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THE AMERICAN ASSOCIATION OF
ENDOCRINE SURGEONS

Thirty-Ninth Annual Meeting
MAY 6-8, 2018

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www.endocrinesurgery.org
AAES FUTURE MEETINGS

April 7-9, 2019
Los Angeles, California
Michael W. Yeh, MD

2020
Birmingham, Alabama
John Porterfield, MD

2021
Cleveland, Ohio
Vikram Krishnamurthy, MD
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<td>Peter Angelos</td>
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OLIVER COPE MERITORIOUS ACHIEVEMENT AWARD

In April of 1984 at the American Association of Endocrine Surgeons Meeting in Kansas City, Drs. Edward Kaplan, Jack Monchik, Leonard Rosoff, Norm Thompson and Stuart Wilson proposed to the Council a new achievement award. The award honors a member of the AAES in recognition for contributions in the field of endocrine surgery as an investigator, teacher and clinical surgeon. It is not an annual award but is to be given to members of our Association who truly aspire to the spirit of this award.

On April 15, 1985 at the annual meeting of the AAES in Toronto, our President, Leonard Rosoff announced the first member to receive this award, Dr. Oliver Cope. In giving this award to Dr. Cope the decision of the Council was that from this day forward the award would be known as the Oliver Cope Meritorious Achievement Award for the American Association of Endocrine Surgeons.

Oliver Cope, MD
Professor of Surgery, Harvard University and the Massachusetts General Hospital
Awarded in Ontario in April 1985.

Stanley R. Friesen, MD, PhD
Professor of Surgery, University of Kansas
Awarded in Detroit, MI in April 1994.
Dr. Friesen served as the President of our Association in 1983.

Norman W. Thompson, MD
Henry King Ransom Professor of Surgery, University of Michigan
Awarded in Atlanta, GA in April 2001.
Dr. Thompson served as our inaugural President in 1980 and 1981.

Jon A. van Heerden, MD
Professor of Surgery Mayo Clinic
Awarded in Charlottesville, NC in April 2004.
Dr. van Heerden served as our Recorder from 1987-1989, as our Vice-President in 1994, and as President in 1996.

Orlo H. Clark, MD
Professor of Surgery, UCSF Mount Zion Medical Center
Awarded in New York, NY in May 2006.
Dr. Clark served as our inaugural Vice-President in 1980 and 1981, and as President in 1993.

Edwin L. Kaplan, MD
Professor of Surgery, University of Chicago
Awarded in Madison, WI in May 2009.
Dr. Kaplan served as our President in 1982.
George L. Irvin, III, MD  
Professor Emeritus of Surgery, University of Miami  
Awarded in Pittsburgh, PA in April 2010.  
Dr. Irvin served as our Recorder from 1993-1996, as Vice-President in 1996, and as President in 1998

Stuart D. Wilson, MD  
Professor Emeritus of the Department of Surgery, Medical College of Wisconsin  
Awarded in Baltimore, MD in April 2016  
Dr. Wilson served as our Secretary-Treasurer from 1984-1988 and President from 1991-1992.
HONORARY MEMBERS

Individuals who have made outstanding contributions to the discipline of Endocrine Surgical Disease:

J. Aidan Carney, Pathologist
Stuart D. Flynn, Pathologist
Ian D. Hay, Endocrinologist
Virginia A. LiVolsi, Pathologist
Frank LoGerfo, Surgeon
A. G. E. “Ace” Pearse, Endocrinologist
Thomas S. Reeve, Endocrine Surgeon
F. John Service, Endocrinologist
Britt Skogseid, Endocrinologist
R. Michael Tuttle, Endocrinologist
William F. Young, Endocrinologist
RESIDENT/FELLOW RESEARCH
AWARD WINNERS & POSTER
COMPETITION WINNERS

The AAES Resident/Fellow Research Award was established in 1990 to encourage interest in endocrine surgery by those training as students and residents in general surgery. Presented work may be honored in either the Clinical or Basic Research categories.

The AAES Poster Competition was established in 2007.

1990

Michael J. Demeure — San Francisco, California
“Actin Architecture of Cultured Human Thyroid Cancer Cells: Predictor of Differentiation?”

Gerard M. Doherty — Bethesda, Maryland
“Time to Recovery of the Hypothalamic-Pituitary-Adrenal Axis After Curative Resection of Adrenal Tumors in Patients with Cushing’s Syndrome”

1992

Rodney Pommier — New York, New York
“Eleven Year Experience with Adrenocortical Carcinoma”

1996

Jennifer Meko — St. Louis, Missouri
“Evaluation of Somatostatin Receptor Scintigraphy in Detecting Neuroendocrine Tumors”

Beth A. Ditkoff — New York, New York
“Detection of Circulating Thyroid Cells in Peripheral Blood”

1997

Herbert Chen — Baltimore, Maryland
“Implanted Programmable Insulin Pumps: 153 Patient Years of Surgical Experience”

K. Michael Barry — Rochester, Minnesota
“Is Familial Hyperparathyroidism a Unique Disease”
1998

Julie Ann Sosa — Baltimore, Maryland
“Cost Implications of the Different Management Strategies for Primary Hyperparathyroidism in the US”

David Litvak — Galveston, Texas
“A Novel Cytotoxic Agent for Human Carcinoid”

1999

Andrew Feldman — Bethesda, Maryland
“Results of Heterotrophic Parathyroid Autotransplantation: A 13-Year Experience”

Alan Dackiw — Houston, Texas
“Screening for MEN1 Mutations in Patients with Atypical Multiple Endocrine Neoplasia”

2000

Electron Kebebew — San Francisco, California
“ID1 Proteins Expressed in Medullary Thyroid Cancer”

2001

Nestor F. Esnaola — Houston, Texas
“Optimal Treatment Strategy in Patients with Papillary Thyroid Cancer: A Decision Analysis”

Katherine T. Morris — Portland, Oregon
“High Dehydroepiandrosterone-Sulfate Predicts Breast Cancer Progression During New Aromatase Inhibitor Therapy and Stimulates Breast Cancer Cell Growth in Tissue Culture: A Renewed Role for Adrenalectomy”

2002

Rasa Zarnegar — San Francisco, California
“Increasing the Effectiveness of Radioactive Iodine Therapy in the Treatment of Thyroid Cancer Using Trichostatin A (TSA), A Histone Deacetylase (HDAC)”

Denise M. Carneiro — Miami, Florida
“Rapid Insulin Assay for Intraoperative Confirmation of Complete Resection of Insulinomas”
RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS CONTINUED

2003

Petra Musholt — Hanover, Germany
“RET Rearrangements in Archival Oxyphilic Thyroid Tumors: New Insights in Tumorigenesis and Classification of Hürthle Cell Carcinoma”

Tina W.F. Yen — Houston, Texas
“Medullary Thyroid Carcinoma: Results of a Standardized Surgical Approach in a Contemporary Series of 79 Consecutive Patients from The University of Texas, M. D. Anderson Cancer Center in Houston”

2004

Rebecca S. Sippel — Madison, Wisconsin
“Does Propofol Anesthesia Affect Intra-Operative Parathyroid Hormone Levels During Parathyroidectomy? A Randomized Prospective Trial”

David Finley — New York, New York
“Molecular Analysis of Hürthle Cell Neoplasms by Gene Profiling”

2005

Mark Cohen — St. Louis, Missouri
“Long-Term Functionality of Cryopreserved Parathyroid Autografts: A 13-Year Prospective Analysis”

Kepal N. Patel — New York, New York
“MUC1 Plays a Role in Tumor Maintenance in Aggressive Thyroid Carcinomas”

2006

Kyle Zanocco — Chicago, Illinois
“Cost-Effectiveness Analysis of Minimally Invasive Parathyroidectomy for Asymptomatic Primary Hyperparathyroidism”

Ashley Kappes Cayo — Madison, Wisconsin
“Lithium Ions: A Novel Agent for the Treatment of Pheochromocytomas and Paragangliomas”
RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS CONTINUED

2007
Tracy S. Wang — New Haven, Connecticut “How Many Endocrine Surgeons Do We Need?”

David Yu Greenblatt — Madison, Wisconsin “Valproic Acid Activates Notch1 Signaling and Inhibits Growth in Medullary Thyroid Cancer Cells”

2008
Elizabeth G. Grubbs — Houston, Texas “Preoperative Vitamin D (VITD) Replacement Therapy in Primary Hyperparathyroidism (PHPT): Safe But Beneficial?”

Linwah Yip — Pittsburgh, Pennsylvania “Loss of Heterozygosity of Selected Tumor Suppressor Genes in Parathyroid Carcinoma”

POSTER: Pierre Leyre — Poiters, France “Does the Risk of Compressive Hematoma After Thyroidectomy Authorize One-Day Surgery?”

2009
Insoo Suh — San Francisco, California “Candidate Germline Alterations Predisposing to Familial Nonmedullary Thyroid Cancer Map to Distinct Loci on Chromosomes 1 and 6”


POSTER: Matthew Nehs — Boston, Massachusetts “Inhibition of B-RAFV600 Oncoprotein Prevents Cell Cycle Progression and Invasion In Vitro and Reduces Tumor Growth and Metastasis in an In Vivo Orthotopic Model of Thyroid Cancer”

POSTER: Bian Wu — Los Angeles, California “Utilization of Parathyroidectomy in the Elderly: A Population-Based Study”
RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS CONTINUED

2010

David T. Hughes — Ann Arbor, Michigan
“Routine Central Lymph Node Dissection For Papillary Thyroid Cancer”

Matthew A. Nehs — Boston, Massachusetts
“Thyroidectomy With Neoadjuvant Plx4720 Extends Survival And Decreases Tumor Burden In An Orthotopic Mouse Model Of Anaplastic Thyroid Cancer”

POSTER: Aarti Mathur — Bethesda, Maryland
“Adrenal Venous Sampling in Primary Hyperaldosteronism: Standardizing A Gold Standard”

2011

Paxton V. Dickson — Houston, Texas
“Achieving Eugastrinemia in MEN1 Patients: Both Duodenal Inspection and Formal Lymph Node Dissection are Important”

Matthew Nehs — Boston, Massachusetts
“Necroptosis is a Novel Mechanism of Radiation-Induced Cell Death in Anaplastic Thyroid Cancer and Adrenocortical Cancer”

POSTER: Luc G.T. Moris — New York, New York
“Rising Incidence of Second Primary Cancer in Low-Risk Patients Receiving Radioactive Iodine Therapy”

2012

Ashley K. Cayo — Milwaukee, Wisconsin
“Predicting the Need for Calcium and Calcitriol Supplementation After Total Thyroidectomy: Results of a Prospective, Randomized Study”

Thomas J. Quinn — Bronx, New York
“Pasireotide (Som230) Is Effective for the Treatment of Pancreatic Neuroendocrine Tumors in a Multiple Endocrine Neoplasia Type 1 Conditional Knockout Mouse Model”

POSTER: Kevin Shepet — Madison, Wisconsin
“Parathyroid Cryopreservation Following Parathyroidectomy: A Worthwhile Practice?”
RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS CONTINUED

2013
Kai-Pun Wong — Hong Kong
“A Prospective Evaluation of Surgeon-Performed Transcutaneous Laryngeal Ultrasonography in Assessing Vocal Cord Function Before and After Thyroidectomy”

Scott K. Sherman — Iowa City, Iowa
“Gastric Inhibitory Polypeptide Receptor: A Future Alternative to Somatostatin Type 2 Receptor Imaging and Treatment in Neuroendocrine Tumors?”

POSTER: Sara Murray — Madison, Wisconsin
“Timing of Symptom Improvement After Parathyroidectomy”

2014
Heather Wachtel — Philadelphia, Pennsylvania
“Long-term Blood Pressure Control in Patients Undergoing Adrenalectomy for Primary Hyperaldosteronism”

Jessica Maxwell — Iowa City, Iowa
“A Practical Method to Determine the Site of Unknown Primary in Metastatic Neuroendocrine Tumors”

POSTER: Ben James — Chicago, Illinois
“A Novel Ultra-Rapid PTH Assay to Distinguish Parathyroid from Non-Parathyroid Tissue”

2015
Diana I. Ortiz — Medical College of Wisconsin “Cosyntropin Stimulation Testing On Postoperative Day 1 Allows for Selective Glucocorticoid Replacement Therapy in Patients Undergoing Adrenalectomy for Hypercortisolism: Results of a Novel, Multidisciplinary-Derived Institutional Protocol”

Melanie A. McWade — Vanderbilt University
“Fluorescence Detection of the Parathyroid Gland: Realizing the Potential for Intraoperative Guidance”

POSTER: Idit Dotan — McGill University Health Center
“Bio-Conjugated Nanotechnology to Target Papillary Thyroid Cancer in Vitro”

POSTER: Uma Rajbeharrysingh — Oregon Health and Science University
“Ionized Calcium And The Utility Of Maxpth To Evaluate Gastric Bypass Patients and Others With Non-Renal Secondary Hyperparathyroidism”
RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS CONTINUED

2016

Bruna Babic – National Institute of Health, National Cancer Institute
“Pediatric Patients with Pheochromocytoma and Paragangliomas Should Have Routine Preoperative Genetic Testing for Common Susceptibility Genes and Imaging to Detect Extra-Adrenal and Metastatic Tumors”

Peter T. White – University of Michigan
“A Novel Heat Shock Protein 90 Inhibitor Overcomes Receptor Tyrosine Kinase Resistance in Differentiated Thyroid Cancer”

POSTER: Selena Brouwer – University Medical Center Utrecht
“Intratumoral Heterogeneity of Microrna Expression is a Pervasive Feature in Papillary Thyroid Carcinoma”

POSTER: Wouter Kluijfhout – University of California San Francisco
“CEA Should Not Routinely be Used for Detection of a First Recurrence in Patients With MTC”

2017

Kendall J Keck – University of Iowa Carver College of Medicine
“Gene expression changes in small bowel neuroendocrine tumors associated with progression to metastases”

Omair Shariq – Mayo Clinic
“Contralateral suppression of aldosterone at adrenal venous Sampling predicts hyperkalemia following adrenalectomy for primary Aldosteronism”

POSTER: Priya Dedhia – University of Michigan
“Human intestinal tissue generates functional insulin producing cells”

POSTER: Heather Wachtel – Massachusetts General Hospital
“A multi-institutional analysis of adrenalectomy for secondary malignancy”
# 2017-2018 NEW MEMBERS

## ACTIVE MEMBERS

| Cameron Adkisson, MD         | Travis McKenzie, MD          |
| Scott Albert, MD             | Jorge Montalvo-Hernandez, MD |
| Emery Chen, MD               | Tricia Moo-Young, MD         |
| Shamly Dhiman, MD            | Sapna Nagar, MD              |
| Robin Cisco, MD              | Matthew Nehs, MD             |
| Peter DiPasco, MD            | Paul Park, MD                |
| Gustavo Fernandez-Ranvier, MD| Danielle Press, MD           |
| Carolyn Garner, MD           | Hadley Ritter, MD            |
| Cara Govednik, MD            | Christina Shaw, MD           |
| Katherine Heiden, MD         | Lawrence Shirley, MD         |
| Ashley Hodes, MD             | Meredith Sorensen, MD        |
| William King Jr., MD         | Insoo Suh, MD                |
| Jennifer Kuo, MD             | Sarah Treter, MD             |
| Leon Kushnir, MD             | Brian Untch, MD              |
| Dana Lin, MD                 | Thomas Wang, MD              |
| Catherine Madorin, MD        | Laura Wharry, MD             |
| Aarti Mathur, MD             |                               |

## CORRESPONDING MEMBERS

| Angkoon Anuwong, MD          | Rajeshbhai Patel, MD         |

## AFFILIATE PROVIDER MEMBER

| Todd Chennell, NP            |
# 2017-2018 NEW MEMBERS CONTINUED

## CANDIDATE MEMBERS

<table>
<thead>
<tr>
<th>Eden Amdemichael, MD</th>
<th>Rosebel Monteiro, MD</th>
</tr>
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<tbody>
<tr>
<td>Courtney Balentine, MD</td>
<td>Emily Murphy, MD</td>
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<tr>
<td>Natalie Calcatera, MD</td>
<td>Pavel Nockel, MD</td>
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<tr>
<td>Tyler Chan, MD</td>
<td>Reese Randle, MD</td>
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<tr>
<td>Patricia Cronin, MD</td>
<td>Henry Reinhart, MD</td>
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<td>Mashaal Dhir, MD</td>
<td>Holly Rochefort, MD</td>
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<td>Babak Givi, MD</td>
<td>Minerva Romero Arenas, MD</td>
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<tr>
<td>Scott Grant, MD</td>
<td>J. Bart Rose, MD</td>
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<tr>
<td>Timo Hakkarainen, MD</td>
<td>Carolyn Seib, MD</td>
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<td>Farah Karipineni, MD</td>
<td>Michael Corey Sullivan, MD</td>
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<td>Mamoona Khokhar, MD</td>
<td>Andrew Swearingen, MD</td>
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<td>Agathoklis Konstantinidis, MD</td>
<td>Heather Wachtel, MD</td>
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<tr>
<td>Brenessa Lindeman, MD</td>
<td>Lucas Watkins, MD</td>
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<td>Roy Lirov, MD</td>
<td>Feibi Zheng, MD</td>
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</tbody>
</table>

## RESIDENT/FELLOW MEMBERS

<table>
<thead>
<tr>
<th>Anna Aronova, MD</th>
<th>Elaine Lee, MD</th>
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<tr>
<td>Iuliana Bobanga, MD</td>
<td>Frances T. Lee, MD</td>
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<tr>
<td>Jessica Buicko, MD</td>
<td>Reema Mallick, MD</td>
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<tr>
<td>Rebekah Campbell, MD</td>
<td>Melissa Mao, MD</td>
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<td>James Davis, MD</td>
<td>Andrea Marcadis, MD</td>
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<tr>
<td>Neeta Erinjeri, MD</td>
<td>Ioanna Mazotas, MD</td>
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<tr>
<td>Brendan M. Finnerty, MD</td>
<td>Kelvin Memeh, MD</td>
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<tr>
<td>Sarah Fisher, MD</td>
<td>Jane Mills, MD</td>
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<tr>
<td>Meghan Garstka, MD</td>
<td>Maureen Moore, MD</td>
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<tr>
<td>Clint Gates, MD</td>
<td>Rosemary Morgan, MD</td>
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<tr>
<td>Vincent Gemma, MD</td>
<td>TK Pandian, MD</td>
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<tr>
<td>Amanda Graff-Baker, MD</td>
<td>Suraj Panjwani, MD</td>
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<tr>
<td>Moska Hamidi, MD</td>
<td>Mara Piltin, MD</td>
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<tr>
<td>Ana K. Islam, MD</td>
<td>Veljko Strajina, MD</td>
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<tr>
<td>Jessica Johnson, MD</td>
<td>Tanaz Vaghaiwalla, MD</td>
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<tr>
<td>Amna Khokar, MD</td>
<td>Sean Wrenn, MD</td>
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<tr>
<td>Eric Kuo, MD</td>
<td>Huan Yan, MD</td>
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<tr>
<td>Denise Lee, MD</td>
<td>Jonathan Zagzag, MD</td>
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</table>
Contributions to the AAES Foundation help enrich and extend the horizons of endocrine surgery. You gift helps support operations including activities related to education and research of endocrine surgical diseases. The AAES Foundation recognizes cumulative lifetime contributions beginning at the Friend level of $500 or less. Donors who have either pledged to donate or have already donated $10,000 to the AAES Foundation will be deemed Norman Thompson Fellows. As of March 14, 2018, the following individuals and organizations have made contributions to the AAES Foundation.

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- Travis Cotton
- Steven A. De Jong
- Quan-Yang Duh
- David R. Farley
- Douglas L. Fraker
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- John Bright Hanks
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Rasa Zarnegar  
Kevin Zirkle  
Washington University  
School of Medicine  
West Bloomfield General Surgery Team

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PAST MEETINGS

1980  Ann Arbor, Michigan  
      Local Arrangements Chair: Norman W. Thompson

1981  Washington, DC  
      Local Arrangements Chair: Glenn Geelhoed

1982  Houston, Texas  
      Local Arrangements Chair: Robert C. Hickey

1983  San Francisco, California  
      Local Arrangements Chair: Orlo Clark

1984  Kansas City, Kansas  
      Local Arrangements Chair: Stanley R. Friesen

1985  Toronto, Ontario, Canada  
      Local Arrangements Chair: Irving Rosen

1986  Rochester, Minnesota  
      Local Arrangements Chair: Jon A. van Heerden

1987  Chicago, Illinois  
      Local Arrangements Chair: Edwin L. Kaplan

1988  Boston, Massachusetts  
      Local Arrangements Chair: Blake Cady

1989  Chapel Hill, North Carolina  
      Local Arrangements Chair: Robert D. Croom

1990  Cleveland, Ohio  
      Local Arrangements Chair: Caldwell B. Esselstyn

1991  San Jose, California  
      Local Arrangements Chair: Maria Allo

1992  Miami, Florida  
      Local Arrangements Chair: George L. Irvin, III

1993  Williamsburg, Virginia  
      Local Arrangements Chair: H. Heber Newsome

1994  Detroit, Michigan  
      Local Arrangements Chair: Gary B. Talpos

1995  Philadelphia, Pennsylvania  
      Local Arrangements Chair: John Kukora
PAST MEETINGS CONTINUED

1996  
**Napa, California**  
Local Arrangements Chair: Quan-Yang Duh

1997  
**Baltimore, Maryland**  
Local Arrangements Chair: Robert Udelsman

1998  
**Orlando, Florida**  
Local Arrangements Chair: Peter J. Fabri

1999  
**New Haven, Connecticut**  
Local Arrangements Chair: Barbara Kinder

2000  
**Joint Meeting: London, United Kingdom/Lille, France**  
Local Arrangements Chair: Jack Monchik

2001  
**Atlanta, Georgia**  
Local Arrangements Chair: Collin Weber

2002  
**Banff, Alberta, Canada**  
Local Arrangements Chair: Janice L. Pasieka

2003  
**San Diego, California**  
Local Arrangements Chairs: Jay K. Harness & John Kukora

2004  
**Charlottesville, Virginia**  
Local Arrangements Chair: John B. Hanks

2005  
**Cancun, Mexico**  
Local Arrangements Chair: Miguel F. Herrera

2006  
**New York, New York**  
Local Arrangements Chair: Ashok R. Shaha

2007  
**Tucson, Arizona**  
Local Arrangements Chair: Michael J. Demeure

2008  
**Monterey, California**  
Local Arrangements Chair: Quan-Yang Duh

2009  
**Madison, Wisconsin**  
Local Arrangements Chair: Herbert Chen

2010  
**Pittsburgh, Pennsylvania**  
Local Arrangements Chair: Sally E. Carty

2011  
**Houston, Texas**  
Local Arrangements Chair: Nancy D. Perrier

2012  
**Iowa City, Iowa**  
Local Arrangements Chair: Ronald Weigel
PAST MEETINGS CONTINUED

2013  **Chicago, Illinois**  
Local Arrangements Chair: Peter Angelos

2014  **Boston, Massachusetts**  
Local Arrangements Chair: Richard A. Hodin

2015  **Nashville, Tennessee**  
Local Arrangements Chair: Carmen Solorzano

2016  **Baltimore, Maryland**  
Local Arrangements Chair: John A. Olson, Jr.

2017  **Orlando, Florida**  
Local Arrangements Chair: Mira Milas
SPECIAL SESSIONS

ADVANCED ENDOCRINE SURGERY COURSE

SATURDAY, MAY 5, 2018  8:00 AM – 4:30 PM
JB Duke Hotel – Executive Classroom
*Separate registration required for this Course

NEW IN 2018 - Take your skills to the next level and help enhance your clinical practice of endocrine surgery. This Course will review current standards in management of complex endocrine diseases, while engaging on a personal level with nationally recognized authorities in the field. A multi-disciplinary panel of experts will highlight the nuances of complex decision making. Panelists will be unaware of the real-life clinical scenarios presented which creates a more practical approach and lends itself well to learning objectives of practicing surgeons with a special interest in thyroid, parathyroid and adrenal disease.

LUNCH SESSION: THE CHANGING FACE OF THYROID CANCER MANAGEMENT FOR SURGEONS: REAL-LIFE APPLICATIONS OF THE NEW ATA GUIDELINES

Educational grant support provided by Sanofi Genzyme

SUNDAY, MAY 6, 2018  12:30 PM – 1:30 PM
JB Duke Hotel – Ballroom (space limited to the first 250 attendees)

This session will be a case-based approach to educate attendees of the American Association of Endocrine Surgeons (AAES) about important changes in the American Thyroid Association (ATA) Guidelines and how they are pertinent to surgeons in their everyday practice.

LUNCH SESSION: THE BUSINESS OF ENDOCRINE SURGERY

MONDAY, MAY 7, 2018  12:00 PM – 1:00 PM
President’s Ballroom

This session will focus on coding and billing in endocrine surgery. The session will be useful to surgeons across the spectrum of work experience and will present the basics of coding and billing, how a surgeon gets paid for any work that they do. The billing cycle will be presented, the process that occurs after one chooses their codes. Speakers will delve into the more intricate parts of office-based coding and how to get the most from E&M coding. Finally, difficult scenarios in operative coding will be discussed and including how to code to best represent the work that is done without overstating what was done.
SPECIAL SESSIONS

BREAKFAST SESSION: TRANSORAL ENDOSCOPIC ENDOCRINE SURGERY IN THE U.S.: LESSONS, TIPS, AND FUTURE DIRECTIONS

Educational grant support provided by Medtronic

TUESDAY, MAY 8, 2018   7:00 AM – 8:00 AM
President’s Ballroom

This session will provide an overview, history, and technical details of transoral endoscopic thyroid and parathyroid surgery. Panelists will discuss the purported advantages and disadvantages, as well as the evolving indications and contraindications, of the transoral approach. They will provide an update on the initial experiences in North America, including the unique issues and challenges in this patient population. In addition, panelists will discuss the role of devices and technological adjuncts in the transoral technique, and discuss the logistical and ethical implications of starting a transoral program at an individual institution as well as broadening dissemination nationally.
HISTORICAL LECTURER

William Stewart Halsted; Our Surgical Heritage (Also an Endocrine Surgeon!)

John Cameron, MD
John Hopkins Hospital

TUESDAY, MAY 8, 2018  8:00 AM – 8:45 AM
Presidents Ballroom

Dr. John L. Cameron is the Alfred Blalock Distinguished Service Professor of Surgery at The Johns Hopkins University School of Medicine and has had a long and distinguished career in alimentary tract surgery and specifically in pancreatic cancer. He has won worldwide acclaim for mastering the Whipple procedure. At the beginning of his career, the mortality rate from the Whipple procedure was nearly 30 percent. He has worked to lower that to 1-2 percent at Johns Hopkins. He has operated on more patients with pancreatic cancer and done more Whipple resections than any other surgeon in the world.

He has been a leader in the surgical profession, serving as president of the American College of Surgeons, the Society for Surgery of the Alimentary Tract, the Southern Surgical Association, the Society of Clinical Surgery, the Society of Surgical Chairs, the Halsted Society and the American Surgical Association. He served as chief of surgery for The Johns Hopkins Hospital for nineteen years.

Dr. Cameron obtained his undergraduate degree from Harvard University in 1958, and his medical degree from The Johns Hopkins University School of Medicine in 1962. All of his training in General and Thoracic Surgery was obtained at The Johns Hopkins Hospital, where he has spent the entirety of his distinguished career in patient care and surgical training. He has trained more surgeons who have gone on to achieve leadership positions in American Surgery than any other chair in the country. He has been married to his wife Doris for fifty-seven years. They have four children, one is a school teacher and three work in the medical sciences.
### HISTORICAL LECTURERS AT RECENT MEETING

<table>
<thead>
<tr>
<th>Year</th>
<th>Speaker</th>
<th>Institution</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Edwin L. Kaplan, MD</td>
<td>University of Chicago</td>
<td><em>Radiation Induced Thyroid Cancer – A Chicago Experience</em></td>
</tr>
<tr>
<td>2010</td>
<td>Norman W. Thompson, MD</td>
<td>University of Michigan</td>
<td><em>The Time Was Right</em></td>
</tr>
<tr>
<td>2011</td>
<td>Jon A. van Heerden, MD</td>
<td>Medical University of South Carolina</td>
<td><em>Pheochromocytoma Resection: Now and Then</em></td>
</tr>
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<td>Orlo H. Clark, MD</td>
<td>University of California, San Francisco</td>
<td><em>Recognition of Endocrine Glands and Abnormalities by Artists and Surgeons</em></td>
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<td>Wen T. Shen, MD MA</td>
<td>University of California, San Francisco</td>
<td><em>From ‘Kindred Spirits’ to the Social Network</em></td>
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<td>Patricia J. Numann, MD</td>
<td>SUNY Upstate Medical University</td>
<td><em>Ode to an Indian Rhinoceros</em></td>
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<td>2015</td>
<td>Robert Beazley, MD</td>
<td>Boston University School of Medicine</td>
<td><em>The Glands of Owen...Who Was Owen?</em></td>
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<td>2016</td>
<td>Samuel A. Wells, Jr., MD</td>
<td>National Cancer Institute</td>
<td><em>The Diagnosis and Treatment of Thyroid Cancer: A Historical Perspective</em></td>
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<td>David L. Nahrwold, MD</td>
<td>Northwestern University</td>
<td><em>Surgery, Surgeons and their College</em></td>
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ORLO & CAROL CLARK
DISTINGUISHED LECTURER IN
ENDOCRINE SURGERY

“Breakthrough to Brave”
Julie Freischlag, MD FRCS Ed (Hon)
Wake Forest University

MONDAY, MAY 7, 2018  8:00 AM – 8:45 AM
Presidents Ballroom

Dr. Freischlag joined Wake Forest Baptist Medical Center in April 2017 as Chief Executive Officer. As CEO, she has the overall responsibility for the Medical Center’s clinical, academic and innovation enterprises and its annual operating budget of $2.5B. On July 1, 2017, Dr. Freischlag became the Interim Dean of Wake Forest School of Medicine.

For more than 15 years, she has led education and training programs at top medical schools in her role as professor and chair of surgery and vascular surgery departments. Dr. Freischlag also has more than 30 years of experience leading patient-care services as chief of surgery or vascular surgery at nationally ranked hospitals. She served as professor, chair of the surgery department and surgeon-in-chief at Johns Hopkins Medical Institutions. She led initiatives to expand research, add specialty clinical services, improve patient-centered care and patient safety, redesign the surgical training program and enhance academic career paths for faculty.

Her national leadership includes serving as a former governor and secretary of the Board of Governors and a regent and past chair of the Board of Regents of the American College of Surgeons. She is the past president of the Society for Vascular Surgery and the Society for Vascular Surgery Foundation, and past president of the Association of VA Surgeons and the Society of Surgical Chairs. Dr. Freischlag was the editor of JAMA Surgery for ten years (2005-2014) and is a member of the editorial boards of the Annals of Vascular Surgery, Journal of the American College of Surgeons, and British Journal of Surgery.

Dr. Freischlag has received numerous teaching awards, an achievement award from the Department of Veterans Affairs, and was elected to the National Academy of Medicine in 2015.
PRESIDENT’S INVITED LECTURERS
AT RECENT MEETINGS

1991  Gregory B. Bulkley, MD
       Johns Hopkins University, Baltimore, Maryland
       *Endothelial Xanthine Oxidase: a Radical Transducer of Signals and Injury*

1992  Donald Coffey, PhD
       Bethesda, Maryland
       *New Concepts Concerning Cancer*

1993  John L. Doppman, MD
       National Institutes of Health, Bethesda, Maryland
       *Recent Advances in Endocrinologic Imaging*

1994  Gordon J. Strewler, MD
       San Francisco, California
       *The Parathyroid Hormone Related Protein: Clinical and Basic Studies of a Polyfunctional Protein*

1995  Ivor M.D. Jackson, MD
       Providence, Rhode Island
       *Regulation of TSH Secretion: Implications for Disorders of the Thyroid Function*

1996  Victor E. Gould, MD
       Rush-Presbyterian-Medical Center, Chicago, Illinois
       *The Diffuse Neuroendocrine System: Evolution of the Concept and Impact on Surgery*

1997  Bertil Hamberger, MD, PhD
       Karolinska Institute, Stockholm, Sweden
       *The Nobel Prize*

1998  Susan Leeman, PhD
       Boston University, Boston, Massachusetts
       *The NeuroPeptides: Substance P and Neurotensin*

1999  James Hurley, MD
       Cornell University, New York, New York
       *Post-Operative Management of Differentiated Thyroid Cancer*

2000  James Shapiro, MD
       University of Alberta, Edmonton, Alberta
       *Pancreatic Islet Cell Transplantation*
PRESIDENT’S INVITED LECTURERS
AT RECENT MEETINGS CONTINUED

2001  Andrew F. Stewart, MD
University of Pittsburgh, Pittsburgh, Pennsylvania
*Parathyroid Hormone-Related Protein: From Hypercalcemia of Malignancy to Gene Therapy from Diabetes*

2002  William F. Young Jr., MD
Mayo Clinic, Rochester, Minnesota
*Adrenal-Dependent Hypertension: Diagnostic Testing Insights*

2003  Sissy M. Jhiang, MD
The Ohio State University, Columbus, Ohio
*Lessons From Thyroid Cancer: Genetics and Gene Therapy*

2004  Edward R. Laws Jr, MD
University of Virginia, Charlottesville, Virginia
*The Diagnosis and Management of Cushing’s Disease*

2005  David Duick, MD
Phoenix, Arizona
*Thyroid Nodules and Mild Primary Hyperparathyroidism: Examples of Clinical Perplexities or Unresolvable Conundrums*

2006  Michael Bliss, PhD
University of Toronto, Ontario, Canada
*Harvey Cushing and Endo-Criminology*

2007  Virginia A. Livolsi, MD
University of Pennsylvania, Philadelphia, Pennsylvania
*Thyroid Nodule FNA and Frozen Section: Partners or Adversaries*

2008  F. John Service, MD, PhD
Mayo Clinic, Rochester, Minnesota
*Hypoglycemia in Adults – 80th Anniversary of Hyperinsulinism*

2009  Jeffrey M. Trent, PhD
Translation Genomics Research Institute, Phoenix, Arizona
Integrating Genetics, *Genomics, and Biology Towards a More Personalized Medicine*

2010  Alexander J.B. McEwan, MB
University of Alberta, Edmonton, Alberta, Canada
*The State of the Art of Radionucleotide Imaging and Therapy in Patients with Neuroendocrine Tumors*
PRESIDENT’S INVITED LECTURERS
AT RECENT MEETINGS CONTINUED

2011 Allan H. (Bud) Selig
9th Commissioner of Major League Baseball
*Major League Baseball – 2011 Economic and Health Related Issues*

2012 Atul A. Gawande, MD, MPH
Brigham and Women’s Hospital
*Strategies for Improving Surgical Performance*

2013 Anders O.J. Bergenfelz, MD, PhD
Lund University Hospital
*Quality Control in Clinical Practice and Postgraduate Education in Endocrine Surgery*

2014 Yuri E. Nikiforov, MD, PhD
University of Pittsburgh School of Medicine
*Progress in Genomic Markers for Thyroid Cancer: How Does it Affect Patient Management?*

2015 Gary Hammer, MD, PhD
University of Michigan
*Translating Adrenal Stem Cells: Implications for Adrenal Disease*

2016 Steven A. Rosenberg, MD, PhD
National Cancer Institute and George Washington University
*The Curative Potential of T-cell Transfer Immunotherapy for Patients with Metastatic Cancer*

2017 Jack A. Gilbert, PhD
University of Chicago
*Thyroid Cancer and the Microbiome*
LEARNING OBJECTIVES

This activity is designed for all endocrine surgeons seeking the latest developments in endocrine surgical technique and its related research. The intent of the program is to improve the quality of patient care and improve overall patient safety. Audience participation and interaction will be encouraged. The content and format of the program have been determined based on evaluations and suggestions of attendees of previous programs.

At the completion of this activity, attendees will be able to:

1. Participate in discussions and explain current developments in the science and clinical practice of endocrine surgery.
2. Explain practical new approaches and solutions to relevant concepts and problems in endocrine surgical care.
3. Apply additional working knowledge to assist them with their existing and growing endocrine practice.
4. Possess new information and recent developments as they relate to recently established guidelines and procedures.
5. Explain the new designation of Noninvasive Follicular Tumor with Papillary-like nuclear Features (NIFTP) and what it means for the management care plan of this subtype of thyroid neoplastic disease.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

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

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of 26.25 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the AMA PRA Category 1 Credits™ listed above, a maximum of 8.50 credits meet the requirements for Self-Assessment.
CME CERTIFICATES AND EVALUATION FORMS

You may complete your attendance verification, meeting evaluation and Self-Assessment posttest online. You will receive your electronic CME certificate after completing the evaluation and posttests. Your final CME hours will be submitted to the ACS. Members of the ACS will have their credits posted to the ACS website around 30 days post-activity.

The website to claim your CME credits will be emailed to all attendees.

The American Board of Surgery requirement for fulfillment of MOC Part 2 is the completion of a minimum of 90 hours of *AMA PRA Category 1 Credit™* over a three-year cycle. At least 60 of the 90 hours must include a self-assessment activity—a written Q&A exercise (paper or online) that assesses the surgeon’s understanding of the material presented during the CME program. A score of 75% or higher must be attained on the self-assessment exercise. Multiple attempts are permitted.

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**MEETING TOTAL**  
**26.25**  **14.00**
DISCLOSURE INFORMATION

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. Therefore, it is mandatory that both the program planning committee and speakers complete disclosure forms. Members of the program committee were required to disclose all financial relationships and speakers were required to disclose any financial relationship as it pertains to the content of the presentations. The ACCME defines a ‘commercial interest’ as “any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients”. It does not consider providers of clinical service directly to patients to be commercial interests. The ACCME considers “relevant” financial relationships as financial transactions (in any amount) that may create a conflict of interest and occur within the 12 months preceding the time that the individual is being asked to assume a role controlling content of the educational activity.

ACS is also required, through our joint providership partners, to manage any reported conflict and eliminate the potential for bias during the activity. All program committee members and speakers were contacted, and the conflicts listed below have been managed to our satisfaction. However, if you perceive a bias during a session, please report the circumstances on the session evaluation form.

Please note we have advised the speakers that it is their responsibility to disclose at the start of their presentation if they will be describing the use of a device, product, or drug that is not FDA approved or the off-label use of an approved device, product, or drug or unapproved usage.

The requirement for disclosure is not intended to imply any impropriety of such relationships, but simply to identify such relationships through full disclosure and to allow the audience to form its own judgments regarding the presentation.

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HOTEL INFORMATION

WASHINGTON DUKE INN & GOLF CLUB (Main Hotel)
3001 Cameron Boulevard, Durham, NC 27705
T: 919-490-0999
W: www.washingtondukeinn.com

JB DUKE HOTEL (Secondary Hotel)
230 Science Drive, Durham, NC 27708
T: 919-660-6400
W: www.jbdukehotel.com

AIRPORT INFORMATION

The Washington Duke Inn is located 20 minutes from the Raleigh-Durham International Airport (RDU). https://www.rdu.com

TRANSPORTATION FROM THE AIRPORT

The Washington Duke Inn and the JB Duke Hotel do NOT provide airport shuttles.

Taxi Service: A one-way taxi ride from the airport to the Washington Duke Inn will cost approximately $45

Uber/Lyft Service: $20 one-way

CONTACTS

Sanziana Roman, MD, Local Arrangements Co-Chair
E: Sanziana.roman@ucsf.edu

Julie Ann Sosa, MD, MA, Local Arrangements Co-Chair
E: Julie.sosa@ucsf.edu

AMERICAN ASSOCIATION OF ENDOCRINE SURGEONS
201 East Main Street, Suite 1405, Lexington, KY 40507
T: 859-402-9810   F: 859-514-9166   E: info@endocrinesurgery.org
W: www.endocrinesurgery.org
6:30 am – 7:00 am
Endocrine Surgery University Registration

7:00 am — 5:45 pm
Endocrine Surgery University
An educational activity for AAES Endocrine Surgery Fellows

COURSE DIRECTOR
Mira M. Milas, MD - Banner Health University Medical Center Phoenix

COURSE FACULTY/PANELISTS
- Michael Campbell, MD - University of California Davis
- James Lee, MD - Columbia University Medical Center
- Chris McHenry, MD - MetroHealth Medical Center
- Rodney Pommier, MD - Oregon Health and Science University
- Randall Scheri, MD - Duke University School of Medicine
- Wen T. Shen, MD MA - University of California-San Francisco
- Rebecca Sippel, MD - University of Wisconsin
- Michael Starks, MD - Penobscot Surgical Care, PA
- Kristin Wagner, MD - Surgical Specialists of Charlotte
- Tracy Wang, MD, MPH - Medical College of Wisconsin
- Martha Zeiger, MD - UVA School of Medicine

6:30 pm — 8:30 pm
Endocrine Surgery University Dinner
Invitation Only
AGENDA CONTINUED
SATURDAY, MAY 5, 2018

6:30 am – 7:00 am
Endocrine Surgery University Registration

7:00 am – 12:00 pm
Endocrine Surgery University, continued

8:00 am – 4:30 pm
ADVANCED ENDOCRINE SURGERY COURSE
*Separate registration required

COURSE DIRECTORS
Shaghayegh Aliabadi, MD - The Oregon Clinic
Erin Felger, MD - Washington Hospital Center

COURSE MODERATORS
- Dina Elaraj, MD – Northwestern University
- Kepal Patel, MD – New York University Langone Medical Center
- Jenifer Rosen, MD – Washington Hospital Center
- Alan Siperstein, MD – Cleveland Clinic

COURSE PANELISTS
- Peter Angelos, MD, PhD – University of Chicago
- Nancy Perrier, MD – MD Anderson Cancer Center
- Denise Carnero-Pla, MD – Medical University of South Carolina
- Kaare Weber, MD – WPHPA Surgical Specialists
- Sara Ahmadi, MD – Duke University School of Medicine
- Janice Pasieka, MD – University of Calgary
- Herb Chen, MD – University of Alabama at Birmingham School of Medicine
- Michael Yeh, MD – University of California Los Angeles
- Julie McGill, MD – Atlanta Endocrine Surgery
- Ralph Tufano, MD – John Hopkins University School of Medicine
- Larry Kim, MD – University of North Carolina
- David Bimston, MD – Memorial Center for Integrative Endocrine Surgery
- Jennifer Perkins, MD - Duke University School of Medicine
- Quan-Yang Duh, MD – University of California San Francisco
- Electron Kebebew, MD – National Institutes of Health
- James Broome, MD – St. Thomas Endocrine Surgery Specialists
- Kim Vanderveen, MD – Denver Center for Endocrine Surgery, P.C.
1:00 pm – 6:00 pm  
**Washington Duke Inn Golf Club**  
**AAES Golf Tournament**  
Additional registration fee applies

2:00 pm – 6:00 pm  
**Ambler Stadium**  
**AAES Tennis Tournament**  
Additional registration fee applies

2:00 pm – 7:00 pm  
**President’s Ballroom Pre-Function**  
**Registration Open**

2:00 pm – 6:00 pm  
**Duke University Room**  
**AAES Council Meeting**

6:30 pm – 8:30 pm  
**NanaSteak Restaurant**  
**Executive Council Dinner**  
Invitation Only

9:00 pm – 11:00 pm  
**Tyler’s Restaurant & Tap Room**  
**324 Blackwell St, Durham, NC**  
**Young Surgeons’ Social**

All young members of the AAES (Resident/Fellow and Candidate members) and those still young at heart are welcome to join in for an evening of comradery, pool and shuffleboard before the Annual Meeting kicks off on Sunday. Tyler’s is a short cab ride away. Transportation not provided.
AGENDA CONTINUED

SUNDAY, MAY 6, 2018

7:00 am — 4:00 pm  
President’s Ballroom Pre-Function
Registration Open

7:00 am — 8:30 am  
Al Buehler Cross County Public Trail
5K Fun Run  
Meet in the lobby of the Washington Duke Inn
Additional registration fee applies.  
On-site registrations will be accepted Sunday morning before the event begins.

7:00 am — 8:00 am  
Duke University Room
Accreditation Committee Meeting

7:30 am — 8:30 am  
Sanford Boardroom
Research Committee Meeting

8:00 am — 9:00 am  
Duke University Room
Fellowship Committee Meeting

8:30 am — 10:00 am  
Forest Room
Poster Walk Around and Poster Judging
Poster Chair: Geeta Lal, MD

9:00 am — 10:00 am  
Duke University Room
Affiliate Provider Meeting

10:00 am — 10:45 am  
President’s Ballroom
AAES Opening Session, Dr. Martha Zeiger

10:45 am — 12:00 pm  
President’s Ballroom
SCIENTIFIC SESSION I: Papers 1-5
MODERATORS: Wen Shen, MD – University of California San Francisco, and Glenda Callendar, MD – Yale University

12:00 pm — 2:00 pm  
President’s Terrace & Gallery; Vista Restaurant
Lunch Break (lunch provided)
12:30 pm — 1:30 pm  
**LUNCH SESSION at the JB Duke Hotel (optional)**  
“The Changing Face of Thyroid Cancer Management for Surgeons: Real-Life Applications of the New ATA Guidelines”  
*Educational grant support provided by Sanofi Genzyme*  
Limited to the first 250 attendees!

MODERATORS: Antonia Stephen - Massachusetts General Hospital, and David T. Hughes - University of Michigan Health System

PANELISTS: Bryan Haugen - University of Colorado; Libby Grubbs - MD Anderson; Julie Ann Sosa – University of California San Francisco; Peter Sadow - Massachusetts General Hospital; and Gary Bloom - ThyCa: Thyroid Cancer Survivors’ Association, Inc.

2:00 pm — 3:00 pm  
**SCIENTIFIC SESSION II: Papers 6-9**

MODERATORS: Sonia Sugg, MD – University of Iowa Hospitals & Clinics, and Jacob Moalem, MD – University of Rochester, Strong Memorial Hospital

3:00 pm — 3:30 pm  
**Break, Exhibits, & Poster Viewing**

3:30 pm — 4:45 pm  
**SCIENTIFIC SESSION III: Papers 10-14**

MODERATORS: Emad Kandil, MD – Tulane School of Medicine, and William Mendez, MD – University of Puerto Rico

6:00 pm — 8:00 pm  
**AAES President’s Reception**  
*Hall of Fame and Hall of Honor*

Join colleagues and friends for the signature kick-off reception to the AAES Annual Meeting. Cameron Stadium is a short ½ mile (14 minute) walk from the Washington Duke Inn. Drink tickets and hors d’oeuvres will be provided.
AGENDA CONTINUED
MONDAY, MAY 7, 2018

6:30 am — 7:00 pm  
President’s Ballroom Pre-Function  
Registration Open

7:00 am — 8:00 am  
Matlock Room  
Education Committee Meeting

7:00 am — 8:00 am  
Biddle Room  
CESQIP Committee Meeting

7:00 am — 8:00 am  
Holloway Room  
IT Committee Meeting

7:00 am — 8:00 am  
Ambassador & Forest Rooms  
Continental Breakfast in Exhibit Hall

7:00 am — 8:00 am  
Duke University Room  
New Member Breakfast  
Invitation Only

8:00 am — 8:45 am  
President’s Ballroom  
Orlo & Carol Clark Distinguished Lecturer in Endocrine Surgery: “Breakthrough to Brave”  
SPEAKER: Julie Freischlag, MD FRCS Ed (Hon) - Wake Forest University

8:45 am — 10:00 am  
President’s Ballroom  
SCIENTIFIC SESSION IV: Papers 15-19  
MODERATORS: Nancy Perrier, MD – MD Anderson Cancer Center, and Karen Devon, MD – University of Toronto

10:00 am — 10:30 am  
Ambassador & Forest Rooms  
Breaks, Exhibits, & Poster Viewing

10:30 am — 11:30 am  
President’s Ballroom  
SPEAKER: Martha Zeiger, MD – University of Virginia School of Medicine

11:30 am — 1:30 pm  
President’s Terrace & Gallery; Vista Restaurant  
Lunch Break (Lunch provided)
12:00 pm — 1:00 pm  
**LUNCH SESSION (optional)**

“The Business of Endocrine Surgery”
MODERATORS: Michael Starks – Penobscot Surgical Care, PA, and Kimberly Vanderveen – Denver Center for Endocrine Surgery, P.C.

SPEAKERS: Kimberly Vanderveen – Denver Center for Endocrine Surgery, P.C.; Tom Connally – Norman Regional Hospital; Denise Carneiro-Pla – Medical University of South Carolina; and Allan Siperstein – Cleveland Clinic

1:30 pm — 2:30 pm  
**SCIENTIFIC SESSION V: Papers 20-23**
MODERATORS: John Phay, MD – *Ohio State Medical Center*, and Linwah Yip, MD – *University of Pittsburgh Medical Center*

2:30 pm — 2:45 pm  
**Breaks, Exhibits, & Poster Viewing**

2:45 pm — 4:15 pm  
**Interesting Cases**
MODERATOR: Carmen Solorzano, MD – Vanderbilt University Medical Center

PANELISTS: Janice Pasieka – University of Calgary; Douglas Evans – Medical College of Wisconsin; and Quan-Yang Duh – University of California San Francisco

4:30 pm — 5:30 pm  
**AAES Business Meeting**
*Only Active, Allied Specialist and Senior Members need attend*

7:00 pm — 8:00 pm  
**Gala Reception**

8:00 pm — 10:30 pm  
**Gala Dinner**
*Gala Dinner included with registration; ticket required for guests*

The AAES Gala Dinner has assigned seating. Please come by the Registration Desk and sign up for your seat by Monday at 1:30pm.
7:00 am — 8:00 am  
President’s Ballroom Pre-Function
Registration Open

7:00 am — 8:00 am  
Ambassador & Forest Rooms
Main Breakfast in Exhibit Space

7:00 am — 8:00 am  
President’s Ballroom
BREAKFAST SESSION (optional)
“Transoral Endoscopic Endocrine Surgery in the U.S.: Lessons, Tips, Future Directions”
Educational grant support provided by Medtronic

FACULTY: Tobias Carling – Yale University; Raymon H. Grogan – Baylor College of Medicine; Insoo Suh – University of California San Francisco; and William B. Inabnet, III - Icahn School of Medicine at Mount Sinai

7:00 am — 8:00 am  
Biddle Room
Community Based Surgeons Committee Meeting

8:00 am — 8:45 am  
President’s Ballroom
HISTORICAL LECTURER
“William Stewart Halsted; Our Surgical Heritage (Also an Endocrine Surgeon!)”
SPEAKER: John Cameron, MD - John Hopkins Hospital

8:45 am — 10:00 am  
President’s Ballroom
SCIENTIFIC SESSION VI: Papers 24-28
MODERATORS: Herb Chen, MD - University of Alabama at Birmingham, and Sarah Oltmann, MD – University of Texas Southwestern

10:00 am — 10:30 am  
Ambassador & Forest Rooms
Break, Exhibits, & Poster Viewing

10:30 am — 12:00 pm  
President’s Ballroom
SCIENTIFIC SESSION VII: Papers 29-34
MODERATORS: Bradford Carter, MD – Bryn Mawr College, and Christina Maser, MD – California State University, Fresno

12:00 pm
Meeting Adjourn
SCIENTIFIC PROGRAM

♦ Denotes Resident/Fellow Research Award Competition Paper

NOTE: Author listed in **BOLD** is the presenting author

The Scientific Program includes all sessions that are eligible for CME credit. Credit amounts for each session are listed on page 37.
8:30 am — 10:00 am
Poster Walk Around & Poster Judging

10:00 am — 10:45 am
AAES Opening Session

Welcome & Memoriam – Martha Zeiger, MD
Welcome to Durham – Sanziana Roman, MD and Julie Ann Sosa, MD, MA
Introduction of New Members
Introduction to 2017 Paul LoGerfo Award Presentations – Kepal Patel, MD
Xavier Keutgen, MD – Rush University Medical Center
Raymon Grogan, MD – Baylor College of Medicine
Introduction to 2017 ThyCa: Thyroid Cancer Survivors’ Association Award for Thyroid Cancer Research – Kepal Patel, MD
Melissa Wilson, MD – NYU Langone Medical Center

10:45 am — 12:00 pm
SCIENTIFIC SESSION I: Papers 1-5
MODERATORS: Wen Shen, MD - University of California San Francisco, and Glenda Callendar, MD – Yale University

10:45 am – 11:00 am
♦ 01. A TALE OF TWO CITIES: INCREASED RAI DOSE IMPROVES RECURRENCE RATES IN ATA HIGH RISK DIFFERENTIATED THYROID CANCER
Katherine D. Gray¹, Sahar Bannani², Cecile Caillard², Sonia Amanat¹, Pavel Romanov¹, Timothy M Ullmann³, Laurent Brunaud³, Toni Beninato¹, Thomas J. Fahey, III¹, Eric Mirallie², Rasa Zarnegar¹
¹New York Presbyterian Hospital, Weill Cornell Medicine, ²Hotel-Dieu Hospital - CHU Nantes, ³University of Lorraine - CHRU Nancy
11:00 am – 11:15 am

♦ 02. DO PATIENTS WITH FAMILIAL NON-MEDULLARY THYROID CANCER PRESENT WITH MORE AGGRESSIVE DISEASE? IMPLICATIONS FOR INITIAL SURGICAL TREATMENT.
Mustapha El Lakis¹, Andreas Giannakou¹, Pavel Nockel¹, Douglas Wiseman¹, Sudheer Gara¹, Dhaval Patel¹, Joanna Klubo-Gwiezdzinska², Naris Nilubol¹, Electron Kebebew¹
¹Endocrine Oncology Branch, National Cancer Institute, ²National Institute of Diabetes and Digestive and Kidney Diseases

11:15 am – 11:30 am

♦ 03. INTER-INSTITUTIONAL VARIATION IN THE PREDICTIVE VALUE OF THYROSEQ V2 FOR THYROID NODULES
Andrea R. Marcadis¹, Allen S. Ho², Jennifer L. Marti³, Justin Tepe¹, Christina E. Swartzwelder¹, Serena Byrd¹, Brian R. Untch¹, Ashok R. Shaha¹, Bin Xu⁴, Oscar Lin⁴, Ronald A. Ghossein⁴, Richard J. Wong¹, Luc G.T. Morris¹
¹Head and Neck Surgery, Memorial Sloan Kettering Cancer Center, ²Surgery, Cedars-Sinai Medical Center, ³Surgery, New York Presbyterian/Weill Cornell Medical Center, ⁴Pathology, Memorial Sloan Kettering Cancer Center

11:30 am – 11:45 am

♦ 04. POSTOPERATIVE HEMATOMA EVACUATION AFTER THYROID AND PARATHYROID SURGERY: AN ANALYSIS OF THE CESQIP DATABASE
Stephanie D Talutis¹, Sowmya R Rao¹, Frederick T Drake¹, David McAneny¹
¹General Surgery, Boston Medical Center

11:45 am – 12:00 pm

♦ 05. TREATMENT OF LATERAL NECK PAPILLARY THYROID CARCINOMA RECURRENCE AFTER COMPARTMENT-ORIENTED LATERAL NECK DISSECTION
Veljko Strajina¹, Zahraa Al-Hilli¹, Benzon M Dy¹, Mabel Ryder¹, Geoffrey B Thompson¹, David R Farley¹, Travis J McKenzie¹, Melanie L Lyden¹
¹Mayo Clinic, Rochester, MN

12:00 pm — 2:00 pm

President’s Terrace & Gallery; Vista Restaurant

Lunch Break (Lunch provided)
12:00 pm — 1:30 pm  
JB Duke Hotel – Ballroom  

LUNCH SESSION at the JB Duke Hotel (optional)  
“The Changing Face of Thyroid Cancer Management for Surgeons: Real-Life Applications of the New ATA Guidelines”  

Educational grant support provided by Sanofi Genzyme  
Limited to the first 250 attendees!

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PANELISTS: Bryan Haugen - University of Colorado; Libby Grubbs - MD Anderson; Julie Ann Sosa – University of California San Francisco; Peter Sadow - Massachusetts General Hospital; and Gary Bloom - ThyCa: Thyroid Cancer Survivors’ Association, Inc.

2:00 pm — 3:00 pm  
President’s Ballroom  

SCIENTIFIC SESSION II: Papers 6-9  

MODERATORS: Sonia Sugg, MD – University of Iowa Hospitals & Clinics, and Jacob Moalem, MD – University of Rochester, Strong Memorial Hospital

2:00 pm – 2:15 pm  
♦ 06. END-ORGAN EFFECTS OF PRIMARY HYPERPARATHYROIDISM: A POPULATION-BASED STUDY  
Yasmine Assadipour1, Hui Zhou2, Eric J Kuo1, Philip I Haigh3, Annette L Adams4, Michael W Yeh1  
1Surgery, UCLA, 2Division of Epidemiology, Kaiser Permanente, 3Oncologic and Endocrine Surgery, Kaiser Permanente, 4Kaiser Permanente

2:15 pm – 2:30 pm  
♦ 07. THE DEVIL IS IN THE DETAILS: ASSESSING TREATMENT AND OUTCOMES OF 6795 PATIENTS UNDERGOING REMEDIAL PARATHYROIDECTOMY IN CESQIP  
Hadiza S Kazaure1, Samantha M Thomas1, Michael T Stang1, Randall P Scheri1, Sanziana A Roman2, Julie Ann Sosa2  
1University of California San Francisco
2:30 pm – 2:45 pm

08. HIGH PREVALENCE OF CHRONIC KIDNEY DISEASE IN PATIENTS WITH MULTIPLE ENDOCRINE NEOPLASIA TYPE 1 AND IMPROVED KIDNEY FUNCTION AFTER PARATHYROIDECTOMY
Patience Green1, Jonathan Zagzag2, Dhavel Patel3, Lee S. Weinstein4, William Simonds4, Stephen Marx4, Electron Kebebew1,5, Nancy Perrier2, Naris Nilubol1

1Endocrine Oncology Branch, National Cancer Institute, 2Department of Surgical Oncology, The University of Texas-MD Anderson Cancer Center, 3Endocrine Oncology Branch, Endocrine Oncology Branch, National Cancer Institute, 4Metabolic Diseases Branch, National Institute of Diabetes and Digestive and Kidney Diseases, 5Department of Surgery, The George Washington University, School of Medicine and Health Science

2:45 pm – 3:00 pm

09. BONE MINERAL DENSITY CHANGES AFTER CURATIVE PARATHYROIDECTOMY: AN ANALYSIS OF PATIENTS WITH PRIMARY HYPERPARATHYROIDISM ACCORDING TO BIOCHEMICAL PROFILES
Denise T Lee1, Marcella D Walker2, John A Chabot1, James A Lee1, Jennifer H Kuo1

1Surgery, New York Presbyterian Hospital/Columbia University Medical Center, 2Medicine, New York Presbyterian Hospital/Columbia University Medical Center

3:00 pm — 3:30 pm

Break, Exhibits, & Poster Viewing

3:30 pm — 4:45 pm

SCIENTIFIC SESSION III: Papers 10-14
MODERATORS: Emad Kandil, MD – Tulane School of Medicine, and William Mendez, MD – University of Puerto Rico

3:30 pm – 3:45 pm

10. CHARACTERIZATION OF SOMATOSTATIN RECEPTORS (SSTRS) EXPRESSION AND ANTI-PROLIFERATIVE EFFECT OF SOMATOSTATIN ANALOGUES IN AGGRESSIVE THYROID CANCERS.
Danilea M Carmona-Matos1, Samuel Jang1, Baraa Hijaz1, Alexander W Chang1, Ricardo V Lloyd2, Herbert Chen3, Renata Jaskula-Sztul3

1Surgery, University of Alabama at Birmingham, 2Pathology, University of Wisconsin School of Medicine and Public health
3:45 pm – 4:00 pm

◆ 11. EPIGENETIC CHROMATIN CONFORMATION CHANGES IN PERIPHERAL BLOOD CAN DETECT THYROID CANCER
Huan Yan¹, Ewan Hunter², Alexandre Akoulitchev², David J Winchester¹, Tricia Moo-Young¹, Richard Prinz¹
¹Surgical Oncology, NorthShore University HealthSystem, ²Oxford Biodynamics

4:00 pm – 4:15 pm

◆ 12. PROSPECTIVE STUDY OF THE PATHOPHYSIOLOGY OF CARCINOID CRISIS
Mary E. Condron¹, Nora Jameson¹, Kristen E. Limbach³, Ann E. Bingham¹, Valerie A. Sera³, Ryan B. Anderson¹, Katie J. Schenning¹, Shaun Yockelson¹, Izumi Harukuni³, Ed A. Kahl¹, Elizabeth Dewey¹, SuEllen J. Pommier², Rodney F. Pommier¹
¹Oregon Health & Science University

4:15 pm – 4:30 pm

◆ 13. 68GALLIUM DOTATATE PET CT CHANGES MANAGEMENT IN A MAJORITY OF PATIENTS WITH NEUROENDOCRINE TUMORS
John F Tierney¹, Cory A Kosche¹, Jennifer Poirier¹, Sam G Pappas¹, Erik Schadde¹, Xavier M Keutgen¹
¹Surgery, Rush University Medical Center

4:30 pm – 4:45 pm

◆ 14. EFFECTIVE CYTOREDUCTION CAN BE ACHIEVED IN PATIENTS WITH NUMEROUS NEUROENDOCRINE TUMOR LIVER METASTASES
Aaron T. Scott¹, Patrick Breheny², Kendall J. Keck¹, Andrew M. Bellizzi³, Joseph S. Dillon⁴, Thomas M. O’Dorisio⁴, James R. Howe¹
¹Department of Surgery, University of Iowa Carver College of Medicine, ²Department of Biostatistics, University of Iowa College of Public Health, ³Department of Pathology, University of Iowa Carver College of Medicine, ⁴Department of Internal Medicine, University of Iowa Carver College of Medicine
MONDAY, MAY 7, 2018

8:00 am — 8:45 am  
**President’s Ballroom**  
Orlo & Carol Clark Distinguished Lecturer in Endocrine Surgery: “Breakthrough to Brave”  
SPEAKER: Julie Freischlag, MD - Wake Forest Baptist Medical Center

8:45 am — 10:00 am  
**President’s Ballroom**  
**SCIENTIFIC SESSION IV: Papers 15-19**  
MODERATORS: Nancy Perrier, MD – MD Anderson Cancer Center, and Karen Devon, MD – University of Toronto

8:45 am – 9:00 am  
♦ 15. NIFT-P: ARE THEY BENIGN RESULTS OF A MULTI-INSTITUTIONAL STUDY.  
Nathalie Chereau¹, Tristan Greilsamer², Eric Mirallie², Samira Sadowski³, Marc Pusztašzeri³, Frederic Triponez³, Gregory Baud⁴, Francois Pattou⁴, Niki Christou⁵, Muriel Mathonnet⁶, Laurent Brunaud⁶, Pierre Goudet⁷, Carole Guerin⁸, Frederic Sebag⁸, Giancula Donatini⁹, Jean-Louis Kraimps⁹, Frederique Tissier¹⁰, Laurence Leenhardt¹⁰, Fabrice Menegaux¹⁰  
¹Hopital PITIE Salpetriere, ²CHU Nantes, ³CHU Genève, ⁴CHU Lilles, ⁵CHU Limoges, ⁶CHU Nancy, ⁷CHU Dijon, ⁸CHU Marseille, ⁹CHU Poitiers, ¹⁰CHU Pitié Salpêtrière

9:00 am – 9:15 am  
♦ 16. THE ASSOCIATION OF THE ULTRASONOGRAPHY TIRADS CLASSIFICATION SYSTEM AND PATHOLOGY IN INDETERMINATE THYROID NODULES  
Zeyad T Sahli¹, Farah Karipineni¹, Jen-Fan Hang¹, Aarti Mathur¹, Jason D Prescott¹, Sheila Sheth¹, Syed Z Ali¹, Martha A Zeiger²  
¹Johns Hopkins, ²University of Virginia

9:15 am – 9:30 am  
♦ 17. TREATMENT STRATEGY OF END-STAGE RENAL DISEASE RELATED HYPERPARATHYROIDISM BEFORE, DURING AND AFTER THE ERA OF CALCIMIMETICS  
Willemijn Y. van der Plas¹, Anton F. Engelsman², Marille Umakanthan³, Amanda Mather³, Stan B. Sidhu², Leigh H. Delbridge², Mark S. Sywak², Schelto Kruijff³  
¹Department of Surgery, University Medical Center Groningen, ²Department of Endocrine Surgery, Royal North Shore Hospital, ³Department of Nephrology, Royal North Shore Hospital
9:30 am – 9:45 am

♦ 18. PARATHYROIDECTOMY VERSUS CINACALCET IN THE MANAGEMENT OF TERTIARY HYPERPARATHYROIDISM: SURGERY IMPROVES TRANSPLANT ALLOGRAFT SURVIVAL

Brendan M Finnerty1, Tyler W Chan1, Gregory Jones3, Tarek Khader1, Maureen Moore1, Toni Beninato1, Anthony C Watkins1, Rasa Zarnegar1, Thomas J Fahey III1
1Surgery, New York Presbyterian Hospital - Weill Cornell

9:45 am – 10:00 am

♦ 19. PREOPERATIVE CALCITRIOL REDUCES POSTOPERATIVE INTRAVENOUS CALCIUM REQUIREMENTS AND LENGTH OF STAY IN PARATHYROIDECTOMY FOR RENAL-ORIGIN HYPERPARATHYROIDISM

Salman K Alsafran1, Scott K Sherman1, Fadi S Dahdaleh1, Brian Ruhle1, Edwin Kaplan1, Peter Angelos1, Raymon H Grogan1
1Endocrine Surgery Research Program, University of Chicago

10:00 am — 10:30 am
Breaks, Exhibits, & Poster Viewing

10:30 am — 11:30 am
President’s Ballroom

SPEAKER: Martha Zeiger, MD – University of Virginia School of Medicine

11:30 am — 1:30 pm
President’s Terrace & Gallery; Vista Restaurant
Lunch Break (Lunch provided)

12:00 pm — 1:00 pm
President’s Ballroom

LUNCH SESSION (optional)
“The Business of Endocrine Surgery”

MODERATORS: Michael Starks – Penobscot Surgical Care, PA, Kimberly Vanderveen – Denver Center for Endocrine Surgery, P.C.

SPEAKERS: Kimberly Vanderveen – Denver Center for Endocrine Surgery, P.C., Tom Connally – Norman Regional Hospital, Denise Carneiro-Pla – Medical University of South Carolina, Allan Siperstein – Cleveland Clinic

1:30 pm — 2:30 pm
President’s Ballroom

SCIENTIFIC SESSION V: Papers 20-23
MODERATORS: John Phay, MD – Ohio State Medical Center, and Linwah Yip, MD – University of Pittsburgh Medical Center
1:30 pm – 1:45 pm

♦ 20. VALIDATION OF A NOVEL PATIENT-REPORTED OUTCOMES MEASURE FOR PARATHYROID AND THYROID DISEASE (PROMPT)
Talia Burneikis¹, Jennifer Colvin¹, Judy Jin¹, Eren Berber¹, Vikram Krishnamurthy¹, Joyce Shin¹, Allan Siperstein¹
¹The Cleveland Clinic

1:45 pm – 2:00 pm

♦ 21. UNRECOGNIZED PRIMARY ALDOSTERONISM IN HYPERTENSIVE PATIENTS WITH HYPOKALEMIA OR SLEEP APNEA
Brian C Ruhle¹, Salman Alsafran¹, Peter Angelos¹, Edwin Kaplan¹, Raymon Grogan¹
¹University of Chicago Medicine

2:00 pm – 2:15 pm

♦ 22. EXPRESSION OF PROGRAMMED DEATH LIGAND-1 AND 2 IN ADRENOCORTICAL CANCER TISSUES: AN EXPLORATORY STUDY
John F Tierney¹, Alyx Vogyl¹, Irene M Min², Jennifer Poirier¹, Brendan Finnerty², Rasa Zarnegar², Theresa Scognamiglio³, Paolo Gattuso⁴, Ritu Ghai⁴, Thomas J Fahey², Xavier M Keutgen¹
¹Surgery, Rush University Medical Center, ²Surgery, Weill Cornell Medical College, ³Pathology, Weill Cornell Medical College, ⁴Pathology, Rush University Medical Center

2:15 pm – 2:30 pm

♦ 23. LONGITUDINAL PATTERNS OF RECURRENCE IN PATIENTS WITH ADRENOCORTICAL CARCINOMA
Jason Glenn¹, Tobias Else², David Hughes¹, Mark Cohen¹, Paul Gauger¹, Gary Hammer², Barbra Miller¹
¹Endocrine Surgery, University of Michigan, ²Endocrinology, University of Michigan

2:30 pm — 2:45 pm

Ambassador & Forest Rooms
Breaks, Exhibits, & Poster Viewing

2:45 pm — 4:15 pm

President’s Ballroom
Interesting Cases
MODERATOR: Carmen Solorzano, MD – Vanderbilt University Medical Center

PANELISTS: Janice Pasieka – University of Calgary; Douglas Evans – Medical College of Wisconsin; and Quan-Yang Duh – University of California San Francisco
SCIENTIFIC PROGRAM CONTINUED

TUESDAY, MAY 8, 2018

7:00 am — 8:00 am  
BREAKFAST SESSION (optional)
“Transoral Endoscopic Endocrine Surgery in the U.S.: Lessons, Tips, Future Directions”
Educational grant support provided by Medtronic

FACULTY: Tobias Carling – Yale University; Raymon H. Grogan – Baylor College of Medicine; Insoo Suh – University of California San Francisco; and William B. Inabnet, III - Icahn School of Medicine at Mount Sinai

8:00 am — 8:45 am  
HISTORICAL LECTURER
“William Stewart Halsted; Our Surgical Heritage (Also an Endocrine Surgeon!)”
SPEAKER: John Cameron, MD - John Hopkins Hospital

8:45 am — 10:00 am  
SCIENTIFIC SESSION VI: Papers 24-28
MODERATORS: Herb Chen, MD - University of Alabama at Birmingham, and Sarah Oltmann, MD – University of Texas Southwestern

24. A PROPENSITY-MATCHED ANALYSIS OF CLINICAL OUTCOMES BETWEEN OPEN THYROID LOBECTOMY AND HIGH INTENSITY FOCUSED ULTRASOUND (HIFU) ABLATION IN THE TREATMENT OF BENIGN THYROID NODULES
Brian H Lang1, Carlos Wong2, Yu Cho Woo3, Keith Chiu4
1Surgery, University of Hong Kong, 2Community Medicine, University of Hong Kong, 3Medicine, University of Hong Kong, 4Radiology, University of Hong Kong

9:00 am — 9:15 am  
25. STAGE MIGRATION WITH THE NEW STAGING SYSTEM [8TH EDITION] FOR DIFFERENTIATED THYROID CANCER
Ashok R. Shaha1, Jocelyn C Migliacci1, Iain J Nixon1, Laura Y Wang 1, Richard J Wong1, Luc G.T. Morris1, Snehal G Patel1, Jatin P Shah3, R. Michael Tuttle1, Ian Ganly1
1Memorial Sloan Kettering Cancer Center

9:15 am — 9:30 am  
26. THE OPTIMAL LEVOTHYROXINE DOSING SCHEME AFTER THYROIDECTOMY: A COMPREHENSIVE COMPARISON AND EVALUATION
Nick Zaborek1, Andy Cheng1, Joseph Imbus1, Kristin L. Long1, Susan C. Pitt1, Rebecca S. Sippel1, David F. Schneider1
1Department of Surgery, University of Wisconsin School of Medicine and Public Health
27. UNILATERAL BENIGN MULTINODULAR GOITER VS SOLITARY NODULE: CONTRALATERAL RECURRENCE RATES AFTER LOBECTOMY
Beatriz de Rienzo-Madero¹, John Sabra¹, Elise Gand¹, Gianluca Donatini¹, Jean-Louis Kraimps¹
¹Endocrine Surgery, CHU Poitiers

28. NATURAL HISTORY OF PAPILLARY THYROID MICROCARCINOMA: KINETIC ANALYSES ON THE TUMOR VOLUME DURING ACTIVE SURVEILLANCE AND BEFORE PRESENTATION
Akira Miyauchi⁴, Takumi Kudo², Yasuhiro Ito¹, Hitomi Oda¹, Masatoshi Yamamoto¹, Hisanori Sasai³, Takuya Higashiyama¹, Mitsuhiro Fukushima¹, Hiroo Masuoka¹, Minoru Kihara¹, Akihiro Miya¹
¹Department of Surgery, Kuma Hospital, ²Department of Internal Medicine, Kuma Hospital, ³Department of Head and Neck Surgery, Kuma Hospital

29. PRIMARY HYPERALDOSTERONISM WITH NON-LOCALIZING IMAGING
Heather Wachtel¹, Sonia Bhandari¹, Robert E Roses¹, Debbie L Cohen², Scott O Trerotola³, Douglas L Fraker¹
¹Dept. of Surgery, Hospital of the University of Pennsylvania, ²Dept. of Medicine, Div. of Renal, Electrolytes and Hypertension, Hospital of the University of Pennsylvania, ³Dept. of Radiology, Div. of Vascular and Interventional Radiology, Hospital of the University of Pennsylvania

30. OVER EXPRESSION OF CELL-CYCLE DEPENDENT PROTEINS ASSOCIATED WITH LOWER SURVIVAL IN ADRENOCORTICAL CARCINOMA PATIENTS
Chitra Subramanian¹, Thomas J Giordano², Mark S Cohen³
¹General Surgery, University of Michigan, ²Pathology, University of Michigan, ³General Surgery and Pharmaceutical sciences, University of Michigan
11:00 am – 11:15 am
31. GROWING HUMAN PARATHYROID IN A MICROPHYSIOLOGICAL SYSTEM: A NOVEL APPROACH TO UNDERSTANDING AND DEVELOPING NEW TREATMENTS FOR HYPERPARATHYROIDISM
Palaniappan Sethu¹, Thomas A Haglund¹, Aaron J Rodgers¹, Herbert Chen², John Porterfield¹, Courtney J Balentine¹
¹UAB, ²Surgery, UAB

11:15 am – 11:30 am
32. THE EFFECT OF TOTAL THYROIDECTOMY ON THE RECOVERY OF BONE MINERAL DENSITY IN SUBJECTS WITH HYPERTHYROIDISM
Poongkodi Karunakaran¹, Premkumar Asokumar³, Kamaleshwaran Koramadai Karuppusamy⁴, Rajasekaran Chockalingam⁵, Vijay Sadasivam⁵, Chandrasekaran Maharajan⁷
¹Endocrine Surgery, Government Mohan Kumaramangalam Medical College, Salem, ²Endocrine Surgery, SKS Hospital, ³Diabetes, Endocrinology and Metabolism, SKS Hospital, ⁴Nuclear Medicine and PET/CT, Kovai Medical Centre and Hospital, ⁵General Surgery, Government Mohan Kumaramangalam Medical College and Hospital, ⁶Radiology, SKS Hospital, ⁷Endocrine Surgery, Madras Medical College, Chennai

11:30 am – 11:45 am
33. TOTAL VS SUBTOTAL PARATHYROIDECTOMY FOR SECONDARY HYPERPARATHYROIDISM
Martin Almquist¹, Elin Isaksson¹, Kerstin Ivarsson², Shahriar Akaberi³, Andreas Muth⁴, Karl-Göran Prutz⁵, Naomi Clyne³, Gunnar Sterner³
¹Dept. of Surgery, Skåne University Hospital, ²Skåne University Hospital, ³Dept. of Nephrology, Skåne University Hospital, ⁴Dept. of Surgery, Sahlgrenska University Hospital, ⁵Dept. of Internal Medicine, Section of Nephrology, Helsingborg Hospital

11:45 am – 12:00 pm
34. INNOVATIVE SURGICAL GUIDANCE FOR LABEL-FREE REAL-TIME PARATHYROID IDENTIFICATION.
Giju Thomas¹,², Melanie A McWade¹,², John Q Nguyen¹,², Melinda E Sanders³, Naira Baregamian⁴, Carmen C Solorzano⁵, Anita Mahadevan-Jansen¹,²
¹Vanderbilt Biophotonics Center, Vanderbilt University, ²Department of Biomedical Engineering, Vanderbilt University, ³Department of Pathology, Microbiology and Immunology, Vanderbilt University Medical Center, ⁴Division of Surgical Oncology and Endocrine Surgery, Vanderbilt University Medical Center

12:00 pm
Meeting Adjourn
ABSTRACTS

♦ Denotes Resident/Fellow Research Award Competition Paper

NOTE: Author listed in BOLD is the presenting author
ABSTRACTS

♦ 01. A TALE OF TWO CITIES: INCREASED RAI DOSE IMPROVES RECURRENCE RATES IN ATA HIGH RISK DIFFERENTIATED THYROID CANCER

Katherine D. Gray1, Sahar Bannani2, Cecile Caillard2, Sonia Amanat1, Pavel Romanov1, Timothy M Ullmann3, Laurent Brunaud3, Toni Beninato3, Thomas J. Fahey, Ill3, Eric Mirallie2, Rasa Zarnegar1

1New York Presbyterian Hospital, Weill Cornell Medicine, 2Hotel-Dieu Hospital - CHU Nantes, 3University of Lorraine - CHRU Nancy

Background: Radioactive iodine (RAI) is commonly used as adjuvant therapy for differentiated thyroid cancer (DTC) with risk factors for residual disease. We aimed to compare the outcomes of patients with ATA high risk DTC in two centers with differing RAI-dosing algorithms.

Methods: The treatment of >1500 patients with DTC at a high volume center in the United States and an unaffiliated high volume center in France between 2004-2014 was reviewed. Patients underwent post hoc stratification using the 2015 ATA guidelines, and only adult patients considered high risk for recurrence were included. Tumors with poorly-differentiated histology were excluded. The final cohort for analysis comprised 183 patients who received either intermediate dose (n=117, median 100 mCi, IQR 100 – 100 mCi) or high dose (n=66, median 150 mCi, IQR 149 – 158 mCi) RAI. Propensity score estimation with nearest neighbor matching was performed to control for baseline characteristics.

Results: Ninety-seven percent of French patients received intermediate dose RAI versus 40% of American patients (p<0.001). In the propensity matched cohort, patients in the intermediate and high dose groups had equivalent rates of gross extra-thyroidal extension (71% versus 71%, p=1.00), positive margins (55% versus 55%, p=1.00), lymph node metastases ≥ 3 cm (9% versus 9%, p = 1.00), extra-nodal extension (32% versus 33%, p=0.85), and distant metastases (2% versus 5%, p=0.31). In the overall cohort, 87% of patients underwent central neck dissection with no difference in the number of lymph nodes examined between groups (p=0.14).

Mean follow-up was 4.9 versus 5.6 years (p=0.31). The overall recurrence rate was higher in the intermediate dose group than the high dose group, 36% versus 20% (p=0.03). Although the majority of recurrences in both groups occurred in cervical lymph nodes, the rate of lymph node metastases was higher in the intermediate dose group (31% versus 13%, p=0.01). There were no differences in the number of local recurrences (p=0.22) or distant metastases (p=0.25).

Conclusions: Although retrospective, our data suggests that high dose RAI (150 mCi) provides improved oncologic control when compared to intermediate dose RAI (100 mCi) and should be considered for patients with high risk DTC.
DO PATIENTS WITH FAMILIAL NON-MEDULLARY THYROID CANCER PRESENT WITH MORE AGGRESSIVE DISEASE? IMPLICATIONS FOR INITIAL SURGICAL TREATMENT.

Mustapha El Lakis¹, Andreas Giannakou¹, Pavel Nockel¹, Douglas Wiseman¹, Sudheer Gara¹, Dhaeval Patel¹, Joanna Klubo-Gwiezdzinska², Naris Nilubol¹, Electron Kebebew¹

¹Endocrine Oncology Branch, National Cancer Institute, ²National Institute of Diabetes and Digestive and Kidney Diseases

Background: Familial non-medullary thyroid cancer (FNMT) accounts for 5% of thyroid cancers. It is defined clinically as the presence of two or more first-degree family members with non-medullary thyroid cancer (NMTC). There have been conflicting reports on whether FNMT is more aggressive than sporadic NMTC. These conflicting reports may be due to study design issues, incomplete FNMT status ascertainment and study sample size. The aim of this study was to determine if the clinical and pathologic characteristics of patients with FNMT was different than sporadic NMTC.

Methods: We compared the clinical and pathologic characteristics of patients with FNMT (papillary thyroid cancer and its subtypes) to the cohort of 53,571 patients with sporadic papillary thyroid cancer and its subtypes from Surveillance, Epidemiology, and End Results (SEER) database.

Results: Seventy-eight patients with FNMT from 32 different kindred were compared to the SEER cohort. Patients with FNMT presented at a younger age (p=0.04), with higher rate T1 disease (p=0.019), lymph node metastasis (p=0.002), and classic variant of papillary thyroid cancer on histology (p<0.001). We stratified FNMT patients by the number of affected members per family. Those with 2 affected members had similar age at presentation, gender distribution, TNM stage and prevalence of extra thyroidal extension compared to patients with sporadic PTC. Whereas patients with ≥3 affected family members presented at a younger age (p=0.046), had lower female-to-male ratio (p=0.04) and had higher rate of lymph node metastasis (p=0.009). Out of 78 FNMT patients, 19 were diagnosed by screening. Lymph node metastasis was more prevalent in patients diagnosed with FNMT at their initial presentation (p=0.003), compared to those diagnosed during screening (p=0.58).

Conclusions: Patients with FNMT have higher rate of lymph node metastasis. This suggests that the surgical treatment should be more aggressive in patients who presently clinically and who have 3 or more first-degree relatives affected.
ABSTRACTS

♦ 03. INTER-INSTITUTIONAL VARIATION IN THE PREDICTIVE VALUE OF THYROSEQ V2 FOR THYROID NODULES

Andrea R. Marcadis¹, Allen S. Ho², Jennifer L. Marti³, Justin Tepe¹, Christina E. Swartzwelder¹, Serena Byrd¹, Brian R. Untch¹, Ashok R. Shaha¹, Bin Xu⁴, Oscar Lin⁴, Ronald A. Ghossein⁴, Richard J. Wong¹, Luc G.T. Morris¹

¹Head and Neck Surgery, Memorial Sloan Kettering Cancer Center, ²Surgery, Cedars-Sinai Medical Center, ³Surgery, New York Presbyterian/Weill Cornell Medical Center, ⁴Pathology, Memorial Sloan Kettering Cancer Center

Background: The Thyroseq v2 next-generation sequencing assay (Thyroseq) estimates the risk of cancer in indeterminate thyroid nodules (ITN). The accuracy of molecular diagnostic tests can vary based on differing prevalence of disease and pathologic interpretation. We evaluated the overall and mutation-specific accuracy of Thyroseq in predicting malignancy in ITN at 4 institutions with differing prevalence of malignancy.

Methods: We analyzed data from 273 Bethesda III/IV ITN evaluated with Thyroseq and surgically resected at 4 institutions. These included 98 ITN with re-review of matching surgical pathology at a tertiary referral cancer center, ITN treated at a multicenter healthcare system (n=60), academic medical center (n=13), and comprehensive cancer center (n=102). A result was considered “Thyroseq-positive” if alterations with malignancy probability > 30% were reported. The positive (PPV) and negative predictive values (NPV) of Thyroseq results, and distribution of final pathology were analyzed. Measured PPV and NPV were compared to values predicted by Bayes Theorem based on prevalence of malignancy and quoted test sensitivity/specificity. Values were alternatively calculated with NIFTP considered benign or malignant. Additional analyses of RAS-mutated nodules included KRAS, NRAS and HRAS hotspot mutations.

Results: Across 4 institutions (n=273 ITN), the overall PPV was 33% (range 22-41%), and NPV 93% (89-100%). Considering NIFTP reclassification, if NIFTPs were still considered positive results, rates would have been PPV 54% (27-79%) and NPV 85% (78-100%). Actual PPV and NPV values correlated with predictions based on institutional prevalence of malignancy ($r^2=.87$), although PPVs were universally lower than expected. Among 91 RAS-mutated nodules, the risk of malignancy was more variable (26%, range 10-36%), and the distribution of benign diagnoses varied markedly across institutions (adenomas 7-85%, NIFTP 5-42%).

Conclusions: The performance of Thyroseq varies across practice settings, largely attributable to differing prevalence of malignancy. In settings with low malignancy prevalence, NPV is >95% and PPV 20-30%. In settings with higher malignancy prevalence, NPV is closer to 90% and PPV 35-40%. Additionally, there is likely institutional variability in pathologic interpretation, most apparent in classification of NIFTPs. It is critical that users of molecular assays understand these characteristics in their practice setting when evaluating patients with ITN for surgery.
04. POSTOPERATIVE HEMATOMA EVACUATION AFTER THYROID AND PARATHYROID SURGERY: AN ANALYSIS OF THE CESQIP DATABASE

Stephanie D Talutis\textsuperscript{1}, Sowmya R Rao\textsuperscript{1}, Frederick T Drake\textsuperscript{1}, David McAneny\textsuperscript{1}
\textsuperscript{1}General Surgery, Boston Medical Center

Background: Although rare, complications after thyroidectomy and parathyroidectomy are highly morbid. A particularly feared complication is a postoperative hematoma (PH) that threatens the airway. The aim of this study is to determine factors associated with PH.

Methods: Patients undergoing thyroidectomy and/or parathyroidectomy were evaluated for PH using the Collaborative Endocrine Surgery Quality Improvement Program (CESQIP) Database. Bivariate analysis was conducted using Chi-squared test. Odds ratios (OR) and 95% confidence intervals (CI) were obtained from multivariable logistic regression to assess the relationship of operative variables with PH, with significance defined as a two-sided $p<0.05$.

Results: Among 19,356 patients, 11,688 (60.4\%) underwent thyroidectomy, 6,763 (34.9\%) underwent parathyroidectomy, and 905 (4.7\%) underwent concurrent thyroidectomy and parathyroidectomy. PH occurred in 118 patients (0.6\%). PH rates were increased in patients who underwent combined thyroidectomy/parathyroidectomy (1.2\%) versus those undergoing thyroidectomy (0.7\%) and parathyroidectomy (0.3\%) ($p<0.001$). The rate of PH was higher among men (1.0\% vs 0.5\%, $p<0.001$) but was not influenced by BMI $>40$ ($p=0.635$), prior anterior neck surgery ($p=0.245$), reoperative thyroidectomy ($p=0.391$), or reoperative parathyroidectomy ($p=0.160$). Patients with PH had longer operative times ($p<0.001$). Patients undergoing bilateral parathyroid exploration or operations for ectopic parathyroid glands were also more likely to experience PH ($p=0.013$).

Multivariable logistic regression determined PH was influenced by operation type (thyroidectomy OR 2.0 CI [1.2, 3.3] and combined thyroidectomy/parathyroidectomy OR 3.6 CI [1.7, 7.4], $p=0.0021$, relative to parathyroidectomy), male sex (OR 2.0, CI [1.4, 3.0], $p=0.0003$), and operative time (1-2 hours: OR 2.2 CI [1.1, 4.4], and time $>2$ hours: OR 3.1 CI[1.5, 6.3], $p=0.0061$, relative to operative time $<1$ hour). However PH was unaffected by prior anterior neck surgery (OR 1.4 CI [0.8, 2.2], $p=0.2140$).

Patients with PH also experienced higher rates of complications: 13.6\% experienced subsequent intubation, 8.8\% tracheostomy, 3.4\% vocal cord dysfunction, 18.6\% ED visits, and 22.9\% readmission within 30 days. Mortality was low in the overall cohort (0.08\%). None of the patients with PH died.

Conclusions: Large databases, such as CESQIP’s, are useful to evaluate rare complications following thyroid and parathyroid operations. PH hazards are increased in those undergoing thyroidectomy +/- concurrent parathyroidectomy, male gender, and longer operative times.
TREATMENT OF LATERAL NECK PAPILLARY THYROID CARCINOMA RECURRENCE AFTER COMPARTMENT-ORIENTED LATERAL NECK DISSECTION

Veljko Strajina1, Zahraa Al-Hilli1, Benzon M Dy1, Mabel Ryder1, Geoffrey B Thompson1, David R Farley1, Travis J McKenzie1, Melanie L Lyden1

1Mayo Clinic, Rochester, MN

Background: Lateral neck nodal metastases are relatively common among patients with papillary thyroid carcinoma (PTC). Recurrence rates following lateral neck dissection for PTC range from 18 to 30%. There is paucity of data regarding optimal treatment options and outcomes for recurrent disease following lateral neck dissection in patients with PTC.

Methods: Recurrences following lateral neck dissection for metastatic PTC were recorded. Treatment modalities included either reoperation or ultrasound-guided ethanol ablation (ETOH). Patient and recurrence characteristics were recorded and correlated with treatment outcomes; groups with either ETOH or surgical reoperation as the primary treatment modality for first time recurrences following lateral neck dissection for PTC were compared.

Results: Sixty-seven first time recurrences were identified in 64 patients following lateral neck dissection. The recurrences were treated between 2001 and 2017. Follow up data were available for 54 patients with 57 recurrences. ETOH was the initial treatment strategy in 37 recurrences (55%, follow up available for 32 patients) and upfront surgery was performed in 30 recurrences (45%, follow up available for 25 patients). Baseline characteristics were different between patients who were initially treated with ETOH vs. surgery: the largest lymph node (LN) diameter (mean 13 vs. 18 mm, p<.001), the mean number of metastatic LNs identified on US (1.3 vs 1.9, p=.04) and the presence of distant metastases (19% vs 32%, p=.3). Four patients who were initially treated with ETOH (13%) subsequently underwent surgery and 3 operated patients (12%) subsequently had ETOH (p=.92). Overall, using the combination of surgery and ETOH resulted in lateral neck recurrence control in 84% of recurrences. Each modality alone achieved comparable rates of disease control on last follow up (74 % for ETOH and 76% for surgery, p=.88), with median lateral neck progression-free interval of 4.8 years (range 0.35-13 years). Mean number of reinterventions was also comparable between groups (1.8 for ETOH, 1.6 surgery p=0.6).

Conclusions: Lateral neck recurrence in PTC may be difficult to control. Both alcohol ablation and surgery can achieve disease control in the majority of appropriately selected patients. Although the baseline characteristics of patients were different, treatment outcomes of these two modalities appear to be comparable.
06. END-ORGAN EFFECTS OF PRIMARY HYPERPARATHYROIDISM: A POPULATION-BASED STUDY

Yasmine Assadipour\textsuperscript{1}, Hui Zhou\textsuperscript{2}, Eric J Kuo\textsuperscript{1}, Philip I Haigh\textsuperscript{3}, Annette L Adams\textsuperscript{4}, Michael W Yeh\textsuperscript{1}

\textsuperscript{1}Surgery, UCLA, \textsuperscript{2}Division of Epidemiology, Kaiser Permanente, \textsuperscript{3}Oncologic and Endocrine Surgery, Kaiser Permanente, \textsuperscript{4}Kaiser Permanente

Background: Patients with primary hyperparathyroidism (PHPT) are at risk for skeletal and renal end-organ damage. We aimed to characterize the frequency and timing of clinical progression in PHPT, and to assess for a correlation between clinical progression and biochemical disease severity.

Methods: We studied patients with biochemically confirmed PHPT within a vertically integrated health system from 1995 to 2014. After quantifying the frequency of pre-existing osteoporosis, nephrolithiasis, and hypercalciuria, we evaluated the cumulative new incidence of these conditions and decline in renal function (advancement of chronic kidney disease stage) for 5 years after the diagnosis of PHPT. The biochemical severity of PHPT was defined by degree of hypercalcemia (severe >11.5 mg/dL, moderate 11.1-11.5 mg/dL, mild 10.5-11.0 mg/dL) and the presence of classic (parathyroid hormone [PTH] >65 pg/mL) or non-classic (PTH 21-65 pg/mL) PHPT. A Cox proportional hazards model was used to evaluate biochemical severity as a predictor of clinical progression.

Results: The cohort comprised 12,800 patients, of whom 4,103 (32%) had pre-existing end-organ effects (osteoporosis, 22%; nephrolithiasis, 10%; hypercalciuria, 4%). Of the 8,697 remaining patients, 2,368 (27%) clinically progressed over a median of 2.1 years. The rates of clinical progression in classic and non-classic PHPT were 35% and 22%, respectively. The most common initial sign of end-organ damage was decline in renal function (13%), followed by osteoporosis (10%), nephrolithiasis (3%), and hypercalciuria (1%). After adjustment for age, sex, and race/ethnicity, the risk of clinical progression in patients with classic PHPT was similar regardless of the degree of hypercalcemia (severe, hazard ratio [HR] 0.96, 95% confidence interval [CI] 0.80-1.16; moderate, HR 1.03, 95% CI 0.91-1.17; mild=reference). The risk of clinical progression was decreased in patients with non-classic PHPT in comparison to classic PHPT, and again the degree of hypercalcemia did not influence outcome (severe, HR 0.58, 95% CI 0.46-0.76; moderate, HR 0.61, 95% CI 0.52-0.72; mild, HR 0.61, 95% CI 0.56-0.68).

Conclusions: End-organ manifestations of PHPT develop prior to biochemical diagnosis or within 5 years in the majority of patients. Adverse skeletal and renal effects occurred more frequently in patients with classic PHPT versus non-classic PHPT, regardless of severity of hypercalcemia.
Background: Remedial parathyroidectomy (R-PTx) is more technically challenging than initial parathyroidectomy (I-PTx). There are scarce data describing the characteristics and outcomes of patients undergoing R-PTx at a multi-institutional level.

Methods: Using data captured in the Collaborative Endocrine Surgery Quality Improvement Program (CESQIP, 2014-17), demographic and clinical characteristics of patients undergoing R-PTx vs. I-PTx were compared, including diagnosis (any hyperparathyroidism), imaging, intraoperative parathyroid hormone (IoPTH) and nerve monitoring (IoNM). Outcomes at ≥6-months were measured, including vocal cord dysfunction, hypoparathyroidism, and failure to cure. Differences between R-PTx vs. I-PTx patients were examined using bivariate methods; multivariate regression was used to estimate the independent effect of R-PTx vs. I-PTx on failure to cure.

Results: There were 6795 cases. A total of 367 (5.4%) underwent R-PTx. Patients undergoing R-PTx more often had non-sporadic primary hyperparathyroidism than those undergoing I-PTx (18.8% vs. 8.1% respectively, p<0.001). A single localization study was done in 24.8% vs. 26.9% of R-PTx vs. I-PTx (p=0.37). Patients undergoing RTx had higher rates of preoperative laryngoscopy (45.5% vs. 6.2%, p<0.001) and IoNM (57.5% vs 34.5%, p<0.001) than those undergoing I-PTx.

More patients undergoing R-PTx failed to have a 50% drop in IoPTH than those undergoing I-PTx (20.2% vs. 13.7%, p<0.001). Among 1157 patients with ≥6-months follow-up, none of the R-PTx vs. three I-PTx patients (0.3%) had vocal cord dysfunction. Hypocalcemia (10.5% vs. 2.3%, p=0.001) and failure to cure (21.1% vs. 4.1%, p<0.001) were more likely after R-PTx than I-PTx. When stratified by diagnosis, patients undergoing R-PTx had higher failure to cure rates than I-PTx patients (sporadic primary hyperparathyroidism: 21.3% vs. 3.8%, p<0.001; secondary/tertiary/familial hyperparathyroidism: 20.0% vs. 9.4% p=0.214). After adjustment, having a single localization study (adjusted odds ratio [AOR] 2.23, p=0.02), concurrent thymectomy (AOR 2.54, p=0.03), R-PTx (AOR 6.58, p<0.001), and <50% drop in IoPTH (AOR 19.41, p<0.001) were associated with failure to cure.

Conclusions: This is the first multi-institutional examination of outcomes from experienced surgeons in CESQIP. While nerve injury rates are low after R-PTX, high rates of hypocalcemia and failure to cure at ≥6-months suggest the potential need for increased preoperative localization to refine remedial surgical management of patients with hyperparathyroidism.
ABSTRACTS

♦ 08. HIGH PREVALENCE OF CHRONIC KIDNEY DISEASE IN PATIENTS WITH MULTIPLE ENDOCRINE NEOPLASIA TYPE 1 AND IMPROVED KIDNEY FUNCTION AFTER PARATHYROIDECTOMY

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Background: Patients with multiple endocrine neoplasia type 1 syndrome (MEN1) frequently have prolonged mild primary hyperparathyroidism (pHPT) before developing metabolic complications. Because chronic kidney disease (CKD) is an important comorbidity associated with pHPT, the aim of this study was to evaluate the prevalence of CKD and the effect of parathyroidectomy on kidney function in patients with MEN1-associated pHPT.

Methods: We performed a retrospective analysis of 112 patients with MEN1 associated pHPT who had at least one operation at two tertiary referral centers. The preoperative and postoperative estimated glomerular filtration rates (eGFR), calculated by the Modification of Diet in Renal Disease Study equation, were compared. The prevalence of CKD stage 3 or worse (eGFR >60 ml/min/1.73m2) in this cohort was compared to the rates in the US population reported by the Centers for Disease Control and Prevention.

Results: The median age at the time of surgery was 40.8 years (range: 13-77 years). Ninety-nine patients had biochemical remission. Of 112 patients, 34 (30.4%) had at least 1 risk factor associated with CKD. The rate of stage 3 or worse CKD in patients with MEN1-associated pHPT was higher than the rate observed in the US population at the ages of 20-39 and 40-59, 4.6% (n=2/44) vs. 0.39% (n=18/4565), P=0.015 and 10.0% (n=4/40) vs. 2.31% (n=89/3848), P =0.015, respectively. We observed significantly improved eGFR in those with CKD stage 3 or worse postoperatively (45.2 vs. 51.3, P=0.048) and a trend towards improved eGFR in patients who had at least 1 risk factor for CKD (83.3 vs. 89.1 ml/min/1.73 m2, P =0.18). 41.2 % (n=42/102) of patients had kidney stones and/or nephrocalcinosis. A successful parathyroidectomy significantly lowered and normalized all 24-hour urine calcium excretion (mean of 306 mg/24 hours to 177 mg/24-hour, P <0.01).

Conclusions: Patients with MEN1-associated pHPT have a higher rate of stage 3 or worse CKD as compared to the US population. Parathyroidectomy improves kidney function in patients with MEN1-associated pHPT and CKD stage 3 or worse. Thus, eGFR < 60ml/min is an indication for parathyroidectomy in patients with MEN1-associated pHPT.
ABSTRACTS

♦ 09. BONE MINERAL DENSITY CHANGES AFTER CURATIVE PARATHYROIDECTOMY: AN ANALYSIS OF PATIENTS WITH PRIMARY HYPERPARATHYROIDISM ACCORDING TO BIOCHEMICAL PROFILES

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Background: Primary hyperparathyroidism (PHPT) is associated with low bone mineral density (BMD) and an increased risk of fragility fractures. Current guidelines suggest parathyroidectomy (PTX) for PHPT patients with osteoporosis as BMD improves after PTX. The effect of PTX on BMD in those with the typical PHPT biochemical profile (high serum calcium, high iPTH) has been well studied. There is little data about BMD changes in those with milder biochemical forms of PHPT: normocalcemic (high PTH, normal calcium) and normohormonal (high calcium, normal PTH) profiles.

Methods: We performed a retrospective cohort analysis of patients with pre- and post-PTX dual-energy X-ray absorptiometry (DXA) who underwent curative PTX for PHPT at a single academic center between 2004-2012. Patients were stratified by biochemical status. Within-person changes in BMD pre- and post-PTX were analyzed using linear mixed models.

Results: 92 PHPT patients (age 63±12, 84% female) with pre- (median time 4.2 months) and post-PTX (13.4 months) DXA were included (typical, N=57; normocalcemic, N=24; normohormonal, N=11). In the typical, normocalcemic and normohormonal groups, mean calcium levels were 11.1±0.7, 9.8±0.3 and 10.8±0.2 mg/dL, and PTH were 156±75, 107±43 and 52±14pg/mL, respectively. BMD increased post-PTX in the whole cohort at the lumbar spine (LS: +2.5%, p<0.01), femoral neck (FN: +2.1%, p<0.01), total hip (TH: +1.9%, p<0.01) and 1/3-radius (-0.9%, p<0.05). Comparing BMD changes by profile, BMD increased (all p<0.01) in those with the typical profile at the LS (3.2%), TH (2.9%) and FN (2.9%) but declined at the 1/3-radius (-1.5%). In the normocalcemic group, BMD declined at the FN (-3.5%, p<0.05) and TH (-3.1%, p<0.01) but did not change at the LS or 1/3-radius. In the normohormonal group, BMD did not change at any site. Comparing between groups, the only statistically significant change in BMD over time was between the normocalcemic and typical groups at the LS (p=0.048).

Conclusions: Our results indicate BMD improves after PTX in patients with the typical biochemical profile of PHPT. The skeletal benefit of PTX was attenuated in those with milder biochemical profiles. These results suggest that skeletal changes after PTX may depend on biochemical profile.
ABSTRACTS

♦ 10. CHARACTERIZATION OF SOMATOSTATIN RECEPTORS (SSTRs) EXPRESSION AND ANTI-PROLIFERATIVE EFFECT OF SOMATOSTATIN ANALOGUES IN AGGRESSIVE THYROID CANCERS.

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Background: Somatostatin (SST) is an inhibitory peptide with ubiquitous presentation in human tissues that exerts its action by binding to somatostatin receptors (SSTR) 1-5. Several human carcinomas have demonstrated distinct expression of SSTRs and provided diagnostic imaging and therapeutic potential with radiolabeled SST analogs. The purpose of this study is to characterize SSTR expression in aggressive thyroid cancers and assess the anti-proliferative effects of somatostatin analogues.

Methods: Proteins from aggressive anaplastic (Hth7 and 8505c) and follicular (FTC236) thyroid cancer cells were isolated and analyzed for basal expression of SSTR1-5 using capillary immunoblotting system followed by densitometry analysis. The basal mRNA expression levels of SSTR1-5 were measured by quantitative real-time PCR (qRT-PCR). All cell lines were treated for two days with one of three SST analogues: octreotide (OCT), pasireotide (SOM230), and KE108. The anti-proliferative effect and IC50 values were determined using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Expression of SSTR2 was examined in human thyroid tissue microarrays.

Results: Capillary immunoblotting analysis demonstrated that all thyroid cancer cell lines expressed SSTR1, SSTR2, SSTR3, and SSTR5 in varying degrees. SSTR3 demonstrated the highest expression among all cell lines while none of them expressed SSTR4. qRT-PCR analysis confirmed the correlation between mRNA expression for SSTR2 and SSTR3 with these proteins. In human primary thyroid samples, SSTR2 was absent in 10 normal thyroid tissues but present in 3 aggressive human thyroid cancers. MTT assay showed that KE108, a pan-somatostatin receptor agonist, demonstrated an IC50 of 24 uM for 8505c and 100uM for Hth7 and FTC236 cells. SOM230, an SSTR5, SSTR3 and SSTR2 agonist, demonstrated an IC50 of 50uM for FTC236 and 75 uM for 8505c and Hth7 cells. However, OCT, a SSTR2 agonist, did not inhibit the proliferation of any cell line below the concentration of 250 uM.

Conclusions: Aggressive anaplastic and follicular thyroid cancer cell lines and human tumors express somatostatin receptors. SST analogs KE108 and SOM230 exhibited the best anti-proliferative activity among these dedifferentiated thyroid cancer cell lines. Our results suggest that somatostatin receptor subtypes (SSTR1-SSTR3 and SSSTR5) are relevant and promising therapeutic targets for aggressive thyroid cancers.
Background: Fine needle aspiration (FNA) has been the traditional method for diagnosing cancer in thyroid nodules. However it is an invasive procedure. The analysis of epigenetic chromatin conformation changes in blood can detect markers of malignancy, such as melanoma, and offers an alternative method of diagnosing thyroid cancer. The purpose of this study is to evaluate an EpiSwitch™ assay of epigenetic markers that can be used to diagnose thyroid cancer in blood samples.

Methods: From August 2014 to December 2016, adult patients with thyroid nodules having thyroidectomy were recruited. Blood samples were collected prior to surgery, and patients were divided into three equal groups based on FNA cytology: benign, malignant, AUS/FLUS. Final pathologic diagnosis was made from the thyroid specimens. The 0.5mL sample of peripheral blood from each patient was analyzed using the epigenetic EpiSwitch™ assay and the results were compared to the surgical pathology findings to determine assay performance.

Results: Fifty-eight patients were recruited for the study: 20 in benign, 20 in malignant, and 18 in AUS/FLUS cytology. The three groups were similar in age, size of nodule, and gender. Average patient age was 51 years, and 39 (67%) of the patients were female. Six (out of 14 total) epigenetic markers were found from initial analysis of the malignant and benign FNA groups. A total of 26 (44.8%) patients had thyroid cancer in their surgical specimens. The assay was able to correctly identify 23 of the 26 malignant nodules, showing sensitivity of 88.5% and specificity of 69.0%. Positive predictive value for the assay was 71.9% while negative predictive value was 87.0%. In the FLUS group, the assay correctly identified malignancy in 2 patients with follicular carcinoma and 1 incidental papillary carcinoma that was not biopsied.

Conclusions: A blood assay using epigenetic markers has a relatively high sensitivity in detecting cancer in thyroid nodules. The assay provides an additional method for diagnosing thyroid cancer.
ABSTRACTS

♦ 12. PROSPECTIVE STUDY OF THE PATHOPHYSIOLOGY OF CARCINOID CRISIS

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Background: Carcinoid tumors secrete an array of vasoactive hormones including serotonin, histamine, tachykinins, and bradykinin. Sudden massive release of these hormones is postulated to cause intraoperative carcinoid crisis, which is characterized by abrupt hemodynamic instability that can result in cardiovascular collapse and death. The pathophysiology underlying crisis is unknown, and the traditional preventive measure of prophylactic octreotide has been recently shown to be ineffective. Optimal treatment and prevention will require improved understanding of the pathophysiology and responsible hormones.

Methods: Carcinoid patients with liver metastases undergoing elective abdominal operations at a high-volume institution from 2015-2017 were prospectively studied using intraoperative transesophageal echocardiography (TEE) and pulmonary artery catheterization. Patients with carcinoid heart disease were excluded. All patients received continuous octreotide infusion at 500 ug/h. TEE videography, hemodynamic data and blood samples were obtained for all patients before incision and during closing, with additional measurements during crises, if they occurred. Serotonin, histamine, kallikrein, and bradykinin levels from blood samples were analyzed by ELISA.

Results: Of the 46 patients studied, 16 had intraoperative hypotensive crises. Pre-incisional serotonin levels were significantly higher in patients who had crises (1063.6 ng/mL vs 452.6 ng/mL, p=0.0064) and were predictive of crisis on a multivariate logistic regression model. The pre-incisional hormone profiles were otherwise diverse. Cardiac function on TEE during crises was normal, but intracardiac hypovolemia was consistently observed. Mean pulmonary artery pressure significantly decreased during crises (p=0.025). Pre-incisional serotonin levels correlated with mid-crisis cardiac index (r=0.73, p=0.017) and cardiac output (r=0.61, p=0.040) on linear regression. Mid-crisis serotonin levels also correlated positively with mid-crisis cardiac index (r=0.61, p=0.017) and cardiac output (r=0.59, p=0.021) and negatively with mid-crisis systemic vascular resistance (r=-0.58, p=0.023). However, there were no significant increases of serotonin, histamine, kallikrein, or bradykinin levels during crises.

Conclusions: The pathophysiology of intraoperative carcinoid crisis is consistent with distributive shock without cardiac dysfunction. Carcinoid tumor hormonal secretion varies widely. Increased pre-incisional serotonin levels correlate with crisis and hemodynamic parameters during crisis. Significant increases of serotonin, histamine, kallikrein, or bradykinin during crisis were not observed, making it unlikely that any of these hormones are directly responsible for precipitating crisis.
13. 68GALLIUM DOTATATE PET CT CHANGES MANAGEMENT IN A MAJORITY OF PATIENTS WITH NEUROENDOCRINE TUMORS

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Background: ⁶⁸GaDOTATATE PET CT detects neuroendocrine tumors (NET) by binding to somatostatin receptors on well differentiated NETs. It has shown superior accuracy in detecting NETs over previously used imaging modalities and was recently approved by the FDA and included in the NCCN Guidelines. It remains unclear, however, which patients benefit most from this imaging modality. We therefore reviewed our initial experience with ⁶⁸GaDOTATATE PET CT to evaluate its usefulness in diagnosing, staging, and surveilling NETs at a tertiary academic medical center.

Methods: Records of patients who underwent ⁶⁸GaDOTATATE PET CT from March 2017 to September 2017 were prospectively evaluated. The primary endpoint was to determine if ⁶⁸GaDOTATATE PET CT changes treatment in patients with NETs when compared to cross-sectional imaging or ¹¹¹In-pentreotide single-photon emission CT. Descriptive statistics and Fisher exact tests were conducted.

Results: 41 consecutive patients were included. 32 patients (78%) had a biopsy-proven NET at the time of imaging. The remaining 9 patients (22%) had either symptoms (2 patients), positive biochemistry (2 patients) or both (5 patients), suggestive of a NET with negative cross-sectional imaging and no tissue diagnosis. The most common indication for ⁶⁸GaDOTATATE PET CT was tumor staging (54%). ⁶⁸GaDOTATATE PET CT changed management in 26 patients (63%); 22 of whom had an inter-modality change (switch from medical to surgical/interventional therapy or vice-versa). Additional lesions were detected in 20 patients (49%); previously suspicious lesions were not avid in 6 patients (15%). One of four unknown primary tumors (25%) was localized with ⁶⁸GaDOTATATE PET CT. None of the scans performed for diagnostic purposes were positive. Patients with liver metastases had a higher likelihood of having a change in management after ⁶⁸GaDOTATATE PET CT was performed. (p = 0.05).

Conclusions: Performing ⁶⁸GaDOTATATE PET CT should be considered for staging and surveillance of NETs in addition to cross-sectional imaging, since it frequently changes management. This imaging modality was not useful for detecting NETs in symptomatic or biochemically positive patients with previous negative cross-sectional imaging.
ABSTRACTS

♦ 14. EFFECTIVE CYTOREDUCTION CAN BE ACHIEVED IN PATIENTS WITH NUMEROUS NEUROENDOCRINE TUMOR LIVER METASTASES

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Background: Cytoreductive surgery for neuroendocrine tumor liver metastases (NETLMs) improves survival and symptomatic control, however, patients often present with numerous, bilobar metastases and are therefore not considered for surgery. Acceptance of a lower target for cytoreduction (≥70% vs. ≥90%) and use of parenchymal sparing techniques has expanded the number of surgical candidates, but the feasibility of achieving adequate cytoreduction in patients with many NETLMs remains uncertain. We set out to compare patient outcomes based upon the number of lesions treated to better define the safety and efficacy of cytoreductive surgery for numerous NETLMs.

Methods: A single institutional surgical database of 391 patients having surgery for gastroenteropancreatic neuroendocrine tumors (GEPNETs) was reviewed and patients undergoing hepatic cytoreductive procedures identified. Pre and postoperative images were reviewed to determine the number of NETLMs, liver tumor burden, and percent tumor debulked. Biochemical response (>50% reduction in elevated hormone levels) and complications were compared between groups. Overall (OS) and progression-free survival (PFS) were compared using the number of lesions treated, percent tumor debulked, and additional clinicopathologic characteristics.

Results: A total of 182 patients undergoing 186 hepatic cytoreductive procedures, including ablations, enucleations and resections for NETLMs were identified. The median number of liver lesions treated was 7 with a range of 1-67. Surgeries were stratified into three groups according to the number of metastases treated: 1-5 (n=74), 6-10 (n=53), and >10 (n=59). Median OS and PFS were 80.4 and 22.9 months, respectively, and were not significantly different between these groups, nor were grade III/IV complications (13.9%), the frequency of ≥70% cytoreduction (76%) or the proportion with biochemical response (69.5%). Patients with 70-90% cytoreduction had similar OS to those with >90% (median 134 months vs. not reached, p=0.639), with both groups showing significantly improved survival relative to those with <70% cytoreduction (median 38 months, p<0.002).

Conclusions: In patients with GEPNETs and NETLMs, ≥70% cytoreduction was associated with improved OS and PFS, and was reliably achieved with similar complication rates in patients undergoing cytoreduction of 1-5, 6-10, or >10 lesions. These data support an aggressive approach to patients with numerous NETLMs to achieve ≥70% cytoreduction.
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Background: The noninvasive encapsulated follicular variant of papillary thyroid carcinoma (EFV-PTC), has recently been reclassified under the terminology of “noninvasive follicular thyroid neoplasm with papillary-like nuclear features” (NIFTP) on the basis of a highly indolent behaviour, a proposal from an international group of experienced thyroid pathologists. To date, there has not been a large, multicentric evaluation of this reclassification as a benign condition. The goal of this retrospective observational study from 9 surgical departments highly-specialized in endocrine surgery over a 10-year period was to validate this reclassification.

Methods: From 2005 to 2015, we retrospectively reviewed all potential cases for NIFT-P (>10 mm) among identified EFVPTC on the basis of pathology reports. Every report was double-checked by two pathologists (a local and another from the working group) specialized in thyroid diseases. Patients were submitted to carcinologic treatment as recommended at the time of management following standardized procedures, with thyroidectomy, sometimes followed by radioiodine therapy. The primary outcome measures were the occurrence of lymph node (LN) metastasis, or a postoperative event (persistence or recurrence of the disease).

Results: From 6,100 PTC, we found 363 patients with a NIFT-P (6%), 274 females (75%) and 89 males, ranging from 15 to 86 years (median 50 years). A total thyroidectomy was performed in 345 cases (95%), including 133 patients (37%) with a LN dissection, and 296 (82%) who had radioiodine treatment. The NIFT-P had a median size of 25 mm (range, 11-90 mm), 14 were multifocal and 7 bilateral. Sixty-five patients had an associated papillary microcarcinoma (micro-PTC). One patient with an associated micro-PTC of 6 mm had a micro-LN metastasis in the central compartment. With a median 4.8-year follow-up, only one patient developed a tumor recurrence 6 years after initial treatment, but he had also an associated micro-PTC (5 mm). All NIFT-P patients without micro-PTC were without evidence of disease during the follow-up.

Conclusions: We found that NIFT-P show a benign behaviour. However, identification of an associated micro-PTC should be carefully evaluated since it could be a factor of LN metastasis and/or recurrence. This support conservative surgery alone although further prospective studies are needed to confirm this result.
16. THE ASSOCIATION OF THE ULTRASONOGRAPHY TIRADS CLASSIFICATION SYSTEM AND PATHOLOGY IN INDETERMINATE THYROID NODULES

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Background: Among cytologically indeterminate thyroid nodules, Afirma has a high sensitivity (92%), low positive predictive value (PPV) (47%), and a benign surgical pathology in more than half of those identified as Afirma ‘suspicious’. In 2015, the Thyroid Imaging Reporting and Data System (TIRADS), was proposed by the American College of Radiology (ACR) to determine when to perform FNA or recommend active surveillance of suspicious nodules. Given the high proportion of cytologically indeterminate, Afirma ‘suspicious’ benign thyroid nodules, our study sought to determine the utility of TIRADS in these subset of patients by examining how it altered the surgical intervention in such patients.

Methods: We retrospectively queried cytopathology archives for thyroid FNA specimens obtained between February 2012 and September 2016 with 1) an indeterminate diagnosis, 2) ultrasound (US) imaging, and 3) Afirma GEC suspicious result. Patients who either did not undergo surgery or did not have ultrasound done at our institution were excluded. We collected and recorded the following: patient demographics, history of Hashimoto’s disease or previous neck surgery, cytology and pathology reports, clinic and operative notes, US reports, and Afirma results.

Results: Our cohort consisted of 133 nodules among 131 patients who underwent thyroid surgery for cytologically indeterminate, Afirma suspicious nodules. The mean thyroid nodule size was 2.3 cm, ranging from 0.5 cm to 8.0 cm. 9 (6.8%) nodules were assigned TR2 ‘not suspicious’; 25 (18.8%), TR3 ‘mildly suspicious’; 81 (60.9%), TR4 ‘moderately suspicious’; and 18 (13.5%), TR5 ‘highly suspicious’. No thyroid nodules were assigned a TR1 or ‘benign’ classification. If one were to apply TIRADS criteria only, 46 nodules (34.6%) would not have had further evaluation, of which, 14 (30.4%) were malignant. However, 32 patients with benign nodules would have been spared unnecessary surgery. Among our cohort, the sensitivity, specificity, PPV, and negative predictive value of TIRADS was 71.4%, 38.1%, 40.2%, and 69.6%, respectively.

Conclusions: Among cytologically indeterminate and Afirma suspicious nodules, TIRADS was not a reliable indicator of the need for further evaluation. Additional prospective studies are needed to validate these findings.
Background: Hyperparathyroidism (HPT) is a common consequence in patients with end-stage renal disease (ESRD). Since the introduction of calcimimetics in 2004, the treatment strategy of ESRD-related HPT has shifted from a surgical towards a more pharmacological approach. Calcimimetics are no longer on the Australian Pharmaceutical Benefits Scheme (PBS) since 2015. We aim to investigate the impact of the successive changes of availability of calcimimetics and treatment strategy on the Australian ESRD-related HPT population.

Methods: A retrospective review of prospectively collected data was performed. Patients were divided into three groups according to the date of their parathyroidectomy (PTx): Group A, before the introduction of calcimimetics (1998 – 2006); Group B, during the era of calcimimetics (2007 – 2014); and Group C (2015 – 2017), after PBS removal of calcimimetics. Primary outcome was time from start dialysis to PTx. Regression analysis was used to examine trends in number of performed parathyroidectomies over time, shown as 95% confidence interval (CI) with R-squared and p-value. Secondary outcomes were baseline characteristics and biochemical measurements.

Results: In total, 195 parathyroidectomies were performed between 1998 – 2017. Baseline characteristics including age, sex, BMI, ASA classification and type of dialysis did not differ significantly between the groups. Patients of Group A were referred for surgery after a median of 69 (33–123) months, of Group B after 67 (31–110) months and of Group C after 44 (23–102) months, p=0.55). PTx rates increased over the full study period (CI 0.09–1.13, R²=0.27, p=0.02). A decreasing trend in PTx rates was seen during the era of cinacalcet compared to before 2007 (p=0.08). Also, median preoperative PTH levels increased significantly over the years (842 [418–1553] vs. 1040 [564–1810] vs. 1350 [1037–1923] pg/mL, for Groups A, B and C respectively [p<0.01]). Preoperative serum corrected calcium, phosphate and alkaline phosphatase levels were not significantly different between the groups and ameliorated all significantly postoperatively.

Conclusions: Over the past 20 years, PTx rates seem to have changed according to the availability of cinacalcet. Despite the use of calcimimetics, this treatment strategy change has been associated with increased preoperative PTH levels, likely reflecting delayed surgery and increased disease severity.
ABSTRACTS

18. PARATHYROIDECTOMY VERSUS CINACALCET IN THE MANAGEMENT OF TERTIARY HYPERPARATHYROIDISM: SURGERY IMPROVES TRANSPLANT ALLOGRAFT SURVIVAL

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Background: Expectant management with long-term cinacalcet therapy remains a common treatment modality for tertiary hyperparathyroidism despite studies suggesting improved normalization of calcium and parathyroid hormone (PTH) levels after sub-total parathyroidectomy. Transplant allograft function in patients who are maintained on cinacalcet therapy versus undergoing parathyroidectomy remains unclear.

Methods: Patients with tertiary hyperparathyroidism were retrospectively reviewed at a single institution from 2002-2017. Demographics, co-morbidities, biochemical data, transplantation variables, transplant allograft failure (estimated glomerular filtration rate < 30), and resolution of hyperparathyroidism were analyzed in patients managed by parathyroidectomy versus observation with cinacalcet therapy. Multivariable analyses are reported in odds ratios (OR) with 95% confidence intervals (95%-CI).

Results: 133 patients were included (33 parathyroidectomy and 100 cinacalcet) with a median transplant allograft survival of 5.9 years [interquartile range (IQR) 4.0-9.0]. Parathyroidectomy was performed at a median of 24 months [IQR 11-61] post-transplantation. Median duration of cinacalcet therapy in the cinacalcet cohort was 51 months [IQR 26-81]. There were no differences in age, sex, BMI, co-morbidities, pre-transplant dialysis duration, cadaveric donor utilization, or rates of delayed allograft function between cohorts; however, more patients were on cinacalcet pre-transplant in the cinacalcet cohort (42% vs. 12%, p<0.001). Normalization of PTH occurred in more patients undergoing parathyroidectomy compared to cinacalcet therapy (67% vs. 15%, p<0.001). In the parathyroidectomy cohort, transplant allograft failure rates were lower (9% vs. 33%, p=0.007), with no difference in years of post-transplant follow-up (7.0 [IQR 4.2-9.3] vs 7.0 [IQR 5.0-10.2], p=0.719). On multivariable analysis, parathyroidectomy was inversely associated with transplant allograft failure (OR 0.28, 95%-CI 0.09-0.86, p=0.027); there were no other associated factors. Patients in the cinacalcet cohort who suffered eventual allograft failure notably had a higher median PTH (pg/mL) at one-year post-transplant (median 348 [IQR 204-493] vs. 195 [IQR 147-297], p=0.025).

Conclusions: Patients who undergo parathyroidectomy for tertiary hyperparathyroidism have lower rates of transplant allograft failure as compared to those maintained on cinacalcet. Allograft failure in patients who are maintained on cinacalcet therapy is associated with higher PTH elevations at one-year post-transplant. Patients with inadequate PTH control on cinacalcet at one-year post-transplant should be considered for parathyroidectomy to prevent potential allograft failure.
19. PREOPERATIVE CALCITRIOL REDUCES POSTOPERATIVE INTRAVENOUS CALCIUM REQUIREMENTS AND LENGTH OF STAY IN PARATHYROIDECTOMY FOR RENAL-ORIGIN HYPERPARATHYROIDISM

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Background: Patients undergoing parathyroidectomy for renal-origin hyperparathyroidism (PTXRO) frequently require postoperative intravenous calcium treatment (Postop-IVCa). Calcitriol is commonly given postoperatively to treat hypocalcemia in these patients, but its effect is typically delayed by 48-72 hours. To avoid this delay, our group began in 2011 to prescribe loading doses of preoperative calcitriol (PC) in PTXRO patients. This study sought to retrospectively test the hypothesis that PC would reduce the need for Postop-IVCa.

Methods: Patients at a single institution undergoing PTXRO in 2004-2016 were reviewed and patients receiving PC were compared to those who did not receive PC (NPC). The PC loading dose was 0.5mcg twice daily for 5 days before surgery. All patients underwent subtotal-parathyroidectomy and received postoperative oral calcitriol and calcium carbonate. Postop-IVCa was given for symptoms of hypocalcemia, calcium <7.0mg/dL, or surgeon preference. The primary endpoint was the need for Postop-IVCa. Fisher-exact test compared proportions. Wilcoxon-test compared continuous data. Multivariable logistic regression adjusted for confounders.

Results: Included were 81 PTXRO patients (40 PC, 41 NPC), of which 77 (95%) were treated for secondary and 4 (5%) for tertiary hyperparathyroidism. PC use increased over time (0% 2004-2010, 69% 2011-2016). There were no significant differences between the PC and NPC groups in median age (45 vs. 47 years), preoperative serum calcium (9.4 vs. 9.3mg/dL), vitamin-D (21.0 vs. 16.0ng/mL), or PTH levels (1655 vs. 1914 pg/mL, p>0.05 for all). A significantly smaller proportion of PC patients required Postop-IVCa relative to the NPC group (34% vs. 90%, p<0.001). Median hospital length of stay (LOS) was significantly shorter for the PC vs NPC group (2.0 vs. 4.0 days, p<0.001). Factors associated with increased Postop-IVCa requirement on univariate analysis included NPC, low preoperative calcium, and high preoperative PTH. After multivariable adjustment for these factors, PC remained independently associated with reduced Postop-IVCa (OR 0.02, 95% CI 0.002-0.10, p<0.001).

Conclusions: A short preoperative course of oral calcitriol reduced the absolute risk of Postop-IVCa by 56% and hospital LOS by 50% in PTXRO patients. Due to these results, we believe PC should be standard of care for PTXRO. Further randomized studies are warranted to corroborate these findings.
Background: Patient-Reported Outcomes Measures (PROMs) are increasingly used to assess disease severity and response to surgery. These clinical tools are being used to assess the value of care provided from the patient’s perspective and are increasingly tied to reimbursement. Rigorous methods now exist to construct and assess the validity of PROMs. Although tools to assess hyperthyroidism exist, PROMs using modern methodology are lacking to assess symptoms of thyroid enlargement and hyperparathyroidism, two conditions where the presence of preoperative symptoms and response to surgery is often questioned.

Methods: A questionnaire reviewing common symptoms was developed from literature review and expert opinion. Pre- and post-operative patients were assessed. Internal validity and initial responsiveness to surgery were evaluated.

Results: PROMPT consists of 30 items to avoid survey fatigue. Ten questions assess the construct of compressive symptoms due to thyroid enlargement. Twenty questions assess the construct of hyperparathyroidism, including the domains of fatigue, sleep, mood, mental clarity, and body aches. The measure was field-tested over 8 months, and 247 surveys were evaluated. When separated by constructs (compressive symptoms and hyperparathyroid symptoms), each showed high internal consistency (Cronbach’s alpha 0.86, and 0.95 respectively). Questions were then scored by construct (scale 0-100), with higher scores corresponding to increased symptom severity. Preoperatively, goiter patients demonstrated significantly higher compressive symptom scores when compared to other thyroid patients and hyperparathyroid patients (mean 50.0 vs. 40.6 vs. 30.0; p=0.0375 goiter vs. other thyroid, and p=0.0002 goiter vs. hyperparathyroid). Two-weeks after surgery, there was a statistically significant improvement in scores amongst hyperparathyroid patients (mean decrease of 8.4 points, p=0.0064, n=16 in matched pairs analysis).

Conclusions: To the best of our knowledge, PROMPT represents the first measure for symptomatic goiters, and the first validated measure for hyperparathyroidism. We have demonstrated internal validity using modern psychometric evaluation. Analysis suggests that, preoperatively, PROMPT differentiates symptomatic goiter patients from other thyroid and hyperparathyroid patients. Additionally PROMPT demonstrates symptom improvement after parathyroid surgery.
ABSTRACTS

♦ 21. UNRECOGNIZED PRIMARY ALDOSTERONISM IN HYPERTENSIVE PATIENTS WITH HYPOKALEMIA OR SLEEP APNEA

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Background: Primary aldosteronism (PA) is the most common form of secondary hypertension, and is estimated to account for at least 10% of complicated hypertension. Delays or failures to diagnosis PA cause significant morbidity. Updated clinical practice guidelines recommend case detection of PA in all patients with hypertension and spontaneous or diuretic induced hypokalemia, and those with hypertension and obstructive sleep apnea (OSA). We hypothesized that many patients with indications for screening for PA are unrecognized.

Methods: Electronic health record (EHR) data on patients from a tertiary referral center between 2001 to 2017 were reviewed. Inclusion criteria for this study cohort were high blood pressure based on ICD and CPT codes and hypokalemia from either ICD codes, laboratory values (potassium < 3.5) or need for potassium supplementation or ICD codes for OSA. Exclusion criteria were age less than 18 years. Patients were checked for documentation of serum aldosterone and/or renin activity, diagnosis of PA, and whether they underwent adrenalectomy.

Results: A total of 125,511 patients had a diagnosis of hypertension with 43,467 patients also having either hypokalemia or OSA. In this patient cohort, 26,571 (61.1%) were female and 26,049 (59.9%) were Black/African Americans. Only 496 (1.1%) patients had an aldosterone and/or renin level measured. Of patients that were screened, 57 (11.5%) were diagnosed with PA and 21 (4.2%) underwent unilateral adrenalectomy. Neither gender (p = 0.18) nor race (p = 0.72) were significantly different between patients who were and were not screened. In a multivariable logistic regression analysis, significant predictors for screening were younger age at first encounter (p < 0.005), and increased clinical visits (p < 0.005). The type of encounter (outpatient, inpatient, or ED) was not predictive of screening.

Conclusions: We found that 99% of patients who should have been screened for PA by national guidelines never underwent screening. Further, of those that were screened and diagnosed with PA, most never underwent an operation which may be contributed by patients not being referred to a surgeon. Improved education and incorporation of EHR alerts prompting further evaluation of select patients with hypertension could raise physician awareness about PA and improve patient outcomes.
22. EXPRESSION OF PROGRAMMED DEATH LIGAND-1 AND 2 IN ADRENOCORTICAL CANCER TISSUES: AN EXPLORATORY STUDY

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Background: The interaction between programmed death-1 (PD-1), expressed on T-cells, and its two ligands, PD-L1 and PD-L2, expressed on tumor cells, facilitates escape from immune detection. Inhibition of PD-L1 and PD-L2 has been successfully used for treatment of multiple advanced cancers. Adrenocortical carcinomas (ACC) have a poor prognosis and ineffective systemic treatment options. In this study, we investigated PD-L1 and PD-L2 expression in ACC in order to determine the potential usefulness of checkpoint inhibitors in these tumors.

Methods: 59 tissue samples from patients with ACC, indeterminate adrenocortical tumors (ACT), adrenal adenomas (AA), and normal adrenal tissue (NA) were identified from two institutional biorepositories. Immunohistochemistry (IHC) was performed on FFPE slides for PD-L1, PD-L2, and CD8 using commercially available monoclonal antibodies. All samples were reviewed blindly by a pathologist and scored for cytoplasmic and/or membranous staining according to the percent of positive cells and intensity. An IRS score was calculated and considered positive if ≥ 6 (≥ 50% of positive cells and ≥ 2+ staining intensity). Tumor characteristics (size, distant metastases, functionality) were obtained and correlated to PD-L expression. Descriptive statistics and Mann-Whitney tests were performed.

Results: 14 ACC samples, 3 ACTs, and 3 AAs were analyzed initially. No samples stained positive for PD-L1, but 2 ACC (14%) and 1 ACT (33%) sample stained positive for PD-L2. An independent validation cohort comprising 22 ACC, 8 AA, and 9 NA samples confirmed strong PD-L2 staining in 6 ACC cases (27%) versus strong PD-L1 staining in only one ACC sample (4%) (p=0.04). 23 of 34 ACC (67%) were either focally or diffusely positive for tumor infiltrating lymphocytes by CD8 staining. There was no significant correlation between PDL-2 and CD8 expression (p=0.36). There was also no significant correlation between PD-L2 or CD8 expression and tumor characteristics (p=0.3).

Conclusions: Programmed Death Ligand-2 (PD-L2), but not PD-L1, is highly expressed in up to a quarter of ACC samples and the utility of checkpoint inhibitors such as Pembrolizumab could therefore be evaluated as a novel therapeutic target for those patients. Further studies, including a larger sample size, are needed to analyze PD-L2 expression and survival in ACC.
ABSTRACTS

♦ 23. LONGITUDINAL PATTERNS OF RECURRENCE IN PATIENTS WITH ADRENOCORTICAL CARCINOMA

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Background: Disease recurrence after curative surgical resection of adrenocortical carcinoma (ACC) is common. Patterns and prognostic implications of recurrent disease are poorly understood. We hypothesize that patterns of disease recurrence will prognosticate disease course and survival.

Methods: A retrospective review was conducted of 577 patients with ACC evaluated at a single tertiary care center; clinicopathological and follow-up data were collected longitudinally. Univariate and multivariate regression models determined associations for primary outcome measures.

Results: Review of longitudinal data from 175 patients with Stage I-III ACC, who underwent initial resection with curative intent, identified 133 (76%) patients with disease recurrence [66% female, median age 47 (18-80)]. Median disease-free interval was 11 months (0.1-210). First recurrences limited to a single site (80%) were most commonly tumor bed (24%), pulmonary (18%), or peritoneal (16%). Fifty-nine patients underwent either one (38), two (14), or ≥ three (7) reoperations: 45/59 recurred after first reoperation and 21/45 underwent second reoperation; 17/21 again recurred and 7/17 underwent additional reoperation(s). Overall, 34% of recurrences after reoperation involved the same site/organ as first recurrence. Median progression-free survival was 11 months (0.2-97) after first reoperation and 14 months (0.8-90) after second reoperation. Patients with peritoneal or other “unspecified” distant recurrences had the shortest progression-free survival after first reoperation. Median length of follow-up was 34 months (3.3-295). Median overall survival after first recurrence was 17 months (1.3-153).

Higher stage at diagnosis was predictive of pulmonary (p<0.01) recurrence; high tumor grade was predictive of pulmonary (p<0.01) and peritoneal (p=0.02) recurrence; lymphovascular invasion was predictive of intra-hepatic (p=0.05) recurrence. Intra-hepatic recurrence was associated with longer disease-free interval (p=0.03). Pulmonary (p<0.01) and multi-site (p=0.02) recurrences were associated with further recurrence after reoperation. Initial tumor size ≤ 8 cm (p=0.03) and curative intent of reoperation (p=0.05) were predictive of longer progression-free survival. Increased risk of death was associated with high tumor grade (p<0.01), disease-free interval <12 months (p<0.01), multi-site recurrence (p=0.03), and no reoperation (p<0.01). Lymphovascular invasion predicted shortened overall survival (p<0.01).

Conclusions: Knowledge of patterns of ACC recurrence, combined with other common prognostic indicators, may lead to improved prediction of disease course and refine selection of treatment, particularly reoperation.
ABSTRACTS

24. A PROPENSITY-MATCHED ANALYSIS OF CLINICAL OUTCOMES BETWEEN OPEN THYROID LOBECTOMY AND HIGH INTENSITY FOCUSED ULTRASOUND (HIFU) ABLATION IN THE TREATMENT OF BENIGN THYROID NODULES

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Background: Benign thyroid nodules are common and although most remain unchanged over time, some do cause local symptoms necessitating surgical resection. High intensity focused ultrasound (HIFU) ablation is a promising non-surgical technique that is effective in not only causing significant nodule shrinkage but also alleviating nodule-related symptoms. However, its treatment-related clinical outcomes have rarely been directly compared to those in the open thyroid lobectomy.

Methods: From 2015 to 2017, any patients with a cytologically-confirmed benign thyroid nodule within one unilateral lobe that was either causing local symptoms or growing in size were offered surgical resection (i.e. an open thyroid lobectomy). Those who were not willing to undergo surgical resection were offered single-session HIFU ablation as an alternative. Clinical outcomes including treatment morbidities, hospital stay, days-to-resume normal work duties, direct procedural cost and voice quality by acoustic voice analysis were compared between the two groups. Propensity score-matching (with age and sex as co-variates) was performed to minimize potential biases.

Results: During this period, 97 consecutive patients underwent HIFU (HIFU group) and 88 patients underwent open thyroid lobectomy (Surgery group). After propensity score matching (1:1 ratio), outcomes of 77 patients in the HIFU group were compared to 77 patients in the Surgery group. In the HIFU group, the 6-month mean nodule shrinkage was 66.72 ± 34.27 % and the overall symptom score significantly improved from baseline (p<0.001). The overall treatment-related morbidity rate was not significantly different between the HIFU and Surgery groups (6.5% vs. 6.5%, p=1.000). However, the hospital stay and the number of days-to-resume normal work duties were significantly shorter in the HIFU group (0.0 day vs. 1.1 days, p<0.001 and 1.0 day vs. 6.6 days, p<0.001, respectively). Also the procedural cost was significantly less in the HIFU group (USD 1928.02 vs. USD 5141.39, p<0.001) and despite the similar voice quality on acoustic voice analysis at baseline, the Surgery group suffered significantly poorer pitch level at 1-week after treatment than the HIFU group (187.57 ± 47.29 Hz vs. 208.71 ± 49.70 Hz, p=0.011).

Conclusions: HIFU ablation treatment is an effective alternative with several distinct advantages over the standard open lobectomy in symptomatic benign thyroid nodules.
ABSTRACTS

25. STAGE MIGRATION WITH THE NEW STAGING SYSTEM [8TH EDITION] FOR DIFFERENTIATED THYROID CANCER

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Background: The stage grouping in thyroid carcinoma is important for decision making. However, in thyroid cancer, many patients with stage III and IV have overall survival of 90%. In other tumors, stage I and II are considered early, while stage III and IV are considered advanced cancer. With extensive review of the data from around the world, the stage grouping is revised in the 8th edition, and the age cut-off is now used as 55. This will have a major impact on the stage migration, and it is anticipated that many patients will be down staged.

Methods: We reviewed our large database to analyze the impact of the new staging system. Our database included 3,650 patients with detailed information of their prognostic factors. There were 994 males (27%) and 2,656 females (73%); the median age was 46. The age range extended from 4 to 94 years. The interquartile range was from 26 to 58 years. We staged these patients based on both the 7th and 8th edition, where the major changes were cut off age of 55 years, new definition of T3 and T4, and nodal staging.

Results: Of 3,650 patients, 1,057 (29%) were downstaged. 104 patients (10%) were downstaged from stage IV to I, 109 (10%) down staged from stage IV to stage II, and 68 (6%) to stage III. 218 patients (21%) were downstaged from stage III to I, and 347 (37%) downstaged from stage III to stage II. 211 (20%) were downstaged from stage II to I. Clearly, this downstaging of 29% patients will have a direct impact on the discussion about their long-term survival and more importantly on adjuvant therapy. The overall, disease-specific and relapse-free survival was analyzed by both staging systems and showed a more appropriate correlation and better stratification with 8th staging system.

Conclusions: With the new staging system, 29% patients were downstaged, while interestingly amongst the downstaged patients 26% were downstaged from stage IV to I, II and III. The new staging system adheres more appropriately to the biology of thyroid cancer and will have a rational impact on the management of thyroid cancer.
Background: Patients often struggle to attain euthyroidism after thyroidectomy, and multiple dosing schemes have been proposed to supplant the standard weight-based approach for initial levothyroxine (LT4) dosing. The objectives of this study were to review the literature for existing LT4 dosing schemes and compare estimation accuracies with novel schemes developed with machine learning techniques.

Methods: This study retrospectively analyzed 598 patients from a single institution who attained euthyroidism with LT4 therapy between 2007 and 2017 after undergoing total or completion thyroidectomy for benign disease. We evaluated several machine learning algorithms for estimating euthyroid dose. Three reviewers independently reviewed articles from PubMed, Cochrane, Scopus, and Web of Science in a scoping review to identify existing LT4 replacement dosing schemes. Using repeated 10-fold cross-validation, we evaluated the accuracy of each dosing scheme by calculating the proportion of patients whose predicted dose was within 12.5 mcg/day of their actual euthyroid dose.

Results: Of the 264 articles reviewed, 9 articles proposed LT4 dosing schemes. Ultimately 7 articles proposed schemes that could be implemented retrospectively. After testing various machine learning algorithms to predict LT4 dose, a novel Poisson regression model proved most accurate, correctly predicting 64.8% of doses. Incorporating 7 clinical variables (BMI, weight, age, sex, preoperative TSH, iron supplement use, and multivitamin/mineral use), Poisson regression was significantly more accurate than the best existing dosing scheme in the literature (a BMI adjusted weight-based scheme) that correctly predicted 60.9% of doses (p=0.031). Weight-based LT4 dosing (1.6 mcg/kg/day) correctly predicted 51.3% of doses, and the least effective dosing scheme proposed in the literature (an age adjusted weight-based scheme) correctly predicted 40.1% of doses. Compared to existing schemes, Poisson regression had the lowest rate of dosing errors greater than 25 mcg/day at 19.1%. Examining extremes of patient weight, Poisson regression yielded the highest predictive accuracy within each BMI tertile (lower: 73.3%, middle: 63.6%, upper: 59.7%).

Conclusions: Using readily available variables, a novel Poisson regression dosing scheme outperforms other machine learning algorithms and all existing dosing schemes in calculating LT4 dose. Implementing Poisson regression into electronic medical systems to automatically calculate LT4 dose could potentially reduce morbidity associated with LT4 replacement after thyroidectomy.
ABSTRACTS

27. UNILATERAL BENIGN MULTINODULAR GOITER VS SOLITARY NODULE: CONTRALATERAL RECURRENCE RATES AFTER LOBECTOMY

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Background: There are few long-term studies defining the appropriate extent of thyroid surgery and rate of recurrent nodular disease for unilateral multinodular goiter (MNG). The aim of the study was to evaluate the rate and time to recurrence of patients with MNG who underwent a lobectomy, as compared to that of patients with a benign solitary nodule (SN).

Methods: We conducted a retrospective study of a prospectively maintained database of all consecutive patients who underwent lobectomy for MNG or SN from 1991 to 2017 at our institution. We analyzed age, sex, final histopathology, recurrence rates and time to recurrence. Recurrence was defined as a clinically significant recurrence requiring surgical intervention: nodule greater than 3 cm, multiple nodules, nodule growth on consecutive ultrasounds, suspicious nodule by ultrasound or FNA, compressive symptoms, and/or patient preference. The primary outcome was the number of patients who underwent completion thyroidectomy. The secondary outcome was the time to clinically significant progression.

Results: A total of 2,675 lobectomies were included: 852 (31.85%) for MNG, and 1,823 (68.15%) for SN. 394 patients (15%) underwent a reoperation: 261 (30.6%) patients with a previous MNG, and 133 (7.29%) patients with a previous SN (p<0.0001). Of the patients with MNG, 80% (n=208) recurred as a MNG. Also, of the patients with a SN, 67.66% (n=90) recurred as a MNG; 3.5% of the recurrences were carcinomas. The mean time to recurrence was 178 months (14.8 years), with no difference between both groups, p=0.5765 (mean (IQR): 170 (146) vs 182 (146)). However, patients with MNG had a shorter time to recurrence (p<0.0001). Patients with no recurrence were younger than patients with recurrence 47+15 vs 54+13, p<0.0001, and male patients were less likely to recur, p<0.0001.

Conclusions: Although recurrence rates for MNG compared to SN are higher (30.6% vs 7.29%), lobectomy for unilateral MNG is reasonable and can be regarded as the procedure of choice given the long time to clinically significant recurrence requiring completion thyroidectomy. This approach avoids unnecessarily exposing patients to the complications of total thyroidectomy. However, patients and surgeons should be aware of the need for long-term surveillance.
ABSTRACTS

28. NATURAL HISTORY OF PAPILLARY THYROID MICROCARCINOMA: KINETIC ANALYSES ON THE TUMOR VOLUME DURING ACTIVE SURVEILLANCE AND BEFORE PRESENTATION

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Background: We showed that only 8% of low-risk papillary microcarcinomas (PMCs) enlarged at 10-year active surveillance (AS). Some of PMCs did show tumor shrinkage, indicating change in growth pattern over time. We can analyze the growth during AS. However, the growth before presentation is unknown. Here, we estimated the growth with a hypothesis described in Method. We compared these two growth values.

Methods: From January 2000 to December 2004, 169 patients with low-risk PMC aged from 24 to 79 years were enrolled in AS. Tumor size at presentation ranged from 3 mm to 10 mm (median: 7 mm). Patients were followed for a median of 10.1 years with periodic ultrasound examinations (median: 12 exams). First, we calculated tumor-doubling time (DT) based on the serial tumor size measurements. Then, we calculated what we term ‘hypothetical maximum tumor-doubling time’ (HM-DT): an estimate of DT before presentation using the patient’s age and size of tumor at presentation, presuming that a single 10 μm-dia. cancer cell was present at birth and grew at a constant rate. To solve the discontinuity problem among positive and negative DT values, we transformed the DTs to their inverse so that large, small, and negative values would indicate rapid growth, slow growth, and shrinkage, respectively.

Results: The inverse DTs (1/year) ranged from -12.8 to 0.95 (median: 0.02), and were >0.5, 0.1–0.5, -0.1–0.1, and <-0.1 in 3, 36, 104, and 26 PMCs. Patients older than 60 years had stable or shrinking PMCs significantly more than younger patients did. The inverse HM-DTs ranged from 0.35 to 1.14 (median: 0.50). These values were larger than the inverse DTs in all patients except three.

Conclusions: Using this novel calculation of inverse DT and inverse HM-DT, only 3 (2%) of cancers in this cohort of 169 patients showed rapid growth, 36 (21%) showed very slow growth, 104 (62%) showed almost stable disease, and 26 (15%) showed shrinkage on AS. The comparison of DT to HM-DT strongly suggests that the rapid growth period occurred some time before enrollment in AS, and that slowing in growth rate and shrinkage during AS was very common.
29. PRIMARY HYPERALDOSTERONISM WITH NON-LOCALIZING IMAGING

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Background: Primary aldosteronism (PA) is the most common cause of secondary hypertension. After biochemical diagnosis, patients with adrenal masses on imaging are referred for surgery and patients with non-localizing imaging are presumed to have hyperplasia and managed medically.

Methods: We performed a retrospective analysis of PA patients undergoing adrenalectomy (1997-2017), who were routinely referred for adrenal vein sampling (AVS). Clinical data were analyzed. Standard blood pressure (BP) criteria were used. Patients were classified by imaging as localized (unilateral adrenal mass ≥1.0 cm with a normal contralateral adrenal gland), or non-localized (no mass, or bilateral masses). Cure was defined as normotension off anti-hypertensive medications (AHM). Improvement was defined as postoperative decrease in BP, AHM, or both.

Results: Of 482 PA patients who underwent AVS, 335 lateralized. Of 259 patients who underwent adrenalectomy, 81.5% (n=211) were localized by imaging. Mean age (51.1 versus 50.6 years; p=0.746) and proportion ≤40 years old (localized: 18.0% versus non-localized: 18.8%, p=1.000) were similar. Non-localized patients had higher BMI (34.2 versus 31.3 kg/m2, p=0.010). Although there was no difference between groups in hypokalemia (localized: 75.1% versus non-localized: 77.1%, p=0.775), median aldosterone-renin ratio (localized: 149.5 versus non-localized: 143.0 (ng/dl)/(ng/ml/hr), p=0.651), or median duration of hypertension (10 years for both groups, p=0.127), localized patients were taking significantly fewer AHM (3 versus 4, p=0.010). Median tumor size was larger in localized patients (1.5 versus 1.0 cm, p<0.001). Pathology was adenoma (83.0% versus 83.3%), adenoma in a background of hyperplasia (13.7% versus 8.3%), or hyperplasia (2.8% versus 8.3%), in localized versus non-localized patients, respectively (p=0.224). On follow-up, localized patients had lower BP (mean localized: MAP 96.0 versus non-localized: 101.1 mmHg, p=0.018), and required fewer AHM (1.7 versus 2.4, p=0.020). The majority in both groups experienced improvement (localized: 93.4% versus non-localized: 91.4%, p=0.711), with a minority completely cured (localized: 11.4%, non-localized: 12.5%, p=0.805).

Conclusions: Higher BMI and larger numbers of AHM are associated with non-localizing preoperative imaging. PA patients with non-localizing imaging but lateralizing AVS experience clear benefit from adrenalectomy, with equivalent rates of improvement and cure. Regardless of imaging findings, patients should undergo routine AVS, as they may be eligible for surgical management.
ABSTRACTS

30. OVER EXPRESSION OF CELL-CYCLE DEPENDENT PROTEINS ASSOCIATED WITH LOWER SURVIVAL IN ADRENOCORTICAL CARCINOMA PATIENTS

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Background: Adrenocortical carcinoma (ACC) is a rare and aggressive malignancy with poor survival. Treatment options are limited for locally advanced ACC with a high risk of relapse, even after major surgical resection. Because of difficulties in early detection, 70% of the ACC patients are present with metastases at the time of diagnosis. Even with surgery or adjuvant treatment (mitotane alone or in multidrug combination(Italian protocol)), survival is poor and durable complete response for advanced disease is not observed, making it paramount to identify improved targets and better therapies. We hypothesize that analyzing the TCGA (The Cancer Genome Atlas) gene expression data could identify important novel biomarkers that correlate with worse prognosis in this disease and represent new opportunities for therapeutic targeting.

Methods: Data mining of University of Alabama UALCAN data base that is an interactive web-portal for in-depth analyses of TCGA gene expression data was used to identify novel biomarkers observed in 79 ACC patients (available mRNA seq data). Identified biomarkers were then examined for prognostic correlation using the cBioportal.

Results: Using the TCGA RNAseq data set at UALCAN, ACC pathways associated with poor survival revealed a significant upregulation in cell-cycle pathway associated genes. Proteins in this pathway such as AURKA, AURKB, CDK1, CDK4, CDK6, PLK1, CHEK1, CHEK2, CDC7, NME1 and NME2 are significantly upregulated (p<0.001 each). On outcome correlation, a higher expression levels of all the genes except CDK4 (20 patients) was associated with a significantly worse survival compared with medium or low gene expression levels (59 patients). Probability surviving 1 year=0.15 for high expressors vs 0.6 for low-med expressors,p<0.0001 which was independent of age or gender. Consistent with our findings in UALCAN, data mining in cBioportal also revealed upregulation of the cell cycle related genes in 72% of patients with a Z score threshold of 1.5. The highest upregulated genes were CDK4(51%), AURK(35%), and CDK1(23%).

Conclusions: Large data-mining from the TCGA and cBioportal identified cell cycle related genes that are significantly correlated with poorer overall survival for ACC. Further evaluation of cell cycle modulators might represent novel effective therapeutic options for ACC patients in the future.
ABSTRACTS

31. GROWING HUMAN PARATHYROIDS IN A MICROPHYSIOLOGICAL SYSTEM: A NOVEL APPROACH TO UNDERSTANDING AND DEVELOPING NEW TREATMENTS FOR HYPERPARATHYROIDISM

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1UAB, 2Surgery, UAB

Background: Our understanding of hyperparathyroidism and our ability to develop new treatments is limited because existing disease models do not allow robust evaluation of how parathyroid hormone simultaneously affects multiple human organ systems. We developed a novel model for studying parathyroid disease by growing ex vivo 3-dimensional human parathyroids as part of a Microphysiological System that mimics human physiology. The system involves growing miniature “pseudoorgans” or “pseudoglands” on chips that are connected with a microvascular and circulatory system that replicates human blood flow and hormonal effects to reproduce critical hormonal interactions within the human body. This allows researchers to evaluate the effects of hormones on multiple human organs (heart, bone, kidneys) without relying on mouse or other animal models. The purpose of this study was to validate the parathyroid portion of the Microphysiological System.

Methods: We prospectively collected tissue from 20 patients treated for hyperparathyroidism and isolated parathyroid cells for growth into pseudoglands on non-adherent 48-well plates. Pseudogland architecture was evaluated via histology and immunofluorescence microscopy. We evaluated calcium responsiveness of pseudoglands via measurement of parathyroid hormone production in response to varying calcium levels.

Results: Following 2 weeks in culture, dispersed cells successfully coalesced into pseudoglands ~ 500-700 µm in diameter that mimicked the appearance of normal parathyroid glands. Functionally, they also appeared similar to intact parathyroids in terms of organization and calcium sensing receptor expression. Immunohistochemical staining for calcium sensing receptor revealed 240-450/cell units of mean fluorescence intensity within the pseudoglands. Finally, the pseudoglands showed varying levels of calcium responsiveness, indicated by decreases in calcium sensing receptor levels in response to increasing calcium levels.

Conclusions: We successfully piloted development of a novel Microphysiological System for studying the effects of hyperparathyroidism on human organ systems. We are currently evaluating the effect of parathyroid hormone on adverse remodeling of tissue engineered cardiac, skeletal and bone tissue within the Microphysiological System.
ABSTRACTS

32. THE EFFECT OF TOTAL THYROIDECTOMY ON THE RECOVERY OF BONE MINERAL DENSITY IN SUBJECTS WITH HYPERTHYROIDISM

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Background: Thyrotoxicosis is associated with high bone turnover osteopenia, reduced bone mineral density (BMD) and its recovery after treatment. However, the degree of improvement of BMD with different forms of treatment such as antithyroid therapy, radioactive iodine and operative treatment remains controversial. This prospective study evaluated the improvement in BMD in thyrotoxic subjects undergoing total thyroidectomy (TT) versus 131I radioactive iodine (RAI) therapy.

Methods: Operative cases with new onset hyperthyroidism (Group 1; n= 127; age= mean +/- SD; 37.1 +/- 9.8 y) were evaluated for BMD by dual energy X-ray absorptiometry in the hip and spine at the time of diagnosis (Point A), on achieving euthyroidism with antithyroid therapy (Point B) and six months after TT (point C). Thyrotoxic subjects undergoing RAI therapy were included in group 2 (n= 30; age= 45.9 +/- 14.54 y).

Results: In group 1, BMD in the hip and spine were 0.842 +/- 9.8 g/cm² and 0.97 +/- 0.155 g/cm² respectively at point A. At point B, BMD in the hip (0.853 +/- 0.157 g/cm²) and spine (0.982 +/- 0.155 g/cm²) improved significantly and further improved at point C (hip, 0.91 +/- 0.158 g/cm² and spine, 1.053 +/- 0.161 g/cm², each P< 0.001). In group 2, pretreatment BMD were 0.741 +/- 0.146 g/cm² (vs. posttreatment 0.761 +/- 0.168 g/cm², P= 0.055) in the hip and 0.823 +/- 0.159 g/cm² (vs. Posttreatment 0.831 +/- 0.159 g/cm², P= 0.001) in the spine respectively. Posttreatment BMD was significantly higher in group 1 subjects post-TT than group 2 subjects post-RAI therapy in the hip (P< 0.001) and spine (P< 0.001).

Conclusions: BMD improved significantly after all forms of definitive treatment of thyrotoxicosis, especially in the lumbar vertebra, a cancellous bone. The degree of recovery of bone mass was highest in subjects with hyperthyroidism undergoing TT as early as six months post-surgery.
Background: There are two principally different surgical techniques in parathyroidectomy (PTX) for secondary hyperparathyroidism (sHPT): total and subtotal PTX. It remains unclear which procedure yields the best outcomes. We investigated the risk of mortality, cardiovascular disease, hip fracture and re-PTX after total vs subtotal PTX in patients on renal replacement therapy.

Methods: Using the Swedish Renal Registry, a nationwide, population-based cohort of patients on dialysis or with a renal transplant, we identified 848 patients who underwent PTX between 1991 and 2013 by crossmatching with the surgical registry for thyroid- and parathyroid surgery and with the national inpatient register, containing discharge diagnoses and procedures. Information on medical treatment was retrieved by crossmatching with the national prescription registry. Blood levels of calcium, parathyroid hormone and phosphate, among others, were extracted from the Swedish Renal Registry. Patients were classified as total (n= 388) or subtotal PTX (n= 436), using procedure codes. Patients were followed from time of surgery until death or incident cardiovascular disease or hip fracture, or until end of follow up, which was 31st December 2013. We compared levels of parathyroid hormone before and after total and subtotal PTX. We calculated the risk of death and incident cardiovascular disease after total vs subtotal PTX using Cox proportional hazards regression, adjusting for age, sex, cause of renal disease, time with a functioning graft before and after PTX, Charlson comorbidity index, year of surgery, prevalent CVD, time on dialysis, renal transplantation at PTX and treatment with calcimimetics before PTX.

Results: Patients who underwent total PTX had higher levels of PTH before surgery, but lower levels after surgery, than patients who underwent subtotal PTX. There was no difference in mortality or risk of incident hip fracture between groups. The adjusted hazard ratio (95% confidence interval) for CVD was 0.56 (0.37-0.86) after subtotal PTX compared with total PTX. The adjusted hazard ratio (95% confidence interval) of re-PTX was 2.68 (1.35-5.32) after subtotal PTX compared with total PTX.

Conclusions: There was a higher risk of cardiovascular disease in patients after total PTX compared with subtotal PTX, but a lower risk of re-PTX.
34. INNOVATIVE SURGICAL GUIDANCE FOR LABEL-FREE REAL-TIME PARATHYROID IDENTIFICATION.

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¹Vanderbilt Biophotonics Center, Vanderbilt University, ²Department of Biomedical Engineering, Vanderbilt University, ³Department of Pathology, Microbiology and Immunology, Vanderbilt University Medical Center, ⁴Division of Surgical Oncology and Endocrine Surgery, Vanderbilt University Medical Center

Background: Difficulty in identifying parathyroid glands during neck surgeries often leads to accidental parathyroid excisions and eventual post-surgical hypocalcemia. This necessitates time-consuming frozen section biopsies for parathyroid identification. A projection Overlay Tissue Imaging System (OTIS) was built to provide spatial information regarding parathyroid glands. The OTIS detects near-infrared auto-fluorescence (NIRAF) from parathyroid glands and back-projects its location using visible green light directly onto the surgical field of view (FOV) to enhance visibility of the gland to the surgeon’s eyes with operation room (OR) lights switched off. In parallel, a clinical prototype - PTEye - was designed with a reusable surgical probe and a user-friendly interface to guide parathyroid identification as OR lights remain switched on. We sought to determine accuracy of these systems for intraoperative parathyroid identification.

Methods: The OTIS was assessed for parathyroid visualization in 15 patients who underwent thyroidectomy or parathyroidectomy, whereas the PTEye was concurrently evaluated in another set of 20 patients. For each OTIS measurement, the surgeon positioned the ‘projector’ above the surgical FOV. If the tissue had relatively high NIRAF counts as observed in parathyroid glands, the system back-projects visible green light directly onto the surgical field of view (FOV) to enhance visibility of the gland to the surgeon’s eyes with operation room (OR) lights switched off. In parallel, a clinical prototype - PTEye - was designed with a reusable surgical probe and a user-friendly interface to guide parathyroid identification as OR lights remain switched on. We sought to determine accuracy of these systems for intraoperative parathyroid identification.

Results: The OTIS was able to successfully visualize parathyroid glands with a 91.7% detection rate. Concurrently, the PTEye achieved 97.4% accuracy in parathyroid identification, despite ambient OR lights. Both the OTIS and PTEye did not require fluorescent dyes and provided real-time results.

Conclusions: The OTIS could enable surgeons to visualize parathyroid glands more clearly within the surgical FOV itself in a label-free manner, without requiring a remote display monitor. The intuitive interface of PTEye and its ability to identify parathyroid despite ambient OR lights, could further aid in rapid parathyroid identification without contrast agents. These two innovative technologies possess high accuracy and can be a valuable adjunct during challenging neck surgeries.
POSTER DISPLAYS

♦ Denotes Resident/Fellow Research Award Competition Poster

NOTE: Author listed in BOLD is the presenting author
01. DEVELOPMENT OF ANTIBODY-DRUG CONJUGATES FOR NEUROENDOCRINE CANCER THERAPY

Jason Whitt, Jianfa Ou, X. Margaret Liu, Tolulope Aweda, Suzanne E. Lapi, Zviadi Aburjania, Herbert Chen, Renata Jaskula-Sztul
1Surgery, University of Alabama at Birmingham, 2Biomedical Engineering, University of Alabama at Birmingham, 3Radiology, University of Alabama at Birmingham

♦ 02. EIGHTH EDITION AJCC STAGING SYSTEM AND FOLLICULAR THYROID CARCINOMA: ONE SIZE DOES NOT FIT ALL

Huan Yan, Chi-Hsiung Wang, Yoko Nakazato, David J Winchester, Richard Prinz, Tricia Moo-Young
1Surgical Oncology, NorthShore University HealthSystem, 2NorthShore University Research Institute

♦ 03. MET AS POTENTIAL TARGET FOR MOLECULAR FLUORESCENCE GUIDED SURGERY IN PAPILLARY THYROID CARCINOMA

Pascal Jonker, Mark Sywak, Dianne Leeuw, Gooitzen van Dam, Anthony Gill, Paul van Diest, Sjoukje Oosting, Rudolf Fehrmann, Schelto Kruijff
1Endocrine Surgery and Surgical Oncology, Royal North Shore Hospital, 2Surgical Oncology, University of Groningen, University Medical Center Groningen, 3Nuclear and Molecular Imaging, Intensive Care, University of Groningen, University Medical Center Groningen, 4Anatomical Pathology, Royal North Shore Hospital, 5Pathology, University Medical Center Utrecht, 6Medical Oncology, University of Groningen, University Medical Center Groningen

♦ 04. EFFECTIVENESS OF INDOCYANINE GREEN FLUORESCENCE IN PREDICTING PARATHYROID VASCULARIZATION AFTER THYROID SURGERY: DO WE NEED TO PERFORM UNNECESSARY AUTOTRANSPLANTATION?

Alexander Razavi, Kareem Ibraheem, Antoine Haddad, Lachin Saparova, Emad Kandil
1Tulane University School of Medicine

♦ 05. SCIENTIFIC PRODUCTIVITY AND NATIONAL INSTITUTES OF HEALTH FUNDING OF ENDOCRINE SURGEONS: WHERE DO WE STAND?

Kareem Ibraheem, Mahmoud Farag, Antoine B. Haddad, Marcus A. Hoof, David C. Nguyen, Christopher J. Carnabatu, Leon J. Wang, Mary Killackey, Emad Kandil
1Tulane University
POSTER DISPLAYS

♦ 06. PRIMARY TUMOR MORBIDITY IN PATIENTS WITH METASTATIC WELL-DIFFERENTIATED MIDGUT NEUROENDOCRINE TUMORS

Janet WY Li¹, David A Kleiman¹, Kelvin Memeh¹, Omobalaji O Akala², Nitya Raj², Diane Reidy-Lagunes², Brian R. Untch¹
¹Surgery, Memorial Sloan Kettering Cancer Center, ²Medicine, Memorial Sloan Kettering Cancer Center

♦ 07. EXIT VAGUS TESTING DURING THYROIDECTOMY OBVIATES THE NEED FOR POSTOPERATIVE LARYNGOSCOPY

Lindsay Kuo¹, Brenessa Lindeman², Nancy Cho¹, Atul Gawande¹, Francis Moore, Jr¹, Gerard Doherty¹, Matthew Nehs¹
¹Brigham and Women’s Hospital, ²University of Alabama
08. CLINICAL OUTCOMES AFTER UNILATERAL ADRENALECTOMY FOR PRIMARY ALDOSTERONISM: A LARGE, WORLDWIDE AND RECENTLY OPERATED COHORT OF 435 PATIENTS.

Wessel M.C.M. Vorselaars1, Sjoerd Nell1, Emily L. Postma1,2, Rasa Zarnegar2, Frederick T. Drake3,4, Quan-Yang Duh3, Stephanie D. Talutis4, David B. McAneny4, Catherine McManus5, James A. Lee5, Scott B. Grant6, Raymon H. Grogan6, Minerva A. Romero Arenas7, Nancy D. Perrier7, Ben J. Peipert8, Michael N. Mongelli8, Tanya Castelino9, Elliot J. Mitmaker9, David N. Parente10, Jesse D. Pasternak10, Anton F. Engelsman11, Mark Sywak11, Gerardo D’Amato12, Marco Raffaelli12, Valérie Schuermans13, Nicole D. Bouvy13, Hasan H. Eker14, H. Jaap Bonjer14, Nina M. Vaarzon Morel15, Els J.M. Nieveen van Dijkum15, Otis M. Vrieling16, Schelto Kruijff16, Wilko Spiering17, Inne H.M. Borel Rinkes1, Gerlof D. Valk18, Menno R. Vriens1

1Department of Surgical Oncology and Endocrine Surgery, University Medical Center Utrecht, 2Department of Surgery, Weill Cornell Medical College, 3Department of Surgery, University of California San Francisco, 4Department of Surgery, Boston University School of Medicine and Department of Graduate Medical Sciences, 5Department of Endocrine Surgery, New York-Presbyterian-Columbia University, 6Department of Surgery, University of Chicago Medical Center, 7Department of Surgery, University of Texas MD Anderson Cancer Center, 8Department of Surgery, Northwestern University Feinberg School of Medicine, 9Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University Health Centre, 10Department of Surgery, University Health Network-Toronto General Hospital, 11Department of Surgery, Royal North Shore Hospital, 12Department of Endocrine and Metabolic Surgery, Policlinico Universitario "A Gemelli"-Universita Cattolica Del Sacro Cuore, 13Department of Surgery, Maastricht University Medical Center+, 14Department of Surgery, VU Medical Center, 15Department of Surgery, Academic Medical Center, 16Department of Surgery, University Medical Center Groningen, 17Department of Vascular Medicine, University Medical Center Utrecht, 18Department of Endocrine Oncology, University Medical Center Utrecht

09. INTRA-OPERATIVE PARATHYROID HORMONE MONITORING IS NECESSARY IN PATIENTS WITH TWO CONCORDANT PREOPERATIVE LOCALIZATION STUDIES

Vivek Sant1, Hunter J Underwood1, Jennifer Ogilvie1, Kepal N Patel1

1Surgery, NYU Langone Medical Center
10. PROSPECTIVE EVALUATION OF BONE MINERAL DENSITY AND BONE-SPECIFIC ALKALINE PHOSPHATASE AS BIOMARKERS OF POST-OPERATIVE HYPOCALCEMIA AFTER TOTAL THYROIDECTOMY IN SUBJECTS WITH HYPERTHYROIDISM

Poongkodi Karunakaran¹,², Premkumar Asokumar³, Chandrasekaran Maharajan⁴, Rajasekar Manickam⁵
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♦ 11. PRIMARY TUMOR SITE IS NOT ASSOCIATED WITH SURVIVAL IN PATIENTS WITH NEUROENDOCRINE TUMOR LIVER METASTASES

John F Tierney¹, Jennifer Poirier¹, Sam G Pappas¹, Erik Schadde¹, Xavier M Keutgen¹
¹Surgery, Rush University Medical Center

♦ 12. FACTORS INFLUENCING SURGEONS’ TREATMENT RECOMMENDATIONS FOR LOW-RISK PAPILLARY THYROID CARCINOMA

Alexandria D McDow¹, Juan P Brito², J Linn Jennings¹, Megan C Saucke¹, Corrine I Voils¹, Benjamin R Roman³, Susan C Pitt¹
¹University of Wisconsin - Madison, ²Mayo Clinic, ³Memorial Sloan Kettering Cancer Center

♦ 13. THE VALIDITY OF CALCIUM CREATININE CLEARANCE RATIO IN 1,000 CONSECUTIVE PATIENTS WITH PRIMARY HYPERPARATHYROIDISM

Edwina C Moore¹, Vikram Krishnamurthy¹, Judy Jin¹, Joyce Shin¹, Eren Berber¹, Allan Siperstein¹
¹Endocrine and Metabolism Institute, Section of Endocrine Surgery, The Cleveland Clinic

♦ 14. INTRAOPERATIVE PARATHYROID LOCALIZATION BY AUTOFLUORESCENCE DETECTION IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM

Malcolm H Squires¹, Rachel Jarvis¹, Lawrence A Shirley¹, John E Phay¹
¹The Ohio State University Wexner Medical Center
15. COMPARISON OF SURGICAL OUTCOMES OF TRANSORAL ROBOTIC THYROIDECTOMY VERSUS CONVENTIONAL OPEN THYROIDECTOMY

Hoon Yub Kim¹, Ji Young You¹, Hong Kyu Kim¹
¹KUMC Thyroid Center, Korea University Hospital, Korea University College of Medicine

16. HEAD TO HEAD COMPARISON OF THE ATA AND TI-RADS ULTRASOUND SCORING SYSTEMS

Sara Ahmadi¹, Taofik Oyekunle¹, Xiaoyin Sara Jiang¹, Jennifer Perkins¹, Randall P Scheri¹, Michael T Stang¹, Samantha Thomas¹, Sanziana A Roman², Julie A Sosa²
¹University of California San Francisco

♦ 17. GENETIC CHARACTERIZATION OF CHILDHOOD SURVIVORS OF THE CHERNOBYL ACCIDENT WITH MEDULLARY THYROID CANCER

Sarah B Fisher¹, Gilbert Cote², Jacqueline Bui-Griffith², Wei Lu³, Ximing Tang³, Tao Ha², Michelle D Williams⁴, Ignacio I Wistuba³, Kevin E Fisher⁵, Steven G Waguespack⁶, Clark Dorman⁶, Michelle S Ludwig⁷, Paul Graham¹, Nancy D Perrier¹, Jeffrey E Lee¹, Elizabeth G Grubbs³
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♦ 18. INFLUENCE OF FINAL INTRAOPERATIVE PARATHYROID HORMONE LEVELS ON LONG-TERM RECURRENCE AFTER PARATHYROIDECTOMY

Natalie Luehmann¹, Jennifer Cirino¹, Wesley Barnes¹, Peter Czako¹, Sapna Nagar¹
¹Beaumont Hospital

♦ 19. UTILITY OF EXOME SEQUENCING DATABASES IN VALIDATING GENETIC VARIANTS ASSOCIATED WITH MULTIPLE ENDOCRINE NEOPLASIA

Tyler J Mouw¹, Alexander Balmaceda¹, Peter J DiPasco¹
¹General Surgery, University of Kansas Medical Center
20. CLINICAL FEATURES OF PATIENTS WITH ADRENAL INCIDENTALOMAS AND SUB-CLINICAL CUSHING’S SYNDROME

Alex Rosenberg¹, Patricia Friedmann¹, Haejin In¹², Noah Bloomgarden¹³, John C McAuliffe¹², Steven K Libutti⁴⁵, Amanda M Laird⁴⁵
¹Albert Einstein College of Medicine, ²Surgery, Montefiore Medical Center, ³Medicine, Montefiore Medical Center, ⁴Surgical Oncology, Rutgers Cancer Institute of New Jersey, ⁵Surgery, Rutgers Robert Wood Johnson Medical School

21. NOT ALL ADRENAL INCIDENTALOMAS REQUIRE BIOCHEMICAL ANALYSIS TO EXCLUDE PHEOCHROMOCYTOMA

Veljko Strajina¹, Geoffrey B Thompson¹, David R Farley¹, Melanie L Lyden¹, Irina Bancos¹, William F Young¹, Travis J McKenzie¹
¹Mayo Clinic, Rochester, MN

22. FAILURE TO DIAGNOSE AND TREAT HYPERPARATHYROIDISM AMONG PATIENTS WITH HYPERCALCEMIA: OPPORTUNITY FOR INTERVENTION AT PATIENT AND PHYSICIAN-LEVEL TO INCREASE SURGICAL REFERRAL

Ammar Asban¹, Alex Dombrowsky¹, Reema Mallick¹, Rongbing Xie², James K Kirklín³, Raymond Grogan⁴, David F Schneider⁵, Herbert Chen¹, Courtney J Balentine¹
¹Department of Surgery, University of Alabama at Birmingham, ²Kirklin Institute for Research in Surgical Outcomes, University of Alabama at Birmingham, ³Department of Cardiovascular Surgery, University of Alabama at Birmingham, ⁴Department of Surgery, The University of Chicago Medicine, ⁵Department of Surgery, University of Wisconsin School of Medicine and Public Health

23. PARATHYROIDECTOMY OUTCOMES IN AN INTEGRATED HEALTHCARE SYSTEM: THE IMPACT OF SURGEON VOLUME AND SPECIALTY

Cassandre Benay¹, Iuliana Dit Bobanga¹, Sarah Choi¹, Raha Hassan², Judy Jin¹, Joyce Shin¹, Eren Berber¹, Allan Siperstein¹, Vikram Krishnamurthy¹
¹Endocrine Surgery, Cleveland Clinic, ²Cleveland Clinic
24. PRACTICE TRENDS AND OUTCOMES OF ADRENAL SURGEONS: A COMPARISON OF DATA FROM CESQIP AND NSQIP

Colleen M Kiernan¹, Carmen C Solorzano², Barbra S Miller³, Nancy D Perrier¹, Jeffrey E Lee¹, Paul G Gauger³, Elizabeth G Grubbs¹, Tracy S Wang⁴
¹Surgical Oncology, MD Anderson Cancer Center, ²Division of Surgical Oncology & Endocrine Surgery, Vanderbilt University, ³Division of Endocrine Surgery, University of Michigan, ⁴Section of Endocrine Surgery, Medical College of Wisconsin

25. LAPAROSCOPIC TUMOR ABLATION AS A FIRST-LINE SURGICAL TREATMENT OPTION IN PATIENTS WITH NEUROENDOCRINE LIVER METASTASES: A 20-YEAR EXPERIENCE

Emin Kose¹,², Bora Kahramangil³, Hideo Takahashi³, Federico Aucejo³, Allan Siperstein², Eren Berber²
¹General Surgery, University of Health Science - Okmeydani Education and Research Hospital, ²Endocrine Surgery, Cleveland Clinic, ³General Surgery, Cleveland Clinic

26. THE PRESENTATION AND DETECTION OF DISTANT METASTASIS IN DTC PATIENTS

Linwah Yip¹, Kelly L McCoy¹, Raja R Seethala², Yuri E Nikiforov², Sally E Carty¹
¹Surgery, University of Pittsburgh, ²Pathology, University of Pittsburgh

27. INTRA-OPERATIVE DETECTION OF PARATHYROID GLANDS: A NOVEL APPROACH USING AUTOFLUORESCENCE LIFETIME IMAGING

Shamira Sridharan¹, Hanna Kim¹, Jakob Unger¹, Richard Bold², Laura Marcu¹, Michael J Campbell²
¹Biomedical Engineering, University of California, Davis, ²Surgery, University of California, Davis

28. PATTERNS IN INTRAOPERATIVE NERVE MONITORING USE DURING THYROIDECTOMY AND ITS ASSOCIATION WITH RECURRENT LARYNGEAL NERVE INJURY

Jessica Y Liu¹,², Jason B Liu¹,³, Mark E Cohen¹, Bruce L Hall¹,⁴, Jyotirmay Sharma²
¹American College of Surgeons, ²Department of Surgery, Emory University, ³Department of Surgery, University of Chicago Medicine, ⁴Department of Surgery, Washington University in St Louis
29. UTILITY OF EARLY POST-OPERATIVE UNSTIMULATED THYROGLOBULIN IN INFLUENCING DECISION-MAKING IN PAPILLARY THYROID CARCINOMA
Alexandria D McDow¹, Cynthia M Shumway¹, Oyinda Fawole¹, Susan C Pitt¹, David F Schneider¹, Rebecca S Sippel¹, Kristin L Long²
¹University of Wisconsin – Madison

30. NATURAL LANGUAGEPROCESSING OF THYROID CYTOLOGY REPORTS: UNLOCKING VALUABLE DATA FROM UNSTRUCTURED TEXT
Joseph R Imbus¹, Yiqiang Song¹, Nick Zaborek¹, Kristin L Long¹, Eneida A Mendonca¹, David F Schneider¹
¹University of Wisconsin, Madison

31. THYROIDECTOMY AND PARATHYROIDECTOMY UTILIZING A TRANSORAL VESTIBULAR APPROACH AT A US TEACHING HOSPITAL
Jon Russell³, Elya Vasiliou³, Christopher Razavi³, Ralph Tufano¹
¹Johns Hopkins Hospital

32. ULTRASOUND IMAGE ANALYSIS USING ARTIFICIAL INTELLIGENCE FOR THE DIAGNOSIS OF THYROID NODULES
Young Jun Chai¹, Ralph Tufano², Joon-Hyop Lee³, Hiroo Masuoka⁴, Akira Miyauchi⁴
¹Seoul National University Boramae Medical Center, ²Johns Hopkins University Hospital, ³Surgery, Gil Medical Center, ⁴Kuma Hospital

33. PREOPERATIVE CT CHANGES SURGICAL MANAGEMENT IN CLINICALLY LOW-RISK DIFFERENTIATED THYROID CANCER
Pim J Bongers¹, Raoul Verzijl¹, Michael Dzingala¹, Menno R Vriens², Eugene Yu³, Jesse D Pasternak³, Lorne E Rotstein⁴
¹General Surgery, University Health Networks, Toronto, Canada, ²Surgery, University Medical Center Utrecht, ³Radiology, University Health Networks, Toronto, Canada

34. AFRICAN AMERICANS SUFFER DISPARITIES IN ACCESS TO PARATHYROID SURGERY: AN OPPORTUNITY FOR INTERVENTIONS TO PROMOTE EQUITY AND IMPROVE OUTCOMES
Reema Mallick¹, Rongbing Xie¹, James K Kirklin¹, Herbert Chen¹, Courtney Balentine¹,²,³,⁴
¹University of Alabama Birmingham, ²Kirklin Institute for Research in Surgical Outcomes, ³Institute for Cancer Outcomes and Survivorship, University of Alabama at Birmingham, ⁴Birmingham/Tuscaloosa VA Health Services Research and Development
35. VALIDATION OF INTRA-OPERATIVE PARATHYROID HORMONE 20 MIN AFTER TOTAL THYROIDECTOMY: TRACING HYPOCALCEMIA-PRONE PATIENTS AND ADJUSTING A PROTOCOL FOR POSTOPERATIVE CALCIUM SUPPLEMENTATION. A PROSPECTIVE COHORT STUDY.

Nathalie Chereau¹, Shabtail Ganon², Gaëlle Godiris-Petit², Severine Noullet², Sophie Tezenas du Montcel², Fabrice Menegaux²
¹Hopital PITIE Salpetriere, ²PITIE Salpetriere, PARIS

36. SURGEON VOLUME AND SPECIALTY ARE ASSOCIATED WITH BETTER PHEOCHROMOCYTOMA OUTCOMES AND SURVEILLANCE

Janeil M. Mitchell¹, Kia J. Nicholson¹, Kelly L. McCoy¹, Sally E. Carty¹, Linwah Yip¹
¹Division of Endocrine Surgery, Department of Surgery, University of Pittsburgh School of Medicine

37. T4 SUPPRESSION THERAPY PER KG LEAN BODY WEIGHT AND BMI UNIT AFTER TOTAL THYROIDECTOMY FOR CANCER DEPENDS ON ASIAN OR NON-ASIAN ETHNICITY

Raoul A. Droeser¹, Roger J. Tabah², Jacques How³, Elliot Mitmaker²
¹General Surgery, University Hospital Basel, ²Department of Surgery, McGill University Health Centre, ³Department of Endocrinology, McGill University Health Centre

38. ADRENALECTOMY VOLUME-RELATED OUTCOMES OF CESQIP-PARTICIPATING SURGEONS

Colleen M Kiernan¹, Carmen C Solorzano², Barbra S Miller³, Nancy D Perrier¹, Jeffrey E Lee¹, Paul G Gauger³, Elizabeth G Grubbs¹, Tracy S Wang⁴
¹Surgical Oncology, MD Anderson Cancer Center, ²Division of Surgical Oncology & Endocrine Surgery, Vanderbilt University, ³Division of Endocrine Surgery, University of Michigan, ⁴Section of Endocrine Surgery, Medical College of Wisconsin

39. RISK SCORE OF NECK HEMATOMA. HOW TO SELECT PATIENTS FOR AMBULATORY THYROID SURGERY?

Fabrice Menegaux¹, Nathalie Chereau¹, Gaëlle Godiris-Petit¹, Severine Noullet¹, Sophie Di Maria¹, Sophie Tezenas du Montcel¹
¹PITIE Salpetriere, PARIS
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¹General Surgery, University Health Networks, Toronto, Canada, ²Joint Department of Medical Imaging, University Health Networks, Toronto, Canada

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¹Brigham and Women’s Hospital, ²Massachusetts General Hospital

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Rajshri Mainthia¹, Jordan Bloom¹, Sareh Parangi¹, Richard Hodin¹, Courtney DeRoo², Antonia E Stephen¹, Vinod Narra¹, Carrie C Lubitz¹, Elizabeth Mort¹
¹Massachusetts General Hospital, Harvard Medical School, ²CRICO Risk Management Foundation

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¹Surgery, NYU Langone Medical Center

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¹Endocrine Oncology Branch, National Cancer Institute, ²Sackler Faculty of Medicine, Tel Aviv University, ³Endocrine and Thoracic Surgery, University Hospitals of Geneva, ⁴Department of Surgery, The George Washington University, School of Medicine and Health Science

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ABSTRACTS

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Jeffrey Moley, MD

On October 19, 2017, Dr. Jeffrey Moley passed away suddenly Sunday evening at his home in St. Louis, Missouri.

Dr. Moley has been a pivotal member of our organization and of the field of Endocrine Surgery. He is a world expert in the treatment of medullary thyroid cancer and his research has helped to shape the way that we care for our patients. He was a Professor of Surgery at Washington University and his passion for the field of Endocrine Surgery helped to inspire many among us to choose a career in Endocrine Surgery. He has been a member of the AAES since 1995 and has served our organization as Vice President in 2008 and as a Council member and Chair of the research committee from 2001-2004.

Dr. Moley was world-renowned for his scientific research and expertise in the endocrine surgical field. He was Professor of Surgery and Chief of the Section of Endocrine and Oncologic Surgery at Washington University in St. Louis. He was also an Associate Director of the Siteman Cancer Center, and the Chief of Surgical Services at the VA Hospital. He was well-known in the St. Louis Medical community and was a highly respected teacher and role model to his medical trainees. Everyone within our organization will feel this loss. He will be missed greatly.

Jan Erik Varhaug, MD

On December 14, 2017 we learned of the passing of our fellow endocrine surgical colleague, Professor Jan Erik Varhaug, at the age of 75.

Dr. Varhaug served as an endocrine surgeon and professor at Haukeland University Hospital, Bergen, Norway for several decades before retiring five years ago. He was a valued member of the IAES. He contributed significantly, both nationally and internationally, to the field of endocrine surgery. His friendly and personal approach, combined with his extensive clinical knowledge, experience and his operative skills, were valued greatly by all his friends and fellow surgeons, and patients alike. He will be missed. Our thoughts, prayers and condolences go out to his family at this time.