency. It is the intent of the bill, which went into effect on July 1, 2006, to encourage physicians and surgeons, CME providers in the state of California, and the Accreditation Council for Continuing Medical Education to meet the cultural and linguistic concerns of a diverse patient population through appropriate professional development. The planners, speakers and authors of this CME activity have been encouraged to address issues relevant in their topic area. In addition, a variety of resources are available that address cultural and linguistic competency, some of which are included in your syllabus or handout materials. Additional resources and information about AB1195 can be found on our website at <http://cme.ucsd.edu>.

Acknowledgements

FOR EDUCATIONAL GRANTS

We would like to offer a very special thank you to the following companies for their generous educational grants. Their financial support has made this conference possible.

Diamond Level
Intuitive Surgical

Silver Level
Covidien

Additional Support
InTouch Health

FOR EXHIBITORS

We would like to acknowledge the following companies and organizations for exhibiting at this conference.

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Ethicon Endo-Surgery, Inc.

Intuitive Surgical, Inc.

Mimic Technologies, Inc.

Stryker Endoscopy

Thoramet Surgical Products, Inc.

Wiley-Blackwell



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Gregory Hager	Intuitive Surgical	Stockholder
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Tod Loofbourrow	i-Robot	Employee
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John Meehan	Intuitive Surgical	Educational Proctoring
Farzad Najam	Cardiac Assist	Consulting/Proctoring
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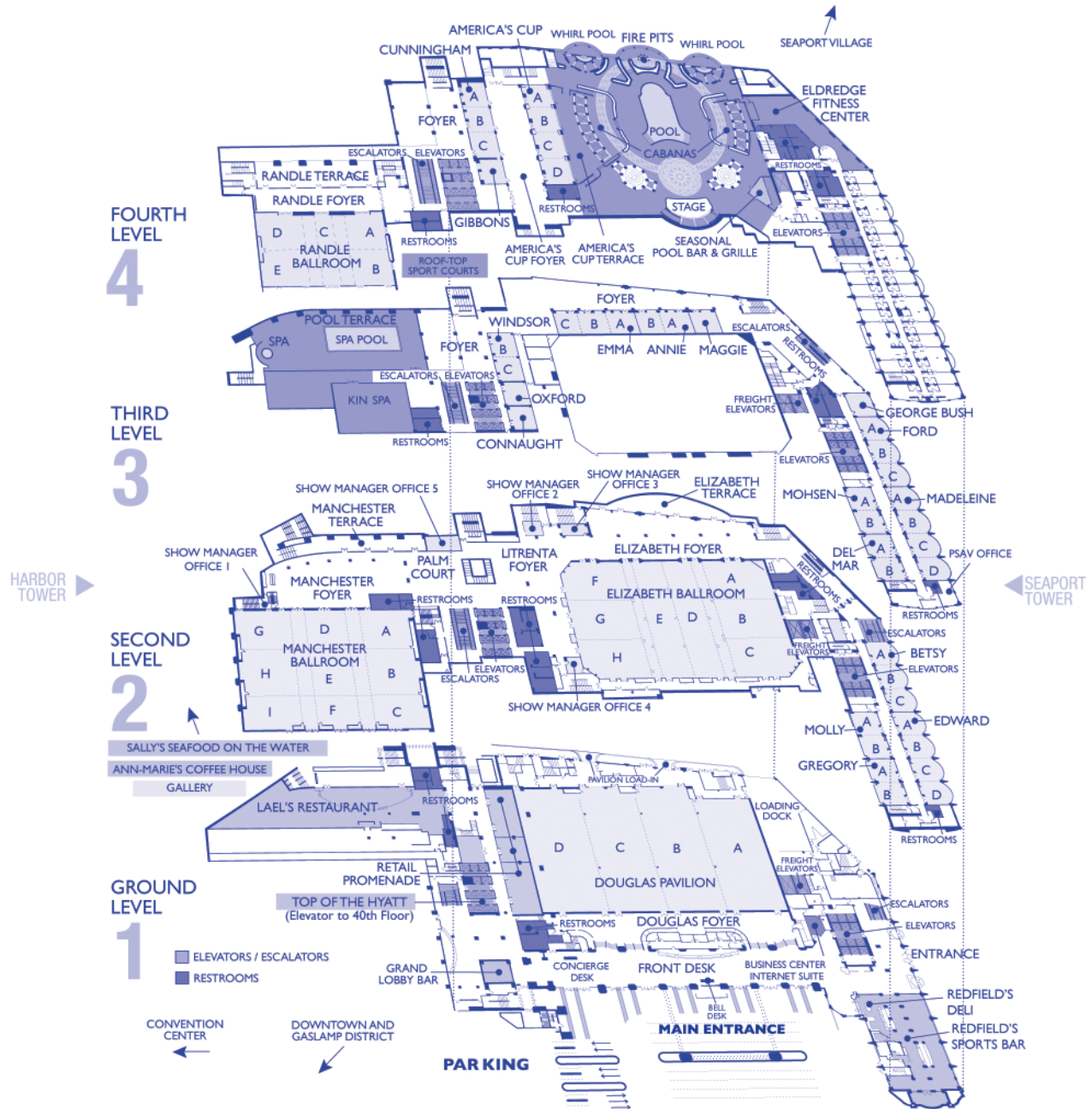
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The views and opinions expressed in this activity are those of the faculty and do not necessarily reflect the views of the University of California, San Diego.

HOTEL FLOOR PLAN



GROUND LEVEL:

Meeting Rooms:

Douglas Pavilion
Douglas Foyer
Gallery

Restaurants:

Sally's Seafood On The Water
Lael's Restaurant
Redfield's Sports Bar
Redfield's Deli
Grand Lobby Bar
Ann-Marie's Coffee House

Retail Promenade:

Grand Floral
HarborLinks
Regency Gifts
Madison Fine Arts

Business Center

SECOND LEVEL:

Meeting Rooms:

Manchester Ballroom
Manchester Foyer
Manchester Terrace
Litrenta Foyer
Elizabeth Ballroom
Elizabeth Foyer
Elizabeth Terrace
Betsy
Edward
Gregory
Molly

THIRD LEVEL:

Meeting Rooms:

Annie
Connaught
Del Mar
Emma
Ford
George Bush
Madeleine
Maggie
Oxford
Mohsen
Windsor

Recreation:

Kin Spa & Pool

FOURTH LEVEL:

Meeting Rooms:

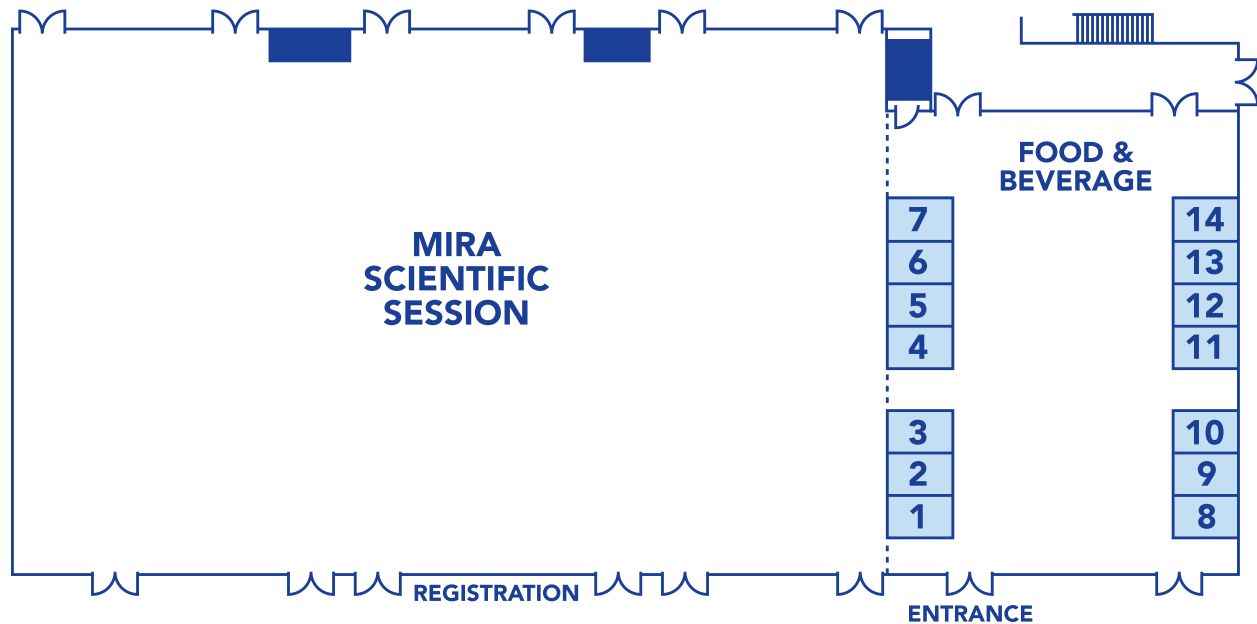
Randle Ballroom
Randle Foyer
Randle Terrace
America's Cup
America's Cup Terrace
America's Cup Foyer
Cunningham
Gibbons

Hospitality Suites
Conference Suites

Recreation:

Pool Deck, Bar and Stage
Fire-pits and Whirl Pools
Eldredge Fitness Center
Sport Courts

EXHIBITOR FLOOR PLAN & PROFILES



COVIDIEN

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#12

ETHICON ENDO-SURGERY, INC.

4545 Creek Road • Cincinnati, OH 45242
 PHONE: 800.USE.ENDO FAX: 800.873.3636
 WEBSITE: www.eesedu.com

Ethicon Endo-Surgery, Inc. develops and markets advanced medical devices for minimally invasive and open surgical procedures. The company focuses on procedure-enabling devices for the interventional diagnosis and treatment of conditions in general and bariatric surgery, as well as gastrointestinal health, plastic surgery, orthopedics, gynecology, and surgical oncology.

#10

INTUITIVE SURGICAL INC.

1266 Kifer Road • Sunnyvale, CA 94086
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 WEBSITE: www.intuitivesurgical.com

Intuitive Surgical, Inc. is the global technology leader in robotic-assisted, minimally invasive surgery. The Company's da Vinci(r) Surgical System offers breakthrough technology designed to enhance surgical capability, improve clinical outcomes and drive operational efficiencies.

#1

MIMIC TECHNOLOGIES, INC.

811 First Avenue, Suite 408 • Seattle, WA 98104
 PHONE: 800.918.1670 FAX: 206.623.3491
 WEBSITE: www.mimic.ws

Mimic Technologies will be demonstrating the dV-Trainer, a simulator that provides cost-effective, off-line skills training for surgeons learning to use the da Vinci® Surgical System. The dV-Trainer is currently in beta testing with product release scheduled for Q2 2010.

#4

STRYKER ENDOSCOPY

5900 Optical Court • San Jose, CA 95138
 PHONE: 800.624.4422 FAX: 800.729.2917
 WEBSITE: www.stryker.com

Stryker Corporation is one of the world's leading medical technology companies with the most broadly-based range of products in orthopaedics and a significant presence in other medical specialties such as minimally invasive endoscopy. Stryker works with respected medical professionals to help people lead more active and more satisfying lives.

#8

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#11

WILEY-BLACKWELL

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The International Journal of Medical Robotics and Computer Assisted Surgery is the Official Journal of MIRA. The journal provides the latest developments in robotics and computer assisted technologies for medical applications. For more information please visit: www.interscience.wiley.com/journal/rcs

#9

SPEAKER HIGHLIGHTS



Gregory D. Hager, PhD

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Department of Computer Science, Baltimore, Maryland

Gregory D. Hager is a Professor of Computer Science at Johns Hopkins University and the Deputy Director of the NSF Engineering Research Center for Computer Integrated Surgical Systems and Technology. His current research interests include visual tracking, vision-based control, medical applications of vision and robotics, and human-computer interaction. He is the author of more than 200 peer-reviewed research articles and books in the area of robotics and computer vision. In 2006, he was elected a fellow of the IEEE for his contributions in Vision-Based Robotics. Professor Hager received the BA degree, summa cum laude, in computer science and mathematics from

Luther College in 1983, and the MS and PhD degrees in computer science from the University of Pennsylvania in 1985 and 1988, respectively. From 1988 to 1990, he was a Fulbright junior research fellow at the University of Karlsruhe and the Fraunhofer Institute IITB in Karlsruhe, Germany. From 1991 until 1999, he was with the Computer Science Department at Yale University. In 1999, he joined the Computer Science Department at Johns Hopkins University.



Tod Loofbourrow

iRobot Corp.
President, Healthcare Business Unit

Tod Loofbourrow has 25 years of entrepreneurial experience building businesses and driving category creation. His expertise includes software-as-a-service, consulting and healthcare information technology. Prior to joining iRobot, Loofbourrow was founder, CEO and chairman of Authoria, Inc., a leader in benefits and talent management for Fortune 2000 clients. Previously, he served as founder, managing director and CEO of Foundation Technologies, a strategic consulting firm for Fortune 2000 CIOs. Loofbourrow holds a bachelor of arts degree from Harvard University.

SAVE THE DATE
Join MIRA in Athens, Greece!

MIRA 2011
6th International
Congress

May 11-14, 2011, Athens, Greece



WEDNESDAY-AT-A-GLANCE

8:00am - 12:00pm	Master's Robotic Hands-On Course Colorectal	<i>Offsite/UCSD Lab</i>
7:50am - 12:00pm	Post-Graduate Course Robotic Thoracic Surgery	<i>Douglas Pavilion B</i>
2:00pm - 6:00pm	Master's Robotic Hands-On Course Urology	<i>Offsite/UCSD Lab</i>
	Master's Robotic Hands-On Course Gynecology	<i>Offsite/UCSD Lab</i>

MASTER'S ROBOTIC HANDS-ON COURSES

(All Hands-On Labs will be held offsite at the UCSD Lab: SRL Lab, 130 Dickinson St., San Diego, CA 92101)

COLORECTAL

COURSE CHAIRS: Slawomir Marecik, MD & Alessio Pigazzi, MD

8:00am - 12:00pm

(Shuttle Pick-Up at 7:00am. Shuttle will pick up participants in the hotel lobby of the Manchester Grand Hyatt. They will be dropped back off at the hotel at the conclusion of the course.)

The Colorectal Robotic Hands-On Course is a structured training program, which will include a practice on the pelvic (human like) simulator, didactics and hands-on laboratory with human cadavers. The main objective is to reveal the potential of robotic technology in total mesorectal excision (TME). The simulator portion will last 1 hour, didactic portion 1/2 hour, followed by cadaver lab. There will be 3 students assigned to each cadaver. The first task in the cadaver lab will be robotic right colectomy. Subsequently, the focus of training will be placed on robotic TME. Each trainee should become proficient in robotic cart assistance as well as the console.

Objectives

At the conclusion of this activity, participants should be able to:

- Recognize the potential role of robotic device in treatment of rectal cancer
- Learn how to setup the robotic device with special attention to right sided colon resection and pelvic dissection
- Acquire necessary skills for robotic right-sided colon resection and total mesorectal excision

UROLOGY

COURSE CHAIRS: Christopher Kane, MD & Ashutosh Tewari, MD

2:00pm - 6:00pm

(Shuttle Pick-Up at 1:15pm. Shuttle will pick up participants in the hotel lobby of the Manchester Grand Hyatt. They will be dropped back off at the hotel at the conclusion of the course.)

The Urology Hands-On Course will be a four-hour, hands-on robotic laboratory using a live porcine (pig) model. Each attendee will have one partner and one faculty member per training station. Each student will review robotic port placement strategies for robotic surgeries, perform suturing practice by performing an uretero-ureterostomy. Then each student will perform all the steps of a robotic partial nephrectomy (ureteral identification, hilar dissection, renal mobilization, hilar control, renal excision, renorrhaphy and closure) and assist as bedside assistant on the second procedure performed by his or her training partner. Each trainee will have over 90 minutes of robotic console training time.

Objectives

At the completion of this activity, participants should be able to:

- Describe the optimal port placement strategies for common GU procedures
- Perform robotic clutch and camera maneuvers smoothly to maximize robotic view and instrument range of motion
- Increase their suturing speed by incorporating suturing and knot tying efficiency tips
- Demonstrate the application and release of laparoscopic vascular bulldogs and clamps
- Demonstrate robotic renal excision and renorrhaphy techniques to perform robotic partial nephrectomy

GYNECOLOGY

COURSE CHAIRS: Emily Lukacz, MD & Javier Magrina, MD

2:00pm - 6:00pm

(Shuttle Pick-Up at 1:15pm. Shuttle will pick up participants in the hotel lobby of the Manchester Grand Hyatt. They will be dropped back off at the hotel at the conclusion of the course.)

The Gynecology Hands-On Course will be a 4-hour robotic laboratory using a live porcine (pig) model. Each attendee will have 2 partners and will focus on acquiring skills relevant to setup, port placement and instrumentation for gynecologic application of robotic surgery. They will learn to identify and assess the role of robotic surgical approach over traditional laparoscopic procedure while obtaining valuable time using the robot specific to GYN procedures.

Objectives

At the completion of this activity, participants should be able to:

- Acquire skills relevant to setup, port placement and instrumentation for gynecologic application of robotic surgery
- Identify and assess the role of robotic surgical approach over traditional laparoscopic procedures
- Learn the techniques related to hysterectomy, oophorectomy, cystotomy and repair, and pelvic lymphadenectomy procedures

POST-GRADUATE COURSE

(Manchester Grand Hyatt, Douglas Pavilion B)

ROBOTIC THORACIC SURGERY

COURSE CHAIRS: Farid Gharagozloo, MD & Marc Margolis, MD

INVITED SPEAKERS: Johannes Bonatti, MD, Bessie Gessner, BA, RN, CNOR, Kemp Kernstine, MD, Bob Kiaii, MD, Kenneth Lee, MD & Eric Strother, BS

7:50am - 12:00pm

The Thoracic Post-Graduate Course will present an overview of a Robotic Thoracic Surgery Program from the administrative aspects of establishing the program, to getting buy-in from referring physicians, to the actual procedures which are performed. The course will present a comprehensive approach to Robotic Lobectomy, Robotic Esophagectomy, Robotic Surgery for benign esophageal disease, and Robotic Approach to the Mediastinum.

Objectives

At the conclusion of this activity participants should be able to:

- Identify the difficulties inherent to the establishment of a Robotic Thoracic Surgery Program
- Review the techniques of various robotic procedures in Thoracic Surgery
- Identify the factors responsible for the success of a Robotic Thoracic Surgery Program

7:50am - 8:00am	Welcome and Course Objectives – Marc Margolis, MD & Farid Gharagozloo, MD
8:00am - 8:25am	Role of Robotics in Thoracic Surgery – Kemp Kernstine, MD
8:25am - 8:50am	Role of Robotics in Thoracic Surgery – Kemp Kernstine, MD
8:50am - 9:15am	Robotic CABG Surgery – Johannes Bonatti, MD
9:15am - 9:40am	Fourth Arm Robotic Lobectomy – Kenneth Lee, MD
9:40am - 10:00am	Break
10:00am - 10:25am	Hybrid Robotic Lobectomy – Marc Margolis, MD
10:25am - 10:50am	Robotic Approaches to Malignant Esophageal Disease – Kemp Kernstine, MD
10:50am - 11:15am	Robotic Approaches to Benign Esophageal Diseases – Farid Gharagozloo, MD
11:15am - 12:00pm	Establishment of Robotic Thoracic Surgery Program – Bessie Gessner, BA, RN, CNOR & Eric Strother, BS

THURSDAY-AT-A-GLANCE

7:00am - 8:00am	Breakfast	<i>Douglas Pavilion Foyer West</i>
8:00am - 12:30pm	Plenary Session I	<i>Douglas Pavilion CD</i>
12:30pm - 1:30pm	Lunch on your own/Exhibits Open	<i>Douglas Pavilion A</i>
1:30pm - 4:30pm	3 Concurrent Sessions Urology Gynecology General Surgery	<i>Douglas Pavilion B</i> <i>Douglas Pavilion C</i> <i>Douglas Pavilion D</i>
5:30pm - 7:00pm	Welcome Reception in Exhibit Hall	<i>Douglas Pavilion A</i>

7:00am - 8:00am	Breakfast	<i>Douglas Pavilion Foyer West</i>
8:00am - 12:30pm	PLENARY SESSION I MODERATORS: Mehran Anvari, MD & Santiago Horgan, MD	<i>Douglas Pavilion CD</i>
8:00am - 8:10am	Welcome Santiago Horgan, MD	
8:10am - 8:40am	Potential New Directions for Robotic Surgery Richard Satava, MD, INTRODUCTION: Santiago Horgan, MD	
8:40am - 9:05am	The Robin Heart Polish Surgical Robot Family - From Virtual to Real Operating Room Zbigniew Nawrat, PhD, INTRODUCTION: Richard Satava, MD	
9:05am - 9:20am	Robotic Assisted Radio Therapy CyberKnife, INTRODUCTION: Santiago Horgan, MD	
9:20am - 9:30am	Image Stability, Centration and Camera Control in Standard and Robot- Assisted Prostatectomy Iva A.M.J Broeders, MD, INTRODUCTION: Santiago Horgan, MD	
9:30am - 10:45am	Presidential Plenary Abstract Session I S001 NATURAL HAPTIC INTERFACE FOR SINGLE-PORT SURGICAL ROBOT WITH GRAVITY COMPENSATION Xiaoli Zhang, PhD , Carl A. Nelson, PhD, Dmitry Oleynikov, MD, University of Nebraska - Lincoln, University of Nebraska Medical Center S002 10 YEARS EXPERIENCE WITH MINIMALLY INVASIVE SURGERY OF TUMORAL AND NONTUMORAL MYASTHENIA GRAVIS - FROM THORACOSCOPIC TO ROBOTIC SURGERY - A SINGLE CENTRE EXPERIENCE Victor Tomulescu, MD, PhD , Oana Stanciulea, MD, Codrut Stanescu, MD, Arleziana Florescu, MD, PhD, Vlad Herlea, MD, PhD, Irinel Popescu, MD, PhD, Fundeni Institute of Digestive Disease and Liver Transplantation, Bucharest S003 RECURRENCES AFTER ROBOT-ASSISTED LAPAROSCOPIC RADICAL HYSTERECTOMY!!! Bilal M. Sert, MD , Vera Abeler, PhD, Oslo University, The Norwegian Radium Hospital S004 ROBOTIC VASCULAR SURGERY, 150 CASES Petr Stadler, MD, PhD , Libor Dvoracek, MD, Petr Vitasek, MD, Pavel Matous, MD, Dept. of Vascular Surgery, Na Homolce Hospital, Praha, Czech Republic S005 CYBERKNIFE RADIOSURGERY FOR INOPERABLE PATIENTS WITH PERIPHERAL STAGE IA Brian T. Collins, MD , Saloomah Vahdat, MD, Sean P. Collins, MD, Eric K. Oermann, MD, Yu Xia, PhD, Cristina Reichner, MD, Eric Anderson, MD, Farid Gharagozloo, MD, Marc Margolis, Georgetown University Hospital, The George Washington University Hospital S006 ONE HUNDRED THIRTY CASES OF ROBOTIC STAGING FOR ENDOMETRIAL CANCER: EXPERIENCE OF A SINGLE SURGEON AT AN ACADEMIC INSTITUTION Karim S. Elsahwi, MD, Charlene Hooper, MD, Masoud Azodi, MD , Yale University School of Medicine S007 DA VINCI IMPROVES SPLEEN-PRESERVING RATE IN BENIGN AND BORDERLINE MALIGNANT TUMOR OF THE PANCREAS REQUIRING PANCREATECTOMY: PRELIMINARY RESULTS Chang Moo Kang, MD , Yonsei University College of Medicine S008 COMPLETE ROBOTIC-ASSISTED LAPAROSCOPIC LIVING DONOR NEPHRECTOMIES: 79 PROCEDURES Jacques Hubert, MD , Zhang Chao, Marc Ladrière, MD, Guillaume Louis, Benoit Feuillu, MD, Luc Frimat, MD, PhD, Grégoire Chopin, MD, Pascal Eschwège, MD, PhD, Michèle Kessler, MD, Departments of 1Urology and 2Nephrology, Nancy University Hospital, 54511 Vandoeuvre-les Nancy, France	

SCIENTIFIC PROGRAM

THURSDAY, JANUARY 28, 2010

10:45am - 11:00am	Break	<i>Douglas Pavilion A</i>
11:00am - 11:30am	Past, Present and Future of MIRA Mehran Anvari, MD, INTRODUCTION: Santiago Horgan, MD	
11:30am - 12:00pm	Intuitive Surgical: Latest Updates Ryan Rhodes, INTRODUCTION: Mehran Anvari, MD	
12:00pm - 12:30pm	Panel Discussion Mehran Anvari, MD, Zbigniew Nawrat, PhD, Ryan Rhodes & Richard Satava, MD	
12:30pm - 1:30pm	Lunch on your own/Exhibits Open	
1:30pm - 4:30pm	3 Concurrent Sessions	

SESSION 1	UROLOGY	<i>Douglas Pavilion B</i>
	MODERATOR: Ashutosh Tewari, MD	
1:30 pm - 2:00 pm	Robotic Lymph Node Dissection During Prostatectomy and Cystectomy; Current Status Chris Kane, MD	
2:00pm - 4:30 pm	Abstract Session II S009 FACTORS PREDICTING TRIFECTA OUTCOMES AFTER ROBOT-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY Hugh J. Lavery, MD , Sudeh Izadmehr, Fatima Nabizada-Pace, MPH, David B. Samadi, MD, Department of Urology, The Mount Sinai Medical Center, New York, NY S010 OUTCOMES OF ROBOTIC RADICAL PROSTATECTOMY IN ELDERLY PATIENTS Fatima Nabizada-Pace, MPH , Hugh Lavery, MD, John Carlucci, MD, Sudeh Izadmehr, BS, David Samadi, MD, The Mount Sinai Medical Center, Department of Urology S011 REFINEMENTS FOR IMPROVING PREDICTIVE VALUE OF POSITIVE EXTRACAPSULAR EXTENSION STATUS ON ENDORECTAL MAGNETIC RESONANCE IMAGING OF PATIENTS WITH PROSTATE CANCER Abhishek Srivastava, MD , Sonal Grover, MD, David L. Peters, DO, Yoessef El Douaihy, MD, Robert Leung, MPH, Gerald Y. Tan, MD, Jason Fung, BS, Majnu John, PhD, Fangmin Chen, MD, Ashutosh Tewari, MD, MCh, Weill Cornell Medical College - New York Presbyterian Hospital S012 MANAGING "PATIENTS EXPECTATIONS" IN MEN UNDERGOING ROBOTIC RADICAL PROSTATECTOMY: LESSONS LEARNED FROM A COHORT STUDY INVOLVING A STRUCTURED PROTOCOL AND PREOPERATIVE COUNSELING Youssef El Douaihy, MD , Kumaran Mudaliar, MD, Abhishek Srivastava, MD, Dave Peters, DO, Sonal Grover, MD, Robert Leung, MPH, Gerald Tan, MD, Ash Tewari, MD MCh, Weill Cornell Medical College - New York Presbyterian Hospital S013 THE ABILITY OF ENDORECTAL COIL MRI TO PREOPERATIVELY PREDICT SEMINAL VESICLE INVASION Jonathan S. Brajtbord , Hugh J. Lavery, Fatima Nabizada-Pace, Prathibha Senaratne, David B. Samadi, Department of Urology, The Mount Sinai Medical Center S014 ROBOTIC ASSISTED PELVIC LYMPH NODE DISSECTION AND PROSTATECTOMY FOR INTERMEDIATE AND HIGH RISK PROSTATE CANCER: REPORT OF INITIAL OUTCOMES Brian Dicks, MD , Jonathan L. Silberstein, MD, Kerrin Palazzi-Churas, MPH, Sean P. Stroup, MD, Christopher J. Kane, MD, University of California San Diego School of Medicine S015 CAN WE BETTER SELECT CANDIDATES FOR HEMIABLATIVE FOCAL MONOTHERAPY, FOR PROSTATE CANCER BASED ON CURRENT BIOPSY NEEDLE PROTOCOLS? Sonal Grover, MD , Abhishek Srivastava, MD, Kumaran M. Mudaliar, MD, David L. Peters, DO, Fangmin Chen, MD, Gerald Tan, MD, Robert Leung, MPH, Majnu John, PhD, Ashutosh Tewari, MD MCh, New York Presbyterian Hospital, New York, NY; Weill Cornell Medical College, New York, NY	
3:00pm - 3:15pm	Break	<i>Douglas Pavilion A</i>
	S016 ROBOT ASSISTED LAPAROSCOPIC REPAIR ALLOWS ANATOMICAL ASSESSMENT FOR INDIVIDUALIZED MANAGEMENT OF PEDIATRIC URETEROPELVIC JUNCTION OBSTRUCTION Derek J. Matoka, MD, Jennifer A Hagerty, DO, Bruce W. Lindgren, MD , Division of Urology, Children's Memorial Hospital, Chicago, IL and Division of Urology, Lutheran General Hospital, Park Ridge, IL S017 PEDIATRIC ROBOTIC PYELOPLASTY: THE LEARNING CURVE AND COMPARISON WITH A COHORT OF OPEN PYELOPLASTY Hubert S. Swana, MD , Alejandro R. Rodriguez, MD, Timothy A. Weber, MD, Mark A. Rich, MD, Nemours Children's Clinic Orlando, University of South Florida School of Medicine, Department of Urology S018 SAFETY AND EFFECTIVENESS OF ROBOT ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY IN MEN WITH HUMAN IMMUNODEFICIENCY VIRUS Jonathan L. Silberstein, MD , Kerrin Palazzi-Churas, MPH, J. Kellogg Parsons, MD, MHS, Tracy M Downs, MD, Ithaar H. Derweesh, MD, Jeffery Woldrich, MD, Sean P. Stroup, MD, Christopher J. Kane, MD, University of California San Diego School of Medicine	

S019 ROBOTIC ASSISTED RADICAL PROSTATECTOMY: A MODEL FOR EXTENDED MENTORSHIP AND THE SAFE INTRODUCTION OF TECHNOLOGY INTO A VA SETTING [Seth A. Cohen, MD](#), Tracy M. Downs, MD, Jonathan L. Silberstein, MD, Kerrin Palazzi-Churas, MPH, Lissette Bennett, MD, Ithaar H. Derweesh, MD, Koyoko Sakamoto, MD, Sean P. Stroup, MD, Christopher J. Kane, MD, University of California San Diego School of Medicine and San Diego VA Healthcare System, La Jolla, CA

S106 ROBOTIC ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY AND CONCURRENT ASPIRIN USE: INITIAL EXPERIENCE [Sepehr Nowfar, MD](#), Ryan Kopp, MD, Kerrin Palazzi-Churas, MPH, Ithaar H. Derweesh, MD, Christopher J. Kane, MD, University of California San Diego School of Medicine

SESSION 2

GYNECOLOGY

Douglas Pavilion C

MODERATOR: Javier Magrina, MD

1:30pm - 2:00pm

Robotics for Ovarian Cancer

Javier Magrina, MD

2:00pm - 4:30pm

Abstract Session III

S020 CURRENT TRENDS IN ROBOTIC SURGERY: A SURVEY OF GYNECOLOGIC ONCOLOGISTS [Nefertiti C. duPont, MD, MPH](#), Rameela Chandrasekhar, MA, Gregory Wilding, PhD, Khurshid A. Guru, MD, Roswell Park Cancer Institute

S021 COMPARISON BETWEEN 100 CASES OF ROBOTIC VS. 100 CASES OF OPEN SURGICAL STAGING FOR ENDOMETRIAL CANCER [Karim S. ElSahwi, MD](#), Charlene Hooper, MD, Thomas J Rutherford, MD, PhD, Dan-arin Silasi, MD, Peter E. Schwartz, MD, Alessandro D. Santin, MD, Masoud Azodi, MD, Yale University School of Medicine

S022 ROBOTIC HYSTERECTOMY FOR VERY ENLARGED MYOMATOUS UTERI [Taryn N. Gallo, MD](#), Dan-Arin Silasi, MD, Masoud Azodi, MD, Yale New Haven Health System / Bridgeport Hospital

S023 THE ROBOTIC SURGICAL EXPERIENCE IN GYNECOLOGY AT A TEACHING COMMUNITY HOSPITAL [Seetal Adhikari, MD](#), Advocate Lutheran General Hospital, Park Ridge, Illinois

S024 ROLE OF ROBOTIC SURGERY IN REDUCING THE RATE OF ABDOMINAL HYSTERECTOMY [Michael Moen, MD](#), Daniel Pesch, MD, Michael Noone, MD, Grishma Shah, BS, Advocate Lutheran General Hospital

S025 POSTERIOR COLPOTOMY-A SUCCESSFUL RETRIEVED FOR PELVIC MASS AND LARGER SPECIMENS FOLLOWING ROBOTIC ASSISTED LAPAROSCOPIC SURGERY [Gerald A. Feuer, MD](#), O.W. Stephanie Yap, MD, Mathew O. Burrell, MD, Patricia Hernandez, MD, Southeastern Gynecologic Oncology, LLC. Atlanta, Georgia, USA

S026 ROBOTIC-ASSISTED LAPAROSCOPIC SACROCOLPOPEXY FOR TREATMENT OF PELVIC ORGAN PROLAPSE [Adeline Germain](#), Marie Galifet, Marie-Lorraine Scherrer, MD, Jean-Michel Tortuyaux, MD, Ahmet Ayav, MD PhD, Laurent Bresler, MD, Jacques HUBERT, MD, (1) Department of General Surgery, University Hospital of Nancy-Brabois, 54511 Vandœuvre-lès-Nancy, France

S027 ADVANCING RESIDENT AND FELLOW EDUCATION IN ROBOTIC SURGERY – FACTORS THAT PROMOTE TRANSITION TO TEACHING [Timothy O. Wilson, MD](#), Bobbie S. Gostout, MD, Christopher J. Klingele, MD, Mayo Clinic Division of Gynecologic Surgery, Rochester MN

3:00pm - 3:15pm

Break

Douglas Pavilion A

S028 ORTHO-CENTRIC DOCKING: AN AID TO ACCESS TO THE PERINEUM IN PELVIC ROBOTIC SURGERY [Daniel H. Smith, MD](#), Hackensack University Medical Center

S029 ROBOTIC SURGERY FOR GYNECOLOGIC PROCEDURES IN SUPER-MORBIDLY OBESE WOMEN [Charlene Hooper, MD, MPH](#), Karim ElSahwi, MD, Masoud Azodi, MD, Peter Schwartz, MD, Thomas Rutherford, MD, PhD, Dan-Arin Silasi, MD, Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University School of Medicine

S030 NEEDLE OOPHROPEXY: A NEW SIMPLE TECHNIQUE FOR OVARIAN TRANSPOSITION PRIOR TO PELVIC IRRADIATION [Waheed Y. Gareer, MD](#), [Zeiad S. Gad, MRCS MD](#), Haytham W. Gareer, MD, Surgical Oncology Department, NCI, Cairo University

S031 RESIDENT TRAINING IN ROBOTIC ASSISTED GYNECOLOGIC SURGERY [Michael L. Galloway, DO](#), David Dhanraj, MD, Gary Ventolini, MD, Wright State University, Boonshoft School of Medicine

S032 OVERCOMING EXTREME OBESITY WITH ROBOTIC SURGERY [Pamela J. Stone, MD](#), Alexander Burnett, MD, Brian Burton, MD, Juan Roman, MD, University of Arkansas for Medical Sciences

S033 SURGICAL TECHNIQUE ENHANCES EFFICIENCY OF ROBOTIC HYSTERECTOMY [Gerald A. Feuer, MD](#), Patricia Hernandez, MD, Southeastern Gynecologic Oncology, LLC. Atlanta, Georgia, USA

S034 ROLE OF ROBOT-ASSISTED LAPAROSCOPY IN THE MANAGEMENT OF OVARIAN CANCER [Gerald A. Feuer, MD](#), Patricia Hernandez, MD, Southeastern Gynecologic Oncology LLC. Atlanta, Georgia - USA

S035 "SIDE-DOCKING" IN ROBOTIC ASSISTED LAPAROSCOPIC GYNECOLOGIC CANCER SURGERY [June Hou, MD](#), Divya Gupta, MD, Dennis Kuo, MD, Albert Einstein School of Medicine /Montefiore Medical Center

SESSION 3

GENERAL SURGERY

Douglas Pavilion D

MODERATORS: Garth Ballantyne, MD & Dmitry Oleynikov, MD

1:30pm - 2:00pm

Use of Robotics on SILS and NOTES™

Dmitry Oleynikov, MD

2:00pm - 4:30pm

Abstract Session IV

S036 DOES PREVIOUS ENDOSCOPIC TREATMENT AFFECT THE OUTCOME OF ROBOTIC-ASSISTED HELLER MYOTOMY? Carlos A. Galvani, MD, Maria V. Gorodner, Alberto A. Gallo, MD, Phillip Donahue, MD, Santiago Horgan, MD, University of Illinois at Chicago/ University of California San Diego

S037 ROBOTIC THORACOSCOPIC HELLER MYOTOMY FOR ACHALASIA Marc Margolis, MD, FACS, Farid Gharagozloo, MD, FACS, Eric Strother, BS, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

S038 ROBOTIC SURGERY IN SPAIN: GROWING EXPERIENCE AND INTERGROUPS COLLABORATION 2006-2009 Elena Ortiz-Oshiro, MD, PhD, Angel Ramos Carrasco, MD, PhD, Carmen Hernandez Perez, PhD, Cristina Pardo Martinez, MD, PhD, Jesus Alvarez Fernández-Represa, MD, PhD, Hospital Clinico San Carlos, Madrid (Spain)

S039 ROBOTIC VS LAPAROSCOPIC NISSEN FUNDOPLICATION FOR GASTRO-OESOPHAGEAL REFLUX DISEASE: SYSTEMATIC REVIEW AND META-ANALYSIS Sheraz R. Markar, MRCSEng, MA, MBBChir, Alan P. Karthikesalingam, MRCSEng, MA, MBBChir, Oliver Wagner, MD, Santiago Horgan, MD, Monika Hagen, MD, MA Talamini, MD, University of California, San Diego (UCSD)

S040 ROBOTIC SURGICAL TRAINING AND DIFFUSION IN UNIVERSITY ENVIRONMENT Elena Ortiz-Oshiro, MD, PhD, Carmen Hernandez Perez, PhD, Angel Ramos Carrasco, MD, PhD, Cristina Pardo Martinez, MD, PhD, Iris Sanchez Egido, PhD, Jesus Alvarez Fernandez-Represa, MD, PhD, Hospital Clinico San Carlos Universidad Complutense de Madrid

S041 ROBOTIC SURGERY OF THE SPLEEN Catalin Vasilescu, Associate Professor, PhD, Olivia Sgarbura, MD, Stefan Tudor, MD, Monica Popa, MD, Fundeni Institute of Digestive Diseases and Liver Transplantation, Carol Davila University of Medicine and Pharmacy, Bucharest Romania

S042 ACCURACY AND SPEED TRADE-OFF IN ROBOT-ASSISTED SURGERY: ROLE IN ROBOTIC SURGICAL PROFICIENCY Jung H. Chien, Manish M. Tiwari, MD, PhD, Irene H. Suh, Mukul Mukherjee, PhD, Shi-Hyun Park, PhD, Dmitry Oleynikov, MD, FACS, Ka-Chun Siu, PhD, University of Nebraska Medical Center

S043 3 YEARS OF EXPERIENCE WITH THE 4-ARM DAVINCI SYSTEM. WHEN TO USE THE ROBOT IN GENERAL SURGERY K. Konstantinidis, S. Hiridis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, Athens Medical Center

3:00pm - 3:15pm

Break

Douglas Pavilion A

3:15pm - 3:45pm

Robotics and Pediatric General Surgery...the Endless Applications

John J. Meehan, MD

S044 ROBOTIC SURGERY IN THE INFANT AND NEONATE POPULATION Juan I. Camps, MD, Joel F. Bradley, MD, Palmetto Health Children's Hospital, Columbia, SC

S045 CAN THE ROBOT HELP IN THE DIFFICULT PARAESOPHAGEAL HERNIA? PRESENTATION OF 2 CASES. K. Konstantinidis, S. Hiridis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, Athens Medical Center

S046 LAPAROBOTIC DUODENAL DIVERTICULECTOMY AND CHOLEDOCHO DUODENOSTOMY – A CASE STUDY AND REVIEW OF LITERATURE Venkata K. Kella, MD, Emil Shakov, MD, Anusak Yiengpruksawan, MD, FACS, Valley Hospital Ridgewood New Jersey

S047 ROBOTIC REPAIR OF A TRAUMATIC HIATAL HERNIA Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta, CRNP, The George Washington University Medical Center

S048 HOW CAN THE SURGICAL ROBOT FACILITATE THE DIFFICULT SPLENECTOMY? REVIEW OF THE LITERATURE AND PRESENTATION OF A RARE CASE. K. Konstantinidis, S. Hiridis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, ATHENS MEDICAL CENTER

S049 ROBOT ASSISTED GASTRIC BYPASS Massimo Senni Buratti, MD, Jean Gugenheim, MD, Centre Hospitalier Universitaire de Nice - Université Sophia Antipolis - France

S050 ROBOTIC ESOPHAGEAL DIVERTICULECTOMY AND HELLER MYOTOMY APPROACHED FROM RIGHT CHEST Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

S051 ROBOTIC-ASSISTED SURGERY IN BRAZIL – INITIAL EXPERIENCE Ricardo Z. Abdalla, Marco A. Arap, Anuar I. Mitre, Sirio Libanes Hospital

5:30pm - 7:00pm

Welcome Reception in Exhibit Hall

Douglas Pavilion A

SCIENTIFIC PROGRAM

FRIDAY, JANUARY 29, 2010

FRIDAY-AT-A-GLANCE

8:00am - 9:00am	Breakfast and Business Meeting for MIRA Members	<i>Douglas Pavilion CD</i>
9:00am - 9:45am	Video Session	<i>Douglas Pavilion CD</i>
9:45am - 10:00am	Break	<i>Douglas Pavilion A</i>
10:00am - 12:30pm	Plenary	<i>Douglas Pavilion CD</i>
12:30pm - 1:30pm	Lunch on your own/Exhibits Open	
1:30pm - 4:30pm	2 Concurrent Sessions Colorectal (Co-sponsored by ASCRS) Head/Neck-Cardio-Thoracic	<i>Douglas Pavilion CD</i> <i>Douglas Pavilion B</i>
6:30pm - 9:00pm	Social Event	<i>USS Midway/Shuttle Pick-Up at 6:00pm in Hotel Lobby</i>

8:00am	Breakfast	<i>Douglas Pavilion Foyer West</i>
8:00am - 9:00am	Business Meeting for MIRA Members	<i>Douglas Pavilion CD</i>
9:00am - 9:45am	Video Session V MODERATORS: Johannes Bonatti, MD & Ivo Broeders, MD	<i>Douglas Pavilion CD</i>
	S052 AXILLARY-CORONARY SEQUENTIAL VEIN GRAFT FOR ROBOTICALLY ASSISTED TOTAL ENDOSCOPIC TRIPLE CORONARY ARTERY BYPASS GRAFTING Johannes Bonatti, MD, Eric J. Lehr, MD PhD, David Zimrin, MD, Mark Vesely, MD, Patrick Odonkor, MD, Bartley Griffith, MD, University of Maryland Heart Center, University of Maryland School of Medicine	
	S053 ROBOT-ASSISTED APICOPOSTERIOR SEGMENTECTOMY OF LEFT UPPER LOBE FOR LUNG CANCER Hyun-Sung Lee, MD, PhD, Hee-Jin Jang, MD, National Cancer Center	
	S054 ROBOT-ASSISTED RIGHT-SIDED LOBECTOMY AND COMPLETE MEDIASTINAL LYMPH NODE DISSECTION Hee-Jin Jang, MD, Hyun-Sung Lee, MD PhD, National Cancer Center	
	S055 ROBOT-ASSISTED LEFT-SIDED LOBECTOMY AND COMPLETE MEDIASTINAL LYMPH NODE DISSECTION FOR LUNG CANCER Hyun-Sung Lee, MD, PhD, Hee-Jin Jang, MD, National Cancer Center	
	S056 ROBOT-ASSISTED IVOR-LEWIS ESOPHAGECTOMY FOR ESOPHAGEAL CANCER Hyun-Sung Lee, MD, PhD, Hee Jin Jang, Jae Ill Zo, National Cancer Center	
	S057 ROBOTIC THORACOSCOPIC APPROACH FOR FIRST RIB RESECTION FOR RELIEF OF THORACIC OUTLET SYNDROME Farid Gharagozloo, MD, Barbara Tempesta, CRNP, Marc Margolis, MD, Eric Strother, RSA, Washington Institute of Thoracic and Cardiovascular Surgery and The George Washington University Medical Center	
	S058 ROBOTIC ABDOMINO-PERINEAL RESECTION Faisal Al-Mufarrej, MD, Howard Pryor, MD MPH, Grace Montenegro, MD, Obias Vincent, MD, George Washington University	
	S059 ROBOTIC ASSISTED ENUCLEATION OF A LARGE LOWER ESOPHAGEAL LEIOMYOMA Abed Khalailah, MD, Ram El Elazary, MD, Avraham Schlager, MD, Mohammed Adileh, MD, Samir Abu-Gazala, MD, Mahmud Abu-Gzala, MD, Avraham I Rivkind, MD, Yoav Mintz, MD, Department of General Surgery, Hadassah Hebrew University Medical Center	
	S060 ROBOTIC VERTICAL SLEEVE GASTRECTOMY FOR MORBID OBESITY Gordon Wisbach, MD, Janos Taller, MD, Naval Medical Center San Diego	
	S061 ROBOTIC ASSISTED URETEROTOMY REPAIR June Hou, MD, Reza Ghavamian, MD, Dennis Kuo, MD, Albert Einstein School of Medicine / Montefiore Medical Center	
9:45am - 10:00am	Break	<i>Douglas Pavilion A</i>
10:00am - 12:30pm	Plenary	<i>Douglas Pavilion CD</i>
10:00am - 10:30am	KEYNOTE: Disruptive Innovation: Robotics, Software and Healthcare Economics Tod Loofbourrow, iRobot, INTRODUCTION: Sonia Ramamoorthy, MD	
1030am - 10:45am	Simulation Training for the da Vinci® Surgical System Jeffrey Berkley CEO, Mimic Technologies, Inc, INTRODUCTION: Sonia Ramamoorthy, MD	
10:45am - 11:00am	Q&A	
11:00am - 12:30pm	Video Session VI MODERATORS: George Denoto, MD & Jacques Hubert, MD	

S062 ROBOTIC WEDGE RESECTION OF THE STOMACH AND INTRACORPOREAL SUTURES FOR GIST AT ANTRUM OF THE STOMACH Seong-Ho Kong, MD, Jong-Won Kim, MD, Hyuk-Joon Lee, MD PhD, Han-Kwang Yang, MD PhD, Seoul National University College of Medicine

S063 ROBOTIC REPAIR OF A NEONATAL HIGH ANORECTAL MALFORMATION Juan I. Camps, MD, Joel F. Bradley III, MD, Prithvi P. Reddy, MD, Palmetto Health Children's Hospital, Columbia, SC

S064 ROBOT ASSISTED RADICAL TRACHELECTOMY WITH PRESERVATION OF THE UTERINE VESSELS FOR CERVICAL CANCER Karim S. ElSahwi, MD, Charlene Hooper, MD, Elena Ratner, MD, Dan-arin Silasi, MD, Alessandro D. Santin, MD, Peter E Schwartz, MD, Thomas J Rutherford, MD, PhD, Masoud Azodi, MD, Yale University School of Medicine

S065 D2 LYMPHADENECTOMY IN ROBOT-ASSISTED GASTRECTOMY FOR GASTRIC CANCER Yoshinori Ishida, PhD, Ichiro Uyama, PhD, Seiichiro Kanaya, PhD, Fujita Health University School of Medicine

S066 ROBOTIC RESECTION OF A MEDIASTINAL NEUROBLASTOMA IN AN INFANT John J. Meehan, MD, Seattle Children's Hospital, University of Washington

S067 ROBOTIC PUESTOW John J. Meehan, MD, Robert Sawin, MD, Seattle Children's Hospital, University of Washington

S068 ROBOTIC-ASSISTED RESECTION OF EPIPHRENIC DIVERTICULUM + HELLER MYOTOMY + DOR FUNDOPLICATION Carlos Galvani, MD, Maria V. Gorodner, MD, Aberto S. Gallo, MD, University of Illinois at Chicago

S069 ROBOTIC-ASSISTED REDO HELLER MYOTOMY Carlos A. Galvani, MD, Maria V Gorodner, MD, Alberto S. Gallo, MD, University of Illinois at Chicago

S070 PREOPERATIVE AND INTRAOPERATIVE USE OF VOLUME-RENDERED CT AND MRI IMAGES AS A GUIDANCE ADJUNCT TO ROBOTIC SURGERY S. Hiridis, K. Konstantinidis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, ATHENS MEDICAL CENTER

S071 POSTAURICULAR AND AXILLARY APPROACH ENDOSCOPIC THYROIDECTOMY WITH THE DA VINCI ROBOT SYSTEM Su-jin Kim, Kyu Eun Lee, Jeonghun Lee, Do Hoon Koo, Yeo-Kyu Youn, Seung Keun Oh, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea

S072 SINGLE-INCISION LAPAROSCOPIC ADRENALECTOMY WITH THE DA VINCI ROBOT SYSTEM Su-jin Kim, Kyu Eun Lee, Jeonghun Lee, Do Hoon Koo, Seung Keun Oh, Yeo-Kyu Youn, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea Cancer Research Institute, Seoul National University College of Medicine, Seoul, Korea

S073 ROBOTIC HELLER MYOTOMY WITH GASTRIC SLEEVE RESECTION FOR THE SIMULTANEOUS TREATMENT OF ACHALASIA AND MORBID OBESITY Julieta Paleari, MD, Monica Hagen, MD, Michael Sedrak, MD, Kari Thompson, MD, Noam Belkind, MD, Garth Jacobsen, MD, Mark Talamini, MD, Santiago Horgan, MD, University of California San Diego

S074 ROBOTIC MEDIASTINAL LYMPH NODE DISSECTION DURING AN ESOPHAGECTOMY Farid Gharagozloo, MD, FACS, Marc Margolis, MD, Eric Strother, BS, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

12:30pm - 1:30pm

Lunch on Own/Exhibits Open

1:30pm - 4:30pm

2 Concurrent Sessions

SESSION 1

COLORECTAL (Co-sponsored by ASCRS)

Douglas Pavilion CD

MODERATORS: James Fleshman, MD & Leela Prasad, MD

1:30pm - 2:00pm

Robotic Rectal Surgery-Current Status

Leela Prasad, MD, INTRODUCTION: Sonia Ramamoorthy, MD

2:00pm - 2:30pm

Robotics and Rectal Cancer: US Trial ACOSOG 6051 (James Fleshman, MD and Multinational Trial: ROLARR (David Jayne, MD)

2:30pm - 3:30 pm

Abstract Session VII

S075 TME FOR RECTAL CANCER IN OBESE PATIENTS: THE ADVANTAGE OF ROBOTIC ASSISTANCE

Leela M. Prasad, MSSurg FRCSE FRCSC FACS FASCRS, Ashwin L. Desouza, MS MRCSEd DNB FCPS MNAMS, Slawomir J. Marecik, MD, John J. Park, MD, Jennifer Blumetti, MD, Andrea Zimmern, MD, Herand Abcarian, MD, Advocate Lutheran General Hospital, Park Ridge IL; University of Illinois at Chicago Medical Center at Chicago, Chicago, IL.

S076 QUALITY OF MESORECTUM AFTER ROBOTIC TREATMENT OF RECTAL CANCER Luca Fabrizio, MD, Biffi Roberto, MD, Valvo Manuela, MD, Pozzi Simonetta, MD, Cenciarelli Sabine, MD, Division of Abdomino-pelvic Surgery, European Institute of Oncology; Milan, Italy

S077 SEXUAL AND URINARY FUNCTIONAL ASSESSMENT FOLLOWING FULL ROBOTIC RECTAL SURGERY FOR CANCER Luca Fabrizio, MD, Valvo Manuela, MD, Biffi Roberto, MD, Cenciarelli Sabine, MD, Pozzi Simonetta, MD, Division of Abdomino-pelvic Surgery, European Institute of Oncology; Milan, Italy

S078 ROBOTIC ASSISTED COMPARED TO STANDARD LAPAROSCOPIC SINGLE INCISION RIGHT COLECTOMY: EARLY EXPERIENCE WITH DIFFERENT APPROACHES [Matthew B. Ostrowitz, MD](#), Eugene Rubach, MD, Charles Choy, MD, George DeNoto, MD, Staten Island University Hospital, North Shore University Hospital

S079 ROBOTIC COLORECTAL PROCEDURES - EARLY EXPERIENCE Rami Makhoul, MD, Grace Montenegro, MD, [Vincent J. Obias, MD MS](#), The George Washington University Hospital

S107 ROBOTIC ASSISTED APPROACHES TO RECTAL PROLAPSE, [Sonia Ramamoorthy, MD](#)

S108 COMPILATIONS OF ROBOTIC CASES, [Eric Haas, MD](#)

S109 75 ROBOTIC COLECTOMIES: REVIEW OF TECHNIQUE & LESSONS LEARNED [George Denoto, MD](#)

SESSION 2

HEAD/NECK-CARDIO-THORACIC

Douglas Pavilion B

MODERATORS: Johannes Bonatti, MD & Farid Gharagozloo, MD

1:30pm - 2:00pm

Arrhythmias and Robotics

Gregory Feld, MD

2:00pm - 4:30 pm

Abstract Session VIII

S080 MODEL-GUIDED SINGLE PORT EPICARDIAL INTERVENTIONS USING A HIGHLY ARTICULATED ROBOTIC SYSTEM Takenori Yokota, MD, PhD, Takeyoshi Ota, MD, PhD, David Schwartzman, MD, Constantinos Nikou, MS, Brett Zubiante, BS, Howie Choset, PhD, [Marco A. Zenati, MD](#), Division of Cardiac Surgery, University of Pittsburgh

S081 APPLICATION OF ROBOTICS TO RESECTIONS OF STAGE II LUNG CANCER Marc Margolis, MD FACS, [Farid Gharagozloo, MD FACS](#), Barbara Tempesta, MS CRNP, Eric Strother, BS, Kimberly Vilmenay, MPH, The George Washington University Medical Center

S082 ROBOTICS CHANGES THE APPROACH TO DIAGNOSIS AND MANAGEMENT OF MEDIASTINAL MASSES Marc Margolis, MD, FACS, Farid Gharagozloo, MD, FACS, Eric Strother, BS, [Kimberly Vilmenay, MPH](#), Barbara Tempesta, CRNP, The George Washington University Medical Center

S083 ROBOTIC RESECTION OF A POSTERIOR MEDIASTINAL GOITER Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, [Barbara Tempesta, CRNP](#), The George Washington University Medical Center

S084 ROBOTIC THYMECTOMY THROUGH LEFT SIDED APPROACH USING 3 PORTS: THE INITIAL INDIAN EXPERIENCE WITH 30 PATIENTS [Roman Dutta](#), Arvind Kumar, Jens Rueckert, Tarun Jindal, Sumit Singh, Amar P. Bhalla, All India institute of Medical Sciences, New Delhi, India.

S085 AN OBJECTIVE ASSESSMENT OF PALMAR SWEATING AFTER ROBOT-ASSISTED HIGHLY SELECTIVE DORSAL SYMPATHECTOMY [H. M. E. Coveliers, MD](#), G.S.A. Abis, MS, W. Wisselink, MD, PhD, Department of Vascular Surgery, VU University Medical Center, Amsterdam, The Netherlands.

S086 ROBOTIC LAPAROSCOPIC BELSEY FUNDOPLASTY FOR GASTROESOPHAGEAL REFLUX DISEASE [Farid Gharagozloo, MD, FACS](#), Marc Margolis, MD, FACS, Mohammed Kalan, MD, Barbara Tempesta, CRNP, Eric Strother, BS, Kimberly Vilmenay, BS, MPH, Farzad Najam, MD, FACS, The George Washington University Medical Center

3:00pm - 3:15pm

Break

Douglas Pavilion A

S087 ROBOTIC LEFT INTERNAL THORACIC ARTERY TAKEDOWN IN THE RIGHT LATERAL DECUBITUS POSITION [Farzad Najam, MD](#), Farid Gharagozloo, MD, Marc Margolis, MD, Robert Gilbert, SA, Eric Strother, SA, Edgar Sadsad, SA, Frederick Lough, MD, The George Washington University Medical Center, Washington, DC

S088 ROBOT-ASSISTED PULMONARY ANATOMICAL RESECTION FOR NON-SMALL CELL LUNG CANCER: INITIAL EXPERIENCE [Hyun-Sung Lee, MD PhD](#), Hee Jin Jang, MD, Seong Yong Park, MD, Jae Ill Zo, MD PhD, National Cancer Center, Korea

S089 CAN TOTALLY ENDOSCOPIC CORONARY ARTERY BYPASS REDUCE THE RISK OF MAJOR INFECTION COMPARED TO CONVENTIONAL CORONARY ARTERY BYPASS? Zachary Kon, [Eric Lehr](#), Atiq Rehman, Nikolaos Bonaros, Dominik Wiedemann, Felix Weidinger, David Zimrin, Guy Friedrich, Bartley Griffith, Johannes Bonatti, University of Maryland School of Medicine, Baltimore, USA and Innsbruck Medical University, Innsbruck, Austria

S090 INTERMEDIATE TERM FOLLOW UP IN 175 CONSECUTIVE ROBOTIC ASSISTED LOBECTOMIES FOR EARLY STAGE LUNG CANCER [Marc Margolis, MD FACS](#), Farid Gharagozloo, MD FACS, Barbara Tempesta, CRNP, Eric Strother, BS, Kimberly Vilmenay, BS MPH, Farzad Najam, MD FACS, George Washington University Medical Center

S091 ROBOTIC RESECTION OF A 20 CM FIBROUS TUMOR OF THE PLEURA Farid Gharagozloo, MD FACS, [Eric Strother, BS](#), Marc Margolis, MD FACS, Kimberly Vilmenay, MPH, Barbara Tempesta, CRNP, The George Washington University Medical Center

SCIENTIFIC PROGRAM FRIDAY, JANUARY 29, 2010

S092 Minimal Extracorporeal Circulation for Robotic Totally Endoscopic Coronary Artery Bypass Hybrid Procedure [Eric J. Lehr, MD PhD](#), Patrick Odonkor, MD, Peter Reyes, MD, Bartley Griffith, MD, Johannes Bonatti, MD, University of Maryland Heart Center, University of Maryland School of Medicine

S093 ROBOTIC RESECTION OF A GIANT RETROCARDIAC BRONCHOGENIC CYST Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, [Eric Strother, BS](#), [Kimberly Vilmenay, MPH](#), Barbara Tempesta, CRNP, The George Washington University Medical Center

S094 ROBOTIC RESECTION OF A SCLEROSING HEMANGIOMA OF THE LUNG Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, [Vicki Cole, PA](#), Eric Strother, BS, Barbara Tempesta, CRNP, Kimberly Vilmenay, MPH, The George Washington University Medical Center

S095 ROBOTIC RESECTION OF A POSTERIOR PARA-AORTIC MULLERIAN CYST Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, [Eric Strother, BS](#), Kimberly Vilmenay, MPH, Barbara Tempesta, CRNP, The George Washington University Medical Center

S096 TECHNICAL ASPECTS OF A ROBOTIC ASSISTED LOBECTOMY Farid Gharagozloo, MD, FACS, [Marc Margolis, MD, FACS](#), Eric Strother, BS, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

6:30pm - 9:00pm

Social Event – USS Midway Museum

Shuttle Pick-Up at 6:00pm in Hotel Lobby

This year's social event will be taking place at the USS Midway Museum. Join us aboard a U.S. Navy aircraft carrier and have the chance to catch up and unwind with your fellow colleagues.

SATURDAY, JANUARY 30, 2010

SATURDAY-AT-A-GLANCE

7:00am - 8:00am	Breakfast	<i>Douglas Pavilion Foyer West</i>
8:00am - 12:00pm	Allied Health Course	<i>Douglas Pavilion B</i>
8:00am - 10:00am	Plenary Session	<i>Douglas Pavilion CD</i>
10:00am - 10:15am	Break	<i>Douglas Pavilion Foyer West</i>
10:15am - 12:00pm	Presidential Panel	<i>Douglas Pavilion CD</i>
12:00pm	Meeting Adjourned	

7:00am - 8:00am **Breakfast** *Douglas Pavilion Foyer West*

8:00am - 12:00pm **Allied Health Course** *Douglas Pavilion B*

This ½ day didactic course has been designed specifically for allied health members who either have a surgical robotic system or are considering purchasing one. It will focus on the development of multi-specialty robotic programs, roles of the perioperative team members, address issues of patient positioning, room turnover, inventory control, cost containment, staff training and competency assessment, validation, and documentation.

At the completion of this activity, participants should be able to:

- Identify factors that contribute to a successful robotics program
- Describe intra operative challenges of robotic surgery
- Evaluate fiscally responsible strategies for robotic surgery
- Distinguish between checklists and competency components for staff

8:00am - 8:45 am *Challenges of Robotic Surgery*

8:45 am - 9:30 am *Development of a Multi-specialty Robotic Program*

9:30 am - 10:00am **Break** *Douglas Pavilion A*

10:00am - 10:45am *Intra-operative Care of the Patient Undergoing Robotic Surgery*

10:45am - 11:30am *Training and Competency*

11:30am - 12:00pm *Panel Discussion*

8:00am - 10:00am	PLENARY SESSION Emerging Technology & Education in Training MODERATORS: Mehran Anvari, MD & Richard Satava, MD	<i>Douglas Pavilion CD</i>
8:00am - 8:30am	KEYNOTE SPEAKER: "A Language of Surgery" for Automation of Training and Skill Evaluation in RMIS Gregory Hager, PhD, INTRODUCTION: Richard Satava, MD	
8:30am - 8:50am	Robotic Simulators Khurshid Guru, MD, INTRODUCTION: Richard Satava, MD	
8:50am - 9:10am	What You Plan is What You Get: Partial Knee Replacement Using Interactive Robotic Guidance Michael Conditt, PhD, INTRODUCTION: Richard Satava, MD	
9:10am - 10:00am	Abstract Session IX S097 ROBUST IDENTIFICATION OF PEOPLE BY MOBILE ROBOTS TO AID IN REMOTE PATIENT MONITORING James Ballantyne , Ara Darzi, Guang-Zhong Yang, Imperial College London S098 DETECTION OF TRANSITION BETWEEN CORTICAL AND CANCELLOUS BONE USING FORCE, VIBRATION AND TEMPERATURE IN AUTOMATED DRILLING Ehsan Shojaei-Baghini , Aaron Muizelaar, Alexandru Patriciu, PhD, Tim Fielding, BSc, Shahin Sirouspour, PhD, Gregory R Wohl, PhD, Departments of Mechanical, and Electrical & Computer Engineering, McMaster University, Hamilton, Ontario, Canada; MDA Space Missions, Brampton Ontario, Canada S099 DEVELOPMENT OF AN IMAGE GUIDED AUTOMATED ROBOT FOR TARGETED THERAPY M Anvari , MB, BS, PhD, FRCSC, FACS, J. Lymer, MAppSc, T. Reedman, BSc, MEng, D. Williams, MSc, MD, CM, LLDHon DSc, Hon, FCFP, FRCR, L. Steinnagel, BScN, MBA, Centre For Surgical Invention & Innovation, Hamilton, Canada S100 MICRO-ACTUATOR DESIGN AND FUNCTIONALITY FOR A NOTES ROBOTIC SYSTEM M. Anvari , MBBS, PhD, FRCSC, FACS, J. Lymer, MAppSc, Centre for Surgical Invention and Innovation, Hamilton, Canada S101 3D SURGEON'S POSTURAL ANALYSIS DURING STANDARD AND ROBOTIC ASSISTED LAPAROSCOPIC PROCEDURES Nicolas Hubert , MD, Martine Gilles, MD, PhD, Jacques Felblinger, MD, PhD, Jean-Michel Hubert, MD, (*) Urology Department, CHU Nancy-Brabois, allée du Morvan, 54511 Vandœuvre les Nancy. (**) INRS Lorraine, avenue de Bourgogne, BP 27, 54501 Vandœuvre cedex. (***) IADI-UHP Inserm (ERI 13), CHU Nancy-Brabois, allée du Morvan, 54511 Vandœuvre les Nancy. S102 ROBOTIC ASSISTED MINIMAL INVASIVE SURGERY - A USEFUL TOOL IN RESIDENT TRAINING - THE PEORIA EXPERIENCE 2002 - 2009 Franziska Huettner , MD, PhD, Arthur L. Rawlings, MD, MDiv, Robin A. Alley, MD, Danuta I. Dynda, MD, Michael J. Ryan, MS, Jamie L. Doubet, RN, BS, David L. Crawford, MD, Division of Minimally Invasive Surgery, Department of Surgery, University of Illinois College of Medicine at Peoria S103 COMPARISONS BETWEEN SUBJECTIVE ANALYSIS AND HIDDEN MARKOV MODELS FOR COMPLEX ROBOTIC MOVEMENTS Avinash Burra, MS, Gary Schwartz , MD, Deva Boone, MD, Shahzad Razi, MD, Faiz Bhora, MD, George Todd, MD, Scott Belsley, MD, St. Luke's Roosevelt Hospital Center S104 THE NEGATIVE EFFECT OF DISTRACTION ON PERFORMANCE OF ROBOT-ASSISTED SURGERY IN MEDICAL STUDENTS AND RESIDENTS Irene H. Suh , MS, Jung-Hung Chien, MS, Shi-Hyun Park, PhD, Dmitry Oleynikov, MD, Ka-Chun Siu, PhD, University of Nebraska Medical Center S105 ROBOTIC HIP ARTHROSCOPY IN HUMAN ANATOMY: TWO INITIAL CASE REPORTS Jens Kather , MD, Monika Hagen, MD, Michael Schueler, MD, Department of Orthopedic Surgery and Traumatology, General Hospital Muensterlingen, Switzerland	
10:00am - 10:15am	Break	<i>Douglas Pavilion Foyer West</i>
10:15am - 12:00pm	Presidential Panel MODERATOR: Jacques Hubert, MD This panel will discuss how robotics has affected each of these Presidents and Past President's specialties: James Fleshman, MD (ASCRS), Camran Nezhat, MD (SLS), Mark Talamini, MD (SAGES), Paul Wetter, MD (SLS)	<i>Douglas Pavilion CD</i>
12:00pm	Meeting Adjourned	

PLENARY

5001 NATURAL HAPTIC INTERFACE FOR SINGLE-PORT SURGICAL ROBOT WITH GRAVITY COMPENSATION Xiaoli Zhang, PhD, Carl A. Nelson, PhD, Dmitry Oleynikov, MD, University of Nebraska-Lincoln, University of Nebraska Medical Center

INTRODUCTION: The objective of this study is to create an intuitive interface for a compact single-port surgical robot with haptic (force feedback) capabilities and gravity compensation. This is a 4-degree-of-freedom (DOF) robot for manipulation of laparoscopic cameras and surgical tools and is characterized by its geared spherical mechanism, which creates a remote center of motion coincident with the skin incision, mimicking the 4-DOF motion typical of laparoscopic tool manipulation. The goal is to make using this robot feel more like intuitive use of a manual tool by incorporating a sophisticated haptic interface. **METHODS & PROCEDURES:** A Phantom Omni (SensAble) six-DOF haptic joystick was adopted to provide the manual interface. A laptop computer running LabVIEW software (National Instruments) was used to create a flexible, modular user interface for the controls, including motion scaling. "Virtual constraints" were programmed in such a way that the tip of the joystick stylus is fixed at a point in space (using stiff virtual springs). This leaves the three rotational DOF free, and the fourth translational DOF is mapped to buttons on the stylus. In addition to this "virtual constraint" paradigm well suited for camera manipulation, a modified kinematic control scheme was also implemented for surgical tool guidance. In this scheme, the tip of the tool is mapped to the position of the joystick stylus (in Cartesian rather than rotational space) in order to achieve a feel more similar to open surgery (unconstrained six-DOF motions). The robot actuators and laptop are interfaced with a PID control algorithm using a field-programmable CompactRIO system (National Instruments), increasing flexibility, robustness, and compactness of the hardware system. Inverse dynamic equations were programmed in LabVIEW to provide torque compensation for removing gravitational effects on the joystick side. Students were asked to perform tissue identification and manipulation tasks in camera (point-constrained) and tool (unconstrained) control modes, respectively. **RESULTS:** The virtually point-constrained joystick interface provides an intuitive analog for constrained laparoscopic motion, and the unconstrained, direct-position interface gives a surgeon more direct control for tool manipulation. Bench-top and clinical animal testing confirmed that the robot control is stable and smooth. Using an animal model, students were able to correctly identify 5 anatomical targets, and manipulate tissues, in the two respective control modes, with speed roughly equal to that achieved in similar manual procedures. With gravity compensation, the controller responds only to user input, and the system is more responsive. Surgeons' response to this feature is very positive.



FIGURE 1: Bench-top setup of experimental robot and haptic control, manipulating robotic grasper.

CONCLUSIONS: An intuitive interface for a compact single-port surgical robot manipulator was created. The interface can mimic the constrained nature of single-incision surgery, and gravity compensation enables improved force feedback through a haptic joystick. Switching between camera and tool control modes allows improved operator perception dependent on the task at hand. Test results showed good performance of the system without a steep learning curve or a significant increase in time to task completion.

5002 10 YEARS EXPERIENCE WITH MINIMALLY INVASIVE SURGERY OF TUMORAL AND NONTUMORAL MYASTHENIA GRAVIS - FROM THORACOSCOPIC TO ROBOTIC SURGERY-A SINGLE CENTRE EXPERIENCE Victor Tomulescu, MD, PhD, Oana Stanciulea, MD, Codrut Stanescu, MD, Arlezia Florescu, MD, PhD, Vlad Herlea, MD, PhD, Irinel Popescu, MD, PhD, Fundeni Institute of Digestive Disease and Liver Transplantation, Bucharest

AIMS: Thymectomy is a generally accepted option in the treatment algorithm of myasthenia gravis. Nowadays, thoracoscopic thymectomy is considered a good alternative to standard open approach due to its higher rates of acceptance, low morbidity and good efficacy. The aim of this paper is to present the advantages and disadvantages of the robotic approach for thymectomy in patients with myasthenia gravis. **MATERIALS & METHODS:** From April 1999 to October 2009 we have performed 338 cases of unilateral extended thoracoscopic thymectomy in tumoral and non tumoral myasthenia gravis. The indications for thoracoscopic thymectomy were patients with generalized myasthenia gravis and stage I and II A Masaoka thymomas. 31 patients (10%) underwent robotic assisted thoracoscopic thymectomy between January 2008 and October 2009. Right-sided approach was used in 114 patients (37, 1%) who underwent classic thoracoscopic thymectomy, compared with only two patients (6%) who underwent robotic surgery. **RESULTS:** There was no perioperative mortality and all procedures were concluded successfully in terms of minimally invasive approach. All the patients were extubated in theatre except one patient who required 5 days of assisted ventilation (toracoscopic approach). The mean operative time was 90+/-50 minutes. Postoperative complications occurred in 12 cases (3,5%). Median postoperative stay was 2,1 days (range 2-6 days). The myasthenia gravis status was improved postoperatively in 95% of cases. **CONCLUSIONS:** In our opinion robotic assisted thoracoscopic surgery in indicated especially in cases of tumoral myasthenia gravis and in cases of reoperations. Better view and tiny, versatile instruments allows us a safe and precise dissection in remote, narrow anatomical region like the mediastinum. Most intraoperative complication could be manageable with the da Vinci robotic system, minimizing the risk of conversion to an open procedure.

5003 RECURRENCES AFTER ROBOT-ASSISTED LAPAROSCOPIC RADICAL HYSTERECTOMY!!! Bilal M. Sert, MD, Vera Abeler, PhD, Oslo University, The Norwegian Radium Hospital

OBJECTIVE: To retrospectively evaluate the recurrences of robot-assisted laparoscopic radical hysterectomy and pelvic lymph node dissection. **METHODS:** We performed a retrospective review of all patients who underwent a robot-assisted laparoscopic radical hysterectomy at our institution between November 2005 and May 2009. Data prospectively collected included age, body mass index, stage, histopathologic subtype, estimated blood loss, perioperative blood transfusions, number of lymph nodes obtained, status of surgical margins, size of both parametrium

and vaginal edge, length of hospital stay, intraoperative and postoperative complications, recurrences and disease free survival. Results: 32 patients underwent robot-assisted laparoscopic radical hysterectomy during the study period. None of the surgeries required conversion to laparoscopy or laparotomy. The mean age was 43.9 years (range, 32-68). 7 cases (22%) were Stage IA2 and 25 cases (78%) were Stage IB1. Among those patients 23 cases (72%) were squamous cell carcinoma and 9 cases (28%) had adenocarcinoma. The mean BMI was 25.2 (range, 19-32). The mean number of resected pelvic lymph nodes was 19.5 (range, 9-35). One patient had nodal disease and one other patient had endometrial extension to the corpus uteri therefore both patients had received additional radiotherapy with concomitant cisplatin. The mean operation time was 260 minutes (range, 145-530 minutes). Right parametrium was 2.96 cm (range, 2-5 cm). Left parametrium was 3.01 cm (range, 2-5 cm). Vaginal cuff was 1.7 cm (range, 0.1- 3.0 cm). The all surgical margins were free of disease in all cases. The mean blood loss was 99 ml (range, 25-300ml). No patient required an intraoperative blood transfusion. The mean length of hospital stay was 3.84 days (range, 2-6). The mean follow-up time was 24 months (range, 4-46). 4 patients had recurrences and one of them died due to an progressive disease. All recurrences occurred 16 months after initial treatment. Comparing with historical open radical hysterectomy we did not observed any recurrences in the open group during the same follow-up time. Conclusions: This study shows that robot-assisted laparoscopic radical hysterectomy is feasible. However until valid prospective oncologic outcome (recurrences-DFS-OS) data are available this modality should be considered and undertaken only on protocol situation as an experimental arm.

S004 ROBOTIC VASCULAR SURGERY, 150 CASES Petr Stadler, MD, PhD, Libor Dvoracek, MD, Petr Vitasek, MD, Pavel Matous, MD, Dept. of Vascular Surgery, Na Homolce Hospital, Praha, Czech Republic

OBJECTIVE: The safety, benefits and usefulness of laparoscopic surgery have been demonstrated. The robot represents the next step of using minimal invasive technique in surgery. We describe our clinical experience with robot-assisted aortoiliac reconstruction for occlusive disease, aneurysm and two hybrid procedures performed using the da Vinci system. METHODS: Between November 2005 and September 2009, we performed 150 robot-assisted laparoscopic aortoiliac procedures. 131 patients were prospectively evaluated for occlusive disease, 16 patients for abdominal aortic aneurysm, two for a common iliac artery aneurysm, one for splenic artery aneurysm and two for hybrid procedures. We used a combination of conventional laparoscopic surgery and robotic surgery. The robotic system was used to construct the vascular anastomosis, for the thromboendarterectomy, for the aorto-iliac reconstruction with the patch closure, for dissection of splenic artery and for the posterior peritoneal suture. RESULTS: 145 cases (97%) were successfully completed robotically, one patient was stopped during laparoscopy for heavy aortic calcification. In four patients (2.7%) conversion was necessary. Thirty-day survival was 100% and non-lethal postoperative complications were observed in four patients (2.7%). CONCLUSION: Our clinical experience with robot-assisted laparoscopic surgery shows that it is a feasible technique for aortoiliac vascular and hybrid procedures. The da Vinci robotic system facilitated the creation of the aortic anastomosis and shortened aortic clamping time compared to purely laparoscopic techniques. Robotic surgery can help us in hybrid procedures.

S005 CYBERKNIFE RADIOSURGERY FOR INOPERABLE PATIENTS WITH PERIPHERAL STAGE IA Brian T. Collins, MD, Salomeh Vahdat, MD, Sean P. Collins, MD, Eric K. Oermann, MD, Yu Xia, PhD, Cristina Reichner, MD, Eric Anderson, MD, Farid Gharagozloo, MD, Marc Margolis, Georgetown University Hospital, The George Washington University Hospital

OBJECTIVE: To report the efficacy of CyberKnife radiosurgery for inoperable patients with peripheral stage IA non-small cell lung cancer (NSCLC). METHODS: Inoperable patients with biopsy-proven peripheral clinical stage IA NSCLC were enrolled. Three-to-five fiducial markers were implanted in or near tumors under CT guidance to serve as targeting references. Gross tumor volumes (GTVs) were contoured using lung windows; the margins were expanded by 5 mm to establish the planning treatment volume (PTV). Treatment plans were designed using hundreds of pencil beams. Doses delivered to the gross tumor ranged from 42-60 Gy in 3 equal fractions (BED Gy10 >100). The 30-Gy isodose contour, biologically equivalent to 50 Gy in 2 Gy fractions, extended at least 1 cm from the GTV to treat microscopic disease. Treatment was delivered utilizing the CyberKnife system with Synchrony. Clinical examination and PET/CT imaging were completed at 6-month intervals following treatment. Results: Twenty-four patients with a mean maximum tumor diameter of 2.2-cm (range, 1.4 - 3.0 cm) and a mean FEV1 of 1.05 L (range, 0.53 - 1.71 L) were treated over a four year period and followed for a minimum of one year. A mean dose of 51 Gy was delivered to the PTV in 1-2 hour fractions over a 5 to 11 day period (mean, 7 days). The 30-Gy isodose contour extended an average of 2.13 cm from the GTV (range, 1.62 - 2.74 cm). At a mean follow-up of 36 months, the 3-year Kaplan-Meier overall survival estimate was 79%. Five patients with severe emphysema (baseline post bronchodilator FEV1 < 40% predicted) died of progressive lung dysfunction at 7, 9, 10, 18 and 25 months. Four patients are alive despite recurrence, one local and three distant. CONCLUSION: CyberKnife radiosurgery is an effective treatment for peripheral stage IA NSCLC. The doses and margins appear sufficient to control treated tumors.

S006 ONE HUNDRED THIRTY CASES OF ROBOTIC STAGING FOR ENDOMETRIAL CANCER: EXPERIENCE OF A SINGLE SURGEON AT AN ACADEMIC INSTITUTION Karim S. Elsahwi, MD, Charlene Hooper, MD, Masoud Azodi, MD, Yale University School of Medicine

OBJECTIVE: To review outcomes of the first 130 cases of endometrial cancer who had robot-assisted surgical staging by a single surgeon. DESIGN: Review of prospectively maintained data. SETTING: Academic institution. PATIENTS: Endometrial cancer cases. Intervention: Robot-assisted surgical staging. RESULTS: Mean age was 61 years (range, 39-84). Mean body mass index (BMI) was 34 Kg/m² (range, 19-63). Most patients (80%) had early stage disease (stage I-II), and approximately 90% had grade 1-2 endometrioid histopathology. Mean length of hospital stay was 1 day (range, 0-9). Mean number of lymph nodes retrieved was 21 (range, 0-64). Mean operative time was 160 minutes (range, 109-221). Mean console time was 110 minutes (range, 75-173), and mean docking time was 13 minutes (range, 7-26). Mean uterine weight was 126 grams (range, 52-400). Mean estimated blood loss was 123cc (range, 5-400). Two patients received packed red blood cell transfusion. There was one case of death due to myocardial infarction as well as one case of urethral injury that was recognized and repaired intraoperatively. One patient developed acute tubular necrosis postoperatively. She was successfully managed conservatively. There was one case of urinary retention, one case of urinary tract infection, and one patient was readmitted due to wound cellulitis. CONCLUSION: Robot-assisted surgical staging

for endometrial cancer is safe and feasible in an academic setting. Adequate surgical procedure is not compromised by the minimally invasive technique. Long-term cancer follow-up is necessary and on-going.

S007 DA VINCI IMPROVES SPLEEN-PRESERVING RATE IN BENIGN AND BORDERLINE MALIGNANT TUMOR OF THE PANCREAS REQUIRING PANCREATECTOMY: PRELIMINARY RESULTS Chang Moo Kang, MD, Yonsei University College of Medicine

BACKGROUND: Function-preserving minimal invasive pancreatectomy is thought to be ideal approach for pancreatic benign and borderline malignant lesions requiring pancreatectomy. In particular, great efforts to preserve spleen are increasing on the basis of this concept. However, conventional laparoscopic spleen-preserving pancreatectomy is not that easy. It must require extensive surgeons' learning-curves (experiences and techniques) due to several disadvantages that conventional laparoscopic surgery has. Robot surgical system was recently introduced to overcome these limitations to provide precise and safe laparoscopic surgery. **MATERIALS & METHODS:** From March 2006 to December 2008, total 26 patients underwent laparoscopic pancreatectomy with intention to preserve spleen by a single pancreatic surgeon. Seventeen patients were done by conventional laparoscopic approach (LP group) and the rest 9 patients by robot-assisted surgery (RP group). The perioperative clinicopathologic variables (age, gender, length of resected pancreas, tumor size, tumor location, bleeding amount, operation time, length of hospital, complication, mortality) were compared between two groups, as well as spleen-preservation rate. Results: All clinicopathologic parameters were comparable between two groups ($p > 0.05$), however, spleen-preserving rate was much higher in RP group than LP group (8/17 vs. 9/9, chi-square, Fisher's exact test, $p < 0.05$). **CONCLUSION:** Robot-assisted pancreatic surgery can provide increased chance for not only spleen preservation but also far advanced laparoscopic surgery. More experiences are mandatory to exactly address the role of robot surgery in far advanced laparoscopic era.

S008 COMPLETE ROBOTIC-ASSISTED LAPAROSCOPIC LIVING DONOR NEPHRECTOMIES: 79 PROCEDURES. Jacques Hubert, MD, Zhang Chao, Marc Ladrière, MD, Guillaume Louis, Benoît Feuille, MD, Luc Frimat, MD, PhD, Grégoire Chopin, MD, Pascal Eschwège, MD, PhD, Michèle Kessler, MD, Departments of 1Urology and 2Nephrology, Nancy University Hospital, 54511 Vandoeuvre-les Nancy, France.

INTRODUCTION: Renal harvesting for living donor transplantation can be performed laparoscopically to reduce morbidity for the donor but it is a challenging procedure, even with hand-assisted technique. Robotics brings high quality of vision and improves the laparoscopist's dexterity, allowing technically demanding procedures such as kidney harvesting to be completed. **OBJECTIVE:** To evaluate our experience with entirely robot-assisted laparoscopic live donor nephrectomies (RALDN) and their following transplantations. **METHODS:** From January 2002 to December 2008, 79 patients (47 female, 32 male; mean age 44.3 years; BMI : 25.2; 72 left kidneys) were operated on with the Da Vinci® standard system, using four ports (three for the robotic arms and one for the assistant). The collateral veins were ligated, and the renal arteries and veins clipped, after completion of ureteral and renal dissection. The kidney was removed via a suprapubic Pfannenstiel incision. A complementary running suture was carried out on the arterial stump to secure the hemostasis. Transplantation was carried out immediately afterwards. Mean recipient age was 41.8 years; 51 male/28 female;

BMI 23.8. **RESULTS:** All RALDN (14 and 4 kidneys with respectively 2 or 3 arteries) were carried out entirely laparoscopically, without complications nor open conversion; blood loss was minimal (post-op Hb drop 0.8 ± 0.5 g/dL); no transfusion was required. Graft weight: 162 g. Mean surgery time, warm ischemia and cold ischemia times were 175 ± 15 , 4.98 ± 1.8 and 204 ± 88 min, respectively. Average donor hospital stay: 6 ± 1.7 days. Postoperative complications: 2 phlebitis with 2 peripheral pulmonary embolism. 1 urinary infection; 1 chylous ascites. Increase of donor mean creatinine level at 1 month: 18.7 ± 1.7 μmol . None but one (1 post-op hemodialysis session in 1 patient) of the transplant recipients had delayed graft function. Mean recipient creatinine level at day 0, 1, and 5: respectively 614.6, 383.4 and 137.7 μmol . Recipients complications comprised 2 phlebitis, 1 peripheral embolism and 1 cystitis. 1 ureteral necrosis required surgical treatment. **CONCLUSIONS:** RALDN can be safely carried out, with excellent short and long term results for both donor and recipient. Robotics enhances the laparoscopist's skills and enables the surgeon to dissect meticulously and to prevent problematic bleeding more easily while allowing the surgeon to work under better ergonomic conditions.

UROLOGY

S009 FACTORS PREDICTING TRIFECTA OUTCOMES AFTER ROBOT-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY Hugh J. Lavery, MD, Sudeh Izadmehr, Fatima Nabizada-Pace, MPH, David B. Samadi, MD, Department of Urology, The Mount Sinai Medical Center, New York, NY

INTRODUCTION: The so-called "trifecta" represents the ideal post-operative outcome following radical prostatectomy: freedom from biochemical recurrence and a return of continence and potency. Rates of trifecta range from 40 to 60% in published literature. We evaluated a large database of robotic-assisted laparoscopic prostatectomies (RALP) to find features predictive of achieving trifecta at a minimum of one year following RALP. **METHODS:** An institutional database of 1218 RALP by a single surgeon (DBS) was queried for all patients with follow-up 12 months or longer after RALP. Patients were then stratified by trifecta status and the groups compared. Trifecta was defined as a patient continent, potent and free from biochemical recurrence at most recent follow-up. Continence was defined as the use of zero or one security pad daily. Potency was defined as erections sufficient for vaginal penetration. Biochemical recurrence was defined as PSA > 0.2 ng/ml. **RESULTS:** Of the 1218 RALP, 540 (44%) had follow-up greater than one year after surgery. Of these, 320 (60%) achieved trifecta status at a median follow-up of 20 months. The patients achieving trifecta were younger (57.1 vs 61.8 yrs), had lower PSA (5.6 vs 6.5 ng/ml) and had smaller prostates (49 vs 56 g) than those who did not achieve trifecta ($p < 0.05$ for all). Trifecta patients had significantly lower biopsy and pathologic Gleason scores, ASA status, pathologic stage, and rates of positive surgical margins. 93% of the trifecta pts underwent bilateral nerve-sparing, compared to 78% of the non-trifecta patients ($p < 0.001$). Absence of lymphovascular invasion, but not perineural invasion, on final pathology also correlated with trifecta status. **CONCLUSIONS:** The majority (60%) of patients can achieve the "trifecta" of freedom from biochemical recurrence with recovery of potency and continence following RALP. This compares very favorably to similar cohorts following open radical prostatectomy. Younger patients with smaller prostates are more likely to achieve trifecta. Better standard prostate cancer risk factors (preoperative PSA, Gleason score, pathologic stage, lymphovascular invasion) are also predictive of trifecta status, likely due to the lower risk of biochemical recurrence.

S010 OUTCOMES OF ROBOTIC RADICAL PROSTATECTOMY IN ELDERLY PATIENTS Fatima Nabizada-Pace, MPH, Hugh Lavery, MD, John Carlucci, MD, Sudeh Izadmehr, BS, David Samadi, MD, The Mount Sinai Medical Center, Department of Urology

OBJECTIVES: As the life expectancy of men increases, it is anticipated that the number of elderly patients diagnosed with localized prostate cancer will increase as well. The goal of this study is to determine the safety and efficacy of robotic radical prostatectomy on elderly patients compared to the younger population. **MATERIALS & METHODS:** We reviewed 1178 robotic prostatectomies performed by one surgeon (DBS) between January 2003 and July 2009 using an IRB approved database. Patients were grouped into 2 categories based on their age: group 1 <70 and group 2 >70. We reviewed and compared preoperative (biopsy Gleason score, preoperative PSA), perioperative (estimated blood loss, operating room time, length of hospital stay), pathological (pathological stage, pathological Gleason score, prostate weight, surgical margins), and continence among the 2 groups. Continence was defined as using 1 pad a day or no pad. Statistical analysis was conducted with the Chi square and the ANOVA tests to compare the 2 groups of patients for categorical and continuous data respectively. **RESULTS:** There were 1094 patients in group 1 with an average age of 58 (40-69) compared to 84 patients in group 2 with an average age of 72 (70-78). The elderly group had significantly worse biopsy and pathological Gleason score consisting of 30% in group 1 with Gleason 6, 64% with Gleason 7, and 6% with Gleason 8,9, or 10 compared to 16%, 69%, 14% respectively in group 2 ($p < 0.001$). Also, the elderly group had significantly worse preoperative PSA (group 1=5.9, group 2=7.7) and prostate weight (group 1=52g, group 2=60g) ($p < 0.001$). However, there was no difference in positive surgical margin rates among the 2 groups. Additionally, our analysis of the data showed no significant differences between the 2 groups in estimated blood loss, operating room time, length of hospital stay, and pathological staging. Urinary continence rates were similar at 3 months after surgery but significantly lower in group 2 at 6 months. At 12 months urinary continence rate was 92.5% for group 1 compared to 84.3% for group 2, which was not statistically significant. **CONCLUSION:** There were worse pathological features in the elderly group which is likely related to selection bias. Despite these worse features, the perioperative outcomes remained the same. Therefore, robotic radical prostatectomy remains a safe and effective option for patients over the age of 70 by offering short operative time, minimal blood loss and short hospital stay. Continence rates were slightly different among the 2 groups during the first 6 months after surgery but were similar at 12 months. Therefore, patients over the age of 70 should be aware preoperatively that return to continence may take longer.

S011 REFINEMENTS FOR IMPROVING PREDICTIVE VALUE OF POSITIVE EXTRACAPSULAR EXTENSION STATUS ON ENDORECTAL MAGNETIC RESONANCE IMAGING OF PATIENTS WITH PROSTATE CANCER Abhishek Srivastava, MD, Sonal Grover, MD, David L. Peters, DO, Yoessef El Douaihy, MD, Robert Leung, MPH, Gerald Y. Tan, MD, Jason Fung, BS, Majnu John, PhD, Fangmin Chen, MD, Ashutosh Tewari, MD, MCh, Weill Cornell Medical College - New York Presbyterian Hospital

INTRODUCTION: Endorectal magnetic resonance imaging (eMRI) of prostate continues to have a poor sensitivity for predicting extracapsular extension (ECE) on final histopathology

in patients undergoing robotic assisted radical prostatectomy (RARP). We look for possible predictors of ECE positivity on eMRI to improve its diagnostic yield. **METHODS & PROCEDURES:** Out of the 656 patients undergoing 1.5/3Tesla eMRI before RARP, 24 patients (3.7%) had positive ECE status on both eMRI and final histopathological diagnosis. Preoperative variables such as age, body mass index (BMI), clinical stage, maximum percentage cancer on biopsy, total positive cores on biopsy, total Gleason score on biopsy, PSA levels, prostate volume and PSA density were analyzed for their predictive potential of ECE positivity on eMRI. Univariate logistic regression analysis and Multivariate logistic regression analysis using Backward Stepwise Wald analysis were performed to identify the predictors of positive ECE on eMRI. Odd ratios (OR) were also determined. **RESULTS:** Univariate analysis identified maximum percentage cancer on biopsy ($p=0.010$; OR = 1.013) and total Gleason score on biopsy ($p = 0.002$; OR = 1.819) as significant predictors of ECE positivity on final histopathology. Subsequent multivariate analysis also identified maximum percentage cancer on biopsy ($p = 0.001$; OR = 1.016) and total Gleason score on biopsy ($p = 0.003$; OR = 1.702) as significant predictors ECE positivity on final histopathology. **CONCLUSION:** Maximum percentage cancer on biopsy and total Gleason score on biopsy are useful refinements for optimizing positive predictive value of ECE in patients receiving preoperative eMRI.

S012 MANAGING "PATIENTS EXPECTATIONS" IN MEN UNDERGOING ROBOTIC RADICAL PROSTATECTOMY: LESSONS LEARNED FROM A COHORT STUDY INVOLVING A STRUCTURED PROTOCOL AND PREOPERATIVE COUNSELING Youssef El Douaihy, MD, Kumaran Mudaliar, MD, Abhishek Srivastava, MD, Dave Peters, DO, Sonal Grover, MD, Robert Leung, MPH, Gerald Tan, MD, Ash Tewari, MD, MCh, Weill Cornell Medical College - New York Presbyterian Hospital

PURPOSE: To present a model that helps delivering satisfaction to Robotic Assisted Laparoscopic Prostatectomy patients and assess the success rate of the model in a cohort of 377 patients over one year of follow up. **MATERIALS & METHODS:** We present our "multiple-prongs" model of delivering a realistic vision of the expected post operative era along side with strategies to minimize the undesired side effects of surgery. The model presents routine measures and guidelines on how to manage obesity, physical activity expectations, return to work expectations, pain expectations, cancer control expectations, and expectations of return to urinary and sexual functions. Assessment of the satisfaction was conducted by means of a short questionnaire inspired from the EPIC questionnaire. Finally HRQOL was studied (IIEF and SHIM) and different domains tested for their predictive power of sexual, urinary and overall satisfaction. **RESULTS:** Preoperatively patients are very compliant with our proposed model, and many manage to lose weight prior to surgery. 97 % of the patients stated that their main post operative concern post surgery is cancer control (over urinary continence 1.8% and sexual potency 0.8%). Post operatively only 11 % of the patients expressed disappointment regarding urinary outcome, 21% regarding sexual outcome and only 7 % had overall regret. By Pearson Chi square analysis only continence was a statistically significant predictor of satisfaction and recurrence was a significant predictor of regret. **CONCLUSION:** Giving a realistic picture along side with providing the right support and incentive to the patient helps in maximizing outcome and insures highest levels of satisfaction. In the first post operative urinary control is a strong player in the patient's daily life. Recurrence of high levels of PSA engenders disappointment.

S013 THE ABILITY OF ENDORECTAL COIL MRI TO PREOPERATIVELY PREDICT SEMINAL VESICLE INVASION

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INTRODUCTION: Preoperative knowledge of the presence of seminal vesicle invasion would significantly alter our operative strategy at the time of prostatectomy, as we would widely resect the neurovascular bundles. Endorectal coil magnetic resonance imaging (erMRI) has been reported to improve the prediction of pathologic T3 disease and has been suggested to be linked to the robotic image during surgery. We evaluate the ability of erMRI to preoperatively predict seminal vesicle invasion in patients with pathologic T3b disease. **METHODS:** An institutional database of 1,240 RALPs between 2004 and July 2009 performed by a single surgeon (DBS) was queried for patients with seminal vesicle invasion on final pathology. We examined preoperative characteristics including age, PSA, clinical stage, and biopsy Gleason scores for all patients and compared the patients who received an erMRI prior to surgery. The erMRI reports were dichotomized into positive or negative; equivocal reports were read as positive. The results of the erMRI were compared with the final pathologic examination of the seminal vesicles, examining the accuracy of the erMRI in predicting side-specific and overall seminal vesicle invasion. **RESULTS:** Out of the 1,240 RALPs performed between 2004 and July 2009, 58 patients were found to have T3b disease on final pathology and constituted our study population. Prior to surgery, 21 (36%) of these patients underwent erMRI. Clinical and pathologic outcomes were similar in the two groups. Patients who underwent erMRI had a similar age, PSA, incidence of palpable disease on clinical staging and final pathology Gleason score. There was a non-significant trend towards higher biopsy Gleason scores in patients who underwent an erMRI: 38% had Gleason 7 and 62% Gleason 8-10 on prostate biopsy, compared to 60% and 37%, respectively, in those who did not undergo erMRI. In the assessment of the accuracy of erMRI in these patients with pT3b, fifteen (71%) were completely negative. In contrast, the erMRI was able to definitively predict SVI in 5 patients (24%). The remaining patient was felt to have amyloidosis on erMRI, not prostate cancer, in a seminal vesicle that was involved with cancer. **CONCLUSIONS:** The erMRI has limited clinically ability to preoperatively predict seminal vesicle invasion in patients with T3b disease. This study is limited by its retrospective nature, but a sensitivity of 24% is a very poor result. The impact of these results on future plans to incorporate preoperative MRI images into real-time surgery via the robotic console is unknown.

S014 ROBOTIC ASSISTED PELVIC LYMPH NODE DISSECTION AND PROSTATECTOMY FOR INTERMEDIATE AND HIGH RISK PROSTATE CANCER: REPORT OF INITIAL OUTCOMES

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OBJECTIVE: Pelvic lymph node dissection (PLND) performed at the time of radical prostatectomy provides important staging information that helps physicians guide further intervention. Although robot-assisted laparoscopic prostatectomy (RALP) has gained rapid acceptance for the surgical treatment of prostate cancer, there is a paucity of data describing concomitant robotic PLND. We here describe the indications and outcomes of our robot-assisted pelvic lymph node dissection (RAPLND) series. **MATERIALS & METHODS:** We reviewed 221 RALPs performed at a single institution by a single surgeon (CJK) between 09/07

and 10/09 and compared the cases that included RAPLND with those that did not. Indications for RAPLND included D'Amico intermediate and high risk patients; and included any of the following factors: highest biopsy Gleason score ≥ 4 , PSA ≥ 10 ng/mL, and/or clinical stage T2b or higher. The lymph node dissection templates included, obturator, internal and external iliac node packets. Patient demographics, PSA, peri- and intraoperative variables, and postoperative outcomes and complications as well as tumor characteristics were analyzed. Statistically significant values were then entered into a univariate model. **RESULTS:** RAPLND was performed in 105 patients and omitted in 116. Demographics and co-morbidities were similar between the groups (ethnicity, body mass index, hypertension, diabetes mellitus, hypercholesterolemia, coronary artery disease, 5 alpha-reductase use). Patients who underwent RAPLND were significantly older (mean age of 62.8 vs. 60.1, $p = 0.002$), had higher-risk prostate cancer as evidenced by higher mean PSA (9.3 vs. 5.6, $p < 0.001$) and higher D'Amico risk group ($p < 0.001$) and higher biopsy Gleason sums ($p \leq 0.001$). Mean operative time for those who had RAPLND was longer (191 minutes versus 173 minutes, $p = 0.004$), and mean estimated blood loss was 155 mL and 149 mL respectively ($p = 0.688$). Mean length of stay was similar, at 1.4 and 1.3 days respectively ($p = 0.647$). Complication rates between the two groups were similar (24.5% vs. 17.9%, $p = 0.308$). In the RAPLND group there were 3 lymphoceles, 1 psoas abscess, a urinoma and 1 patient with multi-organ failure and urosepsis resulting in death. In the group without lymph node dissection, there was 1 urinoma and 1 umbilical hernia at the surgical port site. The RAPLND group had a positive margin rate of 26% versus 17% in those undergoing only prostatectomy alone ($p = 0.139$). Pathologic Gleason sums were significantly higher in those having RAPLND than in the non-RAPLND group ($p \leq 0.001$). In the RPLND group, the mean nodal yield was 18.1 and 7 patients (6.7%) had positive nodes. **CONCLUSIONS:** We demonstrate that robot-assisted PLND is a useful tool to aid in the staging of intermediate and high-risk prostate cancer. Lymph node yields with this approach are comparable to open series. We found only slightly increased operative time and complication rates in our series. As expected, our higher positive margin rate in the RAPLND group is due to their higher risk disease at baseline. RAPLND can provide valuable additional staging information with minimal increases in perioperative risk.

S015 CAN WE BETTER SELECT CANDIDATES FOR HEMIABLATIVE FOCAL MONOTHERAPY, FOR PROSTATE CANCER BASED ON CURRENT BIOPSY NEEDLE PROTOCOLS? Sonal Grover, MD, Abhishek Srivastava, MD, Kumaran M. Mudaliar, MD, David L. Peters, DO, Fangmin Chen, MD, Gerald Tan, MD, Robert Leung, MPH, Majnu John, PhD, Ashutosh Tewari, MD, MCh, 1New York Presbyterian Hospital, New York, NY; Weill Cornell Medical College, New York, NY

OBJECTIVE: Focal/ hemiablatable therapy for prostate cancer remains controversial given its multifocal nature. We sort to identify possible predictors for contralateral involvement and extra prostatic extension (EPE) based on pre operative clinico-pathologic characters. **PATIENTS & METHODS:** Between June 2005 to July 2009, 1822 patients underwent radical robotic prostatectomy at our institution, of these 1114 had unilateral disease on preoperative biopsy. We reviewed biopsy, operative and clinical data to record age, BMI, preoperative prostate specific antigen (PSA), clinical stage, Gleason score, high grade intraepithelial neoplasm (HGPIN), perineural invasion (PNI), prostate volume, number of positive cores and maximum

percentage of positive cores. Clinical and biopsy variables were correlated against final surgical pathology. Logistic regression and Backward Wald analysis were performed to identify possible predictors of cancer in contralateral lobe. Odd ratios (OR) were also determined. RESULTS: Of 1113 patients with unilateral disease on biopsy, 867 (77.89%) had bilateral disease. EPE was found on 133 (11.9%) patients and of these 20 (22.22%) patients had contralateral involvement. HGPIN was the only significant predictor of contralateral involvement on both univariate (P=0.02; OR=1.791) and multivariate (P=0.004; OR=2.677) analysis. Age (P=0.708; OR= 0.996), BMI (P=0.425; OR=1.015), preoperative PSA(log) (P=0.193; OR= 1.469), total positive cores (P=0.287; OR= 1.054), Gleason score (P=0.327; OR=1.791), maximum percentage of positive cores (P=0.583; OR= 1.002), PNI (P=0.251; OR=2.342), Prostate volume (log) (P=0.560; OR= 0.776) were not significant predictors of contralateral involvement. Pre operative PSA (P=0.025; OR=8.569) and clinical stage T2 (cT2) (P=0.012; OR=5.250) were significant predictors of contralateral EPE on univariate analysis, but only cT2 (0.0112; OR=5.250) significantly predicted contralateral EPE on multivariate analysis. CONCLUSION: There is little correlation between biopsy and the final surgical pathology which makes patient selection for focal/hemiablative therapy challenging. 78% of patients with unilateral disease on biopsy actually had contralateral involvement and 1.8% had contralateral EPE on final pathology. Among various clinic-pathological variables, HGPIN and Clinical T2 significantly predict contralateral involvement and contralateral EPE respectively and should be exclusion criteria for selection into mono focal therapy.

S016 ROBOT ASSISTED LAPAROSCOPIC REPAIR ALLOWS ANATOMICAL ASSESSMENT FOR INDIVIDUALIZED MANAGEMENT OF PEDIATRIC URETEROPELVIC JUNCTION OBSTRUCTION Derek J. Matoka, MD, Jennifer A. Hagerty, DO, Bruce W. Lindgren, MD, Division of Urology, Children's Memorial Hospital, Chicago, IL and Division of Urology, Lutheran General Hospital, Park Ridge, IL

PURPOSE: Laparoscopic robotic technology continues to impact the therapeutic management of ureteropelvic junction (UPJ) obstruction in the pediatric population. We report our experience with robotic-assisted laparoscopic (RAL) management of pediatric UPJ obstruction, and particularly how intra-operative findings complement pre-operative imaging to dictate the type of repair. METHODS: We retrospectively reviewed consecutive cases of transperitoneal RAL management of UPJ obstruction. Evaluation of symptoms, improved ultrasound appearance and/or resolution of obstruction by diuretic renography at >3 months were used to assess postoperative outcomes. RESULTS: Thirty-three cases were identified (29 primary and 4 secondary repairs) in patients 12 mos. to 20 yrs. of age (mean 9.5 yr). Procedures performed included standard dismembered pyeloplasty (27), ureterocalycostomy (UC) (4), vascular hitch (1) and nephrectomy (1). The approach was chosen based on standard pre-operative work-up and intra-operative findings. UC was performed based on renal hilar scarring during a secondary procedure in 2 patients and a small intrarenal pelvis in 2 primary repairs; all 4 showed calyceal dilation with severely thinned parenchyma on preoperative imaging. A vascular hitch was performed on one patient with a crossing vessel and no identified ureteral narrowing. The nephrectomy was completed after visualizing significantly thinned parenchyma and atretic renal vasculature consistent with minimal function on pre-operative renography. The remainder underwent dismembered pyeloplasty. Improvement in ultrasound and/or diuretic renography at >3 months of follow-

up was seen in 32/33 patients (97%). All secondary procedures (UC or pyeloplasty) were successful. The vascular hitch was complicated by a urinoma and required a second procedure (UC) due to persistent obstruction. There were no other major complications. CONCLUSIONS: Determining the best type of repair for UPJ obstruction requires intra-operative evaluation. A robot assisted laparoscopic approach provides excellent intra-operative "in-situ" assessment of the anatomy via a wide field of vision, allowing for an individually tailored approach to the type of repair that is performed. Our series demonstrates this to be a useful strategy with excellent short-term results.

S017 PEDIATRIC ROBOTIC PYELOPLASTY: THE LEARNING CURVE AND COMPARISON WITH A COHORT OF OPEN PYELOPLASTY Hubert S. Swana, MD, Alejandro R. Rodriguez, MD, Timothy A. Weber, MD, Mark A. Rich, MD, Nemours Children's Clinic Orlando, University of South Florida School of Medicine, Department of Urology

INTRODUCTION: Open pyeloplasty (OP) remains the standard for repair of pediatric ureteropelvic junction obstruction against which new techniques must be judged. New techniques have a unique learning curve based on complexity and the technology involved. We compared robotic pyeloplasty (RP) in older children and compared an age-matched cohort that underwent open pyeloplasty for safety, efficacy, operative time, in-hospital stay and return to full activities. METHODS & PROCEDURES: We performed a retrospective case-control study from 2003 to 2009 of 20 patients undergoing open pyeloplasty and 24 patients undergoing robotic pyeloplasty. All surgeries were performed by fellowship trained pediatric urologists. Average age of each group was not significantly different (RP= 9.0 years vs OP 9.1 years). Variables measured included return to full activity: defined as the number of days required to return to unrestricted play, competitive sports or gym class. Also analyzed were operative time, length of hospital stay, complications and need for additional surgery. To determine the number of cases necessary to achieve outcomes that matched or exceeded the results of open pyeloplasty, we compared the operative time for the first sixteen cases (group 1) and compared them to the next eight cases of robotic pyeloplasty (group 2). RESULTS: The etiology of ureteropelvic junction obstruction was similar in both open and robot cases. Analysis of data variables revealed a significant difference in the mean operative time for OP (129 minutes) and RP (195 minutes) (p=0.001). Mean robot console time was 156 minutes. As RP experience increased, operative times decreased and approached the OP experience. The mean total operative time for the first sixteen robot cases (group 1) was 218 minutes vs 149 minutes (p= 0.001) for the next eight cases of robot pyeloplasty (group 2). Mean console time also decreased from 174 minutes in group 1 to 118 minutes in group 2. Patients undergoing RP had a mean hospital stay of 2.4 days compared to 3.6 days for OP (p= 0.01). There was a significant difference in return to full activity 16 days vs 31 days (p=0.002) in the RP and OP groups respectively. All patients in the RP group and 19/20 in the OP demonstrated resolution of hydronephrosis, improvement in drainage on lasix renal scans and relief of symptoms. RP complications included 1 patient requiring reoperative surgery to reposition a dislodged internal double-J-stent. In the open group one patient developed stenosis of the UPJ that was managed by attempted balloon dilation and subsequent redo-pyeloplasty. CONCLUSIONS: Robotic pyeloplasty can be safely performed in older children. Robotic pyeloplasty can be performed with similar success rates to open pyeloplasty. Robotic pyeloplasty has the benefits of decreased hospital stay, and faster return to

full physical activities. The learning curve demonstrated that after an experience of approximately sixteen cases, robotic operative times approach those of open surgery.

S018 SAFETY AND EFFECTIVENESS OF ROBOT ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY IN MEN WITH HUMAN IMMUNODEFICIENCY VIRUS Jonathan L. Silberstein, MD, Kerrin Palazzi-Churas, MPH, J. Kellog Parsons, MD, MHS, Tracy M. Downs, MD, Ithaar H. Derweesh, MD, Jeffery Woldrich, MD, Sean P. Stroup, MD, Christopher J. Kane, MD, University of California, San Diego School of Medicine

INTRODUCTION & OBJECTIVE: Highly active antiretroviral therapy (HAART) has dramatically increased the survival of HIV positive patients, including those with prostate cancer. However, the safety and effectiveness of radical prostatectomy in this population remains undefined. We report the first series of robotic assisted laparoscopic prostatectomy (RALP) for Human Immunodeficiency Virus (HIV) positive prostate cancer patients. **METHODS:** We performed a prospective cohort study of patients undergoing RALP at a single academic institution. In exploratory analyses, we identified all men who were known to be HIV positive prior to surgical intervention and compared patient demographics, tumor characteristics, complications, and short term oncologic outcomes of HIV positive men to the overall cohort. **RESULTS:** From 2007 to 2009, 272 men underwent RALP, 5 of who were HIV positive. Preoperatively, all 5 had undetectable viral loads (<50); mean CD4 count was 583 cells/mm³. Compared to the overall cohort, HIV positive men were younger (54 vs 62 years $p = 0.009$) and less likely to be White ($p = 0.045$). There were no significant differences with respect to clinical tumor stage, biopsy Gleason sum or D'Amico risk stratification. Peri-operative transfusions occurred more frequently in HIV positive patients (40%) than the overall cohort (3.5%) ($p = 0.015$); this difference persisted in multivariable logistic regression modeling adjusting for age, race, Gleason sum, tumor stage, and nerve sparing status ($p = .003$). There were no significant differences in peri-operative complications, pathologic Gleason score, or T stage. All 5 HIV positive men had a final pathologic stage of T2 and none had positive margins or lymph node involvement. After 8 months of follow-up, PSA remained undetectable in all 5 HIV patients. **CONCLUSIONS:** In this first series of RALP for HIV positive prostate cancer patients we have demonstrated that RALP is safe for, and demonstrates excellent short term oncologic efficacy in, HIV positive patients with prostate cancer. Long term outcomes with greater numbers of men will be necessary to confirm these findings.

S019 ROBOTIC ASSISTED RADICAL PROSTATECTOMY: A MODEL FOR EXTENDED MENTORSHIP AND THE SAFE INTRODUCTION OF TECHNOLOGY INTO A VA SETTING Seth A. Cohen, MD, Tracy M. Downs, MD, Jonathan L. Silberstein, MD, Kerrin Palazzi-Churas, MPH, Lissette Bennett, MD, Ithaar H. Derweesh, MD, Koyoko Sakamoto, MD, Sean P. Stroup, MD, Christopher J. Kane, MD, University of California San Diego School of Medicine and San Diego VA Healthcare System, La Jolla, CA

INTRODUCTION: Robotic assisted Laparoscopic Prostatectomy (RALP) has become a common method of Prostate Cancer (PCa) treatment in the United States. Despite this, the daVinci robot surgical system (Sunnydale, CA) has only been introduced at a small number of VA medical centers throughout the country. In this study we wanted to demonstrate that RALP can be introduced into a VA setting, in a safe, efficacious manner. **METHODS:** The da Vinci robot was introduced into the San Diego VA Health Care System (SDVAHCS) in October 2008. From 10/08 to 4/09, 21

RALPs have been successfully performed at SDVAHCS by multiple urologic surgeons, in a setting proctored by a credentialed robotics instructor. These patients' demographics, oncologic characteristics, and surgical outcomes were compared with that of 21 patients who underwent RALP by a single experienced surgeon (CJK) at an academic comprehensive cancer center (UCSD) within the same time period. Independent T-Test, Mann-Whitney test and Chi2 tests were used to compare disease and surgery characteristics to determine statistical differences. **RESULTS:** Patient populations were similar in baseline preoperative profiles (age $p = 0.281$, BMI $p = 0.387$, T staging $p = 0.121$, Gleason scores $p = 0.753$, PSA $p = 0.271$ and risk stratification $p = 0.575$). The length of surgery was significantly longer within the VA patient population (304 mins vs 177 mins, $p \leq 0.0001$). In addition, the length of surgery within the proctored setting was further characterized by specifically looking at the SDVA OR times for those cases in which the proctor/experienced surgeon was present, in comparison to those VA cases in which he was not present; with the proctor/experienced surgeon in the room, case length was significantly shorter (251 mins vs 389 mins, $p \leq 0.003$). The estimated blood loss ($p = 0.647$), rate of blood transfusion, length of hospital stay ($p = 0.708$), rate of open conversions, surgical margins, pathological T staging, and pathologic Gleason scores ($p = 0.435$) were comparable in the two groups. No significant complications were seen in either group. **CONCLUSIONS:** Demographics, short term peri-operative outcomes, and oncologic outcomes were similar in both groups, even though the novices took significantly longer to complete the procedures. Thus, it is evident that robotic laparoscopic prostatectomy can be safely introduced into a VA setting. This example of an extended mentorship model, under the tutelage of a credentialed robotics instructor, may prove to be the optimum model by which to safely, efficaciously introduce the da Vinci Surgical System.

S106 ROBOTIC ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY AND CONCURRENT ASPIRIN USE: INITIAL EXPERIENCE Sepehr Nowfar, MD, Ryan Kopp, MD, Kerrin Palazzi-Churas, MPH, Ithaar H. Derweesh, MD, Christopher J. Kane, MD, University of California San Diego School of Medicine

INTRODUCTION: New cardiology guidelines recommend continuous antiplatelet therapy for some patients with cardiac stents. Aspirin use is relatively contraindicated during urologic surgery due to increased bleeding risks. We sought to review the outcomes and risks of aspirin use during robotic assisted laparoscopic radical prostatectomy. **MATERIALS & METHODS:** Between September 2007 and April 2009, 176 patients (Group 1) underwent robotic assisted laparoscopic prostatectomy by a single surgeon. Ten patients had coronary artery stents. In consultation with the patients' cardiologists, six patients were allowed to hold aspirin for ten days (Group 2), four patients could not have aspirin held (Group 3). Pre-operative characteristics were analyzed including age, PSA, D'Amico risk as were operative time, blood loss, hematocrit changes, transfusion requirements, length of hospital stay, and Clavien related complications. **RESULTS:** There were no statistical differences in the age distribution of our cohort. Operative time and blood loss were similar between these three groups. There were no significant differences hematocrit changes. No patients in Groups 2 or 3 required blood transfusions. Further, there were no significant differences in length of hospital stay between groups. No patients with cardiac stents or cardiac stents with aspirin had complications greater than Clavien I. In Group 1, however, four patients required interventions for symptomatic lymphoceles.

Patients had no sequelae after intervention. **CONCLUSIONS:** Patients with coronary artery stents with life-long antiplatelet medication are at high risk of coronary embolism and sudden death following cessation of aspirin. Our initial experience in robotic prostatectomy with patients on perioperative aspirin show no increased blood loss, operative time, transfusion requirement, hospital stay or operative complications. Larger studies need to be performed to validate these observations.

GYNECOLOGY

5020 CURRENT TRENDS IN ROBOTIC SURGERY: A SURVEY OF GYNECOLOGIC ONCOLOGISTS Nefertiti C. duPont, MD, MPH, Rameela Chandrasekhar, MA, Gregory Wilding, PhD, Khurshid A. Guru, MD, Roswell Park Cancer Institute

OBJECTIVES: To understand the impact and utility of robot assisted surgery in gynecologic oncology. **METHODS:** Urologists at our institution created a 53 item paper questionnaire to assess the opinions of urologists toward robot assisted surgery. This survey was adapted to a gynecologic oncology audience and created in a web based format. A link to the survey was sent electronically to all members of the Society of Gynecologic Oncologists (n=1024). Six members did not have an email address. Sixteen emails were undeliverable. The surveys were completed from June 2009 to August 2009. **RESULTS:** Two hundred seventy seven surveys were completed (28%). Sixty two percent of the respondents were male and fifty percent have been in practice for over 10 years. Most survey participants practiced at an academic or cancer institute and 99% of participants stated that minimally invasive surgery is performed at their institution. Seventy one percent have performed a robot assisted hysterectomy and 50% have performed a robot assisted radical hysterectomy with lymphadenectomy. Nearly 40% felt robot assisted surgical training was required as a part of their career goals. However, over 85% of respondents would not pursue a separate robot assisted surgery fellowship. Seventy five percent would take additional courses in order to integrate robot assisted surgery into their practice. When asked about the current status of robot assisted surgery in gynecologic oncology, 50% of participants stated that robot assisted surgery was as good as laparoscopic hysterectomy for treatment of benign disease. In terms of staging for early endometrial cancer, 39% of participants felt that robot assisted surgery was as good as laparoscopic staging and 23% thought robot assisted surgery should be the gold standard for the treatment of endometrial cancer. Regardless of practice patterns most participants thought the greatest advantage of robot assisted surgery was to enhance a patient's quality of life. **CONCLUSIONS:** Robot assisted surgery is gaining widespread acceptance in gynecologic oncology and is perceived to be as good as laparoscopic staging surgery for the treatment of early stage endometrial and cervical cancers. The greatest assets of robot assisted surgery are its ease of use and perceived improvement in a patient's quality of life.

5021 COMPARISON BETWEEN 100 CASES OF ROBOTIC VS. 100 CASES OF OPEN SURGICAL STAGING FOR ENDOMETRIAL CANCER Karim S. ElSahwi, MD, Charlene Hooper, MD, Thomas J. Rutherford, MD, PhD, Dan-arin Silasi, MD, Peter E. Schwartz, MD, Alessandro D. Santin, MD, Masoud Azodi, MD, Yale University School of Medicine

OBJECTIVE: To compare 100 cases of endometrial cancer who had robot-assisted surgical staging to 100 open cases. **DESIGN:** Retrospective chart review. **SETTING:** Academic institution. **PATIENTS:** Endometrial cancer cases. **Intervention:** Robot-assisted and open surgical staging. **RESULTS:** For the robotic arm; The

Median age was 60 years (range, 39-84). The Median body mass index (BMI) was 34.4 Kg/m² (range, 19-63). Most patients (80%) had early stage disease (stage I-II), and approximately 90% had grade 1-2 endometrioid histopathology. The Median length of hospital stay was 1day (range, 0-9). The Median number of lymph nodes retrieved was 21 (range, 0-64). The Median operative time was 138 minutes (range, 109-221). The Median console time was 96 minutes (range, 75-173), and the Median docking time was 10 minutes (range, 7-26). The Median uterine weight was 126 grams (range, 52-400). The Median estimated blood loss was 100cc (range, 5-400). Two patients received packed red blood cell transfusions. There was one case of uretral injury that was recognized and repaired intraoperatively. One patient developed acute tubular necrosis postoperatively. She was successfully managed conservatively. There was one case of urinary retention, one case of urinary tract infection, and one patient was readmitted due to a wound cellulitis. **CONCLUSION:** Above outcomes will be compared to those of 100 open cases using standard statistical tests, and appropriate conclusions will be drawn.

5022 ROBOTIC HYSTERECTOMY FOR VERY ENLARGED MYOMATOUS UTERI Taryn N. Gallo, MD, Dan-Arin Silasi, MD, Masoud Azodi, MD, Yale New Haven Health System/ Bridgeport Hospital Study

OBJECTIVE: To summarize our experience with the robotic system for the surgical management of large myomatous uteri. **METHODS:** A retrospective case series of 17 consecutive patients who underwent total robotic hysterectomy for a symptomatic myomatous uterus weighing greater than 1000 grams. **RESULTS:** The mean uterine weight was 1467 grams (range 1000 – 3543gms). The mean age of our patients was 45 years (range 39 – 65 years) and the mean BMI was 29 kg/m² (range 18.5 – 56.3 kg/m²). Intraoperatively, the recorded mean blood loss was 170 mL (range minimal to 600 mL). Fifteen (88%) patients were discharged from the hospital on postoperative day 1 (range 1 – 2 days). All operations were completed laparoscopically. No complications requiring reoperation occurred. One patient was readmitted on POD#4 for suspected ureteral obstruction. No obstruction or ureteral injury was identified. **CONCLUSION:** Robotic hysterectomy for very enlarged myomatous uteri is feasible and can be performed safely. By using this approach, we noted decreased morbidity for our patients and shorter hospital stay.

5023 THE ROBOTIC SURGICAL EXPERIENCE IN GYNECOLOGY AT A TEACHING COMMUNITY HOSPITAL Seetal Adhikari, MD, Advocate Lutheran General Hospital, Park Ridge, Illinois

OBJECTIVE: The purpose of this study is to evaluate the application of Robotic Gynecologic Surgery using the DaVinci Platform at a teaching community hospital. **METHODS:** This study is a retrospective chart review of patients undergoing gynecologic robotic surgery from January 2007 to December 2008. Residents and/or other attendings in training assisted these cases. We abstracted the patient demographic data, operative time, any complications, and length of stay for all procedures. We performed a breakdown of the number of cases performed by each attending physician to see if there was a correlation between experience and operative time. We calculated the mean of each variable and performed a correlation analysis between operative time and each variable using the Pearson r correlation coefficient. The operative time trends for the surgeons performing the majority of the cases were also analyzed separately. **RESULTS:** A total of 131 charts were reviewed and 119 patients were included. Twelve patients were excluded due to unrelated additional procedures (1) or intraoperative conversion to laparotomy (11).

Nine surgeons were responsible for all of the surgeries, however, 5 surgeons performed the majority of procedures (n=112). There was no significant correlation noted between operative time and age, BMI, # of previous abdominal surgeries, length of hospital stay or complications. A positive correlation was noted between the operative time and the mass of the specimen (correlation coefficient 0.213, p=0.02) and the EBL/drop in Hb (correlation coefficients 0.589/0.248, p=0.01). Mean operative times for all surgeons ranged between 145.4 and 193.4 minutes. The operative time trends for the 5 surgeons overall showed a weak negative correlation (correlation coefficient -0.104, p=0.30). However, one surgeon who operated with the same team consistently showed the greatest negative correlation with operative time over the 2 years (correlation coefficient -0.156, p=0.594). **CONCLUSION:** Robotic Gynecologic surgery is a valuable technology in the community teaching hospital. The learning curve appears to be affected not only by the experience of the surgeon, but also the consistency of the team.

S024 ROLE OF ROBOTIC SURGERY IN REDUCING THE RATE OF ABDOMINAL HYSTERECTOMY Michael Moen, MD, Daniel Pesch, MD, Michael Noone, MD, Grishma Shah, BS, Advocate Lutheran General Hospital

OBJECTIVE: To describe our experience using robotic surgery to reduce the rate of abdominal hysterectomy **METHODS:** This is a retrospective analysis of types of hysterectomies performed during representative time periods prior to and subsequent to the introduction of robotic surgery at a large, community teaching hospital. All hysterectomies performed for benign indications during a 6 month period in 2004 and a 6 month period in 2009 were analyzed. Patient characteristics, indication(s) for hysterectomy, intraoperative and postoperative data and surgeon characteristics (i.e. generalist, subspecialist) were noted. **RESULTS:** Hysterectomy rates in 2004 were: 56.4% abdominal (TAH); 24.6% vaginal (VH); 1.7% Laparoscopically-assisted vaginal (LAVH); 14% Laparoscopic supracervical (LSH); and 3.3% total laparoscopic (TLH). Hysterectomy rates in 2009 were: 32.3% TAH; 24% VH; 6.6% LAVH; 15.5% LSH; 7.2% TLH; and 14.4% Robotic (RH). Overall, the majority of TAH, LSH and RH were performed by generalists, whereas the majority of VH, LAVH and TLH were performed by fellowship-trained specialists. **CONCLUSION:** The introduction of RH resulted in a reduced rate of abdominal hysterectomies without reducing the rate of other MIS approaches for hysterectomy. RH and LSH appear to be the two techniques utilized most often by generalists as MIS alternatives to abdominal hysterectomy.

S025 POSTERIOR COLPOTOMY-A SUCCESSFUL RETRIEVED FOR PELVIC MASS AND LARGER SPECIMENS FOLLOWING ROBOTIC ASSISTED LAPAROSCOPIC SURGERY Gerald A. Feuer, MD, O.W Stephanie Yap, MD, Mathew O. Burrell, MD, Patricia Hernandez, MD, Southeastern Gynecologic Oncology, LLC. Atlanta, Georgia, USA

OBJECTIVE: To report the technique and results of transvaginal extraction of pelvic masses or larger specimens that need to be removed during robot-assisted laparoscopic surgery in order to avoid increasing port incisions and postoperatively reduce pain. **MATERIALS & METHODS:** Between July 2007 and July 2009, 50 women underwent a transvaginal incision to remove pelvic masses or larger specimens such as omentum after robot-assisted laparoscopic hysterectomies. A majority of these patients (78%) had a prior history of abdominal or pelvic surgery. Two patients had a history of cancer (fallopian tube; endometrial), with the remaining patients presenting with adnexal or pelvic masses. The average

patient body mass index was 32.6 ± 1.15 (16.5-53.3). For larger adnexal masses the fluid was drained in the bag without spillage. Following completion of the primary robotic procedure, a posterior colpotomy was performed. The bagged specimen was delivered into the vagina and then extracted. The vaginal incision was closed robotically with a running suture. **RESULTS:** Vaginal extraction of pelvic masses was successful in all attempted cases and in no cases were there any spillage. The mean operative time was 94.22 ± 4.48 minutes (range 45-180). Blood loss was minimal (26.6 ± 5.02 ml; range 0-150ml) and the average patient hospitalization was $1.2 \pm .09$ days (range of 1-4 days). The pelvic masses ranged from 3.2-19.2 cm. No intraoperative complications occurred and clinical follow-ups revealed excellent patient satisfaction and pain control. **CONCLUSIONS:** Vaginal removal of larger specimens is a useful adjunct to robot-assisted laparoscopic resection of pelvic tumors in order to avoid the need to make larger incisions and reduce postoperative pain issues. This technique can be considered efficacious and safe with minimal morbidity. We suggest a surgical set-up inclusive of v-care to be prepared should the specimen be too large to remove via the port site and thus enabling the surgeon the opportunity to perform this procedure with ease if necessary.

S026 ROBOTIC-ASSISTED LAPAROSCOPIC SACROCOLPOPEXY FOR TREATMENT OF PELVIC ORGAN PROLAPSE Adeline Germain, Marie Galifet, Marie-Lorraine Scherrer, MD, Jean-Michel Tortuyaux, MD, Ahmet Ayav, MD, PhD, Laurent Bresler MD, Jacques Hubert, MD, (1) Department of General Surgery, University Hospital of Nancy-Brabois, 54511 Vandœuvre-lès-Nancy, France

BACKGROUND: Transabdominal sacrocolpopexy has a high long-term success rate for the treatment of pelvic organ prolapse. In order to reduce morbidity and to improve postoperative recovery, laparoscopic sacrocolpopexy has been developed. This procedure requires a high skill level especially in suturing. Robotic surgery may be an answer to this problem. We performed a retrospective study of our series of patients treated for genital prolapse with the Da Vinci system to evaluate the feasibility, the complications rate, the functional and anatomic results of the procedure. **METHODS:** From January 2002 to January 2009, 40 patients with pelvic organ prolapses underwent robotic abdominal sacrocolpopexy repair. All patients underwent a telephone questionnaire in order to determine the recurrence rate, and were asked about current problems with stress urinary incontinence, pelvic heaviness, dysuria, dyspareunia and dyschesia. Patients were also asked for global improvement. **RESULTS:** The median age at the time of surgery was 60 years (35-79). Sixteen patients (40%) had a history of open abdominal surgery. The median duration of follow-up was 25 months (6-84). Thirty-nine procedures were totally realized robotically, one patient had to be converted to an open procedure because of adhesions. Median operative time was 190 minutes (75-340). Four short-term complications were observed: 1 peritonitis due to a small bowel injury, 1 urinary tract infection, 1 abscess of the abdominal wall and 1 arm numbness, which resolved within few hours. The median hospital stay was 6 days (3-50). There were only 2 recurrent pelvic organ prolapses (1 patient developed an asymptomatic recurrent cystocele, and a vaginal vault prolapse was noted at 51 months after surgery requiring a trachelectomy). Thirty-seven patients (92,5%) stated that they were improved after surgery. **CONCLUSIONS:** Sacrocolpopexy using the Da Vinci® robotic system is feasible and effective for the treatment of pelvic organ prolapse.

S027 ADVANCING RESIDENT AND FELLOW EDUCATION IN ROBOTIC SURGERY – FACTORS THAT PROMOTE TRANSITION TO TEACHING Timothy O. Wilson, MD, Bobbie S. Gostout, MD, Christopher J. Klingele, MD, Mayo Clinic Division of Gynecologic Surgery, Rochester MN

INTRODUCTION: Surgical teaching is vital for preparation of the next generation of surgeons. The introduction of robotic surgery may incite fear that resident and fellow experience will suffer. We undertook this study to evaluate the progression from learner to teacher in a large academic gynecologic surgery practice. **METHODS:** Robotic gynecology surgery cases were reviewed through the first 30 months of department use. Resident and fellow case logs were cross referenced to determine level of participation in each case. We evaluated trainee involvement in cases as a function of types of cases, individual surgeon case numbers, and department case numbers. **RESULTS:** 518 gynecologic robotic cases were performed in the first 30 months following introduction of the technology. Surgeons were sequentially certified for robotic surgery as case volumes increased. Median case volume was 39, range 10 – 184. Case distribution included 270 benign robotic hysterectomies and 139 procedures for gynecologic malignancies. Gynecologic surgery fellows received organized pre-clinical instruction in the use of the robot, while residents received instruction only through independent arrangements. The timing of transition from learner to teacher of robotic surgery was at the discretion of individual surgeons. We are currently evaluating resident and fellow involvement in surgical cases to determine patterns and associations with individual surgeons transition to the teaching role. **CONCLUSIONS:** In our teaching institution, transition to robotic surgery has been accomplished with limited disruption of resident teaching. Pre-clinical training for residents and fellows facilitates comfort in teaching and in performing robotic surgery, allowing earlier involvement. We are evaluating the impact of total case numbers as well as the frequency of robotic cases on staff willingness to transition to a teaching role in robotic surgical cases.

S028 ORTHO-CENTRIC DOCKING: AN AID TO ACCESS TO THE PERINEUM IN PELVIC ROBOTIC SURGERY Daniel H. Smith, MD, Daniel H. Smith, MD, Hackensack University Medical Center

S029 ROBOTIC SURGERY FOR GYNECOLOGIC PROCEDURES IN SUPER-MORBIDLY OBESE WOMEN Charlene Hooper, MD, MPH, Karim ElSahwhi, MD, Masoud Azodi, MD, Peter Schwartz, MD, Thomas Rutherford, MD, PhD, Dan-Arin Silasi, MD, Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University School of Medicine

OBJECTIVE: To summarize the experiences and outcomes of robotic surgery in treating patients with super-morbid obesity (BMI of 50 kg/m²) for gynecologic conditions. **METHODS:** A retrospective analysis of charts from all patients undergoing robotic gynecologic procedures was performed. All patients with BMIs greater than 50 kg/m² were included in the study. **RESULTS:** 21 patients were included in the analysis. Mean age was 51 years (36-70), and mean BMI was 58 kg/m² (50-87). Operative indications included menorrhagia with leiomyoma (n=6), pelvic mass (n=3), endometrial complex atypical hyperplasia (n=1), and endometrial carcinoma (n=11). Common comorbidities included hypertension (66%), respiratory disease (38%) diabetes (33%) and arthritis (23%). Procedures performed included robotic hysterectomy and bilateral salpingo-oophorectomy with or without lymph node dissection, omentectomy, and lysis of adhesions. Average blood loss was 200 mL (50-700) and there were no intraoperative complications

or conversions to laparotomy. Three patients required additional port placement intraoperatively and 3 cases had part of the procedure completed vaginally secondary to positional difficulty. Reported challenges related to obesity included: inability to obtain maximum Trendelenburg (4/21), inadequate pneumoperitoneum (1/21), pelvic depth (2/21) and port placement (3/21). One patient was unable to be extubated and required overnight intubation in the ICU. Average hospital stay was 1 day (15/21) and 85% were discharged by the second post operative day (18/21). Longer hospitalizations were secondary to upper extremity numbness (1/21), post operative ileus (1/21) and respiratory complaints (2/21). There were no readmissions, wound infections or reoperations. **CONCLUSION:** Roboticsurgeryforgynecologicproceduresaffords good surgical outcomes and short hospital stays for patients with extreme body habitus. There are unique challenges to performing robotic surgery on the super-morbidly obese patient that are likely best suited for experienced robotic surgeons.

S030 NEEDLE OOPHOPEXY: A NEW SIMPLE TECHNIQUE FOR OVARIAN TRANSPOSITION PRIOR TO PELVIC IRRADIATION Waheed Y. Gareer, MD, Zeiad S. Gad, MRCS, MD, Haytham W. Gareer, MD, Surgical oncology department, NCI, Cairo University

INTRODUCTION: Irradiation of the pelvis will almost always result in ovarian failure unless the ovaries are shielded adequately. To protect the ovaries, an oophoropexy may be performed, which involves moving the ovaries away from the pelvic lymph node fields. The objective of this study was to evaluate the feasibility, morbidity, and efficacy of bilateral laparoscopic ovarian transposition using simple percutaneous needle technique. **PATIENTS & METHODS:** This is a report of the outcome of ten patients (seven presenting with rectal cancer and three presenting with Hodgkin's disease) who underwent laparoscopic oophoropexy at the National Cancer Institute, Cairo University. The operative technique consisted of laparoscopic releasing of the ovary through cutting the uteroovarian ligament followed by placing the ovaries on the anterior abdominal wall medially and above the anterior superior iliac spine. Percutaneous straight needle is introduced through 2 mm skin incision at site of fixation. Repositioning of the ovaries has been simply done through cutting the subcutaneous suture using local anesthesia on outpatient basis without the need for readmission to the operating theatre. **RESULTS:** The technique showed its effectiveness, reliability and simplicity with no morbidities. The mean time was 10 minutes and patients returned home day of surgery. Repositioning was performed simply on seven of them in the outpatient clinic **CONCLUSION:** Percutaneous needle transposition is simple effective reliable and easy technique for both ovarian transposition and repositioning. It has short learning curve and can be easily done by less experienced laparoscopic surgeons.

S031 RESIDENT TRAINING IN ROBOTIC ASSISTED GYNECOLOGIC SURGERY Michael L. Galloway, DO, David Dhanraj, MD, Gary Ventolini, MD, Wright State University, Boonshoft School of Medicine Residency Training in Robotic Assisted Gynecologic Surgery, Michael L. Galloway, D.O., Assistant Professor, Director of Gynecologic Surgery, Associate Program Director Ob/Gyn Residency Wright State University, Boonshoft School of Medicine, Department of Obstetrics and Gynecology David Dhanraj, MD, Assistant Professor, Director of Minimally Invasive Surgery Gary Ventolini, Professor and Chair Department of Obstetrics and Gynecology

ABSTRACT OBJECTIVE: Robotic surgery using the daVinci system (Intuitive Surgical, Sunnyvale, CA), is a revolutionary operative tool for many surgical specialties. Gynecologic surgery has been in the

forefront in using this new technology since 2005. Gynecologic surgical options include benign hysterectomy, myomectomy, tubal reanastomosis, sacrocolpopexy, radical hysterectomy and lymph node dissection. Currently, Gynecologic surgeons are trained post-residency using animate models in labs. Additionally, in gynecologic resident education, there is no formal robotic training program. We designed a longititude course in Robotic Assisted Gynecologic Surgery. The goal of this program is to facilitate the incorporation of this specific surgical method into the Gynecologic section of the residency program. The addition of a formal program will improve knowledge with regard to this system, including surgical anatomy and skills. Evaluation of performance is done to assess progress of educational process. Institutional Review Board and the consent process has been followed. METHODS: The course includes all of the components of surgical education: knowledge, basic and specific surgical robotic skills, experience/decision-making, procedural performance, and evaluation. It includes PGY I to PGY IV Residents. We estimate the training to include a one-hour online program and five blocks of 4-hour robotic simulation surgery totaling approximately 21 hours. Robotic simulation includes complete setup, port placement, docking and four-to-five training exercises. Training exercises contend with camera control, dexterity, dissection and suturing. Evaluation of skills and performance will be completed at each step of the education program. RESULTS: Throughout the course the residents acquired the necessary knowledge, basic surgical skills and experience to properly perform Robotic Assisted Gynecologic Surgery. Evaluation of residents included online documentation, skills assessment evaluation, procedure review and global rating at completion of surgical rotation. Documentation of this training is issued at completion of the course. A trial of the course completed by four of our residents showed remarkable ability to acquire the robotics skills. Overall surgical experience was parallel to resident's current year level in training. CONCLUSION: We are presenting a longitudinal course with a formal surgical education program for gynecologic residents in Robotic Assisted Gynecologic Surgery. Initial trials of the course completed thus far by our residents were notable.

S032 OVERCOMING EXTREME OBESITY WITH ROBOTIC SURGERY Pamela J. Stone, MD, Alexander Burnett, MD, Brian Burton, MD, Juan Roman, MD, University of Arkansas for Medical Sciences

ABSTRACT: Obesity is often associated with endometrial cancer and has posed a challenge in surgical management. Complications such as wound breakdown, respiratory challenges, cardiac complications, difficult intubations are associated with obesity. For the patient with uterine cancer, surgery is necessary for staging, control of symptoms and cure. With the advent of minimally invasive surgery and specifically the daVinci Intuitive robot, alternative surgical options can now be offered to these patients. While surgery is the principal modality for treatment and management of uterine cancer, the morbidly obese patient faces increased complications and longer postoperative recovery. Minimally invasive surgery has been advocated for endometrial cancer to decrease postoperative morbidity. As studied in LAP2, comparable outcomes have been noted in laparotomy versus laparoscopic surgery. Recently, minimally invasive surgery has been refined with the advent of the daVinci robotic system. Applying a minimally invasive technique further enhanced with the daVinci robotic system, a total laparoscopic hysterectomy with bilateral salpingo-oophorectomy was performed on a patient with a BMI of 98. To our knowledge, this is the largest patient operated on using the daVinci robotic system for endometrial cancer. CASE: A 35 year old G0 woman with a BMI 98 presented with heavy vaginal

bleeding and anemia. She was diagnosed with endometrioid adenocarcinoma of the uterus, FIGO grade 1. She was treated with a robotically assisted total laparoscopic hysterectomy and bilateral salpingo-oophorectomy. Her postoperative course was uncomplicated and she was discharged home on post-operative day 1. CONCLUSION: Since obesity is a significant risk factor for endometrial cancer and the prevalence of obesity is increasing, developing surgical techniques to appropriately manage these patients is important. Minimally invasive surgery specifically with robotic assistance has increased the possibilities of performing minimally invasive surgery in morbidly obese women. It allows navigation around anatomic barriers and decreases the fatigue experienced by the operating surgeons. By performing this surgery via robotically assisted laparoscopy, our patient was able to have an uncomplicated and shortened postoperative recovery as well as assurance of controlled vascular pedicles and inspection of the peritoneal cavity. For patients with extreme obesity, the surgical techniques, outcomes and complications with robotic surgery have not been well described. With increasing obesity of our population and high prevalence of uterine cancer, further advancement of equipment, anesthesia and surgical techniques to accommodate the larger patient while decreasing complications have yet to be standardized. Additional study is advocated in this group of patients to reduce complications without incurring increased cost or compromising care.

S033 SURGICAL TECHNIQUE ENHANCES EFFICIENCY OF ROBOTIC HYSTERECTOMY Gerald A. Feuer, MD, Patricia Hernandez, MD, Southeastern Gynecologic Oncology, LLC. Atlanta, Georgia, USA

OBJECTIVE: The purpose of this study was to evaluate the benefits and morbidity associated with a novel technique for a hysterectomy designed specifically for a robotic-assisted laparoscopic procedure. INTRODUCTION: Recent studies have compared the robotic-assisted laparoscopic hysterectomy versus an open hysterectomy. In comparison, robotic procedures have resulted in a minimal post-operative hospital stay, less blood loss during surgery, and reduced complications; however their operative times have been significantly longer. We have developed a surgical technique that has enabled us to efficiently decrease the standard operative time. METHODS: 55 patients were retrospectively analyzed that had presented with either cases of pelvic masses, abnormal bleeding, fibroids, adenomyosis, or endometriosis. All patients underwent a robotic-assisted hysterectomy utilizing a novel surgical technique with four specific components inclusive of a unidirectional approach to the surgical procedure, the lateral dissection of the bladder flap, the deliberate incision of the posterior peritoneum exposing the uterine vessels, and the incorporation of the Hem-olok® locking clip. RESULTS: This surgical technique has enabled us to efficiently decrease the standard operative time to an average of 80.9 ± 3.44 minutes. The estimated blood loss was $63.5 \text{ ml} \pm 3.76$ ml and patients had an average post-surgery hospital stay of 1.3 ± 0.15 days. There were minimal complications during surgery (1.8%). CONCLUSION: We have provided an efficient technique that is safe, easily producible, and comparable to open hysterectomy operation times.

S034 ROLE OF ROBOT-ASSISTED LAPAROSCOPY IN THE MANAGEMENT OF OVARIAN CANCER Gerald A. Feuer, MD, Patricia Hernandez, MD, Southeastern Gynecologic Oncology LLC. Atlanta, Georgia - USA

OBJECTIVE: Most ovarian cancers are predominantly treated via laparotomy; however there have been a limited number of laparoscopic cases. We report here the use of robot-assisted

laparoscopy for patients with a new diagnosis of ovarian cancer. This work will elucidate whether the increased dexterity and three-dimensional visualization of robotics can play a greater role for management of ovary cancer. **METHODS:** 19 patients had been evaluated between January 2008 - August 2009. Each had presented with either a description of ovarian cancer needing initial staging, a pelvic mass with an intraoperative description of ovarian cancer, or the need for subsequent exploration and staging following neoadjuvant chemotherapy. Secondary staging was done on six patients inclusive of patients with epithelial ovary cancer and included a bilateral pelvic node dissection, a paraaortic dissection, a greater omentectomy and appendectomy, a laparoscopic visualization of the diaphragm, and robotic assisted inspection of the entire small intestine. **RESULTS:** All 19 patients (mean 52.42 ± 2.82 years; 32-74 years) were robotically explored for a presumptive ovarian malignancy without any reported perioperative complications. The majority had received prior abdominal surgery (84.2%) and had an average BMI of 29.43 ± 2.31 (19.2-55.4). Seven patients had epithelial ovarian cancer consisting of 2 (IA), 1 (IB), 3 (IC), 1 (IIA), 1 (IIIB). Five patients had been diagnosed intraoperatively with ovarian cancer, but had a final diagnosis of borderline cancer. There were 2 patients with granulosa tumors, 1 patient with carcinoid of the ovary, one with an invasive implant of papillary serous carcinoma, one patient with primary peritoneal carcinoma, and another patient with a mucinous adenocarcinoma from the pancreas. The average operative time was 120.95 ± 4.79 minutes (59-160 mins). There was an estimated blood loss of 77.63 ± 12.9 ml (50-300ml) and a mean post-operative hospitalization of 1.21 ± 0.9 days. (1-2 days). **CONCLUSION:** This study demonstrates that robotic surgery may play a significant role in the surgical treatment of ovarian cancer especially for stages I-II, secondary staging, and exploration after neoadjuvant surgery. Further study in this area is warranted.

S035 "SIDE-DOCKING" IN ROBOTIC ASSISTED LAPAROSCOPIC GYNECOLOGIC CANCER SURGERY **June Hou, MD, Divya Gupta, MD, Dennis Kuo, MD, Albert Einstein School of Medicine / Montefiore Medical Center**

OBJECTIVE: The da Vinci robot has revolutionized surgical approach to complicated gynecologic cancer surgeries. Traditionally the patient-side cart (PSC) is centrally docked (CD) between the patient's legs. This approach limits access to the vagina/perineum, which makes uterine manipulation and/or retrieval of large specimen from the vaginal canal difficult. For this reason we have initiated side-docking (SD) to perform robotic assisted gynecologic cancer surgeries. We formally evaluated the feasibility of this approach. **MATERIALS:** With IRB approval, we utilized the SD method in 12 consecutive patients. Docking was performed with the operating table turned at a 30° angle to the patient's left. The PSC was brought in from the patient's right side also at a 30° angle with the patient's right knee as the center of reference (sweet spot). A 4-arm da Vinci Standard Robot was used. The patients' body mass index (BMI), time of docking, uterine weight, specimen retrieval time were recorded and compared to the preceding 12 robotic assisted gynecologic oncology cases performed with traditional CD approach. Statistical analysis was performed using the student t-test or the Wilcoxon test. **RESULTS:** All cases were performed successfully without conversion to laparotomy. Docking time for the SD approach is slightly higher than the CD approach, most likely due to a learning curve, as the latter cases were shorter. The difference was not significant (p= 0.353). The BMI (p=0.421), uterine weight (p=0.832), specimen retrieval time (p=0.469) between the two groups were also similar. All specimens in the

SD group were removed without undocking the PSC. The largest specimen utilizing CD weighed 414 grams, and its retrieval was possible only after undocking the cart. The time to retrieve this specimen was 25 minutes. **CONCLUSIONS:** Side-docking of the patient-side cart to perform robotic assisted laparoscopic gynecologic cancer surgeries is a feasible approach. Differences in time of specimen retrieval was not significant between the two docking approaches. This may be due to our limited sample size. We observe that the dexterity of the 4th arm was slightly hindered, however, our overall outcome was not affected. The use of the more advanced da Vinci S or da Vinci Si may alleviate the difficulty that we have encountered with the standard robot.

GENERAL SURGERY

S036 DOES PREVIOUS ENDOSCOPIC TREATMENT AFFECT THE OUTCOME OF ROBOTIC-ASSISTED HELLER MYOTOMY? **Carlos A. Galvani, MD, Maria V. Gorodner, Alberto A. Gallo, MD, Phillip Donahue, MD, Santiago Horgan, MD, University of Illinois at Chicago/University of California San Diego**

INTRODUCTION: The advent of minimally invasive techniques for the treatment of achalasia offered patients the durability of a myotomy without the price of increased post-operative morbidity. Nevertheless, the majority of patients are still referred for surgery only after unsuccessful endoscopic treatment. The reported incidence of esophageal mucosal perforation is in the range of 1% to 8%. This study aims to evaluate the effect of Robotic Surgery in patients undergoing Heller myotomy after failed endoscopic treatment in comparison with patients who underwent surgery primarily. **METHODS & PROCEDURES:** All patients undergoing robotic-assisted surgical treatment for achalasia were analyzed. Prospectively collected perioperative data was retrospectively reviewed. Patients were divided into two groups; group A – patients with endoscopic therapy before surgery, and group B – patients undergoing surgery primarily. Age, gender, duration of symptoms, preoperative studies, main symptoms, peri-operative data and patient follow-up were recorded. **RESULTS:** A total of 104 consecutive patients underwent RAHM for esophageal achalasia at the Minimally Invasive Surgery Center at the University of Illinois at Chicago between September 2000 and September 2007. There were 54 women and 50 men. The mean age was 44±18 (14-87).

	Group A (n=55)	Group B (n=49)	p value
Age	49±18	38±15	<0.001
Gender (% of pts)			
• Female	64	39	
• Male	36	61	
Duration of symptoms (months)	71±80	48±68	0.043
Weight loss (%pts)	47	49	NS
Dysphagia (%pts)	100	98	NS
Extra-esophageal symptoms (# of pts)			
• chronic cough	2	2	
• laryngeal cancer	1	-	
• aspiration pneumonia	7	-	
Total	10/55(18%)	2/49(4%)	0.05
LESF (mmHg)	29±13	34±11	0.05
Operative time (min)	168±38	123±48	0.001
Esophageal perforation	0	0	
Length of follow-up (months)	25±20	22±16	NS
Good/Excellent results (%pts)	94	90	NS

CONCLUSIONS: The current series has shown that although Heller myotomy performed on patients after a failed endoscopic procedure is indeed more difficult, as interpreted by the considerably longer operative times, Robotic-assisted surgery diminishes esophageal perforation. Primary findings also revealed that, previously treated patients tend to be older, with longer duration of symptoms and

ABSTRACT PROGRAM

the increased incidence of extra-esophageal manifestations. Supporting the notion of early definitive treatment is essential to prevent potential complications

5037 ROBOTIC THORACOSCOPIC HELLER MYOTOMY FOR ACHALASIA **Marc Margolis, MD, FACS, Farid Gharagozloo, MD, FACS, Eric Strother, BS, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center**

OBJECTIVE: The surgical treatment of achalasia remains controversial. Controversies include open vs. videoscopic approach, laparoscopic vs. thoracoscopic approach, and the need for an antireflux procedure. Laparoscopic Heller myotomy is hampered by the requirement of an added antireflux procedure. Thoracoscopic Heller myotomy does not require an antireflux procedure, but is associated with greater rates of residual achalasia. Robotics by virtue of 3-D visualization and greater maneuverability may facilitate thoracoscopic Heller myotomy. **METHODS:** From 12/05 to 9/09, 18 patients underwent robot-assisted thoracoscopic esophageal myotomy for achalasia without an antireflux procedure. Diagnosis of achalasia was confirmed by radiography, endoscopy, and manometry. Patients underwent intraoperative EGD. Robot-assisted myotomy was accomplished through 4 ports in the left chest. Myotomy was extended approximately 1 cm onto the proximal stomach. Success of the myotomy was determined by intraoperative EGD, postoperative contrast radiography, subjective symptom questionnaire, and Viscik grading. **RESULTS:** There were 5 men and 13 women. 10/18 (55%) patients had undergone botulinum toxin injection. There were no mucosal injuries or conversion to a thoracotomy. Median hospitalization was 3 days. All patients reported improvement in dysphagia. Symptom relief was graded as: 12 Viscik I = 16 patients, Viscik II = 2 patients. 10/18 patients reported symptoms which mimicked reflux but were not associated with objective reflux. Objectively proven gastroesophageal reflux was seen in 1 patient. **CONCLUSIONS:** The surgical robot facilitates thoracoscopic Heller myotomy. Although greater experience is needed, the preliminary results of this study suggest that robot-assisted thoracoscopic Heller myotomy without an antireflux procedure may represent an excellent alternative to laparoscopic myotomy with an antireflux procedure.

5038 ROBOTIC SURGERY IN SPAIN: GROWING EXPERIENCE AND INTERGROUPS COLLABORATION 2006-2009 **Elena Ortiz-Oshiro MD, PhD, Angel Ramos Carrasco MD, PhD, Carmen Hernandez Perez PhD, Cristina Pardo Martinez MD, PhD, Jesus Alvarez Fernández-Represa MD, PhD, Hospital Clinico San Carlos, Madrid (Spain)**

INTRODUCTION: The first European robotic experiences in digestive surgery were reported in 1998 and 1999 by Cadière's team (Brussels, Belgium)¹⁻³. These procedures were performed with a Da Vinci's prototype called Mona. Posteriorly, as soon as 2001, three pioneer groups published their initial Da Vinci experience: abovementioned Cadière's team in Belgium⁴, Hanisch E et al in Frankfurt (Germany)⁵ and Marescaux J et al in Strasbourg (France)⁶. In Spain, the two first Da Vinci robots were installed in private institutions dedicated only to urologic surgery (Barcelona 2005 and Bilbao 2006). The third one was set up in our Hospital in June 2006, and applied to public health multidisciplinary procedures⁷. Nowadays, there are 13 robots in Spain. Our aim is to analyse the robotic surgery growing process in our country and to show our current experience, comparing it to European environment. **METHODS:** Our data's source comes from our pioneer role along the time, by providing communication and learning among hospitals and groups intending to incorporate to robotic surgery. Otherwise, industry (in our country, Palex SA

distributing Intuitive Surgical) holds an important connecting role, by promoting and sustaining professionals relationships, and providing information too. **RESULTS:** Since 2006, three new health institutions every year have implemented their surgical activity with a Da Vinci system. In many cases, robot is shared by several specialties teams. The majority of Da Vinci acquisitions from public health institutions in Spain have been promoted and managed by regional ministries authorities (suprahospital management). Current distribution of robots in Spain is shown in Fig 1. Five of them are private hospitals (38,5%), seven are public institutions (53,8%) and there is one Da Vinci in a training center (CMAT. lavante Foundation, Granada). There are four hospitals using Da Vinci only for Urology. The rest of them have robotic teams for different specialties: overall, we have 12 Urology teams (41,4%), 8 General and Digestive Surgery teams (27,6%), 7 Gynecology teams (24,1%), one Cardiac Surgery team and one starting Pediatric Surgery team. Table 1 shows our position respecting to the rest of European countries. **CONCLUSION:** Along the last three years we have witnessed an exponential and unexpected growth of Da Vinci robot acquisitions in our country. This fact enlarges the importance of international and national intergroups relationships among professionals. Our pioneer experience has a significant role in training and diffusion of robotic procedures among Spanish-speaking countries. **REFERENCES:** 1. Himpens J et al. Surg Endosc 1998;12:1901; 2. Cadière GB et al. Obes Surg 1999;9(2):206; 3. Cadière GB et al. Ann Chir 1999;53(2):137; 4. Cadière GB et al. World J Surg 2001;25(11):1467; 5. Hanisch E et al. Chirurg 2001;72(3):286; 6. Marescaux J et al. Ann Surg 2001;234(1):1-7; 7. Ortiz Oshiro E. SECLAEndosurgery n° 17 (Octubre-Diciembre 2006). En Internet: <http://www.seclandosurgery.com/seclan17/articulos/reportaje.htm> ISSN: 1698-4412



Locations of the Spanish robots:

- 2005: Fundació Pulgvert (Barcelona)
- 2006: Clínica Virgen Blanca (Bilbao), Hospital Clínico San Carlos (Madrid), Hospital Ruber Internacional (Madrid)
- 2007: Hospital Carlos Haya (Málaga), Hospital Virgen del Rocío (Sevilla), CMAT (Training Center) (Granada)
- 2008: Policlínica Gipuzkoa (San Sebastián), Hospital Civil de Resurso (Bilbao), Hospital Txagorritxu (Vitoria)
- 2009: Vall d'Hebrón (Barcelona), Hospital San Jaime de Torrevieja (Alicante), Hospital de Donostia (San Sebastián)

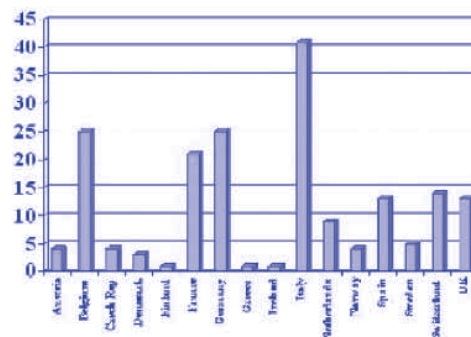


Table. Da Vinci robots in European countries
Source: www.intuitive-surgical.com

S039 ROBOTIC VS LAPAROSCOPIC NISSEN FUNDOPPLICATION FOR GASTRO-OESOPHAGEAL REFLUX DISEASE: SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION: Laparoscopic Nissen Fundoplication is the "gold standard" treatment for Gastro-Oesophageal Reflux Disease (GORD) that is resistant to medical management. However several limitations such as non-articulating rigid instruments, poor ergonomics and two-dimensional visualization are attributable to this technique. Robotic surgery provides increased dexterity, improved ergonomics and a true three-dimensional and magnified view of oesophago-gastric anatomy. However, there is a paucity of comparative evidence to highlight its clinical advantages for Nissen fundoplication. The aim of this study was to provide pooled analysis of individually small trials comparing robotic Nissen fundoplication with standard laparoscopic Nissen fundoplication. METHODS: A systematic literature search of Medline, Embase and Cochrane Library databases was performed. The search terms "Nissen Fundoplication", "Robotic Surgery", "Gastro-Oesophageal Reflux Disease" and MeSH headings "Fundoplication"(MeSH), "Laparoscopy"(MeSH), and "Surgery, Computer-Assisted" were used. The electronic search was supplemented by a hand-search of abstracts from the European Association for Endoscopic Surgery, the Clinical Robotic Surgery Association, the Minimally Invasive Robotic Association, the Surgical Research Society, the Society of Academic and Research Surgery, the Society of American Gastrointestinal and Endoscopic Surgeons and the Association of Surgeons of Great Britain and Ireland. Reference lists of all relevant studies and the Current Controlled Trials Register were reviewed. Selection criteria comprised randomised controlled trials comparing robotic and laparoscopic Nissen fundoplication in adults. Primary outcome measures were the requirement for re-operation, post-operative mortality and post-operative dysphagia. Secondary outcome measures were operative time, hospital stay, operative complications, and cost. The weighted mean difference was calculated for continuous variables and pooled odds ratios for discrete variables using random-effects models. Heterogeneity was assessed by Cochran's Q statistic and the Egger test was used to detect bias. RESULTS: 6 Randomized trials, of 226 patients, met the selection criteria. There was a significantly reduced total operative time in the laparoscopic group (weighted mean difference = 4.154; 95% C.I. = 1.932 to 6.375; p=0.0002). There was no significant difference in requirement for re-operation (pooled odds ratio = 0.854; 95% C.I. = 0.212 to 3.440; p=0.825) or in post-operative dysphagia (pooled odds ratio = 1.005; 95% C.I. = 0.357 to 2.828, p=0.992). There was no mortality in either group. There was no significant difference between robotic and laparoscopic groups for hospital stay (weighted mean difference = -0.516; 95% C.I. = -1.546 to 0.515, p=0.327) or operative complications (pooled odds ratio = 0.307; 95% C.I. = 0.0501 to 1.884; p=0.202). Although there were insufficient data to allow meta-analysis of cost, the mean cost of robotic surgery was between 501 and 1806 euros more expensive than the mean cost of laparoscopic nissen fundoplication. CONCLUSION: Robotic Nissen fundoplication offered no significant clinical benefit over the standard laparoscopic approach, but was associated with an increased operative time and procedure cost. At present, laparoscopic nissen fundoplication should remain the goldstandard. The technical advantages of robotic surgery may offer clinical benefit in a - group of "high-risk" patients. Larger-scale trials should provide level 1 evidence with

formal assessment of post-operative quality of life and detailed health economic assessment.

S040 ROBOTIC SURGICAL TRAINING AND DIFFUSION IN UNIVERSITY ENVIRONMENT Elena Ortiz-Oshiro, MD, PhD, Carmen Hernandez Perez, PhD, Angel Ramos Carrasco, MD, PhD, Cristina Pardo Martinez, MD, PhD, Iris Sanchez Egido, PhD, Jesus Alvarez Fernandez-Represa, MD, PhD, Hospital Clinico San Carlos, Universidad Complutense de Madrid

INTRODUCTION: The Hospital Clínico San Carlos (HCSC) of Madrid is a large public health institution for quite a while linked to University (Universidad Complutense, UCM). This tertiary hospital is currently leading introduction of robotic surgery in Spain since July 2006, when the first Da Vinci robot dedicated to public Spanish health was acquired. Previous training in laparoscopic surgery, coordinated team work and institutional support are considered the key components to reach success in any robotic surgery program. Moreover, multispecialty procedure development is very important when any new technology is introduced in surgery¹. Our aim is to analyse training and diffusion academic activities included in our robotic surgery program to determine factors enabling to integrate multispecialty robotic surgery into the routine of a university hospital. METHODS: Adding to clinical activities, since the beginning of our robotic surgery program, we have conducted three kind of purposes: 1. State-of-the-art research, 2. Providing robotic surgery training and 3. Communication and diffusion of robotic procedures among interested professionals. RESULTS: Training activity has included: briefing sessions to HCSC Departments and Units (Nurses, Medical and Surgical Departments, General Sessions) (N=12), training seminars in Da Vinci OR (N=12, 30 participants) and inclusion of training seminars in Da Vinci OR in Minimally Invasive Surgery Training courses directed to surgical residents (General Surgery, Urology, Gynecology, Pediatric Surgery..) and to specialists (continuing educations programs). We have received several visiting surgeons from Spanish-speaking countries interested on laparoscopic and robotic surgery. Communication and diffusion tasks have been summarized in Tables 1 and 2. CONCLUSION: To a large extent, working time of the robotic surgery team in a university linked institution is dedicated to internal and external training and communication tasks. These activities may encourage integration and progress of the robotic team clinical outcomes. REFERENCES: 1. Chitwood WR et al. Robotic surgical training in an academic institution. Ann Surg 2001;234(4):475-486

TABLE 1: Communication and diffusion tasks 2006-2009.

Literature

	Book Chapters	Articles	Internet
General Surgery	3	3	10
Urology	1	2	6
Nursery	-	-	1

TABLE 2: Communication and diffusion tasks 2006-2009.

Meetings Participation

	Nationwide Invited	Nationwide Oral Communication	International Invited	International Oral Communication
General Surgery	15	7	10	4
Urology	1	15	2	-
Nursery	1	1	1	-

S041 ROBOTIC SURGERY OF THE SPLEEN **Catalin Vasilescu, Associate Professor, PhD, Olivia Sgarbura, MD, Stefan Tudor, MD, Monica Popa, MD, Fundeni Institute of Digestive Diseases and Liver Transplantation, Carol Davila University of Medicine and Pharmacy, Bucharest Romania**

INTRODUCTION: The laparoscopic approach of the spleen is feasible and efficient as well as preferable to the open approach for most indications. Laparoscopic splenectomy is recommended in both malignant and benign diseases but splenomegaly, portal hypertension and conditions that require a partial resection of the spleen question the utility of minimally invasive surgery. The aim of this study is to prove that robotic surgery of the spleen is a useful tool in these cases. **METHODS & PROCEDURES:** Out of the 280 cases of robotic surgery performed in our department in 20 months since the acquisition of the robot, there were 42 operations targeting the spleen: 30 total splenectomies, 11 partial splenectomies, 1 ligation of a splenic artery aneurism. For each of them, we studied individual variables, surgical variables and surgical outcome variables. **RESULTS:** The final group consisted of 14 males and 28 females, aged between 6 -76 years old. The total splenectomies were performed for idiopathic thrombocytopenic purpura (14 cases), Non Hodgkin malignant lymphoma (4), hypersplenism in liver cirrhosis (3), splenomegaly with portal cavernoma (1), other (8). The partial splenectomies were performed for spherocytosis (6), parasitic cysts (4), non-parasitic cysts (1). One double ligation of a splenic artery aneurism was performed. The average operative time was 135 +/- 15 min. The average length of stay was 3.5 +/- 1.2 days. There were no reinterventions and no mortality. **CONCLUSIONS** Robotic surgery of the spleen is a useful tool in difficult cases and it results in no significantly increased operative time and improves the visualization and dissection of splenic vessels with minimal blood loss. Whenever the equipment is available and the team is experienced, this technology should be used to handle difficult surgical conditions of the spleen such as partial splenectomies, splenomegaly, tumors, portal hypertension but is not indicated in usual splenectomies that continue to target laparoscopy. Further studies are required to prove the utility of the robot in splenic surgery.

S042 ACCURACY AND SPEED TRADE-OFF IN ROBOT-ASSISTED SURGERY: ROLE IN ROBOTIC SURGICAL PROFICIENCY **Jung H. Chien, Manish M. Tiwari, MD, PhD, Irene H. Suh, Mukul Mukherjee, PhD, Shi-Hyun Park, PhD, Dmitry Oleynikov, MD, FACS, Ka-Chun Siu, PhD, University of Nebraska Medical Center**

INTRODUCTION: Currently, no standardized system to assess robotic surgical proficiency exists. To develop a robotic proficiency assessment tool, it is necessary to study factors that can impact robotic surgical skills. Surgical task speed and task accuracy are vital components of robotic surgical skills. This study was designed to investigate the relationship between accuracy and speed for robot-assisted surgical skills. **METHODS:** Seven different novice subjects participated in this study. Subjects were instructed to manipulate the instrument tip of the daVinci surgical robotic arm. Subjects were asked to alternately touch two circular targets with the robotic tip. Three different sizes of circular targets were used. Circular targets were placed at different distances of 2, 3, and 4 inches. This was done to change the level of task difficulty based on Fitt's law. Movement time for each task was recorded. In addition, smoothness of movement for each task was determined. Statistical correlation between task difficulty, movement time and movement smoothness was analyzed. **RESULTS:** As the level of task difficulty increased, mean movement time increased from

1.2 seconds to 1.7 seconds. A significantly strong linear correlation ($R = 0.745$, $p = 0.021$) was revealed between movement time and task difficulty. This implies that speed is reduced to maximize accuracy at different difficulty levels. In addition, a linear correlation between movement smoothness and movement time was found ($R = 0.51$, $p = 0.15$). However, this result was not found to be statistically significant. These data suggest that as the task difficulty is increased, subjects take more time to complete the task and perform less smooth movements in order to maintain accuracy. **CONCLUSIONS:** Accuracy and speed for robot-assisted surgical skills appear to be influenced by task difficulty. This study reveals that there is a trade-off between speed and accuracy during robotic surgical task performance. These results also show that subjects may perform less smooth movements to improve robotic performance accuracy. Future studies will re-evaluate novice subjects and compare these results with expert surgeons. These results of speed, accuracy and smoothness of movement during robotic surgical tasks will be used to develop a standardized system to assess robotic surgical proficiency.

S043 3 YEARS OF EXPERIENCE WITH THE 4-ARM DAVINCI SYSTEM. WHEN TO USE THE ROBOT IN GENERAL SURGERY **K. Konstantinidis, S. Hiridis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, Athens Medical Center**

INTRODUCTION: Robotic surgery has spread rapidly all over the world in the past 9 years. The great potential of the surgical robots was the answer of technology to inherent limitations of laparoscopy. After 3 years of experience with the daVinci, we attempt to reevaluate the exact indications for its use. Robotic surgical systems are very well accepted by the urologic society. However, there is much controversy on the appropriate indications in general surgery. **AIM:** We present our clinic's experience in general surgical procedures. **Methods :** From September 2006 till July 2009, 237 robotic surgical procedures have been performed by our team, using the 4-armed DaVinci robotic surgical system. We have recorded a detailed database of these patients in terms of trocar positioning, surgical and anesthetic times as well as OR setup times, conversion ratio, intraoperative and postoperative morbidity and mortality. **RESULTS:** In a 3-year period (September 2006 – Aug 2009) we have performed a series of minimally invasive general surgical procedures using the DaVinci Surgical System. These operations include : 48 Nissen Funduplications, 4 paraesophageal hernias and 12 Heller myotomies, 3 Gastrectomies, 1 Distal pancreatectomy, 1 liver segmentectomy, 4 liver cyst excisions, 48 cholecystectomies, 4 sigmoidectomies with rectopexy for treatment of rectal prolapse, 4 low anterior resections for cancer, 5 appendectomies, 3 renal cyst excisions, 4 nephrectomies and 4 adrenalectomies, 5 inguinal and 29 ventral hernia repairs and various other operations. Our urological team has performed 322 operations including prostatectomies, nephrectomies and radical cystectomies. Indications for robotic surgery include: the need for intracorporeal suturing, the narrow surgical field, the expectant difficult dissection and/or adhesiolysis often met in reoperations especially in the upper abdomen, near the hiatus and very low in the pelvis. **CONCLUSIONS:** Robotic surgical procedures in General Surgery are safe in experienced hands and seem to be superior to conventional laparoscopy for certain operations such as Heller myotomy, Nissen fundoplication, adrenalectomies and very low anterior colectomies. Additional modalities (haptic feedback, image analysis, augmentation of the operative field and navigation) are expected to counterbalance the cost and magnitude of the surgical robot and extend its applications in general surgery.

S044 ROBOTIC SURGERY IN THE INFANT AND NEONATE POPULATION **Juan I. Camps,MD, Joel F. Bradley, MD, Palmetto Health Children's Hospital, Columbia, SC**

INTRODUCTION: Robotic surgery has become widely used in many surgical specialties over the past decade. The use of robotics has shown great benefits in reducing blood loss, recovery time and hospital stay compared with other traditional surgical techniques. Robotic surgery has recently moved into the pediatric population. However, robotic surgery in infants and neonates is still in its initial stages. Unique features of infants and neonates, such as small body size and complex pathology, make robotic surgery ideal in this special group of patients. The purpose of this study is to show our learning experience and feasibility of using robotics in the infant and neonate population. **METHODS:** We conducted a retrospective review of our robotic procedures in the pediatric population at our institution from February 2008 to August 2009. A total of 68 robotic abdominal procedures were performed. We included all patients who were less than 12 months of age. Measurements of weights, set up times, and total case times were evaluated. None of the infant population had chronic lung disease or other medical conditions that would be a contraindication to pneumoperitoneum. The set up for an infant was slightly different and there were obstacles to overcome for this. First the baby had to be elevated off of the operating room table with a 10 cm foam pad. This elevation allows enough room for the robotic arms to function properly. There was only enough room for two 5 mm robotic arms and an 8.5 mm scope. With the small size there was not room for a 3rd robotic arm. **RESULTS:** A total of 68 robotic surgical procedures were performed from February 2008 to August 2009 in our pediatric population. There were 11 procedures performed in infants, or patients less than 12 months of age. All of the procedures were performed by the same pediatric surgeon. No immediate or late complications were noted and all patients were discharged from the hospital in the expected times. The weights of the patients ranged from 4 kilograms to 6.2 kilograms with a mean of 5.3 kilograms. Procedures included 5 Nissen funduplications, 4 gastric tube placements, 1 imperforate anus with rectourethral fistula repair, and 1 intracorporeal small bowel resection for an obstructing duplication cyst. We compared set up times and total case times for robotic Nissen funduplications between infants (N=4) and older children (N=7). There was no statistical difference in the mean set up time for infants (59 minutes) when compared to older children (53 minutes) with a p-value of 0.593. There was also no statistical difference in the mean case time of the infant group (192 minutes) and the older group (189 minutes) with a p-value of 0.925. **CONCLUSIONS:** Despite the sizable equipment of the robot, its use in infants and neonates is feasible. In a routine pediatric surgical procedure, Nissen funduplication, there is no difference in set up times or operating times compared to older, larger patients.

S045 CAN THE ROBOT HELP IN THE DIFFICULT PARAESOPHAGEAL HERNIA? PRESENTATION OF 2 CASES **K. Konstantinidis, S. Hiridis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, Athens Medical Center**

INTRODUCTION: The less common types of hiatal hernia, types II, III, and IV, are varieties of "paraesophageal" hernia which account for up to 5% of all hiatal hernias. Robotic hiatal hernia repair has been extensively reported soon after introduction of surgical robotics. The advanced technology of these systems could potentially overcome some of the technical challenges arising in certain cases of paraesophageal hernia repair. **AIM:** Our scope is

to present two complicated cases of paraesophageal hernia that underwent robotic repairs. **METHODS:** From September 2006 till July 2009, 52 robotic hiatal hernia repairs have been performed by our team, using the 4-armed DaVinci robotic surgical system. 4 of them were paraesophageal. We present the case of a 35-year old man with chronic reflux symptoms and epigastric pain from a large paraesophageal hernia occupying significant space of the left hemithorax and erosive gastropathy. The patient had a history of chronic renal failure under dialysis, an operation for kidney transplantation and subsequent failure and removal of the graft. The 2nd case is of a 83-year old man with a large, chronic paraesophageal hernia, night coughs and pain. Both patients received a robotic hiatal repair from the same surgeon, after proper workup and preparation for surgery. **RESULTS:** Hasson trocar was inserted in the upper abdominal midline. Two robotic ports of 8-mm were placed laterally to the camera port and in the middle between the umbilicus and the anterior superior iliac spine. Finally, two 12-mm assistance ports were placed just between the robotic assistant ports and the camera port. The robot was positioned above the head of the patient. After meticulous dissection around the gastroesophageal region, the herniated stomach was reduced. Dissection of the hernia sac was initiated to separate it from the surrounding tissues. Identification and preservation of the vagal nerves was greatly enhanced by the 3D stereoscopic vision. An extensive esophageal mobilization was carried out and a posterior crural repair was performed with non-resorbable sutures. The short gastric vessels were divided using the robotic ultrasonic forceps. A loose Nissen funduplication was created. Same technique was used in both patients. The younger patient spent the night in ICU because of his severe renal insufficiency. Unfortunately he presented with hemorrhage of the upper leg as a complication from catheterization efforts in ICU. The older patient ran a normal postoperative convalescence for the following 3 days. On day 4 he presented with a severe, persistent gastroparesis and vomiting at every effort of oral hydration. He was treated with total parenteral nutrition and supportive therapy for at least three weeks before his discharge from the hospital. **CONCLUSIONS:** Robotic treatment of GERD can be easily applied to the simple, uncomplicated hiatal hernias. Also, in complicated cases, choice of the robot may increase the quality of visualization and the dexterity of maneuvers, essential elements for the safe completion of an effective repair.

S046 LAPAROBOTIC DUODENAL DIVERTICULECTOMY AND CHOLEDOCHO DUODENOSTOMY – A CASE STUDY AND REVIEW OF LITERATURE **Venkata K. Kella, MD, Emil Shakov, MD, Anusak Yiengpruksawan, MD, FACS, Valley Hospital Ridgewood New Jersey**

INTRODUCTION: Duodenum is the 2nd most common site for diverticulae, next to colon, They are common after the 5th decade and usually asymptomatic. 10% present with symptoms, which; include abdominal pain, hemorrhage, duodenal obstruction, diverticulitis, perforation, pancreatitis and obstructive jaundice. We present, what we believe the first of its kind, a case of Duodenal diverticulum compressing the common bile duct presenting with obstructive jaundice, managed by laparoscopic duodenal diverticulectomy with choledocho-duodenostomy and discuss the operative technique. **CASE STUDY:** 78-year-old female was found to have abnormal cholestatic liver function profile and dilated common bile duct during the workup for upper abdominal pain. CT scan showed dilated common bile duct. Endoscopic ultrasound, showed a large diverticulum next to the ampulla. Upper GI endoscopy confirmed duodenal diverticulum, arising from the 2nd part of Duodenum. Laparoscopic

duodenal diverticulectomy and choledochoduodenostomy was performed. Her post operative course was complicated by Clostridium difficile diarrhea, treated with Metronidazole and was discharged home on 6th post op day. One year later she developed cholangitis due to choledocholithiasis and underwent ERCP, Sphincterotomy and Metal stent placement for distal bile duct stricture. Follow-up at 18 months, she is well. **CONCLUSION:** Symptomatic duodenal diverticulum, in particular, obstructive jaundice due to compression by the diverticulum is rare. It poses diagnostic challenge and requires technically demanding surgical and endoscopic interventions. Robotic surgical system have revolutionized the field of minimally invasive surgery by improving the vision and motion control. Robotic duodenal diverticulectomy and choledochoduodenostomy is safe and feasible.

S047 ROBOTIC REPAIR OF A TRAUMATIC HIATAL HERNIA **Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta CRNP, The George Washington University Medical Center**

Blunt diaphragmatic injury is a rare entity which is often difficult to diagnose. The overall incidence of diaphragmatic injury is 1-6%. The majority of diaphragmatic injuries are localized to the body of the diaphragm. Traumatic hiatal hernias are rare occurrences. This video depicts application of robotics to the repair of this unusual diaphragmatic injury. The patient is a 44 year old female who was in a motor vehicle accident 8 months prior to surgery. She was wearing a seat belt but there was no air bag deployment. She presented with persistent, severe epigastric pain associated with intermittent periods of palpitations and occasional shortness of breath with a known diagnosis of sternal fracture. Upper GI endoscopy revealed a traumatic hiatal hernia. This video portrays the surgical technique of a laparoscopic closure of the hiatal hernia with concomitant Belsey Mark IV fundoplasty. There was no operative or post-operative complication. Patient was discharged in less than 24 hours and has had complete resolution of all symptoms. **CONCLUSIONS:** Robotics enables accurate dissection and repair of the esophageal hiatus. The ease of robotic dissection in the setting of traumatic injury demonstrates the advantages of 3D visualization and greater dexterity. These advantages can be useful in applying robotics to elective hiatal repair.

S048 HOW CAN THE SURGICAL ROBOT FACILITATE THE DIFFICULT SPLENECTOMY? REVIEW OF THE LITERATURE AND PRESENTATION OF A RARE CASE **K. Konstantinidis, S. Hiridis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, Athens Medical Center**

INTRODUCTION: Cystic lesions of the spleen are very rare. Primary splenic cysts other than echinococcal disease are also very rare. Decision for splenectomy is made after evaluation of the size of the cyst and relation to the remaining physiological splenic tissue as well as in cases of high suspicion for malignancy. Robotic surgery offers a modern alternative to conventional laparoscopy enhancing the visual field and the degrees of freedom for the surgical instruments. **AIM:** We present the case of a 32-year old female patient, with a large cystic mass of the spleen in the left upper abdomen (size 10 x 4 cm). The mass was discovered accidentally during an ultrasound examination for exclusion of splenomegaly in the context of possible mononucleosis. There was no previous injury in the patient's history which only included 2 previous operations for ovarian cysts, penicillin-containing drug allergy and a cecal polyps found in lower GI endoscopy. **METHODS:** We proceeded with a detailed preoperative planning including

patient's history and physical examination, a full laboratory examination profile imaging investigations with upper and lower abdominal computerized tomography and magnetic-resonance. During the preoperative planning, we were assisted by three-dimensional models reconstructed in a portable PC which was also used during surgery for navigation purposes. The mass invaded the largest part of the spleen. **RESULTS :** After insertion of the trocars, a huge cystic splenic mass was revealed with multiple calcifications as well as strong adhesions with the stomach, the diaphragm, and the lateral abdominal wall. Initially we performed an effort to mobilize the mass which appeared to be an echinococcal cyst. Aspiration of its gelatinous content was done to minimize its size, followed by infusion of hypertonic solution. Biopsy during surgery excluded echinococcal disease but could not exclude malignancy. A robotic splenectomy was performed using the 3 of the 4 arms of the surgical robot. An assistant trocar was used to safely ligate the hilar vessels using hemostatic clips. The spleen was removed in an endobag through a small extension of the umbilical incision. There was no significant blood loss. Histology showed a rare non-parasitic splenic pseudocyst and remnants of splenic parenchyma with hemorrhagic infiltration. There was no evidence of malignancy. Patient declared satisfied by the operation. **CONCLUSION:** The differential diagnosis for a surgeon approaching a large splenic cyst should include echinococcal disease as well as rare, non-parasitic cysts. Diagnostic evaluation should include exclusion of malignancy. Robotic surgery enhances visualization of the field and provides the surgeon with the ability to perform complex manipulations in a narrow field, as was also in our case due to the large dimensions of the mass. As a result, it increases safety and decreases blood loss. A large experience in advanced laparoscopic techniques is a requisite for a good outcome of such patients.

S049 ROBOT ASSISTED GASTRIC BYPASS **Massimo Senni Buratti, MD, Jean Gugenheim, MD, Centre Hospitalier Universitaire de Nice - Université Sophia Antipolis - France**

INTRODUCTION: Laparoscopic Gastric Bypass is a technically demanding procedure. Hand sewn gastro-jejunal anastomosis is a particularly challenging step that requires a long learning curve. In literature 2% of anastomotic leaks and 4% of anastomotic stenosis have been reported. Increased dexterity and security with shortened learning curve could be achieved by performing hand sewn anastomosis with the Da Vinci S surgical robot. **MATERIALS & METHODS:** We realised 68 consecutive robot assisted laparoscopic gastric bypass from December 2006 to November 2009. We compared them to 248 conventional laparoscopic gastric bypass. There were 61 women and 7 men, mean age was 46 years (range from 19 to 57) and mean BMI was 43.9 (range from 38 to 47). **RESULTS:** Mean operative time was 142 minutes (range from 80 to 195), mean robot docking time was 13 minutes (range from 4 to 60), and the mean time to perform the anastomosis was 24 minutes (range from 10 to 60). There were 3 re-operations, one for postoperative occlusion, one for postoperative peritonitis and one explorative laparoscopy. There was 1 anastomotic leak and no postoperative death. In 2 patients a conversion to laparotomy was necessary. **CONCLUSIONS:** Da Vinci S surgical robot allows to perform the gastrojejunal anastomosis with greater dexterity even in difficult conditions like in case of a large left hepatic lobe, abundant peritoneal fat and thick abdominal wall. Robot assisted gastric bypass allows to perform laparoscopic hand sewn anastomosis with more dexterity and with similar complications than traditional without significant increase in operative time.

S050 ROBOTIC ESOPHAGEAL DIVERTICULECTOMY AND HELLER MYOTOMY APPROACHED FROM RIGHT CHEST
Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

Mid-Esophageal diverticuli require diverticulectomy and esophageal myotomy. The conventional approach necessitates a left thoracotomy and extensive dissection of the esophagus. When the diverticulum is in the right chest the open approach is even more cumbersome and at times requires bilateral thoracotomy. This video depicts resection of a right-sided esophageal diverticulum and distal myotomy to the GE junction through the right chest using the extraordinary dexterity of the surgical robot. This patient is a 63 year old female with a history of rheumatoid arthritis who presented with a long standing history of reflux, throat pain, dysphagia, and odynophagia. Radiography revealed a large mid esophagus diverticulum on the right, dilated esophagus proximal and distal to the diverticulum, and dysmotility of the esophagus. In this video, the robot approaches from the right chest and a diverticulectomy is performed. Then, continuing from the right chest, a long myotomy is performed down to the gastroesophageal junction. There were no intra-operative complications. CONCLUSION: Robotics has the potential of changing the surgical approach to diverticuli of the mid-esophagus.

S051 ROBOTIC-ASSISTED SURGERY IN BRAZIL – INITIAL EXPERIENCE
Ricardo Z. Abdalla, Marco A. Arap, Anuar I. Mitre, Sirio Libanes Hospital

INTRODUCTION: Robotic-assisted surgery is an evolving minimally invasive treatment for many benign and malignant diseases. It is rapidly growing field in the United States and Europe. However, only a few centers in Latin America started their program. We present our initial experience of the first 94 consecutive cases, in 9 areas: urology, gynecology, proctology, bariatric, oncology, general surgery, thoracic surgery, cardiovascular and head and neck surgery.. This article shows the planning of actively support cases in the OR; support surgeon as well as staff; provide verbal technical assistance in the safe and effective use of the system. We created The Robotic Training Center to work with surgeons to help enhance their surgical skills, and reinforce concepts in safety and secure technical steps for the patient. MATERIALS & METHODS: Ninety four patients underwent 19 different procedures between March 2008 and January 2009. All patients were informed of the lack of experience in robotically-assisted procedures and all surgeons were certified-trained in robotically-assisted surgery. The console surgeon performed all steps of the intervention via the remote da Vinci console. A scrub nurse and a second laparoscopic-trained surgeon stood at the patient side and assisted in port placement, exposure of the operative field, hemostasis and removal of the operative specimen (when needed). Data collection included specialties involved in the program, procedures done robotically and peri-operative complications. RESULTS: Nine different specialties and 19 different procedures were involved in the program (table 1). There were no major peri-operative complications. CONCLUSIONS: All different robot procedures done in our Institution were feasible and completed robotically endoscopic assisted. This new technology enhanced endo surgery dexterity. The learning curve for the console surgeon is intuitive, shorter in time than video surgery and could be done in our provided laboratory. However, in our experience, the importance of the patient-side assistance became evident, and therefore is focused on during training. Our initial experience with robotic surgery indicated that many procedures are still to be initiated

robotically in a safe environment. Table 1 – Different procedures involved in the robotic-assisted laparoscopy program Urology: Prostatectomy 43; Pyeloplasty 2; Nephrectomy 2 Gynecology: Hysterectomy 4 General Surgery: Hepatectomy 1; Gastric GIST resection 2; Cholecystectomy 4; Partial Pancreatectomy + Splenectomy 1; Hiatus Hernioplasty 11; Incisional Hernioplasty 2; Bilateral Inguinal Hernioplasty 1 Coloproctology: Rectum-sigmoidectomy 1 Bariatric: Sleeve Gastrectomy 2; Gastric bypass + Roux in Y 9; Adjustable Gastric Band 3 Thoracic Surgery: Lung dissection + Pleurodesis 1 Head and Neck: Pharynx tumor resection 4 Cardiovascular: IMA dissection 1

VIDEO SESSION I

S052 AXILLARY-CORONARY SEQUENTIAL VEIN GRAFT FOR ROBOTICALLY ASSISTED TOTAL ENDOSCOPIC TRIPLE CORONARY ARTERY BYPASS GRAFTING.
Johannes Bonatti, MD, Eric J. Lehr, MD, PhD, David Zimrin, MD, Mark Vesely, MD, Patrick Odonkor, MD, Bartley Griffith, MD, University of Maryland Heart Center, University of Maryland School of Medicine

Multivessel robotic totally endoscopic coronary artery bypass grafting (TECAB) is currently performed using both internal mammary arteries, however, the number and location of target vessels is limited with by this approach. Vein grafts have rarely been applied in TECA. We describe a case in which the left axillary artery was used for the first time as an inflow source for a vein jump graft to the lateral and posterolateral wall of the heart. This case demonstrates that the left axillary artery can be used as an inflow vessel for completely endoscopic coronary artery bypass grafting. Moreover, it broadens the population of patients suitable for TECAB by expanding the possibilities for full revascularization.

S053 ROBOT-ASSISTED APICOPOSTERIOR SEGMENTECTOMY OF LEFT UPPER LOBE FOR LUNG CANCER
Hyun-Sung Lee, MD, PhD, Hee-Jin Jang, MD, National Cancer Center

Lobectomy is the standard treatment of early stage lung cancer. However, the parenchymal saving pulmonary resection can be performed in special situations. A 75-year-old male was diagnosed as lung cancers in both upper lobes. Ground glass opacity in right upper lobe and T2 lesion in left upper lobe were revealed. I will introduce "robot-assisted apicoposterior segmentectomy of left upper lobe for lung cancer".

S054 ROBOT-ASSISTED RIGHT-SIDED LOBECTOMY AND COMPLETE MEDIASTINAL LYMPH NODE DISSECTION
Hee-Jin Jang, MD, Hyun-Sung Lee, MD, PhD, National Cancer Center

Currently, robotic surgery has been evolved in the oncologic field. However, in the field of thoracic surgery, the application of robotic surgery is limited. We performed over 70 cases of robot-assisted surgery for lung and esophageal cancer. This video will show the robot-assisted lobectomy and complete mediastinal lymph node dissection for right-sided lung cancer.

S055 ROBOT-ASSISTED LEFT-SIDED LOBECTOMY AND COMPLETE MEDIASTINAL LYMPH NODE DISSECTION FOR LUNG CANCER
Hyun-Sung Lee, MD, PhD, Hee-Jin Jang, MD, National Cancer Center

Currently, robotic surgery has been evolved in the oncologic field. However, in the field of thoracic surgery, the application of robotic surgery is limited. We performed over 70 cases of robot-assisted surgery for lung and esophageal cancer. This video will show the robot-assisted lobectomy and complete mediastinal lymph node dissection for left-sided lung cancer.

S056 ROBOT-ASSISTED IVOR-LEWIS ESOPHAGECTOMY FOR ESOPHAGEAL CANCER Hyun-Sung Lee, MD, PhD, Hee Jin Jang, Jae Ill Zo, National Cancer Center

Currently, robotic surgery has been evolved in the oncologic field. However, in the field of thoracic surgery, the application of robotic surgery is limited. We performed over 70 cases of robot-assisted surgery for lung and esophageal cancer. This video will show the robot-assisted Ivor-Lewis esophagectomy for esophageal cancer. Intrathoracic anastomosis at the level of thoracic inlet can be safely performed with circular stapler.

S057 ROBOTIC THORACOSCOPIC APPROACH FOR FIRST RIB RESECTION FOR RELIEF OF THORACIC OUTLET SYNDROME Farid Gharagozloo, MD, Barbara Tempesta, CRNP, Marc Margolis, MD, Eric Strother, RSA, Washington Institute of Thoracic and Cardiovascular Surgery and The George Washington University Medical Center

Resection of the first rib is an effective means of relieving thoracic outlet syndrome. Previously described techniques have included transaxillary, transthoracic, posterior thoracic, and supraclavicular approaches. These approaches are associated with significant incidence of incomplete rib resection, and neurovascular complications. This video presents a minimally invasive robotic thoracoscopic approach for complete resection of the first rib. This technique is feasible, allows for complete resection of the first rib, and is associated with a lower likelihood of neurovascular complications compared to previously described techniques. A robotic thoracoscopic approach may represent the preferred approach for the resection of the first rib in patients with thoracic outlet syndrome.

S058 ROBOTIC ABDOMINO-PERINEAL RESECTION Faisal Al-Mufarrej, MD, Howard Pryor, MD, MPH, Grace Montenegro, MD, Obias Vincent, MD, George Washington University

We present the case of a 56 year old otherwise healthy male with rectal cancer who underwent a robotic abdomino-perineal resection after neoadjuvant chemoradiation. The video details the fundamental steps and the outcomes of the procedure. By virtue of its three-dimensional visualization, greater dexterity, and more accurate dissection, the Da Vinci robot extends the minimally-invasive platform to surgical diseases of the rectum.

S059 ROBOTIC ASSISTED ENUCLEATION OF A LARGE LOWER ESOPHAGEAL LEIOMYOMA Abed Khalailah, MD, Ram El Elazary, MD, Avraham Schlager, MD, Mohammed Adileh, MD, Samir Abu-Gazala, MD, Mahmud Abu-Gzala, MD, Avraham I Rivkind, MD, Yoav Mintz, MD, Department of General Surgery, Hadassah Hebrew University Medical Center

Leiomyoma is the most common benign esophageal neoplasm making up 70-80% of all benign esophageal tumors. Various surgical approaches have been described for the management of such lesions, including open and minimally invasive surgery. We hereby, describe surgical treatment of a large horseshoe shaped leiomyoma of the distal esophagus via robotic-assisted left thoracoscopic enucleation. A 40-year-old asymptomatic and healthy male was, found to have a lower mediastinal mass on a screening x-ray. Physical examination and blood tests were within normal limits. CT scan of the chest and abdomen demonstrated a 40 x 30 mm mass of the distal esophagus. On Esophagogastroduodenoscopy, a protruding esophageal submucosal mass with intact overlying mucosa was encountered at 35-38 cm. A swallow study demonstrated a filling defect in the lower esophagus with intact smooth mucosal surface. EUS demonstrated a 5 x 3 cm mass with no lymph node enlargement and biopsies performed showed no malignancy. After induction

of general anesthesia and placement of a double-lumen endotracheal tube, the patient was positioned with his left side up. A 30 degree laparoscope was introduced into the left 7th intercostal space on the posterior axillary line, and two 8-mm robotic trocars were inserted in the left 5th and 9th intercostal spaces along the same line. An assistant port was inserted between the right robotic trocar and the spine. With the aid of concurrent intra-operative esophagoscopy, the esophageal mass was clearly visualized on the border between the heart, diaphragm and aorta. The parietal pleura overlying the esophagus was opened and the tumor was freed from the mediastinal attachments. The esophagus was encircled both proximally and distally to the mass and manipulated using two penrose drains. The muscular layer of the lower esophagus was incised using cautery and the lesion was enucleated without mucosal penetration. Intraoperative endoscopy ensured mucosal integrity. The muscular layer was not sutured and chest drain was left in place. Gastrografin swallow study on the first post-operative day demonstrated good esophageal clearance with no leak, at which time, the patient began a liquid diet. After an uneventful postoperative course, the patient was discharged on post-operative day number three tolerating a liquid diet. Pathological examination confirmed the lesion to be a benign leiomyoma.

S060 ROBOTIC VERTICAL SLEEVE GASTRECTOMY FOR MORBID OBESITY Gordon Wisbach, MD, Janos Taller, MD, Naval Medical Center San Diego

INTRODUCTION: The benefits of laparoscopy are well established in the field of bariatrics, however the role of robotic surgery is evolving. An increasingly popular operation to treat morbid obesity in our institution is the laparoscopic vertical sleeve gastrectomy. We present for review a video that demonstrates our robotic technique for this minimally invasive weight loss procedure. METHODS: Our patient was a 44 year-old woman with a BMI of 51 kg/m² and a weight of 308 lbs. Her past medical history was significant for hypertension, hyperlipidemia, obstructive sleep apnea and osteoarthritis. Her significant past surgical history included a cesarean section. She was evaluated by our bariatric team, deemed a suitable candidate for weight loss surgery and consent was obtained for a robotic vertical sleeve gastrectomy. In the main operating room, initial entry into the peritoneal cavity was achieved under visual guidance using an optical trocar. After limited exploration, four trocars and a liver retractor were inserted and the patient-side cart was docked over the patient's left shoulder. After complete mobilization of the greater curvature of the stomach and division of retrogastric attachments, a subtotal stapled gastrectomy was performed along a 32 Fr esophageal bougie. This video highlights the application of robotic surgery to this minimally invasive procedure. RESULTS: The robotic operation was completed in 140 minutes with an estimated blood loss of 50 ml. The patient recovered uneventfully and was discharged home on post-operative day 2. At a 4-month follow up appointment, she was doing well and had an excess body weight loss of 19%. CONCLUSION: Robotic vertical sleeve gastrectomy is a safe and effective alternative to the conventional laparoscopic technique.

S061 ROBOTIC ASSISTED URETEROTOMY REPAIR June Hou, MD, Reza Ghavamian, MD, Dennis Kuo, MD, Albert Einstein School of Medicine / Montefiore Medical Center

Robotic Injuries are uncommon, and occur in approximately 0.3-2.5% of laparoscopic hysterectomies. There is increasing literature demonstrating the feasibility and effectiveness of intra-operative laparoscopic reconstruction. We present a case of a

66yo African American female who underwent a robotic assisted total laparoscopic hysterectomy, bilateral salpingo-oophorectomy, pelvic and para-aortic lymph node dissection for endometrial carcinoma. A ureteral injury was recognized intra-operatively. The following video clip describes our approach to repair and reconstruction.

VIDEO SESSION II

S062 ROBOTIC WEDGE RESECTION OF THE STOMACH AND INTRACORPOREAL SUTURES FOR GIST AT ANTRUM OF THE STOMACH Seong-Ho Kong, MD, Jong-Won Kim, MD, Hyuk-Joon Lee, MD, PhD, Han-Kwang Yang, MD, PhD, Seoul National University College of Medicine

We present one case of gastric wedge resection using daVinci system. The patient was 57 years old male with abnormal finding in screening gastroscopy. Gastroscopy and CT scan showed 4.5cm sized submucosal tumor at the antrum area. GIST was most likely suspected. At the beginning, Maryland forceps was installed at the right side of the patient, and Cardiere forceps and ultrasonic shears at the left side of the patient. Instruments between right and left side were sometimes switched due to lack of dexterity of ultrasonic shears. After the blood vessels covering the mass in lesser curvature side were cleared, multiple traction sutures were performed all around the mass. These sutures and gauzes were used for retraction of the mass to prevent a rupture. The stomach was cut by ultrasonic shears with a gross free margin from the mass. After the resection of the mass, the defect of the stomach was repaired with a continuous interlocking suture with a few supplementary interrupted sutures. The suture was continued in a transverse direction perpendicular to the longitudinal axis of the stomach. Pathology result reported a GIST as a final diagnosis. Upper GI series on 5th postoperative day showed no narrowing or passage disturbance. This robotic gastric wedge resection and intra-corporeal sutures seems to be a good option of minimally invasive surgery for the moderately large-sized GIST. This operative method has advantages of easy dissection and suturing and enables to obtain appropriate gross free margins and to handle the tumor meticulously to prevent a rupture of the mass.

S063 ROBOTIC REPAIR OF A NEONATAL HIGH ANORECTAL MALFORMATION Juan I. Camps, MD, Joel F. Bradley III, MD, Prithvi P. Reddy, MD, Palmetto Health Children's Hospital, Columbia, SC

INTRODUCTION: Anorectal malformations occur 1 in 2,500 to 5,000 live births. High lesions carry a great deal of morbidity and usually will require multiple operations and hospitalizations. The traditional treatment for intermediate and high malformations includes a diverting colostomy at birth and creation of a neo-anus with colonic pull-through once the child has grown to an acceptable size. The most common repair has traditionally been a posterior sagittal anorectoplasty as described by Peña. Here we present a case of imperforate anus with recto-urethral fistula that was repaired with a robotically assisted laparoscopic fistula repair and colo-anal pull-through. **CASE PRESENTATION:** The patient is a four month old baby boy with history of high imperforate anus and recto-urethral fistula. He underwent colostomy at birth and presented for fistula ligation and coloanal pull-through. He underwent a transabdominal robotic assisted laparoscopic repair at 4 months of age. One 12 mm camera port was used in the umbilicus along with two robotic 5 mm ports in the upper flanks for dissectors and one 5 mm accessory port on the left for suction or retraction. A 10 mm port was placed in the center of the external anal sphincter and mobilized in to the transpelvic floor

under direct vision of the two bellies of the levator ani muscle. The operation was successful and there were no immediate or late surgical complications. He was discharged on postoperative day three. The patient has done well at subsequent follow up visits. **CONCLUSION:** Robotic assisted repair of anorectal malformation with recto-urethral fistula is a safe and feasible procedure. The robotic approach provides a great deal of maneuverability in the infant's pelvis. In the last decade, some articles have described the benefits of using MIS in the repair, but it requires experience and dexterity. However, robotic equipment provides an easier approach. Immediate advantages compared to laparoscopic approach are: deep visual perception and magnified view of the pelvic anatomy and extremely easy use of the robotic arms in a rather small anatomic space. This advantage will improve the surgical outcomes and decrease the incidence of urethral diverticulum's.

S064 ROBOT ASSISTED RADICAL TRACHELECTOMY WITH PRESERVATION OF THE UTERINE VESSELS FOR CERVICAL CANCER Karim S. ElSahwi, MD, Charlene Hooper, MD, Elena Ratner, MD, Dan-arin Silasi, MD, Alessandro D. Santin, MD, Peter E. Schwartz, MD, Thomas J. Rutherford, MD, PhD, Masoud Azodi, MD, Yale University School of Medicine

OBJECTIVE: To present a patient with early stage cervical cancer who wishes to preserve fertility and describe the technique of robot-assisted radical trachelectomy with preservation of the uterine vessels. **METHODS:** A 39 year-old G0 with stage IB1 adenocarcinoma of the cervix who wishes to preserve fertility undergoes a robot-assisted radical trachelectomy with preservation of the uterine vessels. An 8-minute narrated video of the procedure is shown. **RESULTS:** Operative time (docking to skin closure) was 210 minutes. Estimated blood loss was less than 100 ml. Length of hospital stay was 24 hours. No intraoperative, immediate or delayed postoperative complications were recorded. Final pathology report showed lack of parametrial/lymphatic/vascular spread, and confirmed negative margins on the specimen. Follow-up was 3 months. **CONCLUSIONS:** Robot-assisted radical trachelectomy for early-stage cervical cancer is a safe minimally invasive approach that is feasible in an acceptable period of time. It offers wider resection margins than vaginal trachelectomy, and allows preservation of the uterine vessels. The impact on fertility remains to be seen.

S065 D2 LYMPHADENECTOMY IN ROBOT-ASSISTED GASTRECTOMY FOR GASTRIC CANCER Yoshinori Ishida, PhD, Ichiro Uyama, PhD, Seiichiro Kanaya, PhD, Fujita Health University School of Medicine

In Japan laparoscopic surgery is becoming popular and the number of the laparoscopic surgery cases is increasing now. However robotic surgery is not so popular, especially in the field of general surgery. We started robotic surgery for gastric cancer using da Vinci surgical system from January in 2009. We have 18 cases of Robot-assisted gastrectomy (RAG) with lymphnode dissection. We present our technique of D2 lymphadenectomy for gastric cancer on the Japanese Gastric Cancer Classification. After No.5 lymphadenectomy, the lymph nodes around the left gastric artery are dissected from central side to peripheral side. At first, lymphadenectomy around the common hepatic artery is performed toward the portal vein behind the proper hepatic artery. Then, lymph nodes along the splenic artery are dissected. During lymph node dissection around here, the pancreas is pulled down to caudal side to expose the upper side of the hepatic common artery or the splenic artery, by the robotic arms or with help of assistant. All patients were performed successfully without

open or laparoscopic conversion. There was no postoperative mobility and no mortality. Although we have only 18 cases, RAG with D2 lymphadenectomy has possibility of applied a safer and more efficient operation for gastric cancer because of advantages of da Vinci system.

S066 ROBOTIC RESECTION OF A MEDIASTINAL NEUROBLASTOMA IN AN INFANT John J. Meehan, MD, Seattle Children's Hospital, University of Washington

This video is an example of using robotic surgery to resect a solid chest tumor and also an introduction of the relatively new 8.5 mm 3-D camera. A 5 month old boy presented with new onset lower extremity paralysis. Workup revealed a large mass in the right chest that was traversing into the spinal column through a nerve foramina creating spinal cord impingement. The initial size of the tumor was 7.4 x 4.2 x 7.4 cm. Biopsy confirmed a neuroblastoma and he underwent chemotherapy with a reasonable reduction in tumor size. His paralysis also resolved during chemotherapy. The tumor shrunk to a size of 6.2 x 1.8 x 4.9 cm and surgery was planned using robotic technology. The child was now 8 months old and 7.3 kg in weight. A new 8.5 mm 3-D camera was used in this procedure along with two 5 mm robotic ports. Additionally, one 5 mm handheld accessory port was needed for suctioning and assisting in retraction. The video will demonstrate the highlights of the case including positioning of the robot and trocar placement. No difficulties were noted with this new 3-D camera and the visualization was excellent. The tumor was resected en bloc and a chest tube was left in place. A small chylous leak was noted during feeding which delayed his discharge but this resolved after about 48 hours. He went home on post-op day number 4. SUMMARY: Robotic technology affords excellent mobility for resecting solid mediastinal tumors even in small children. The addition of the 8.5 mm 3-D camera improves visualization and is a reasonable sized camera for thoracic procedures even in the small chest of an infant.

S067 ROBOTIC PUESTOW John J. Meehan, MD, Robert Sawin, MD, Seattle Children's Hospital, University of Washington

INTRODUCTION: A 13 year old girl was admitted for multiple bouts of pancreatitis. Work up including an MRCP revealed a tortuous and severely dilated pancreatic duct. Non-operative management including ERCP with sphincterotomy failed to improve her symptoms and her bouts of pancreatitis continued to require multiple hospital admissions. The decision for a Roux-En-Y lateral pancreaticojejunostomy (Puestow) was made and she was underwent this procedure using robotic surgery. We present the video from this operation. METHODS: The 3 arm standard Da Vinci surgical robot (Intuitive Surgical, Sunnyvale, CA) was used for the procedure. The operation was performed through 3 robotic ports including one 12 mm camera port at the umbilicus and two 5 mm instrument ports. A 12 mm accessory port for dividing and stapling bowel was placed in the right lower quadrant and a 5th accessory port (5 mm) was placed in the lower abdomen for retraction. RESULTS: The entire procedure was performed intracorporeally. The patient did well and there were no complications. She was on a clear liquid diet by post-operative day 4. Her diet was advanced slowly to a low-fat diet. A Jackson-Pratt drained intraoperatively was removed on post-operative day 6. She went home on post-operative day 8. CONCLUSION(S): The complex details of performing a minimally invasive Puestow can be accomplished safely and effectively using robotic surgery. The advantages of robotic surgery may allow this procedure to be performed using minimally invasive techniques more frequently in the future.

S068 ROBOTIC-ASSISTED RESECTION OF EPIPHRENIC DIVERTICULUM + HELLER MYOTOMY + DOR FUNDOPLICATION Carlos Galvani, MD, Maria V. Gorodner, MD, Aberto S. Gallo, MD, University of Illinois at Chicago

INTRODUCTION: Robotic assisted resection of epiphrenic diverticulum + Heller myotomy is an appealing alternative to traditional laparoscopic technique. The aim of this video is to show our surgical technique using the da Vinci Surgical System®. METHODS: 77 yo man referred for evaluation and treatment of possible achalasia and epiphrenic diverticulum. Patient has been complaining of weight loss, dysphagia to solids and liquids, heartburn, regurgitation, and cough for approximately 1 year. An upper GI showed an epiphrenic diverticulum towards the right side of the esophagus. An EGD confirmed an esophageal diverticulum and narrowing at the GE Junction. An esophageal manometry demonstrated an ineffective esophageal motility disorder, but not achalasia. RESULTS: Robotic assisted resection of epiphrenic diverticulum + Heller myotomy + Dor fundoplication was performed. The patient had uneventful postoperative recovery. He was discharged on postoperative day # 3. Operative time was 120 min and blood loss 30 cc. At 3 months follow up, the patient reports complete resolution of symptoms CONCLUSIONS: Robotic assisted resection of epiphrenic diverticulum + Heller myotomy + Dor fundoplication offers a safe and efficient alternative to laparoscopic technique.

S069 ROBOTIC-ASSISTED REDO HELLER MYOTOMY Carlos A. Galvani, MD, Maria V. Gorodner, MD, Alberto S. Gallo, MD, University of Illinois at Chicago

INTRODUCTION: Robotic assisted redo Heller myotomy is an appealing alternative to traditional laparoscopic technique. The aim of this video is to show our surgical technique using the da Vinci Surgical System®. METHODS: 52 year old female who came complaining of dysphagia to solids and liquids, nausea and regurgitation. Her past medical history was significant for achalasia. Her past surgical history was significant for robotic Heller myotomy done in an outside hospital 1 month ago. An upper GI showed delayed esophageal emptying of the contrast with spontaneous regurgitation. An area of tapering at the GE junction which could represent a fundoplication was also observed. Patient was recommended to follow a full liquid diet, drink slowly and avoid any hard food for the first 8 weeks after surgery. She came back 6 months later, complaining of the same symptoms. She underwent a dilatation with a 60 Fr Savary dilator. One month later she returned to clinic reporting slight improvement of her dysphagia but she was still complaining of heartburn, regurgitation and chest pain. She refused another dilatation, therefore she was offered a redo Heller myotomy. RESULTS: Robotic assisted redo Heller myotomy + Dor fundoplication was performed. The patient had uneventful postoperative recovery. She was discharged on postoperative day # 3. Operative time was 160 min and blood loss 60 cc. At 9 months follow up, the patient reports complete resolution of symptoms CONCLUSIONS: Robotic assisted redo Heller myotomy offers a safe and efficient alternative to laparoscopic technique.

S070 PREOPERATIVE AND INTRAOPERATIVE USE OF VOLUME-RENDERED CT AND MRI IMAGES AS A GUIDANCE ADJUNCT TO ROBOTIC SURGERY. S. Hiridis, K. Konstantinidis, M. Vorias, G. Sambalis, M. Georgiou, K. Anastasakou, A. Xiarchos, Athens Medical Center

INTRODUCTION : Development of radiology software and easier accessibility by surgeons is leading to a new era of intraoperative dynamic analysis of imaging information. MRI, helical CT, CT-

angiography and three-dimensional (3D) volume rendering can be combined through simple commercial software to reconstruct photorealistic models of patient's anatomy at desirable views at every step of a robotic surgical procedure. **AIM :** We present our clinic's experience with intraoperative guidance by volume-rendered CT and MRI images in general surgical procedures. **METHODS :** From September 2006 till July 2009, 232 robotic surgical procedures have been performed by our team, using the 4-armed DaVinci robotic surgical system. A novel method of intraoperative navigation was used with 6 of our patients, by combined use of a common PC next to the daVinci console. The procedures included 3 nephrectomies, 2 splenectomies, 1 distal pancreatectomy. Preoperative CT and MRI images of the patients were imported in DICOM format and reconstructed in 3D photorealistic models of the patient's anatomy. Different angles of these dynamic models could be adjusted by the surgeon according to the view from the robotic system. We used a questionnaire to assess the extent of facilitation of the procedure by using this method. **RESULTS :** This simple method of intraoperative guidance had no direct physical effect on the operation or the patient and demanded only a little more workspace. In all questions assessing facilitation of the operation both the surgeon and his assistant responded that this system may augment the surgeon's perception of the operative field, especially if overlaid in the actual field during surgery. However, even in this form the surgeons had an early anticipation of the exact anatomical variations of each patient, before dissecting through the tissues. All attending surgeons responded that the era of augmented reality-aided robotic surgery is coming. **CONCLUSIONS:** As robotic systems evolve, new technologies will integrate in the original systems. The use of augmented-reality images may enhance the perception of the field without the need of extensive dissection. It may also provide the further advantage of early anticipation of anatomical variations especially in deep-seated vessels.

S071 POSTAURICULAR AND AXILLARY APPROACH ENDOSCOPIC THYROIDECTOMY WITH THE DA VINCI ROBOT SYSTEM Su-jin Kim, Kyu Eun Lee, Jeonghun Lee, Do Hoon Koo, Yeo-Kyu Youn, Seung Keun Oh, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea

INTRODUCTION: Robotic thyroid surgery is successfully used for various thyroid diseases with excellent cosmetic outcome. We established a technique for endoscopic neck surgery using the bilateral axillo-breast approach (BABA). Many women, especially young girls, are reluctant to have their breast involved. Consequently, we developed the postauricular and axillary approach (PAA) which uses postauricular incisions and applied this technique using the da Vinci robot system. **PATIENTS & METHODS (OPERATION SUMMARY):** A 28 year-old woman with papillary microcarcinoma underwent robotic thyroidectomy using the PAA. Diluted epinephrine solution (1:200,000) is infiltrated into the subcutaneous fat layer to create a plane to which the trocars will be inserted to prevent bleeding during flap formation. Axillary incisions are made along with the skin crease. The subcutaneous plane is created using straight mosquito clamps, long Kelly clamps, and the vascular tunnelers. Trocars for the camera and a port for (arm number 2) are inserted through the right and left axillary incisions, unerspace of the flap was insufflated with low-carbon dioxide gas (5-6mmHg). Postauricular incisions are made and two 5mm trocars are inserted. Using a monopolar cautery with hook, the midline incision of the strap muscle is made. And then isthmus is divided using the ultrasonic shears. The recurrent

laryngeal nerve must be identified by carefull dissection. At this point nerve monitoring is used to facilitate the identification of the recurrent laryngeal nerve. After identification of the superior parathyroid gland, carefull dissection is performed, while preventing injury to the feeding vessels. The specimen is drawn out in a lap bag through the left axillary incision. With the lobectomy already taken place, central node dissection can be performed relatively easy. The recurrent laryngeal nerve is well preserved. The camera is inserted into the opposite axillary incision. After arm number 1 and 2 are exchanged with each other, contralateral lobectomy is taken place in a similar manner. Irrigation and inspection of the operative field is performed after complete thyroid removal for any bleeding.

S072 SINGLE-INCISION LAPAROSCOPIC ADRENALECTOMY WITH THE DA VINCI ROBOT SYSTEM Su-jin Kim, Kyu Eun Lee, Jeonghun Lee , Do Hoon Koo, Seung Keun Oh, Yeo-Kyu Youn, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea Cancer Research Institute, Seoul National University College of Medicine, Seoul, Korea

INTRODUCTION: Laparoscopic adrenalectomy has been widely accepted as the standard of method for most adrenal disorders. Advances in laparoscopic instrumentation enables more minimally invasive surgery and one of them is single-incision laparoscopic adrenalectomy. Despite advances in surgical instrumentation, dissection through a single incision have some limitations in precise, meticulous manipulation of the surgical tissues. The da Vinci robotic system provides a 3-D dimensional magnified field of view, precise and multi-articulated hand-like motions. We anticipated that these advantages can improve the single-incision laparoscopic surgery and performed the single-incision adrenalectomy using the da Vinci robot system. **PATIENTS & METHODS (OPERATION SUMMARY):** A 32 year-old woman with a 3.2cm mass in her left adrenal gland. She was diagnosed as primary adrenal Cushing's syndrome with weight gain, hirsutism, and easy bruising. 2.5cm incision is made at the 2cm below of the intersection of the midclavicular line and costal margin. Trocar for the camera, and the ports for (arm number 1, 2) are inserted through 2.5cm sized incision. The 12mm port for camera is placed in the upper part of the incision and 8mm port for robot arm 1 and 2 are placed below the 12mm port. The lateral attachment of the spleen is taken down first. Splenic mobilization was performed using Maryland dissector, and monopolar cautery with hook. The splenic flexure of the colon can be mobilized caudally by dividing the splenocolic ligament. Dissect pancreas tail and spleen to the right side, and kidney and left adrenal gland to the left. The left adrenal vein is encountered at the inferomedial aspect of the adrenal gland. The left adrenal vein is identified and is carefully dissected out. The adrenal vein is clipped leaving two clips on the patient side and is dividied. The left adrenal gland is liberated by completing the dissection circumferentially and posteriorly. The specimen is taken off the superior pole of the kidney and posterior abdominal wall. The specimen is drawn out in a lap bag through the 2.5cm sized incision.

S073 ROBOTIC HELLER MYOTOMY WITH GASTRIC SLEEVE RESECTION FOR THE SIMULTANEOUS TRATMENT OF ACHALASIA AND MORBID OBESITY Julieta Paleari, MD, Monica Hagen, MD, Michael Sedrak ,MD, Kari Thompson, MD, Noam Belkind, MD, Garth Jacobsen, MD, Mark Talamini, MD, Santiago Horgan, MD, University of California San Diego

INTRODUCTION: Achalasia is a relatively rare medical condition that occurs in 0.5-1.0 per 100 000 people in the US. It usually

presents with progressive dysphagia, regurgitation and weight loss. Therefore, the incidence of achalasia in the morbidly obese is unique. Only few reports of simultaneous Heller myotomy in combination with gastric bypass or duodenal switch can be found. The surgical approach for concomitant treatment of these two diseases must be taken into consideration in order for each to be successful. This video demonstrates the simultaneous treatment of achalasia and morbid obesity by robotic Heller myotomy and laparoscopic gastric sleeve resection utilizing the same trocars for each portion of the procedure. **METHODS & PROCEDURES:** Robotic Heller myotomy with the da Vinci S System and simultaneous laparoscopic gastric sleeve resection through the same trocars were performed in a 69-year-old female patient with early achalasia and morbid obesity (BMI of 40kg/m²). Two 12 mm trocars and two 8 mm da Vinci trocars were placed in the upper abdomen. After initial laparoscopy, the da Vinci S System was docked and robotic Heller Myotomy was performed. Next, the robotic system was removed and a laparoscopic gastric sleeve resection was performed through the same trocars. The entire procedure including intra-operative endoscopy was recorded and the video edited. **RESULTS:** No intraoperative or postoperative complications occurred. The patient was discharged on postoperative day 4 on a liquid diet. Five weeks postoperatively, the symptoms of achalasia had resolved and the patient lost 11 pounds. **CONCLUSION:** The positive short-term outcomes in our patient show that simultaneous robotic Heller myotomy and laparoscopic gastric sleeve resection are technically feasible through the same trocars for the treatment of achalasia and morbid obesity. This combination might represent a very effective, but minimally invasive treatment for the rare combination of these two diseases. Further follow up will confirm mid- and long term effects of our unique surgical approach.

S074 ROBOTIC MEDIASTINAL LYMPH NODE DISSECTION DURING AN ESOPHAGECTOMY Farid Gharagozloo, MD, FACS, Marc Margolis, MD, Eric Strother, BS, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

The extent of mediastinal nodal dissection is a significant determinant of the success of esophagectomy and the overall prognosis of surgically treated esophageal cancer. Blunt esophagectomy is associated with fewer resected nodes and higher mediastinal recurrence. Open Trans-thoracic esophagectomy affords better nodal dissection. Due to the greater visualization and increased dexterity with the surgical robot, a nodal dissection comparable to an open technique is possible. This video depicts a robotic nodal dissection with a trans-thoracic esophagectomy.

COLORECTAL

S075 TME FOR RECTAL CANCER IN OBESE PATIENTS: THE ADVANTAGE OF ROBOTIC ASSISTANCE. Leela M. Prasad, MSSurg, FRCSEd, FRCSC, FACS, FASCRS, Ashwin L. Desouza, MS, MRCSEd, DNB, FCPS, MNAMS, Slawomir J. Marecik, MD, John J. Park, MD, Jennifer Blumetti, MD, Andrea Zimmermann, MD, Herand Abcarian, MD, Advocate Lutheran General Hospital, Park Ridge IL; University of Illinois at Chicago Medical Center at Chicago, Chicago, IL

OBJECTIVE OF THE STUDY: This study was designed to retrospectively evaluate the safety, feasibility and efficacy of robotic assisted Total Mesorectal Excision (TME) for rectal cancer. **METHODS & PROCEDURES:** From August 2005 till September 2009, 51 cases of robot assisted TME for rectal

cancer were performed by one of two board certified colorectal surgeons (PL, MS). All procedures were performed using a hybrid technique i.e. laparoscopic descending colon mobilization and robot-assisted TME. **RESULTS:** The gender distribution, mean age, procedural breakup and pathology are presented in Fig1. Thirteen patients had prior abdominal surgery and 31 patients received neoadjuvant chemo-radiation (CRT). This study has the highest reported mean BMI (27.8 Kg/m²) as compared to other reported similar retrospective case series. The mean operating time, blood loss and median length of stay were 340.4 min, 208.9ml and 5 days respectively. Robotic TME was completed in an average of 109 min and the mean robot docking time was 12.3 min. There were no intra-operative complications or any robot associated morbidity. All patients receiving CRT were diverted with an ileostomy. Of the patients not receiving CRT, only three patients received a diverting stoma. Two of these had an ultra-low anterior resection with a coloanal anastomosis and the third had a nearly obstructing mid-rectal lesion with a history of prior pelvic radiation for prostatic carcinoma. Histopathology revealed a mean tumor size of 2.8 cm, and a mean lymph node harvest of 14.6 nodes. The radial margin was negative in all patients but the distal margin showed in-situ carcinoma in one patient. This was a 49 yr old woman with an invasive adenocarcinoma 3 cm from the dentate line. As the patient was young and preoperatively staged as T2N0, a robot-assisted sphincter saving resection was attempted and a clear gross margin of 0.4cm could be achieved. In view of the final pathological findings, the patient underwent a trans-anal revision of the anastomosis which was negative for residual malignancy and received appropriate adjuvant therapy. However, eight months later the patient developed a local recurrence at the anastomotic site and underwent an APR. There were 3 anastomotic leaks in this series (3/41=7.3 %) Two patients were managed with laparoscopic drainage of the pelvic collection and loop ileostomy. The third patient was already diverted and had a well localized pelvic abscess that was drained transanally. Two Patients were converted to open on account of obesity (3.9%). The mean BMI of converted patients was 41.5 Kg/m², and the highest BMI at which Robotic TME was successfully completed was 40.28 Kg/m². On comparison with reported literature on laparoscopy for rectal cancer, this series demonstrates the lowest conversion rate and a much higher mean BMI for converted patients, suggesting that a minimally invasive TME in obese patients is more likely to succeed when performed robotically. **CONCLUSIONS:** Robot assistance in rectal cancer is safe, and feasible with acceptable immediate post-operative and oncological outcomes. Robotic TME might be the preferred minimally invasive option in obese individuals with rectal cancer.

S076 QUALITY OF MESORECTUM AFTER ROBOTIC TREATMENT OF RECTAL CANCER Luca Fabrizio, MD, Biffi Roberto, MD, Valvo Manuela, MD, Pozzi Simonetta, MD, Cenciarelli Sabine, MD, Cenciarelli Sabine, MD, Division of Abdomino-pelvic Surgery, European Institute of Oncology; Milan, Italy

INTRODUCTION: complete resection of the mesorectum has proved to improve the long-term oncologic outcome after surgical treatment of rectal cancer. Quality assessment of mesorectal fascia according to Quirke's criteria has become one of the pathological parameters to evaluate the risk of local recurrence together with distal and circumferential margins and number of lymphnodes retrieved. This study was designed to analyze the quality of the mesorectum, the prognostic factors and the oncologic outcome of patients undergoing robotic

total mesorectal excision (TME) for rectal cancer. **METHODS & PROCEDURES:** a consecutive series of 61 patients affected by rectal cancer underwent full robotic resection of the rectum with total mesorectal excision in the Division of Abdomino-Pelvic Surgery, European Institute of Oncology, Milan, Italy in the period January 2007-June 2009. Clinical and pathological data were collected prospectively in a dedicated database and analyzed. Pathologic examination included stage of disease, number of lymph nodes harvested, longitudinal and radial margins of resection and quality of mesorectum. **RESULTS:** the mean age was $61,24 \pm 10,75$ years. 39 patients were treated by anterior resection of the rectum, 9 patients by abdomino-perineal resection, 13 by colo-anal. 40 patients received pre-operative radio- and chemotherapy. Anastomotic leakage rate was 6 %. The mean number of lymph nodes harvested was $17,88 \pm 8,73$. The mesorectum was classified "complete" in 52 cases (85,2%) and "nearly complete" in 9 (14,8%). We had no "incomplete" TME specimens. No positive distal margin was reported. After a mean follow-up of 8.8 ± 6.6 months, the local recurrence rate was 1.6% (1/61 cases). The 2-years overall survival rate was 98.3%; the 2-years cancer specific survival rate was 100%, with a disease free survival of 96.7% **CONCLUSIONS:** the technical characteristics of the Da Vinci Surgical System such as the tridimensional magnified view and the fine controls of the robotic instruments permit a precise dissection in confined spaces like the pelvis. This ensure a high percentage of completeness of the mesorectum.

S077 SEXUAL AND URINARY FUNCTIONAL ASSESSMENT FOLLOWING FULL ROBOTIC RECTAL SURGERY FOR CANCER
Luca Fabrizio, MD, Valvo Manuela, MD, Biffi Roberto, MD, Cenciarelli Sabine, MD, Pozzi Simonetta, MD, Division of Abdomino-pelvic Surgery, European Institute of Oncology; Milan, Italy

INTRODUCTION: Urinary and sexual dysfunctions are common complications after total mesorectal excision (TME) for rectal cancer. The risk of bladder dysfunction and loss of erection are reported to be up to 32% and 55% respectively. Robotic (TME) for rectal cancer has been proven to be oncologically safe and several authors also suggest a possible advantage in preserving the inferior hypogastric plexus and reduce collateral damage to the genitourinary system. The aim of our study was to evaluate functional results after robotic treatment of rectal cancer. **METHODS & PROCEDURES:** from April 2008 37 patients undergoing full robotic resection for rectal cancer were included in the study. Urinary and sexual dysfunctions as long as quality of life were assessed with specific self-administered questionnaires: pre-operatively after one month, six months and one year. For evaluating urinary function and impact on quality of life we used the Female and the Male Lower Urinary Tract Symptoms from "International Consultation on Incontinence Modular Questionnaire" (ICIQ-FLUTS and ICIQ-MLUTS questionnaire). For sexual functioning we used the International Index of Erectil Function (IIEF) and the Female Sexual Function Index (FSFI) questionnaire. **RESULTS:** sexual function and general sexual satisfaction decreased significantly one month after surgery but then there was a progressive increase of both parameters and one year after intervention the questionnaires scores were comparable to those measured before surgery. For urinary function the grade of incontinence measured one year after the intervention was lower when compared to the pre-operative status for both genders.

	IIEF Range	Before surgery	1 month after surgery	6 months after surgery	1 year after surgery
Erectil function	(0-30)	18.3	10.7	12.9	15.8
General satisfaction	(2-10)	6.4	5.07	4.4	6.2
	FSFI Range	Before surgery	1 month after surgery	6 months after surgery	1 year after surgery
Sexual function	(0-30)	11.4	3.3	15	20.5
General satisfaction	(2-10)	3.5	1.3	3.6	6

CONCLUSIONS: robotic TME allows for better preservation of urinary and sexual function. This in probably due to the stability of the robotic arms that, together with the high flexibility and manoeuvrability in narrow spaces of the instruments, minimizes trauma to the inferior hypogastric plexus.

S078 ROBOTIC ASSISTED COMPARED TO STANDARD LAPAROSCOPIC SINGLE INCISION RIGHT COLECTOMY: EARLY EXPERIENCE WITH DIFFERENT APPROACHES
Matthew B. Ostrowitz, MD, Eugene Rubach, MD, Charles Choy, MD, George DeNoto, MD, Staten Island University Hospital, North Shore University Hospital

BACKGROUND: Application of single incision laparoscopic surgery is increasing across surgical disciplines. In addition to the possibility of decreased post-operative pain, it offers better cosmesis with virtually "scarless" surgeries while avoiding the increased costs and complexity of Natural Orifice Surgery. Instrument conflict minimization often requires crossing of articulating instruments, which can be facilitated using the daVinci-S robotic system or articulating laparoscopic instruments. We describe our early experience with three different techniques for robotic assisted single incision right colectomy (RASIRC), as well as our approach to standard laparoscopic single incision right colectomy (SIRC). **METHODS:** Robotic assisted single incision right colectomies were performed using the daVinci-S robotic system utilizing a single 4 cm incision through the umbilicus, three separate skin and fascial incisions, or the SILS™ port. These procedures were performed using three robotic arms, a 12mm camera and two 8mm robotic ports. A medial to lateral approach was used and an extracorporeal resection and anastomosis was performed after undocking the robot. Similar techniques were used for the standard single incision cases, except that the ports used were all 5mm or the SILS™ port, and the camera was a flexible tip laparoscope. **RESULTS:** There were no intraoperative or postoperative complications with either method. Average operative time for the three robotic cases was 152 minutes, compared to 125 minutes for the ten standard laparoscopic single incision cases. One of the robotic cases was converted to standard laparoscopic single incision right colectomy during mobilization of the ascending colon due to uncontrollable air leakage around the ports. Other robotic cases were successfully completed without air loss by purse-stringing sutures around each individual port and the use of the SILS™ port, respectively. None of the single incision laparoscopic cases required the addition of extra ports. **CONCLUSIONS:** Robotic Assisted Single Incision Right Colectomy can be successfully and safely performed using the daVinci-S robotic system. Several techniques may be employed to prevent the loss of pneumoperitoneum. We believe

right colectomy lends itself to single-site surgery because specimen extraction requires a 4 cm incision, and may confer patient benefit with decreased postoperative pain and improved cosmesis. While the robotic approach does facilitate a more intuitive surgical approach, allowing a right-handed surgeon to perform the case with the dominant hand, it may require slightly more operative time. We discuss the various techniques we have used to successfully perform these procedures.

S079 ROBOTIC COLORECTAL PROCEDURES - EARLY EXPERIENCE Rami Makhoul, MD, Grace Montenegro, MD, Vincent J. Obias, MD, MS, The George Washington University Hospital

INTRODUCTION: Robotic colorectal surgery is an emerging field in minimally invasive surgery. The first few cases were reported in 2002. Robotic surgery provides three-dimensional viewing, increased reticulation, and finer dissection which may lead to improved functional and cancer outcomes. Our department started using robotics in colorectal procedures in October 2009. The aim of this review is to share our early experience in a wide variety of colorectal procedures. **METHODS:** Over the period of two months (October to November 2009) a total of 6 patients underwent surgery utilizing a full robotic technique with the Da Vinci-S robotic system. Data regarding outcomes including operative time, post-op day to discharge, operative blood loss, intra-op and post-op complications, conversion rates, and pathologic outcomes were examined. **RESULTS:** The following procedures were performed: abdominoperineal resection, low anterior resection, right hemicolectomy, sigmoid colectomy and rectopexy, ileocectomy, and exploration with drainage of pelvic abscess and biopsy of pelvic tissue. None were converted to open or laparoscopic surgery. No intra-operative complications occurred. There were two post-operative complications: the first was a readmission for pelvic abscess requiring drainage and loop ileostomy, the second was prolonged post operative ileus. The median post-operative day to discharge was five days (range 3-10 days). The median operative time was 227.5 minutes (120-500 min). The mean number of lymph nodes harvested was 16, and margins were negative in cancer cases. **CONCLUSION:** Robotic colorectal surgery is a safe and effective technique with a promising future. Robotic surgery provides an additional tool for optimal management of more complex colorectal pathology such as rectal cancer. Further studies are required to define the role and economic feasibility of robotics in colorectal surgery.

S107 ROBOTIC ASSISTED APPROACHES TO RECTAL PROLAPSE, Sonia Ramamoorthy, MD

S108 COMPILATIONS OF ROBOTIC CASES, Eric Haas, MD

S109 75 ROBOTIC COLECTOMIES: REVIEW OF TECHNIQUE & LESSONS LEARNED George Denoto, MD

HEAD/NECK-CARDIO-THORACIC

S080 MODEL-GUIDED SINGLE PORT EPICARDIAL INTERVENTIONS USING A HIGHLY ARTICULATED ROBOTIC SYSTEM Takenori Yokota MD, PhD, Takeyoshi Ota, MD, PhD, David Schwartzman, MD, Constantinos Nikou, MS, Brett Zubiate, BS, Howie Choset, PhD, Marco A. Zenati, MD, Division of Cardiac Surgery, University of Pittsburgh

INTRODUCTION: We have developed a Novel Highly Articulated Mechatronic Robotic System (Cardio ARM) that can enable minimally invasive epicardial therapeutic interventions (e.g. injections, ablations) through a single port subxiphoid approach. The Cardio ARM is a robotic surgical system having an articulated

design to provide unlimited but controllable flexibility. It consists of serially connected, rigid cylindrical links housing flexible working ports through which catheter-based tools for therapy and imaging can be advanced. In the previous studies, the only feedback was provided by the on-board camera. We believe that knowing the relative position and configuration of the Cardio ARM to a detailed representation of the actual anatomy would be more helpful. The cardio ARM features a novel real-time image-guidance system using the integration of three-dimensional CT angiography (3D CTA) and electromagnetic tracking system. This study investigates the ability of the Cardio ARM using this novel image-guidance system. **METHODS & PROCEDURES:** In a porcine preparation, subjects (n=5) received preoperative 3D CTA scan. Registration of the 3D CTA images with an electromagnetic tracking system (Aurora, NDI) was achieved using fiducials prior to the procedure. Magnetic tracking sensors were used to represent the real-time location of the Cardio ARM on the registered 3D CTA images using dedicate software (Blue Belt Technologies, Pittsburgh, PA). Via a small subxiphoid incision, the Cardio ARM was introduced inside the pericardial space, and navigation trial to acquire several anatomical targets (right atrial appendage, superior vena cava, ascending aorta, left atrial appendage, transverse sinus from the left side, and atrioventricular groove in the posterior wall of the heart) and a series of myocardial injections of dye into anterior and lateral walls of the left ventricle and bilateral atrial appendages were performed using the real-time image-guidance system. **RESULTS:** The real-time image-guidance system provided accurate 3D rendering of both epicardial surface and the position of the tip of the cardio ARM in the body relative to the pig's heart. All navigation trials and injection trials were successfully performed without adverse event (i.e. bleeding, fatal arrhythmia). All subjects tolerated well the injection trials. Accuracy of dye injections was confirmed in the excised hearts. Surrounding mediastinal structures (e.g. esophagus, phrenic nerve, and pericardium) were intact upon post-mortem examinations. No hemodynamic or electrophysiological events were occurred. **CONCLUSIONS:** The novel real-time image-guidance system was helpful in providing information about the location of Cardio ARM. Based on these preliminary studies, navigation and interventions throughout the pericardial space from a subxiphoid access was easily achieved. We believe that the Cardio ARM using this novel integrated image guidance technology promises to enable development of minimally invasive intrapericardial therapeutic delivery.

S081 APPLICATION OF ROBOTICS TO RESECTIONS OF STAGE II LUNG CANCER Marc Margolis, MD, FACS, Farid Gharagozloo, MD, FACS, Barbara Tempesta, MS, CRNP, Eric Strother, BS, Kimberly Vilmenay, MPH, The George Washington University Medical Center

PURPOSE: VATS lobectomy is difficult in patients with Stage II lung cancer. The difficulty stems from the extent of hilar and mediastinal adenopathy and the difficulty associated with hilar and pulmonary artery dissection. Robotic surgical systems enable complex 3-D maneuvers, fine dissection and have the potential to enhance VATS lobectomy in patients with disease involving the fissure, hilum and mediastinum. **METHODS:** Over a 62 month period, 175 patients underwent robotic assisted VATS lobectomy and complete mediastinal nodal dissection for early stage lung cancer. Of this cohort, 31 patients (18%) were in Stage II pre-operatively. (16 men, 15 women, mean age 65.7 years). **RESULTS:** Lobectomies were RUL 8, RML 1, RLL 10, LUL 7, LLL 5. Complete mediastinal exenteration was achieved in all patients. Operative times were 3 to 6 hours (median 3.5 hours). There were 20 ACA, 8 SCCA, 1 Adenosquamous, 2 poorly differentiated. Pathologic upstaging was noted in 12/31

patients (39%) from Stage II to IIIa. There were no emergent conversions to a thoracotomy. Median hospitalization was 4 days. Complications included atrial fibrillation (3), pleural effusion (1). There was 1 mortality, which was an unexplained respiratory arrest. Follow up was complete in 26/30 patients (88%). At a mean follow up of 40 months, 3 patients had died from their cancer (10%), 2 had distant metastases (6%), and there were 2 local recurrences (6%). **CONCLUSIONS:** Robot assisted VATS lobectomy for Stage II lung cancer is safe and is associated with low morbidity, low local recurrence, and short hospitalization. Robotic assistance during VATS lobectomy may enable a more complete hilar and mediastinal dissection and enhances the accuracy of surgical staging.

S082 ROBOTICS CHANGES THE APPROACH TO DIAGNOSIS AND MANAGEMENT OF MEDIASTINAL MASSES Marc Margolis, MD, FACS, Farid Gharagozloo, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta CRNP, The George Washington University Medical Center

OBJECTIVE: The conventional approach to the diagnosis of mediastinal masses is associated with a high level of inaccuracy and the need for multiple interventions. Robotics has the potential of providing a highly accurate approach to the diagnosis and management of mediastinal masses. **METHODS:** From 9/05 - to 9/09, 48 patients were diagnosed with a mediastinal mass and underwent transthoracic robotic biopsy and, if appropriate, robotic resection. **RESULTS:** There were 18 anterior, 22 mid, and 8 posterior mediastinal masses. Of the anterior mediastinal masses, 15 were thymic in origin, 2 lymphomas, and 1 germ cell. Mid mediastinal masses: 12 lymphatic in origin and 10 aerodigestive cysts. Of the posterior mediastinal masses: 3 neurogenic and 5 benign cysts. The robotic approach was from the right pleural space in 33 patients and from the left pleural space in 15 patients. The sensitivity of the robotic technique was 98% and specificity was 100%. 34 patients underwent simultaneous robotic resection of the mass. Two patients required conversion to an open procedure. **CONCLUSIONS:** Robotic approach to the diagnosis and treatment of mediastinal masses is associated with high sensitivity and specificity for diagnosis. Furthermore, in patients in whom resection of the mass is indicated, the robot can be used for resection in the same operative setting.

S083 ROBOTIC RESECTION OF A POSTERIOR MEDIASTINAL GOITER Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta CRNP, The George Washington University Medical Center

Thyroid goiters can extend into the posterior mediastinum in 10- 25% of patients. Transcervical approach to these goiters can be difficult and resection usually requires a high thoracotomy. By virtue of greater dexterity, more accurate dissection and 3D visualization, the da Vinci robot enables the minimally invasive approach to the posterior superior mediastinum in these patients. In this video, a 69 year old man is presented with a large thyroid goiter which extended 7cm into the posterior mediastinum to the level of the aortic arch. The trachea was deviated to the left. The blood supply for the intrathoracic thyroid originated from the right internal thoracic artery. The procedure was performed by a right transthoracic robotic dissection of the intrathoracic component followed by transcervical thyroidectomy and delivery of the tumor. There was no operative or postoperative complication. Patient was discharged on the sixth postoperative day. **CONCLUSIONS:** Robotic technology has the potential of broadening the application of minimally invasive techniques to complex lesions of the mediastinum.

S084 ROBOTIC THYMECTOMY THROUGH LEFT SIDED APPROACH USING 3 PORTS: THE INITIAL INDIAN EXPERIENCE WITH 30 PATIENTS Roman Dutta, Arvind Kumar, Jens Rueckert, Tarun Jindal, Sumit Singh, Amar P. Bhalla, All India Institute of Medical Sciences, New Delhi, India.

AIMS & OBJECTIVES: All India Institute of Medical Sciences, New Delhi, India is a tertiary care referral centre. It receives large number of patients of myasthenia gravis and thymoma referred for thymectomy. The "da Vinci S Surgical robotic system" has been used to perform thymectomy for the past 16 months. Herein, we present our initial experience with 30 cases of robotic thymectomy. **METHODS:** Robotic thymectomy was performed on 30 consecutive patients of MG and other thymic pathology since June, 2008. Myasthenia gravis was diagnosed on the basis of clinical criteria, circulating acetylcholine receptor (AChR) antibody level, electromyography, and edrophonium chloride test. Thymoma was detected on CECT chest. Thymoma of ≤ 3 cm in size without evidence of invasion of adjacent structures in preoperative CT chest were attempted through robotic approach. **RESULTS:** Robotic extended thymectomy was completed successfully in 29 patients (96.66%). It includes patients of MG (26), hyperparathyroidism due to thymic nodule (1), and thymoma without MG (2). 5 patients of MG had associated thymoma. In 1 patient, the excision was completed through left anterolateral thoracotomy due to involvement of left phrenic nerve by thymoma. The mean age of the operated patients was 31 years. One patient had transient neurapraxia involving left brachial plexus and one developed left vocal cord palsy due to injury of left recurrent laryngeal nerve. The largest thymoma excised was 7 x 5 cm in size. **CONCLUSION:** In patients with myasthenia Gravis, Robotic Thymectomy can be performed safely from left side approach using 3 ports. The enhanced visualization and better dexterity of robotic instruments allows total clearance of the gland under vision from one phrenic nerve to the other and from thyrothymic ligament to diaphragm. It is possible to carry out thymectomy in selected cases of small thymoma.

S085 AN OBJECTIVE ASSESSMENT OF PALMAR SWEATING AFTER ROBOT-ASSISTED HIGHLY SELECTIVE DORSAL SYMPATHECTOMY H. M. E Coveliers, MD, G.S.A. Abis, MS, W. Wisselink, MD, PhD, Department of Vascular Surgery, VU University Medical Center, Amsterdam, The Netherlands.

BACKGROUND: Endoscopic thoracic sympathectomy is a safe and effective treatment for upper limb hyperhidrosis, however compensatory sweating (CS) is a frequently occurring side effect. Instead, selective ramicotomy, whereby the sympathetic trunk remains intact, reportedly has fewer side effects but is technically demanding and seems to have a high recurrence rate. Robot-assisted instrumentation could conceivably facilitate this procedure and increase its accuracy. However, efficacy of this procedure has never been objectively evaluated. We report an objective assessment of the sweat output of the palms after robot-assisted highly selective dorsal sympathectomy (HSDS). **METHODS:** Robot-assisted HSDS was performed by division of the rami communicantes efferentes grisei of the T2, T3 and T4 sympathetic ganglia in 20 patients with severe palmar sweating. Preoperative and postoperative sweat measurements of the palms were done by capacitance hygrometry and compared to an age and gender matched control group of healthy persons without hyperhidrosis. In addition we used the Hyperhidrosis Disease Severity Scale (HDSS) to qualitatively evaluate the effect of sweating of the hand on daily activities before and after HSDS. We also registered the incidence of disturbing compensatory

hyperhidrosis (CS). RESULTS: Preoperatively measured palmar sweat output was significantly higher in the hyperhidrosis group than the control group (5.207 ml/cm².min vs. 4.270 ml/cm².min). Sweat output fell significantly after HSDS from 5.207 ml/cm².min to 4.045 ml/cm².min, there was no significant difference with the output measured in the control group. The HDSS showed a one-point drop in 65% and two-point drop in 35% of the cases. Mild CS occurred in 35% of the patients and 5% (one patient) suffered from disturbing CS. CONCLUSION: According to objective sweat measurements of the hand, robot-assisted HSDS reduces the palmar sweat output to normal levels in patients suffering from primary idiopathic palmar hyperhidrosis.

S086 ROBOTIC LAPAROSCOPIC BELSEY FUNDOPLASTY FOR GASTROESOPHAGEAL REFLUX DISEASE **Farid Gharagozloo MD, FACS, Marc Margolis, MD, FACS, Mohammed Kalan, MD, Barbara Tempesta, CRNP, Eric Strother, BS, Kimberly Vilmenay, BS, MPH, Farzad Najam, MD, FACS, The George Washington University Medical Center**

OBJECTIVE: Belsey Mark IV fundoplasty is associated with less gas bloat and dysphagia compared to the Nissen wrap. Thoracoscopic Belsey Fundoplasty is technically difficult. By virtue of 3-D visualization and greater maneuverability, the surgical robot facilitates a laparoscopic Belsey Mark IV procedure. A laparoscopic Belsey fundoplasty may represent an alternative to the Nissen procedure. METHODS: During a 40 month period, 80 patients (41 men, 39 women, mean age 41 +/- 9 years) with gastroesophageal reflux disease underwent robot-assisted laparoscopic Belsey fundoplasty. All patients underwent preoperative manometry and 24 hour pH study. Indications for surgery were intractability of symptoms (73) and pulmonary complications (7). The procedure was performed through five laparoscopic ports. The hiatus was closed anteriorly and posteriorly. The esophagus was intussuscepted into the stomach by 2 cm for 270 degrees. Results were assessed by preoperative and postoperative endoscopy, manometry, 24 hour pH study, UGI study, subjective symptom questionnaire, and objective Viscik grading. RESULTS: Median OR time: 3 hours. Median hospitalization: 1 day. Mean follow up was 28 months. Subjective symptomatic improvement: (maximum 12/patient) decreased from 8.3 +/- 0.6 to 0.7 +/- 0.2 (p<0.05). 63 patients scored 0 and were completely free of reflux symptoms. 91% were Viscick I or II. 75 patients (94%) had transient postoperative dysphagia which resolved by the third postoperative week. There was no gas bloat or long term dysphagia. Recurrent hiatal hernia was seen in 4 pts. (5%). CONCLUSIONS: Robotic laparoscopic Belsey fundoplasty is feasible. This procedure is associated with a low incidence of gas bloat and dysphagia. Although greater experience is necessary, a laparoscopic approach to the Belsey Fundoplasty may represent an alternative to the Nissen procedure.

S087 ROBOTIC LEFT INTERNAL THORACIC ARTERY TAKEDOWN IN THE RIGHT LATERAL DECUBITUS POSITION **Farzad Najam, MD, Farid Gharagozloo, MD, Marc Margolis, MD, Robert Gilbert, SA, Eric Strother, SA, Edgar Sadsad, SA, Frederick Lough, MD, The George Washington University Medical Center, Washington, DC**

INTRODUCTION: Robotic Left Internal Thoracic Artery (LITA) takedown has been performed in the supine position with the use of carbon dioxide (CO₂) insufflation. The takedown of the LITA graft in this position is difficult because of incomplete visualization of the LITA and the limitation of movements of the right arm of the robot because of the patient's left shoulder. We present a video presentation of a better technique for the harvest

of the LITA graft in the right lateral decubitus position in a 59 year old male patient who needed a single vessel coronary artery bypass grafting. METHODS & PROCEDURES: After double lumen endotracheal intubation, the patient was positioned in a right lateral decubitus position. The robotic camera port was inserted in the left 7th intercostal space, in the mid-axillary line. The right robotic arm was inserted through the left 6th intercostal space in the posterior axillary line. The left robotic arm was inserted through the left 8th intercostal space in the anterior axillary line with an Endo Paddle Retract™ 12 mm Retractor (Covidien, Mansfield, Massachusetts) placed through the 7th intercostal space. The endo retractor was used to retract the heart, which allowed for the dissection of the LITA graft to proceed without carbon dioxide (CO₂) insufflation. The full length of the LITA graft, from the proximal part to the bifurcation, was easily visualized and was dissected with a pedicle. The patient was then placed in a supine position for a small left anterior thoracotomy for grafting of the LITA graft to the left anterior descending coronary artery. RESULTS: The entire length of the LITA graft could be easily visualized and accessed for dissection without any limitations. The robotic arms were free to move unhindered over the length of the LITA and the position of the patient's left shoulder was not obstructive. CO₂ insufflation did not need to be used as the endo-retractor provided gentle retraction of the heart without any hemodynamic compromise. CONCLUSIONS: Robotic LITA takedown in the right lateral decubitus position may allow for complete and easier mobilization of the LITA graft as compared to the supine position. Robotic LITA harvest can be performed in the right lateral decubitus position without any limitations posed by the position of the heart, without the use of CO₂ insufflation, and without the restraints of the patient's left shoulder.

S088 ROBOT-ASSISTED PULMONARY ANATOMICAL RESECTION FOR NON-SMALL CELL LUNG CANCER: INITIAL EXPERIENCE **Hyun-Sung Lee, MD, PhD, Hee Jin Jang, MD, Seong Yong Park, MD, Jae Ill Zo, MD, PhD, National Cancer Center, Korea**

INTRODUCTION: There is little experience with robotic assistance for pulmonary anatomical resection of non-small cell lung cancer. We developed a technique for robotic assisted pulmonary resection for lung cancer and report our initial results. METHODS & PROCEDURES: Robot-assisted pulmonary anatomical resection with the da Vinci Surgical System (Intuitive Surgical, Sunnyvale, Calif) was attempted in 43 patients (median age, 64.0 years; age range, 40-81 years). Robotic instruments were used for individual dissection of the hilar structures through 2 ports and a 3-5cm utility incision in 5th intercostal space x anterior axillary line without rib spreading. Data on patient characteristics and perioperative results were collected prospectively. RESULTS: Robot-assisted pulmonary anatomical resection was accomplished in 43 patients (25 female and 18 male patients). Lobectomy was performed in 37 patients. Segmentectomy and pneumonectomy was done in 5 and 1 patients, respectively. There was no conversion to thoracotomy. The majority of patients had adenocarcinoma (31/43 [72%]). Every patient underwent an R0 resection. The mean number of dissected lymph nodes was 21.8 ± 8.6. Operative mortality was 0%, with no in-hospital or perioperative deaths. Median length of stay was 6 days (range, 4-22 days). The median operative time was 236 minutes (range, 110-367 minutes). CONCLUSIONS: Robot-assisted pulmonary anatomical resection for lung cancer is a feasible procedure and can be performed safely. It provides an excellent operative field view enabling easy identification of vital structures.

S089 CAN TOTALLY ENDOSCOPIC CORONARY ARTERY BYPASS REDUCE THE RISK OF MAJOR INFECTION COMPARED TO CONVENTIONAL CORONARY ARTERY BYPASS? Zachary Kon, Eric Lehr, Atiq Rehman, Nikolaos Bonaros, Dominik Wiedemann, Felix Weidinger, David Zimrin, Guy Friedrich, Bartley Griffith, Johannes Bonatti, University of Maryland School of Medicine, Baltimore, USA and Innsbruck Medical University, Innsbruck, Austria

BACKGROUND: Totally endoscopic coronary artery bypass (TECAB) has several theoretical advantages over conventional coronary artery bypass via a median sternotomy (CABG), including reduced surgical trauma, preservation of sternal stability, and shorter hospital stay. Additionally, it has been proposed that TECAB should be associated with a reduction in deep thoracic wound infections. We investigated the observed rate of major infection in TECAB compared to the predicted value for patients undergoing CABG. **METHODS:** 290 patients with a mean age of 57 (37-90) and EuroSCORE of 1.9 (0-8) underwent TECAB using the daVinci telemanipulation system. Patient demographics and intraoperative data were prospectively collected and used to calculate "Preop Only" and "Combined" Fowler Scores, which were developed for the assessment of major wound infection risk in conventional CABG. A cumulative risk-adjusted major infection rate (CRAMI) plot was used to assess the number of observed infections compared to the predicted value for CABG. **RESULTS:** The mean major infection probability based on the "Preop Only" score was 1.6% (0.9-7.4%), and 1.9% (0.8-6.7%) based on the "Combined" score. Three groin infections and one superficial chest port-site infection were seen, requiring surgical intervention (1.4% overall infection rate). However, no deep thoracic wound infection was noted. **CONCLUSION:** TECAB seems to result in major infection rates as predicted by the Fowler Score, but may prevent the occurrence of deep thoracic wound infections. Prospective comparative studies are needed to further evaluate this question.

S090 INTERMEDIATE TERM FOLLOW UP IN 175 CONSECUTIVE ROBOTIC ASSISTED LOBECTOMIES FOR EARLY STAGE LUNG CANCER Marc Margolis, MD, FACS, Farid Gharagozloo, MD, FACS, Barbara Tempesta, CRNP, Eric Strother, BS, Kimberly Vilmenay, BS, MPH, Farzad Najam, MD, FACS, George Washington University Medical Center

OBJECTIVE: Robotics enables anatomic lobectomy by video assisted techniques without the need for a utility thoracotomy. We present one institution's intermediate follow up experience with 175 consecutive robotic lobectomies for early stage lung cancer. **METHODS:** Over a 62 month period, 175 patients (96 men, 79 women), mean age 66.2 years, underwent robotic video assisted anatomic lobectomy. The robot was used for vascular and bronchial dissection through three 2 cm ports followed by division of these structures using conventional video assisted techniques. A utility thoracotomy was not used. This technique was designed to replicate lobectomy by thoracotomy. **RESULTS:** The median operative time was 3 hours. The distribution of lobectomies was RUL 49, RML 12, RLL 29, LUL 51, and LLL 34. Distribution of cancer includes: 111 adenocarcinoma, 34 squamous cell, 9 adenosquamous, 1 large cell, 10 bronchoalveolar, 5 poorly differentiated, 3 carcinoid, 1 mucoepidermoid, 1 spindle cell. There were two emergent conversions to a thoracotomy, and one non-emergent conversion to repair a dural leak. Median hospitalization was 4 days. Complications included A-fib (23), hydropneumothorax (1), atelectasis (7), prolonged air leak (11), pleural effusion (9), and pulmonary embolism (5). There were 2 deaths in the first 20 patients; mortality in the last 155 patients

was 0. Pathologic upstaging was noted in 30 patients (17%); 18 patients to IIB, 12 to IIIA. Mean follow up of 40 months: death from cancer 6 (3.4%), distant metastases 7 (4%), new lung primary 5 (3%), and local recurrence 2 (1.2%). **CONCLUSIONS:** Robotics enables minimally invasive anatomic lobectomy comparable in technique to lobectomy by thoracotomy. Robotic lobectomy is associated with low morbidity and mortality. Low local recurrence rate and pathologic upstaging may be due to enhanced visualization and more accurate and extensive mediastinal and hilar nodal dissection afforded by the robot. The results improve significantly with greater experience.

S091 ROBOTIC RESECTION OF A 20 CM FIBROUS TUMOR OF THE PLEURA Farid Gharagozloo, MD, FACS, Eric Strother, BS, Marc Margolis, MD, FACS, Kimberly Vilmenay, MPH, Barbara Tempesta, CRNP, The George Washington University Medical Center

Solitary fibrous tumors of the pleura are rare tumors that often display unpredictable behavior. The usual approach to the resection of these masses has been by thoracotomy. VATS has been reported for tumors less than 10 centimeters. Robotic surgery, by virtue of more accurate dissection, greater maneuverability and 3D visualization, enables the application of minimally invasive techniques to these challenging tumors. This video depicts the resection of a 20 centimeter fibrous tumor of the pleura. A 74 year old man presented with a persistent cough and a large fibrous tumor of the pleura. He underwent robotic resection. Post-operative course was uncomplicated. **Conclusions:** Robotic technology has the potential of expanding the application of minimally invasive techniques to these large, complicated tumors of the pleura.

S092 MINIMAL EXTRACORPOREAL CIRCULATION FOR ROBOTIC TOTALLY ENDOSCOPIC CORONARY ARTERY BYPASS HYBRID PROCEDURE Eric J. Lehr, MD, PhD, Patrick Odonkor, MD, Peter Reyes, MD, Bartley Griffith, MD, Johannes Bonatti, MD, University of Maryland Heart Center, University of Maryland School of Medicine

Robotically assisted totally endoscopic coronary artery bypass grafting (TECAB) can be performed on the beating heart with cardiopulmonary bypass support in high-risk patients or in patients where technical difficulties are expected with a complete off-pump approach. To minimize the inflammatory response and reduce the requirement for transfusion, MECC is an attractive option for robotic TECAB procedures. Femoral arterial cannulation is commonly used for TECAB, but has been associated with additional risk of retrograde cerebral embolization, and axillary cannulation is an alternative cannulation strategy particularly in patients with a high atherosclerotic burden. We describe a case where MECC was used for the first time in TECAB performed with the da Vinci telemanipulation system and axillary artery cannulation.

S093 ROBOTIC RESECTION OF A GIANT RETROCARDIAC BRONCHOGENIC CYST Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta, CRNP, The George Washington University Medical Center

Bronchogenic cysts are usually adherent to adjacent structures which makes a complete resection by conventional thoracoscopy difficult. The 3-D visualization, greater instrument maneuverability, and more accurate dissection of robotic surgical systems are ideally suited for the thoracoscopic resection of mediastinal bronchogenic cysts. We present a video demonstration of robot positioning and robot-assisted thoracoscopic resection of a

large retrocardiac bronchogenic cyst. This patient is a 28 year old female who presented with shortness of breath and fatigue. Radiography revealed a subcarinal soft tissue mass. There was no operative or post-operative complication. Patient was discharged in 3 days. CONCLUSIONS: The robot assistance allows for a more accurate thoracoscopic dissection of bronchogenic cysts away from the surrounding structures.

S094 ROBOTIC RESECTION OF A SCLEROSING HEMANGIOMA OF THE LUNG Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Vicki Cole, PA, Eric Strother, BS, Barbara Tempesta, CRNP, Kimberly Vilmenay, MPH, The George Washington University Medical Center

Sclerosing hemangioma is a rare benign pulmonary mass of uncertain etiology but recently thought to be related to alveolar epithelial cells. It typically presents in asymptomatic middle aged women as a peripheral lung nodule. Surgical management is typically curative. Robotics has the potential of offering curative resection with minimal morbidity. This video depicts the case of a 56 year old Asian female with a past medical history of meningioma. Surveillance radiography revealed a lung mass abutting the vertebral column. The patient was asymptomatic. This video shows robotic resection of this mass. There was no operative or post-operative complication. The patient was discharged home in 4 days. Conclusion: Application of robotic technology offers a minimally invasive option to the management of pulmonary Sclerosing hemangiomas.

S095 ROBOTIC RESECTION OF A POSTERIOR PARA-AORTIC MULLERIAN CYST Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Kimberly Vilmenay, MPH, Barbara Tempesta CRNP, The George Washington University Medical Center

Most cysts in the mid and posterior mediastinum are aerodigestive in nature. However, a small proportion of these cysts have been shown to have features consistent with a mullerian cyst. These cysts typically occur in middle-aged women. They are thin walled cysts, the walls of which contain smooth muscle. They are usually lined by ciliated epithelium resembling uterine tubal epithelium. They also typically have a paravertebral location. As with all mediastinal cysts, surgical resection is indicated and definitive diagnosis of a mullerian cyst is made histologically. Due to their unique location, these cysts lend themselves to the unique capabilities of the robotic systems. The greater maneuverability of the robotic arms combined with 3-D visualization allow for a safe, effective resection of these cysts. This patient is a 50 year old female who was asymptomatic. Radiography revealed a cystic structure in the para aortic region. This video shows the fine dissection of the cyst off surrounding structures and complete excision. There was no operative or post-operative complication. The patient was discharged home in 4 days. CONCLUSION: The robot allows for a more accurate dissection of mediastinal cysts in complex locations away from the surrounding structures. Complete excision of all mediastinal cysts with the robot is associated with low morbidity and short hospitalization.

S096 TECHNICAL ASPECTS OF A ROBOTIC ASSISTED LOBECTOMY Farid Gharagozloo, MD, FACS, Marc Margolis, MD, FACS, Eric Strother, BS, Barbara Tempesta, MS, CRNP, The George Washington University Medical Center

OBJECTIVE: Robotics enables anatomic lobectomy by video assisted techniques without the need for a utility thoracotomy. We present one institution's intermediate follow up experience with 175 consecutive robotic lobectomies for early stage

lung cancer. This video depicts the OR setup, positioning, mediastinal and vascular robotic dissection and techniques utilized in our lobectomy series. METHODS: Over a 62 month period, 175 patients (96 men, 79 women), mean age 66.2 years, underwent robotic video assisted anatomic lobectomy. The robot was used for vascular and bronchial dissection through three 2 cm ports followed by division of these structures using conventional video assisted techniques. A utility thoracotomy was not used. This technique was designed to replicate lobectomy by thoracotomy. RESULTS: The median operative time was 3 hours. The distribution of lobectomies was RUL 49, RML 12, RLL 29, LUL 51, and LLL 34. Distribution of cancer includes: 111 adenocarcinoma, 34 squamous cell, 9 adenosquamous, 1 large cell, 10 bronchoalveolar, 5 poorly differentiated, 3 carcinoid, 1 mucoepidermoid, 1 spindle cell. There were two emergent conversions to a thoracotomy, and one non-emergent conversion to repair a dural leak. Median hospitalization was 4 days. Complications included A-fib (23), hydropneumothorax (1), atelectasis (7), prolonged air leak (11), pleural effusion (9), pulmonary embolism (5). There were 2 deaths in the first 20 patients; mortality in the last 155 patients was 0. Pathologic upstaging was noted in 30 patients (17%); 18 patients to IIB, 12 to IIIA. Mean follow up of 40 months: death from cancer 6 (3.4 %), distant metastases 7 (4%), new lung primary 5 (3%), and local recurrence 1 (0.6%). CONCLUSIONS: Robotics enables minimally invasive anatomic lobectomy comparable in technique to lobectomy by thoracotomy. Robotic lobectomy is associated with low morbidity and mortality. Low local recurrence rate and pathologic upstaging may be due to enhanced visualization and more accurate and extensive mediastinal and hilar nodal dissection afforded by the robot. The results improve significantly with greater experience.

EMERGING TECHNOLOGY AND EDUCATION IN TRAINING

S097 ROBUST IDENTIFICATION OF PEOPLE BY MOBILE ROBOTS TO AID IN REMOTE PATIENT MONITORING James Ballantyne, Ara Darzi, Guang-Zhong Yang, Imperial College London

INTRODUCTION: The next generation healthcare systems will monitor the condition of patients 24 hours a day whether the patient is at home or in the hospital. To help alleviate excess demand on healthcare workers, mobile robots can be used to measure vital signs of the patients and upload these directly to electronic medical records for healthcare providers. To this end, these robots will need to differentiate their assigned patients from the rest of the environment. This study presents a novel computer-based technique for distinguishing people in the environment from surrounding objects, which is the prerequisite of automatic navigation of assistive robots. METHODS: This study utilizes a state-of-the-art time-of-flight camera, which provides real-time 3D depth maps of the environment. The data is presented as a dense point cloud of the current environment. The proposed system analyses each frame of depth data in three stages: segmentation, shape descriptor construction, and classification. First Stage: The segmentation stages processes the raw data received from the camera and segments the image into a collection of groups, where each group represents a different object in the scene. Segmentation is performed by analyzing neighboring pixels in the image and grouping them if the variation in depth is sufficient. Second Stage: The robot steps through each group and builds an 1D rotation-invariant shape descriptor. This descriptor is formed by

mapping each 3D point cloud group to a spherical coordinate system using a spherical extent function. Subsequently, the spherical descriptor is decomposed using spherical harmonics. Finally, the 1D descriptor is generated by computing the L2-norm of the spherical harmonic components at every frequency. For this study, only the first 11 spherical frequencies are used. Third Stage: The robot classifies each 1D signature as a person using a Bayesian classifier. Signatures were built for a sample data set of both positive and negative samples (250 positive and 430 negative samples for this study). From these samples, Principle Component Analysis (PCA) was used to determine the variability of the spherical harmonics components across the signature. The first four spherical components proved to provide the highest variability enabling reduction of the 1D signature. Then, both the positive and negative sample sets were fit with a Gaussian distribution. Finally, a Naïve Bayesian classifier was formulated to allow comparison of new signatures against the trained human model. RESULTS: We tested the accuracy of the proposed system using 144 3D objects representing people found in everyday activities in an indoor environment. The system correctly identified 91% of the people. CONCLUSION: A rotational invariant spherical harmonic descriptor for identifying people using data from a 3D real time-of-flight video camera is proposed. The system showed high accuracy in correctly identifying people in complex environments in the testing set. Future work will aim to fully test the system in everyday activities as the robot navigates around the environment. Furthermore, the system will be enhanced to enable identification of specific patients who need monitoring.

S098 DETECTION OF TRANSITION BETWEEN CORTICAL AND CANCELLOUS BONE USING FORCE, VIBRATION AND TEMPERATURE IN AUTOMATED DRILLING Ehsan Shojaei-Baghini, Aaron Muizelaar, Alexandru Patriciu PhD, Tim Fielding BAsc, Shahin Sirouspour PhD, Gregory R Wohl PhD, Departments of Mechanical, and Electrical & Computer Engineering, McMaster University, Hamilton, Ontario, Canada; MDA Space Missions, Brampton Ontario, Canada

OBJECTIVE: Pedicle screws are routinely used in fixation of bones in spine surgery. This project concerns with the design of a robotic system for automated drilling of pilot holes for placement of vertebral pedicle screws. The system will use pre-operative images (e.g. computed tomography) of vertebrae combined with real-time sensory feedback to accurately drill the hole and avoid damage to the spinal canal or thermal necrosis of the cancellous bone. The purpose of this study was to evaluate if feedback parameters from the drilling (force, vibration, temperature) can be used to measure the transition between tissues of different material properties (e.g., cortical and cancellous bone). Further, measurements obtained from these experimental studies can be used as input for bone drilling simulations for surgical training. METHODS: Using a 1-degree-of-freedom drilling platform (MDA Space Missions), drilling tests were performed on artificial bone (SawBone) with regions of low and high density to mimic cancellous and cortical bone. For each test, we controlled for drill bit type, feed rate, spindle speed, and incident angle. We recorded (10 kHz) force (6-axis force sensor, ATI), acceleration (3D accelerometer), and temperature (surface probe), and performed post-processing (custom MATLAB software). Three methods were evaluated to determine the sensitivity for detecting transition between low and high density material: 1) low-pass filtering of resultant force, 2) calculating power of vibration, and 3) average of high frequencies in Fast Fourier Transform (FFT). In a second set of

experiments, preliminary tests were performed using porcine spine acquired from the abattoir (all protocols were approved by the Animal Research Ethics Board of the University as governed by the Canadian Council on Animal Care). For each vertebra, pre- and post-operative microCT scans were acquired to verify alignment of the drilled hole with the pedicles. Drilling parameters were measured as with artificial bone tests. RESULTS: For artificial bone tests, all three techniques (low-pass filter of resultant force, power of vibration, and FFT) proved capable of detecting a difference between cancellous (low density) and cortical bone (high density). Using low-pass filtering we were also able to determine the angle at which the drill was touching the cortical bone. In tests on porcine vertebra, only the FFT method was able to detect tissue transition while the other techniques did not provide conclusive results. Comparing microCT acquired data with FFT analysis there was a clear correlation between regional bone density in the porcine vertebra and increase in high frequency signatures. CONCLUSIONS: Using three methods to evaluate force feedback data (low-pass filter, power of vibration, and average high frequency after FFT) we were able to detect transitions during drilling between low and high density artificial bone. When applied to real bone (porcine vertebra) only the high frequency average after FFT was able to detect transitions between cortical and cancellous bone. Future work will look at variation in drilling parameters (feedrate, RPM) on feedback variables. Development of a real-time feedback control system would be used to enhance patient safety during robotic or assisted surgical drilling procedures.

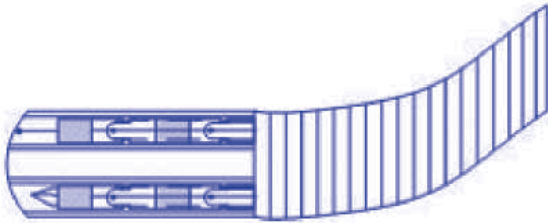
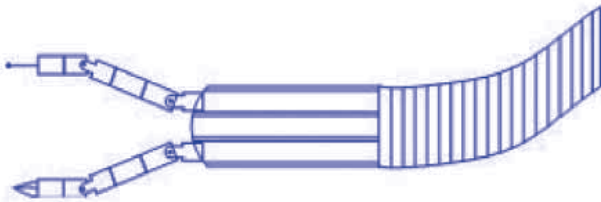
S099 DEVELOPMENT OF AN IMAGE GUIDED AUTOMATED ROBOT FOR TARGETED THERAPY M Anvari MB, BS, PhD, FRCSC, FACS, J Lymer MAppSc, T Reedman BAsc, MEng, D Williams MSc, MD, CM, LLDHon, DSc, Hon, FCFP, FRCP, L Steinnagel BScN, MBA, Centre For Surgical Invention & Innovation, Hamilton, Canada

Targeted therapy using real-time imaging has significant potential to reduce the trauma of obtaining access to the body and improve both the accuracy and cost associated with a number of surgical procedures in different specialties. These targeted therapies are increasingly being applied to a variety of cancer therapies as well as spinal, and orthopedic procedures. Our group has been working to develop a multi-purpose robot with seven degrees of freedom, that can complete a variety of targeted surgical tasks with high degree of precision using real-time imaging obtained from a variety of sources, including USS, CT & MRI scan as well as PEM. We will demonstrate the early prototype in action and discuss the development work in pre-planning and automation of the tasks as well as potential strategies to accommodate for respiration and mitigate the potential for accidental patient movement.



S100 MICRO-ACTUATOR DESIGN AND FUNCTIONALITY FOR A NOTES ROBOTIC SYSTEM M. Anvari, MBBS, PhD, FRCSC, FACS, J. Lymer, MAppSc, Centre for Surgical Invention and Innovation, Hamilton, Canada

Development of a robotic endoscope capable of performing high precision surgical task has been seen as the major breakthrough necessary to enable wide adoption of NOTES as the primary approach to various surgical disorders. Current endoscopic systems have 3 and 5 mm working channels through which an instrument with 2-3 degrees of freedom can be passed to enable the operator to complete the various surgical tasks from dissection to traction to clipping and cutting. Unfortunately, the lack of fine control of these instruments has hindered our ability to perform surgical task requiring high degree of precision. Our group has completed a design study of micro-actuator robotic arms which can be built with 3 and 5 mm diameter to possess at least 6 degrees of freedom (mimicking the human wrist) and be capable of performing precise surgical task such as suturing and dissection. We will present our findings and the current limitations in development of a fully robotic endoscope with micro-actuators.



S101 3D SURGEON'S POSTURAL ANALYSIS DURING STANDARD AND ROBOTIC ASSISTED LAPAROSCOPIC PROCEDURES Nicolas Hubert, MD, Martine Gilles, MD, PhD, Jacques Felblinger, MD, PhD, Jean-Michel Hubert, MD, (*) Urology Department, CHU Nancy-Brabois, allée du Morvan, 54511 Vandœuvre les Nancy, (**) INRS Lorraine, avenue de Bourgogne, BP 27, 54501 Vandœuvre cedex, (***) IADI-UHP Inserm (ERI 13), CHU Nancy-Brabois, allée du Morvan, 54511 Vandœuvre les Nancy.

INTRODUCTION: Standard Laparoscopic (SL) is known for the uncomfortable position it imposes to the surgeon. When performing Robotic Assisted Laparoscopic (RAL), surgeons

reported that this new surgical technique decreased their mental and physical stress. The first part of our study showed that muscular and mental workload are effectively decreased when performing RAL. The objective of this study was to evaluate 3D surgeon's posture when performing SL and RAL procedures. **METHODS:** Laparoscopic procedures requiring three different surgeon's position (pelvis, retroperitoneum and upper abdomen) and one robotic (Da Vinci, Intuitive Surgical®) were performed on pigs by 23 surgeons. Position of 37 retroreflective markers was recorded using infrared cameras (motion capture system Vicon®), allowing 3D body reconstruction. Trunk twist and body unbalance (distance between left-right hip-shoulder joint center and vertical position of left-right shoulder joint center) were analysed. **RESULTS:** 44 procedures were performed (33 SL and 11 RAL). Trunk twist is significantly increased when performing pelvis SL ($p < 0,05$). Minimal trunk twist is shown for retroperitoneum, upper abdomen and RAL. Body unbalance is increased for the 3 SL techniques ($p < 0,05$) comparatively to RAL, especially for pelvic surgery. **CONCLUSION:** RAL surgeons posture is most comfortable, with few trunk unbalance and few twist. Postural strains are different for each of the three SL techniques. Pelvis posture appears to be the most anti-ergonomic posture with large unbalance and large twist.

S102 ROBOTIC ASSISTED MINIMAL INVASIVE SURGERY - A USEFUL TOOL IN RESIDENT TRAINING - THE PEORIA EXPERIENCE 2002 - 2009 Franziska Huettner, MD, PhD, Arthur L. Rawlings, MD, MDiv, Robin A. Alley, MD, Danuta I. Dynda, MD, Michael J. Ryan, MS, Jamie L. Doubet, RN, BS, David L. Crawford, MD, Division of Minimally Invasive Surgery, Department of Surgery, University of Illinois College of Medicine at Peoria

OBJECTIVE: The purpose of the study was to review the use of robotic-assisted laparoscopic general surgery at our institution. We evaluated the eight-year experience (2002 – 2009) of one minimally invasive surgery (MIS) fellowship trained surgeon in Peoria, IL performing 240 cases of foregut, colon, solid organ, and biliary surgery using the da Vinci Telerobotic system with resident assistance. Foregut and colon procedures are the 5th and 6th most commonly performed procedures of the senior author annually. **METHODS:** An IRB approved retrospective review of prospectively collected data from 2002 – 2009 representing 124 foregut and 102 colon operations was performed. Data analyzed were procedure performed, indication for surgery, gender, age, body mass index (BMI), estimated blood loss (EBL), port setup time (PST), robot operating time (ROT), total case time (TCT), length of stay (LOS), complications, conversions, and resident involvement. Fourteen cases including gastric resection (4), pyloroplasty (2), splenectomy (5), cholecystectomy (2), and adrenalectomy (1) were excluded from the data review. Statistical Analysis using the Anova test was applied. A specific review of resident participation in didactic lectures, skills labs and case involvement was performed. **RESULTS:** Times for 226 foregut and colon cases were: PST 31.2 ± 9.4 (10-64) min, ROT 119.3 ± 41.5 (12-306) min, and TCT 194.8 ± 50.3 (50-380) min. The EBL was 48.6 ± 55.0 (5-500) ml, BMI 28.5 ± 4.7 (15.4-46.8) kg/m^2 , and the median LOS 2.0 (0-27) day. The overall complication rate was 13.3 %. No deaths occurred. Over the study period the number of cases participated in by 1st through 5th year residents was 12, 23, 24, 28 and 59 respectively. 124 foregut cases were performed for indications of GERD (71), achalasia (26), and hiatal hernia (27). Times for the foregut cases were: PST 30.6 ± 8.8 (14-63) min, ROT 113.3 ± 40.6 (31-250) min, and TCT 174.4 ± 45.0 (102-321) min. The EBL was 33.8 ± 29.4

(5-200) ml, BMI 29.4 ± 4.8 (15.5-46.8) kg/m², and the median LOS 1.0 (0-14) day. The conversion rate was 4.0%. Residents participated in 68.5% of cases. 102 colon cases were performed for indications of diverticular disease (27), polyps (53), cancer (19), and carcinoid (3). Times for the colon cases were: PST 31.9 ± 10.1 (10-64) min, ROT 126.6 ± 41.6 (12-306) min, and TCT 219.6 ± 45.1 (50-380) min. The EBL was 66.6 ± 71.3 (15-500) ml, the BMI 27.4 ± 4.3 (17.0-40.5) kg/m², and the median LOS 3.0 (2-27) days. The conversion rate was 8.8%. Residents participated in 59.8% of cases. CONCLUSION: This series demonstrates the technical feasibility and safety of robotic surgery for the foregut and colon in a clinical setting where the surgeon does far more of other types of MIS. This series compares favorably with the literature. Incorporation of robotic training in the curriculum has allowed residents to learn robotic techniques in an effective manner. Resident participation is important for the future of robotic surgery.

S103 COMPARISONS BETWEEN SUBJECTIVE ANALYSIS AND HIDDEN MARKOV MODELS FOR COMPLEX ROBOTIC MOVEMENTS Avinash Burra, MS, Gary Schwartz, MD, Deva Boone, MD, Shahzad Razi, MD, Faiz Bhora, MD, George Todd, MD, Scott Belsley, MD, St. Luke's Roosevelt Hospital Center

OBJECTIVE: The need for an objective evaluation of surgical performance is increasingly relevant due to the recent introduction of certification into the surgical curriculum. We have previously reported using the advanced programming interface (API) of the da Vinci surgical system to employ Hidden Markov Models (HMMs) to distinguish between expert and novice surgeons performing simple shape tracing and suturing tasks. We now aimed to compare the HMM-generated metrics with subjective blinded video grading on robotic suturing and knot-tying tasks. METHODS: Nine subjects (two experts and seven novices) performed four suturing and knot-tying tasks each on the da Vinci robot and the corresponding API data stream was recorded. The motion sequences were then segmented into 25 second sub-sequences. Four Gaussian Mixture HMMs were created using Kevin Murphy's Bayes Net Toolbox for MATLAB. Each was separately trained with expert velocity, expert jerk (rate of change of acceleration), novice velocity and novice jerk data obtained from the sub-sequences. Path lengths for all motions were calculated using MATLAB. The trained model was then used to classify test motion sequences. Six blinded graders evaluated randomly chosen videos on the following criteria on a scale of 1 to 5 for surgical dexterity: smoothness, accuracy, efficiency and overall performance. Results from the classification methods were compared in SPSS using Pearson's correlation coefficient (PCC). RESULTS: Only the expert jerk HMM correlated strongly with subjective video grading (Table 1; PCC = 0.641, p-value = 0.002). This HMM also correlated strongly with all subjective evaluation categories (Table 2). The HMM was able to classify experts and novices with 75% accuracy as opposed to 80% by the subjective graders. Path lengths (Range: 79.94-210.04cm, Mean = 134.57 ± 44.13 cm) displayed no significant correlation with any of the subjective grading categories (Table 3). CONCLUSIONS: Only the HMM trained with expert jerk data was comparable to the categorization of subjective graders, lending more credibility to the hypothesis that jerk-based metrics are a reliable indicator of surgical motion quality. Further research to integrate these metrics into other HMMs and Bayesian probabilistic models is necessary. The lack of correlation between the subjective notion of 'efficiency' and path length (which should be mathematically analogous) may highlight a deficiency in subjective grading.

TABLE 1

HMM type	HMM type PCC of HMM vs. subjective score aggregates (p-value in parenthesis)
Expert Jerk	0.641 (0.002)
Novice Jerk	0.042 (0.086)
Expert Velocity	0.004 (0.986)
Novice Velocity	-0.068 (0.777)

TABLE 2

HMM type	PCC of HMM vs. Smoothness	PCC of HMM vs. Accuracy	PCC of HMM vs. Efficiency	PCC of HMM vs. Overall Performance
Expert Jerk	0.501 (0.024)	0.575 (0.008)	0.649 (0.002)	0.629 (0.003)
Novice Jerk	0.054 (0.822)	-0.018 (0.941)	0.144 (0.546)	-0.019 (0.936)
Expert Velocity	-0.114 (0.633)	-0.038 (0.873)	0.082 (0.732)	0.055 (0.817)
Novice Velocity	-0.0477 (0.747)	-0.049 (0.838)	0.005 (0.985)	-0.122 (0.607)

TABLE 3

PCC of Path Length vs. Smoothness	PCC of Path Length vs. Accuracy	PCC of Path Length vs. Efficiency	PCC of Path Length vs. Overall Performance
-0.115 (0.629)	-0.308 (0.187)	-0.281 (0.230)	-0.267 (0.256)

S104 THE NEGATIVE EFFECT OF DISTRACTION ON PERFORMANCE OF ROBOT-ASSISTED SURGERY IN MEDICAL STUDENTS AND RESIDENTS Irene H. Suh, MS, Jung-Hung Chien, MS, Shi-Hyun Park, PhD, Dmitry Oleynikov, MD, Ka-Chun Siu, PhD, University of Nebraska Medical Center

INTRODUCTION: Operating rooms are generally full of distractions. The purpose of this research is to investigate the effect of distractions on robot-assisted surgical skill performance in medical students and residents. METHODS: Fourteen participants (10 medical students, 4 residents) were instructed to perform a suture tying task with the DaVinci Surgical System while one of the following secondary tasks were performed simultaneously: solving arithmetic problems, answering basic science questions, memorizing and recalling muscle names listening to a pre-recorded noise from operating rooms. The established control condition was that of an environment without distractions. The time to task completion and the total distance traveled by the instrument tips were used to evaluate performance. A two-way repeated-measures ANOVA with secondary tasks (arithmetic problems, basic science questions, memory, noise and no distraction) and level of experience (medical students and residents) as the between-subject factors was applied. Scores of arithmetic problems, basic science problems, and the memory task were calculated to compare and assess attention capacity between medical students and residents. RESULTS: A significant secondary task effect was found for both the time of task completion (p = 0.003) and decreased speed (p < 0.001). The increase of time to task completion in the follow-up pairwise comparisons indicated that subjects were distracted by all the secondary tasks: arithmetic problems (p = 0.003), basic science questions (p = 0.008), memory (p = 0.014) and noise (p = 0.037).

The reduction of speed in the follow-up pairwise comparisons showed subjects were only distracted by arithmetic problems ($p < 0.001$), basic science questions ($p = 0.019$) and memory task ($p < 0.001$). There were no significant differences between the residents and novices in time to task completion and speed while performing suturing and distraction task. However, the score of each secondary task for residents was significantly higher than novice: arithmetic problems ($p = 0.014$), memory ($p = 0.007$), and basic science questions ($p = 0.022$). CONCLUSIONS: The performance of a robot-assisted surgical task was negatively distracted by secondary tasks in both medical students and residents. In particular, secondary task requires cognition such as solving arithmetic problems that may substantially affect surgical performance for a general medical trainee. Residents with more surgical experience could establish larger attention capacity for multitasking in this study. Recognizing how surgeons respond to cognitive secondary tasks while performing robot-assisted surgery is important in developing strategies for surgical education. Future studies will investigate the effect of combined secondary tasks on performance between novice and expert in robotic surgery.

S105 ROBOTIC HIP ARTHROSCOPY IN HUMAN ANATOMY: TWO INITIAL CASE REPORTS Jens Kather, MD, Monika Hagen, MD, Michael Schueler, MD, Department of Orthopedic Surgery and Traumatology, General Hospital Muensterlingen, Switzerland

Robotic Hip arthroscopy in human anatomy: TWO INITIAL CASE REPORTS: Jens Kather¹, Monika Hagen², Philippe Morel², Jean Fasel³, Michael Schueler¹ (¹Department of Orthopedic Surgery and Traumatology, General Hospital Muensterlingen, Switzerland, ²Hôpitaux Universitaires de Genève, Chirurgie Viscérale et Transplantation ³Hôpitaux Universitaires de Genève, Morphologie et Anatomie) OBJECTIVE OF STUDY: Hip arthroscopy is getting more popular since the last 15 years with growing numbers of patients. However, technical difficulties limit the extent and

therapeutic options during hip arthroscopy: Movements of instruments are limited because of thick soft tissue surrounding creating a long distance between skin level and region of surgery. Certain locations such as the dorso-inferior part of the hip joint cannot be reached. We assumed that robotic surgery with intuitive control, 7 degrees of freedom at the instrument's tip and the force that can be applied, might offer advantages for this kind of surgery. DESCRIPTION OF METHODS: Two initial hip arthroscopies were performed in a human cadaver with da Vinci standard system. First hip arthroscopy was performed with a 12 mm laparoscopic trocar that was modified to be introduced from the proximal antero-lateral approach into the antero-lateral part of the right femur neck in seldinger technique. As next the da Vinci 10mm camera was introduced into the peripheral part of the hip joint by hand. The region between glenoid and femoral head was clearly identified including the surrounding limbus. Under arthroscopic control, a 5 mm da Vinci trocar was inserted into the hip joint over a guide wire. Now, the robot was docked using the camera and the left robotic arm for instrument manipulation. Second hip arthroscopy was performed with a 8.5mm camera And two 8 mm robotic instruments. PRELIMINARY RESULTS: Docking of the robotic system was possible and instruments could be manipulated inside the hip joint. Still, articulating area of 5 mm instruments was relatively long and resulted in limited movements inside the joint. This problem was solved by using 8 mm instrument (Shorter area of articulation) in the second cadaver, but their size seemed relatively large for this kind of surgery. also, the 10 mm camera was large in relation to the work space. The 8.5 mm camera allowed better overview and easier access.. CONCLUSIONS: Hip arthroscopy using the da Vinci standard system appears feasible in these two initial cases. Instruments and method of application have to be modified before clinical application, but further research seems justified considering the clinical value of such an approach.

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Residency Institution	Dates Attended	Degree/Date
_____	_____	_____
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_____	_____	_____

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Name/Department/Location	Year of Appointments	Staff Position/Title
Name/Department/Location	Year of Appointments	Staff Position/Title

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University	Dates	Title

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MIRA is a multidisciplinary association that provides multi-specialty forums to present new advances and clinical outcomes in all aspects of robotic surgery.

We invite not only surgeons, but also internists, radiologists, engineers and computer scientists interested in robotics, telerobotics, telepresence, teleconferencing, and telementoring to join MIRA.

The ambitious purposes of the association, well stated in its constitution, are:

- To promote and maintain high standards of minimally invasive robotic interventions and to disseminate information relating to the performance and perfection of robotic procedures
- To facilitate the exchange of information between professionals with a primary interest in minimally invasive robotic interventions
- To support and contribute to the academic activities of its members in the pursuit of improving this technique and patient care
- To carry out activities related to minimally invasive robotic interventions that members feel appropriate
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