

Message from the Vice Presidents

Welcome to Miami Beach! Thank you for attending our Combined Sections Meeting. It has been a pleasure to serve the membership as Section Vice Presidents this year and we are very proud of the outstanding program that has been assembled by our Program Chair, Dr. Stephen Park, our Section Liaisons, Drs. Doug Girod, Al Merati, Wendell Yarbrough, and Sam Selesnick, and our Program Committee. Some of the highlights include Thursday's panels on "What's the Latest and Greatest", the "Vascular Anomaly Update" and, "Parathyroid Surgery". Thursday's sessions also include the popular "Point/Counterpoint" followed by the video sessions on "How I Do It". Friday highlights will include panels on "Cutaneous Malignancies and Local Flap Reconstruction", "Making Sense of Chronic Rhinosinusitis", "Aural Rehabilitation", and "Making Sense of Sleep Apnea". Friday's session is rounded out with the Resident Bowl. Saturday's panel on "Contemporary Surgical Neurolaryngology" is followed by "Lessons from Challenging Cases in Head and Neck Cancer". You won't want to miss Dr. Anna Pou's invited lecture "Ethical Issues Embedded in Disaster Relief", which you will find fascinating and thought provoking. We look forward to our panel of experts who will give a great wrap-up to the meeting by imparting "Wisdom and Experience: Viewing the Past and the Future". We are confident that you will find this meeting to be of great value in assisting you with the care of your patients, your research endeavors, and your teaching. We look forward to renewing old friendships and meeting new colleagues.



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Southern Section Vice President



DAVID M. BARRS, MD FACS
Western Section Vice President

Meeting Overview

Wednesday, January 25

5:00 - 7:00 pm Registration - Rotunda East
Speaker Ready Room - New York/Sands

5:00 - 8:00 pm Exhibitor and Poster set up - Americana 3 & 4

Thursday, January 26

6:30 am - 5:30 pm Speaker Ready Room - New York/Sands

7:00 am - 5:30 pm Registration - Rotunda East

7:30 - 9:00 am Poster Set up - Americana 3 & 4

7:30 am - 3:30 pm Exhibits Open (Continental Breakfast @ 7:30) - Americana 3 & 4

7:50 am - 5:15 pm SCIENTIFIC SESSIONS

8:30 - 11:00 am Spouse Hospitality - Rotunda

9:00 - 6:15 pm Poster Viewing - Americana 3 & 4

Thursday continued on next page

Meeting Overview

Thursday, January 26

continued from previous page

12:15 - 1:15 pm	Laryngoscope Associate/Section Editors Meeting - Poinciana 3
12:15 - 1:15 pm	Past Presidents Luncheon - Poinciana 1
12:15 - 1:30 pm	Thesis Seminar (candidates and potential candidates) - Poinciana 2
1:15 - 5:15 pm	SCIENTIFIC SESSIONS
5:00 - 6:15 pm	Exhibits Open
5:15 - 6:15 pm	Meet the Authors Poster Reception - Americana 3 & 4
6:15 - 7:30 pm	Vice Presidents Welcome Reception - Americana Lawn

Friday, January 27

7:00 - 7:50 am	Southern Section Business Meeting - Poinciana 3
7:00 - 7:50 am	Western Section Business Meeting - Poinciana 2
7:00 am - 12:30 pm	Speaker Ready Room - New York/Sands
7:00 am - 2:30 pm	Registration - Rotunda East
7:30 - noon	Poster Viewing - Americana 3 & 4
7:30 - 11:00 am	Exhibits Open (Continental Breakfast @ 7:30) - Americana 3 & 4
8:00 am - 12:15 pm	SCIENTIFIC SESSIONS
8:30 - 11:00 am	Spouse Hospitality - Rotunda
12:30 - 2:00 pm	RESIDENT BOWL - Americana 1 & 2
	Afternoon recreation Free evening

Saturday, January 28

7:00 - 7:50	Eastern Section Business Meeting - Poinciana 2
7:00 - 7:50 am	Middle Section Business Meeting - Poinciana 3
7:00 - 11:00 am	Speaker Ready Room - New York/Sands
7:00 am - 12:30 pm	Registration - Rotunda East
7:30 - 10:30 am	Poster Viewing - Americana 3 & 4
7:30 - 10:30 am	Exhibits Open (Continental Breakfast @ 7:30) - Americana 3 & 4
8:00 am - 12:15 pm	SCIENTIFIC SESSIONS
8:30 - 11:00 am	Spouse Hospitality - Rotunda
12:30 pm	MEETING ADJOURNS

Combined Sections Meeting Loews Miami Beach Hotel Miami Beach, Florida January 26-28, 2012

About the Triological Society

The American Laryngological, Rhinological and Otological Society, Inc., aka The Triological Society, was founded in 1895 in New York, NY. In the years since its founding, the Triological Society has attracted the best and brightest in academic and clinical otolaryngology. Membership in the Triological Society brings the distinction of being elected to the most prestigious society in otolaryngology. Active Fellowship is achieved by presenting a thesis in the field of otolaryngology considered acceptable to a panel of peers. For those entering the field of otolaryngology, the Society provides role models. For those who are committed to research and related scholarly activity, the Society offers fellowship with like-minded peers who share common values, interests, and concerns.

The Society disseminates scientific information by presenting the latest basic science and clinical information at scientific meetings and through publication of its scientific journal, The Laryngoscope. The Society promotes research into the causes of and treatments for otolaryngic diseases by attracting promising physicians to scholarly otolaryngology research and supporting their development, providing financial support for the research efforts of young scientists, and promoting the highest standards in the field of otolaryngology-head and neck surgery.

Mission Statement

The mission of the Triological Society is to assist physicians and other health care professionals in maintaining and enhancing their knowledge of and skills in otolaryngology-head and neck surgery in pursuit of improved patient care.

Goals

- To disseminate the latest basic and evidence based clinical research findings pertaining to the diagnosis, treatment and prevention of the full spectrum of disorders of the head and neck and related structures in pursuit of improved patient care.
- To provide a forum for the international exchange of ideas and knowledge in otolaryngology-head and neck surgery and related fields of medicine and science.
- To provide for physician professional development through support of teaching and peer reviewed research.
- To encourage the highest ethical and professional standards in the delivery of patient care by otolaryngologists-head and neck surgeons.
- To promote academic excellence by requiring peer recommendations and an acceptable mentored thesis for admission to membership.
- To ensure that all educational activities comply with ACCME requirements.
- To ensure the continuation of the noble legacy of the Triological Society by mentoring young otolaryngologists to become scholars and leaders.

To facilitate the above goals, the Society sponsors educational meetings. The Society's journal, The Laryngoscope, serves as a means of disseminating the latest basic and clinical research results. The Society encourages clinical and basic research by providing research grants and awards on a competitive basis.

Educational Objectives for Program

After attending the 2012 Combined Sections Meeting, participants will be able to:

- Better understand EBM as it applies to clinical treatment protocols;
- Understand the controversies of such topics as hearing rehabilitation, residency training, contemporary management of head and neck cancer;
- Develop an algorithm for challenging cutaneous defect repair;
- Develop pearls for the workup and treatment of parathyroid neoplasms;
- Acquire specific technical pearls for surgical treatment of a variety of disorders;
- Review the latest research areas in the field of head and neck cancer research;
- Be abreast of the most recent developments of facial transplantation.

Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American College of Surgeons and the Triological Society. 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 13.25 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.



AMERICAN COLLEGE OF SURGEONS

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Highest Standards, Better Outcomes*

Exhibits/Commercial Support

Exhibitors will include representatives of pharmaceutical companies, instrument companies (including laser and endoscopic equipment), diagnostic equipment companies, publishers, public service companies, and others. We encourage attendees to examine the exhibits for information that may assist in their pursuit of improved patient care. Exhibitor arrangements and commercial support are in compliance with the Accreditation Council for Continuing Medical Education (ACCME) revised Standards for Commercial Support.

Information presented by exhibitors and oral and poster presenters does not represent an endorsement by the Triological Society.

Program Evaluation and CME Certificates

Participant comments on program evaluation forms assist Program Advisory Committees in determining the direction of future educational activities. We appreciate your input and request that you complete a program evaluation in exchange for a certificate of attendance. Records are maintained in the Administrative Office of the Society and maintained by the American College of Surgeons for Fellows of the College. Requests may be made by sending a self-addressed envelope to: Triological Society • 13930 Gold Circle, Suite 103 • Omaha, NE 68144 • 402-346-5500

Triological Society Thesis Seminar

Building Your Triological Thesis: Planning, Starting and Finishing - Maureen Hannley, PhD

This seminar is aimed at Triological Society active candidates as well as those interested in pursuing Active Fellowship in the Triological Society. Seminars are open to Triological Society Fellows. In this seminar, candidates will learn how to select and focus an appropriate topic and research question, how to select a study design based on the research question, select variables, and some basic principles of study conduct. The seminar will also present some useful tips on organizing, analyzing, and presenting the data, and sources of funding for continued investigation. The seminars will be conducted by Maureen Hannley, PhD, a research mentor in otolaryngology-head and neck surgery.

The Seminar will be held immediately following the morning scientific session on Thursday, January 26th.

Program Planning and Advisory Committee

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**Disclosure Information
Triological Society 2012 Combined Sections Meeting
January 26-28, 2012
Miami Beach, Florida**

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 sponsorship 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.

SPEAKERS / MODERATORS/ CHAIRS / DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE (As it pertains to the content of the presentation)
Stewart I. Adam, MD	X	
W. Greer Albergotti, BA	X	
Brian T. Andrews, MD	X	
Simon I. Angeli, MD	X	
Donald J. Annino Jr., MD	X	
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Moises A. Arriaga, MD	X	
Karam W. Badran, BSc	X	
Thomas J. Balkany, MD	X	
David M. Barrs, MD	X	
David M. Barrs, MD	X	
Brent Jason Benscoter, MD	X	
Wayne E. Berryhill, MD	X	
Jason A. Beyea, MD PhD	X	
Angela C. Blount, MD	X	
Joel H. Blumin, MD	X	
Ryan C. Borek, BS	X	
Carol R. Bradford, MD	X	
Dale H. Brown, MD	X	
Jeffrey M. Bumpous, MD		LifeCell (honorarium--consultant)
Michael J. Cipolla, MD	X	
Francisco J. Civantos, MD	X	
Amelia K. Clark, BA	X	
Lanny Garth Close, MD	X	
Bryant T. Conger, MD	X	

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Robert H. Deeb, MD	X	
M. Jennifer Derebery, MD		Ear Professionals International Corp. (board of directors, stock holder); Sonitus Medical (board of directors, stock holder)
Karuna Dewan, MD	X	
Justin W. Douglas, MD MS	X	
Sigsbee W. Duck, MD	X	
Ardalan Ebrahimi, MD	X	
David W. Eisele, MD	X	
Antoine Eskander, HBSc MD	X	
Alexander A. Farag, MD	X	
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Michael Friedman, MD		TriCord Pharmaceuticals (consultant)
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Matthew R. Garrett, MD	X	
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Jonathan R. George, MD MPH	X	
M. Boyd Gillespie, MD MSc	X	
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J. Blake Golden, MD	X	
Gregg H. Goldstein, MD	X	
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Neerav Goyal, MD MPH	X	
Teresa A. Hadlock, MD	X	
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Gady Har-El, MD	X	
Willard C. Harrill, MD	X	
George T. Hashisaki, MD	X	
Bruce H. Haughey, MBChB	X	
David S. Haynes, MD		Advanced Bionics (advisory board); Anspach (advisory board); Cochlear Corporation (advisory board); Grace Medical (advisory board); Zeiss (consultant)
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Carolyn P. Ojano-Dirain, PhD	X	
Michael D. Otremba, BA	X	
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Theodoros N. Teknos, MD	X	
David J. Terris, MD		Johnson & Johnson (honorarium/course director-speaker)
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**COMBINED SECTIONS MEETING PROGRAM
JANUARY 26 - 28, 2012
MIAMI BEACH, FLORIDA**

THURSDAY, JANUARY 26, 2012

Americana 1 & 2

- 7:50 WELCOME BY VICE PRESIDENTS**
David M. Barrs, MD*, Scottsdale, AZ *Western Section*
Michael G. Stewart, MD*, New York, NY *Eastern Section*
C. Gaelyn Garrett, MD*, Nashville, TN *Southern Section*
Henry T. Hoffman, MD*, Iowa City, IA *Middle Section*
- 7:55 WESTERN SECTION GUEST INTRODUCTIONS - David M. Barrs, MD***
Citation Awardees: James E. Saunders, MD*, Lebanon, NH
G. Richard Holt, MD*, San Antonio, TX
William E. Brant, MD, Evergreen, CO
Lawrence W. De Santo, MD*, Scottsdale, AZ
- Guest of Honor:** Frank W. Shagets, MD, Joplin, MO
Disaster in the Midwest—Medical Impact
- 8:10 EASTERN SECTION GUEST INTRODUCTIONS - Michael G. Stewart, MD***
Citation Awardees: Ellen M. Friedman, MD*, Houston, TX
Jesus E. Medina, MD*, Oklahoma City, OK
William J. Richtsmeier, MD*, Cooperstown, NY
Samuel H. Selesnick, MD*, New York, NY
- Guest of Honor:** Michael M.E. Johns, MD,* Atlanta, GA
Looking Backwards: Leadership Lessons Learned
- 8:25 SOUTHERN SECTION GUEST INTRODUCTIONS - C. Gaelyn Garrett, MD***
Citation Awardees: Mark S. Courey, MD*, San Francisco, CA
Amelia F. Drake, MD*, Chapel Hill, NC
Robert H. Ossoff, DMD MD*, Nashville, TN
Lou Reinisch, PhD, Nashville, TN
- Guest of Honor:** Harold C. Pillsbury, MD*, Chapel Hill, NC
Bucket List
- 8:40 MIDDLE SECTION GUEST INTRODUCTIONS - Henry T. Hoffman, MD***
Citation Awardees: Bruce J. Gantz, MD*, Iowa City, IA
Gerry Funk, MD, Iowa City, IA
Timothy M. McCulloch, MD, Madison, WI
Randal S. Weber, MD*, Houston, TX
- Guest of Honor:** Charles N. Ford, MD*, Madison, WI
Pivot Point
- Introduction of Middle Section George L. Adams, MD Young Faculty Award - Henry T. Hoffman, MD***
Julie L. Wei, MD*, Kansas City, KS
- 9:00 RECOGNITION OF TRIOLOGICAL SOCIETY SPECIAL HONOREE - Gerald B. Healy, MD***
Jonas T. Johnson, MD*, Pittsburgh, PA, Editor, The Laryngoscope 2003-2011

* Denotes Fellow

- 9:05 INTRODUCTION OF TRIOLOGICAL SOCIETY GRANT AWARDEES**
Career Development Awards
Ronna Hertzano, MD PhD, Baltimore, MD
Bruce K. Tan, MD, Chicago, IL
Triological/American College of Surgeons Career Scientist Awards
Seungwon Kim, MD, Pittsburgh, PA
Young Jun Kim, MD, Baltimore, MD
Michael E. Kupferman, MD, Houston, TX
Frank R. Lin, MD PhD, Baltimore, MD
Triological Career Scientist Award
Benjamin T. Crane, MD PhD, Rochester, NY
- 9:10 PRESIDENTIAL ADDRESS**
Robert H. Ossoff, DMD MD*, Nashville, TN
- 9:25 PATRICK E. BROOKHOUSER, MD: A TRIBUTE AND LESSON IN LEADERSHIP**
H. Bryan Neel III, MD PhD*, Rochester, MN

9:45 - 10:15 Break with Exhibitors/Poster Viewing - Americana 3 & 4

2010-2011 TRIOLOGICAL SOCIETY THESIS AWARDEES

Americana 1 & 2

Moderators: David M. Barrs, MD*, Phoenix, AZ
Henry T. Hoffman, MD*, Iowa City, IA

- 10:15 HONORABLE MENTION**
Biomarkers in Advanced Larynx Cancer
Carol R. Bradford, MD*, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to identify several biomarkers that predict outcome in advanced laryngeal cancer.

Objectives: The objective of this study is to determine if certain relevant tumor biomarkers are predictive of outcome in a prospective cohort of patients with advanced larynx cancer treated according to a phase II clinical trial. **Study Design:** Prospectively collected biopsy specimens from 58 patients entered into a long-term Phase II trial of organ preservation in advanced laryngeal cancer were evaluated for expression of a large panel of biomarkers and correlations with outcome were determined. **Methods:** Patients with Stage III (n=27) or IV (n=31) laryngeal cancer were treated with a single course of induction cisplatin (100mg/m² day 1) and 5-FU (1000mg/m²/day x 5). Patients achieving >50% tumor reduction received concurrent cisplatin (100mg/m² days 1,2,4,3) and 70 Gy radiation. Non-responders underwent planned laryngectomy and neck dissection. Tissue microarrays were constructed from pretreatment biopsies and stained for cyclin D1, CD24, EGFR, MDM2, PCNA, p53, survivin, Bcl-xL, Bcl-2, BAK, rhoC, and NF B. The pathologist blinded to outcome scored location of biomarker expression, as well as proportion and intensity. Pattern of invasion (growth pattern) was scored according to published criteria. p53 mutations were assessed as described previously. Correlations with overall survival (OS), disease-specific survival (DSS), time free from indication of surgery, induction chemotherapy response, and chemoradiation response were determined. Cox models were used to assess combinations of these biomarkers. **Results:** Low intensity of expression of BAK was associated with response to induction chemotherapy and chemoradiation response. Similarly, low intensity of expression of NF B in the cytoplasm was associated with chemoradiation response. A greater percentage of tumors with aggressive histologic growth pattern responded to induction chemotherapy. Patients whose tumors had a pushing border were more likely to experience local failure and require laryngectomy. Expression of cyclin D1 was the most promising biomarker predictive of overall and disease-specific survival. In fact, expression of cyclin D1 adds information to a survival model based upon clinical stage alone. Cyclin D1 expression was associated with mutant p53 status. Overexpression of EGFR was also associated with an increased risk of death from disease [Hazard Ratio (HR) 2.47, 95% Confidence Interval (CI), 1.031, 5.917]. Bcl-xL expression increased significantly in persistent/recurrent tumors specimens when compared to pretreatment specimens derived from the same patient (p = 0.0003). **Conclusions:** Evaluation of biomarker expression in pretreatment biopsy specimens can lend important predictive and prognostic information for patients with advanced larynx cancer. Importantly, tumor expression of cyclin D1 is an important biomarker that is predictive of overall and disease-free survival. EGFR intensity has been previously shown to be a marker of poor prognosis in oropharynx cancer and is now also shown to be a predictor of poor outcome in larynx cancer. These findings demonstrate that assessment of biomarker expression on pretreatment biopsy specimens can be used to predict disease-specific prognosis and add meaningful information to the tumor staging system. Furthermore, knowledge of biomarkers profile differences between pretreatment and post-treatment specimens, like Bcl-xL, can inform targets for future therapeutic intervention.

10:22

HONORABLE MENTION**Inflammatory Mediators Drive Metastasis and Drug Resistance in Head and Neck Squamous Cell Carcinoma (HNSCC)**

Maie A. St. John, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how: 1) inflammatory mediators upregulate COX-2/PGE₂ (prostaglandin E₂), which then in turn regulate E-cadherin expression in HNSCC; and 2) PGE₂ down-regulates E-cadherin via transcriptional repressors of E-cadherin in HNSCC. These repressors might be an appropriate therapeutic target to interfere with the EMT process, and in turn, to block tumor invasion. An understanding of the mechanisms of action of targeted agents will help us define the mechanisms of resistances in HNSCC. The tailoring of individual treatment strategies to aggressively treat HNSCC will improve long-term survival.

Objectives: The presence of regional metastases in head and neck squamous cell carcinoma (HNSCC) patients is a common and adverse event associated with poor prognosis. Understanding the molecular mechanisms that mediate HNSCC metastasis may enable identification of novel therapeutic targets. E-cadherin plays a key role in epithelial intercellular adhesion; its down-regulation is a hallmark of the epithelial-to-mesenchymal transition (EMT; an essential process during tumor progression); and it is associated with invasion, metastasis, and decreased survival. Inflammatory cytokines have been implicated in the progression of HNSCC. Herein I investigate the mechanisms by which the inflammatory mediator, Interleukin-1 β (IL-1 β), might contribute to EMT in HNSCC. The pathways involved in E-cadherin regulation in HNSCC had not previously been defined. I hypothesize that 1) Inflammatory mediators upregulate COX-2/PGE₂ (prostaglandin E₂), which then in turn regulate E-cadherin expression in HNSCC, and 2) PGE₂ down-regulates E-cadherin via transcriptional repressors of E-cadherin in HNSCC. The outcome of the proposed research will allow us to define how resistance to epidermal growth factor receptor (EGFR)-selective tyrosine kinase inhibitors (TKIs) is mediated and whether the benefits of combination therapy are due to the capacity of COX-2 inhibitors to increase E-cadherin expression and thus create a more sensitive target for EGFR TK inhibition. **Study Design:** Basic science, molecular biology, animal model, immunohistochemistry. **Methods:** We evaluated the effect of IL-1 β on the molecular events of EMT in surgical specimens and HNSCC cell lines. We examined the correlation with tumor histologic features, and a SCID xenograft model was used to assess the effects in vivo. **Results:** COX-2-dependent pathways contribute to the modulation of E-cadherin expression in HNSCC. An inverse relationship between COX-2 and E-cadherin was demonstrated in situ by double immunohistochemical staining of human HNSCC tissue sections. Treatment of HNSCC cells with IL-1 β , caused the downregulation of E-cadherin expression and upregulation of COX-2 expression. This effect was blocked in the presence of COX-2 shRNA. IL-1 β -treated HNSCC cell lines demonstrated a significant decrease in E-cadherin mRNA and an increase in the mRNA expression of the transcriptional repressor Snail. IL-1 β exposure led to enhanced Snail binding at the chromatin level. ShRNA-mediated knockdown of Snail interrupted the capacity of IL-1 β to downregulate E-cadherin. Snail overexpression in normal oral keratinocytes and HNSCC cells is sufficient to drive EMT and confers resistance to erlotinib. In a SCID xenograft model, HNSCC Snail overexpressing cells demonstrated significantly increased primary and metastatic tumor burdens. **Conclusions:** The inflammatory mediator IL-1 β modulates Snail and thereby regulates COX-2-dependent E-cadherin expression in HNSCC. This is the first report indicating the role of Snail in the inflammation-induced promotion of EMT in HNSCC. This newly defined pathway for transcriptional regulation of E-cadherin in HNSCC has important implications for targeted chemoprevention and therapy.

10:29

HONORABLE MENTION**Spontaneous Laryngeal Reinnervation Following Recurrent Laryngeal Nerve (RLN) Injury: Evidence for Superior Laryngeal Nerve Source, Central Nervous System Plasticity and RLN Regeneration**

Norman D. Hogikyan, MD*, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the possible sources of laryngeal reinnervation following recurrent laryngeal nerve injury.

Objectives: The long term objective of this research is to improve laryngeal function following nerve injury by enhancing the understanding of spontaneous laryngeal muscle reinnervation following recurrent laryngeal nerve (RLN) injury. The current study is to test the hypotheses that: 1) the nerve fibers responsible for thyroarytenoid (TA) muscle reinnervation can originate from multiple sources; and 2) the superior laryngeal nerve (SLN) is a source of reinnervation. **Study Design:** Prospective, controlled, animal model. **Methods:** Overall study design was to use a rat model of chronic RLN injury to determine sources of spontaneous TA muscle reinnervation using a combination of retrograde neuronal labeling techniques, immunohistochemistry, and sequential observations of vocal fold mobility. Experimental methods were previously developed during preliminary studies and Control neuronal mapping data were subsequently acquired. The current study details analyses in Sham surgical and Denervated group animals for location of neuronal cell bodies reinnervating the TA muscle, existence of RLN regeneration, and vocal fold mobility. **Results:** Retrograde mapping of motor neurons innervating the TA muscle in the normal state identifies cells in both the RLN and SLN regions of the nucleus ambiguus (NA) in the medulla, with the RLN region predominating. At 3 months post RLN resection, neuronal labeling directly through the SLN or from TA muscle injections identifies new cells caudal to the NA, in addition to the characteristic SLN cell body location. Two-thirds of examined animals in the Denervated group demonstrated regrowth of neuron fibers across the site of previous RLN resection. **Conclusions:** The TA muscle in the rat receives dual innervation from the RLN and the SLN in the normal state. Following chronic RLN injury, CNS plasticity is demonstrated with cells outside the cluster of cells normally supplying the SLN as well

Thursday

as normally identified SLN neurons projecting to the TA muscle through the SLN. The RLN does have a propensity to regenerate across a surgically created gap, but functional significance of these regenerated axons is unclear.

10:36 HONORABLE MENTION
Virtual Temporal Bone Dissection System: Development and Testing
Gregory J. Wiet, MD*, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the rationale for simulation training and understand the issues involved with development and testing of a simulator for temporal bone surgery.

Objectives: The objective of this project was to develop a virtual temporal bone dissection system that would provide an enhanced educational experience for the training of otologic surgeons. **Study Design:** A randomized, controlled, multi-institutional single blinded validation study. **Methods:** The project encompassed 4 areas of emphasis: structural data acquisition, integration of the system, dissemination of the system, and validation. **Results:** Structural acquisition was performed on multiple imaging platforms. Integration achieved a cost effective system. Dissemination was achieved on different levels including casual interest, downloading of software, and full involvement in development and validation studies. A validation study was performed at 8 different training institutions across the country using a two arm, randomized trial where study subjects were randomized to a two-week practice session using either the virtual temporal bone or standard cadaveric temporal bones. Eighty subjects were enrolled and randomized to one of the two treatment arms, 65 completed the study. There was no difference between the two groups using a blinded rating tool to assess performance after training. **Conclusions:** 1) A virtual temporal bone dissection system has been developed and compared to cadaveric temporal bones for practice using a multi-center trial; 2) there is no statistical difference seen between practice on the current simulator when compared to practice on human cadaveric temporal bones; and 3) further refinements in structural acquisition and interface design have been identified which can be implemented prior to full incorporation into training programs and use for objective skills assessment.

10:43 WITH DISTINCTION
Safety and Efficacy of Once Daily Intranasal Gentamicin Irrigation Compared to Isotonic Saline in the Treatment of Pediatric Chronic Rhinosinusitis
Julie L. Wei, MD*, Kansas City, KS

Educational Objective: At the conclusion of this presentation, the participants should be able to increase ability to diagnose pediatric chronic rhinosinusitis based on history and symptoms, and recommend once daily saline irrigation as an effective treatment for this problem.

Objectives: To compare efficacy and outcome of daily saline irrigation versus saline/gentamicin for treating chronic rhinosinusitis (CRS). **Study Design:** Prospective, randomized, double-blinded study. **Methods:** Forty children diagnosed with CRS were enrolled. Patients were randomized to once-daily irrigation with saline or saline/gentamicin for 6 weeks. Treatment outcomes were measured using 1) Lund-Mackay scoring system of pre and post-treatment computer tomography (CT); and 2) Sinonasal Quality-of-Life Survey (SN-5) completed at baseline, and after 3 weeks and 6 weeks of irrigation. **Results:** Thirty-four patients completed the study and followup. There were statistically significant improvements in quality-of-life (QoL) scores after 3 weeks of irrigation within both groups. However, there were no statistically significant differences in the SN-5 scores between the two treatment groups after 3 and 6 week ($P = .067$). CT scores for each sinus and total scores were reduced for both groups after 6 weeks, and the differences in scores were statistically significant within each group after treatment, but there were no differences between the two treatment groups. Only one patient required functional endoscopic sinus surgery due to persistent symptoms. Compliance was over 90% for once daily irrigation over the 6week treatment period. **Conclusions:** Once-daily intranasal irrigation for 6 weeks is safe and equally effective in the treatment of pediatric CRS using saline or saline plus gentamicin, and QoL was significantly improved after 3 weeks of irrigation in both groups. High tolerance, compliance, and effectiveness of irrigation support its use as a first-line treatment for pediatric CRS before considering surgical intervention.

10:50 Q&A

FIRST PLACE SECTION RESIDENT RESEARCH AWARDS

Moderators: C. Gaelyn Garrett, MD*, Nashville, TN
Michael G. Stewart, MD*, New York, NY

10:55 SHIRLEY BARON, MD RESIDENT RESEARCH AWARD (Western Section)
Comparison of Imaging Modalities for Pediatric Thyroglossal Duct Cysts
Kevin C. Huoh, MD, San Francisco, CA; Megan L. Durr, MD, San Francisco, CA; Anna K. Meyer, MD, San Francisco, CA; Kristina W. Rosbe, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the different imaging modalities in their utility for diagnosis of pediatric thyroglossal duct cysts.

Objectives: To compare the accuracy of different imaging modalities including ultrasound (US), magnetic resonance imaging (MRI), and computed tomography (CT) in the diagnosis of thyroglossal duct cysts (TGDC) in children. **Study Design:** Retrospective cohort study. **Methods:** A retrospective chart review was performed on patients under the age of 18 who had undergone surgical excision of midline neck masses between January 2002 and June 2011. All patients had preoperative imaging. Data including age at surgery, preoperative imaging results, and postoperative pathology results were recorded. Preoperative imaging diagnoses were then compared to postoperative pathologic diagnoses. Diagnostic test statistics were performed. **Results:** A total of 44 patients met study criteria. 15 patients underwent more than one modality of imaging study. US had a sensitivity of 75% in diagnosis of TGDC. MRI sensitivity was 60% and CT was 82%. None of the tests had high specificity for TGDC; US was the highest at 80%. All three modalities had positive predictive values higher than 90%. US had the highest positive likelihood ratio (3.8), although the 95% confidence interval was not statistically significant. **Conclusions:** In a comparison of the three most commonly used imaging modalities for pediatric TGDC, US was the preferred exam given its ease of administration and cost. In addition to higher cost, the added risks of general anesthesia with MRI and ionizing radiation with CT are not justified in this setting given their nearly equivalent or inferior performance when compared to US in this cohort. MRI and CT may be reserved for select complex cases.

11:02 **PAUL HOLINGER, MD RESIDENT RESEARCH AWARD (Middle Section)**
Modification and Comparison of Minimally Invasive Cochleostomy Techniques: A Pilot Study
Michael J. Cipolla, MD, Columbus, OH; Pritish Iyer, BS, Columbus, OH; Claudia Dome, AuD, Columbus, OH;
 D. Bradley Welling, MD PhD*, Columbus, OH; Matthew L. Bush, MD, Lexington, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of CO₂ laser use for performing a minimally invasive cochleostomy.

Objectives: Bimodal stimulation may offer improved auditory function following cochlear implantation. Modification of technique during cochleostomy may minimize trauma and maximize residual hearing. We hypothesize that CO₂ laser use during cochleostomy is useful and may decrease intracochlear trauma. This study examines the utility of CO₂ laser to perform cochleostomy and compares intracochlear sound and temperature levels during laser and drill usage. **Study Design:** Experimental study (30 cadaveric temporal bones). **Methods:** A CO₂ laser at 3 watts (4 bones) and 6 watts (4 bones) and otologic drill (6 bones) were utilized to perform a cochleostomy while recording operative time. Subsequently, 16 bones were used to simultaneously record intracochlear sound (decibels) and temperature (°F) during CO₂ laser (8 bones) and drill cochleostomies (8 bones). **Results:** Average cochleostomy time for CO₂ laser was 15.5 minutes (3 Watts) and 7.75 minutes (6 Watts) and 8 minutes for the drill. Average intracochlear sound level was 54.9 dB during laser use and 89.9 dB for drill use ($p < 0.001$), while maximal levels were 75-118 dB during laser use and 95-136 dB during drill use ($p = 0.018$). Average temperature was 63.4°F during laser use and 61.5°F during drill use ($p = 0.151$) while maximum temperatures ranged from 66-120°F during laser use and 62-70°F during drill use ($p = 0.045$). **Conclusions:** CO₂ laser can create cochleostomies comparable in operative time and intracochlear temperature to drilling while decreasing intracochlear sound levels. Further investigation is warranted to minimize trauma and maximize auditory function during cochleostomy.

11:09 **JOHN E. BORDLEY, MD RESIDENT RESEARCH AWARD (Southern Section)**
Comorbid Predictors of Poor Response to Chemoradiotherapy for Laryngeal Squamous Cell Carcinoma
Melissa S. Hu, MD, Shreveport, LA; Cheryl A. Clark, PhD, Shreveport, LA; Kunal A. Sonavane, MD, Shreveport, LA; Gloria C. Caldito, PhD, Shreveport, LA; Cherie Ann O. Nathan, MD*, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of comorbid health on outcomes of primary radiotherapy and chemoradiotherapy treated laryngeal carcinoma.

Objectives: To investigate whether medical comorbidities affect outcomes of recurrent disease in primary radiotherapy (XRT) ± chemotherapy (CRT) in laryngeal squamous cell carcinoma. **Study Design:** Retrospective medical record review. **Methods:** A retrospective chart review was performed on patients diagnosed with laryngeal carcinoma between 1997-2011. The Adult Comorbidity Evaluation 27 (ACE 27) index was used to evaluate severity of comorbid health. Disease free survival rates and median disease free intervals were calculated, and significant associations between disease recurrence and comorbid factors were determined using the log rank test. Independent significant risk factors for disease recurrence were determined with the Cox proportional hazard regression model. **Results:** Of the 181 patients identified, 121 were treated nonsurgically with either primary XRT (49%) or CRT (51%). 60 (50%) experienced recurrence of their disease. Disease free survival was 23.8% and median disease free survival was 58 months (±12-108 months). Factors observed to be significantly associated with recurrence were renal disease ($p < 0.01$), pulmonary disease ($p < 0.01$), malnutrition ($p < 0.01$), T size ($p < 0.01$), and ACE 27 Index ($p < 0.01$). Independent significant risk factors for recurrence were malnutrition ($p < 0.01$), T-size ($p = 0.01$) and ACE 27 ($p < 0.01$). Adjusted hazards (probability of recurrence per unit month) were 43% for T-size, 158% for ACE 27, and 215% for malnutrition. **Conclusions:** The results of this study demonstrate that there is a significant association between increased comorbidity and recurrent disease in laryngeal carcinoma treated with XRT/CRT. The consideration of comorbid health in primary treatment planning may improve the success and survival of patients with laryngeal squamous cell carcinoma.

Thursday

11:16 **JOHN J. CONLEY, MD RESIDENT RESEARCH AWARD (Eastern Section)**
Thyroid Cancer Characteristics in the Population Surrounding Three Mile Island
Neerav Goyal, MD MPH, Hershey, PA; **Joseph Mangano, MPH MBA**, Ocean City, NJ; **Fabian Camacho, MS MA**, Hershey, PA; **David Goldenberg, MD**, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the differences regarding thyroid cancer characteristics in the population surrounding Three Mile Island.

Objectives: To determine differences in disease characteristics between the thyroid cancer populations in the area around the Three Mile Island nuclear power plant and the rest of the state of Pennsylvania. **Study Design:** Retrospective study. **Methods:** Historical data from the Pennsylvania Cancer Registry from 1985 to 2008 were reviewed and information regarding age at diagnosis, sex, race, residential status, county of residence, thyroid pathology, thyroid surgery, and staging was recorded. Dauphin, Lancaster, and York counties were defined as the Three Mile Island (TMI) area. **Results:** Records of 26,357 thyroid cancer patients were reviewed, with 2,611 patients within the Three Mile Island area. A higher proportion of papillary thyroid cancer ($p < 0.001$) and lower proportion of follicular thyroid cancer ($p < 0.001$) were noted in the TMI area population. Thyroid cancer cases from the TMI area were found to be more likely to be diagnosed before the age of 65 ($p < 0.001$), be Pennsylvania born ($p < 0.001$), be well differentiated ($p < 0.001$), be less than 10mm in size ($p < 0.001$), and be localized without spread ($p < 0.001$). Though the TMI area shows a higher incidence of thyroid cancer as compared to the rest of the state, this was not statistically significant. **Conclusions:** The TMI population showed a higher proportion of papillary thyroid cancer, and also less aggressive pathology and earlier diagnosis compared to the rest of Pennsylvania. No statistically significant difference in thyroid cancer incidence was noted. Overall, the study does not show a clear link with more advanced thyroid cancer and proximity to the TMI nuclear reactors.

11:23 - 12:15 **PANEL: WHAT'S THE LATEST AND GREATEST IN . . .**

Moderator: Steven D. Schaefer, MD*, New York, NY
Head and Neck Cancer Research
Theodoros N. Teknos, MD, Columbus, OH
Endocrine Surgery
David J. Terris, MD*, Augusta, GA
Sialendoscopy
M. Boyd Gillespie, MD MSc, Charleston, SC
Audiological Rehabilitation
Wayne E. Berryhill, MD*, Oklahoma City, OK
Evidence Based Medicine
Michael G. Stewart, MD*, New York, NY
Facial Transplantation
Donald J. Annino, Jr. MD, Boston, MA
Facial Reanimation
Teresa A. Hadlock, MD*, Boston, MA

12:15 - 1:15 Lunch in Exhibit Hall/View Posters

12:15 - 1:45 Thesis Seminar (open to candidates and potential candidates - pre-registration required) - Poinciana 2

1:15 - 5:25 SCIENTIFIC SESSIONS

CONCURRENT SESSION I -- OTOTOLOGY AND PEDIATRICS Americana 1

Moderator: Sigsbee W. Duck, MD*, Rock Springs, WY

1:15 **Factors Predictive of Professional Burnout among Practicing Otolaryngologists**
Aaron M. Fletcher, MD, Iowa City, IA; Nitin A. Pagedar, MD, Iowa City, IA; Richard J. Smith, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the contributory factors to burnout in practicing otolaryngologists.

Objectives: This study sought to determine which demographic and practice characteristics were predictive of professional burnout in otolaryngologists. **Study Design:** Cross-sectional survey. **Methods:** Postal mailings including the Maslach Burnout Inventory (MBI) and a demographic data sheet questionnaire was sent to alumni of the author's institution. Each participant completed the MBI according to the enclosed instructions. In addition, they answered a brief questionnaire comprised of eight items which were designed to collect basic demographic information about their practice structure and family life. The MBI was then scored and sub-

jects were classified according to their degree of burnout as compared to the established normative data for health professionals. Statistical analysis was then performed and correlations were used to summarize associations between continuous variables.

Results: We had a response rate of 49% to our survey. 3.5% of respondents met criteria for burnout syndrome. 16% of subjects were classified as having high levels of burnout according to the MBI. Young age, number of hours worked per week, and length of time in practice were found to be statistically significant predictors of burnout. In addition, the length of time married and the presence of children in the home were also significant predictors of burnout. There was no association between burnout and type of practice (i.e. academic vs. private practice or solo vs. group practice). **Conclusions:** Burnout is a recognized and widespread problem in contemporary medicine. We report here a comprehensive investigation of burnout in practicing otolaryngologists using a validated instrument with correlation to potentially modifiable risk factors. A large number of survey respondents experienced moderate to high levels of burnout. The experience of burnout was found to correlate significantly with both personal and professional factors, each of which can be potentially addressed to curb the incidence of burnout. Further understanding of the potential risk factors for burnout is necessary to minimize and prevent burnout among practicing otolaryngologists.

1:22

Comparison of Performance of a Unilateral CI to CROS Microphone and CI: A Prospective Study

Roochi A. Arora, BSc, Toronto, ON Canada; Hosam A. Amoodi, MD, Toronto, ON Canada; Suzanne Stewart, MSc, Toronto, ON Canada; Julian M. Nedzelski, MD*, Toronto, ON Canada; Vincent Y. Lin, MD, Toronto, ON Canada; Joseph M. Chen, MD, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the benefits that a CROS microphone combined with a unilateral cochlear implant can provide compared to use of just a unilateral cochlear implant.

Objectives: The purpose of the study was to investigate the clinical advantages of incorporating a contralateral routing of signal (CROS) microphone in unilateral cochlear implanted users. **Study Design:** A prospective study was undertaken on a group of 26 postlingually deafened adults, all had implantation with the same multichannel cochlear implant system. **Methods:** Performance with a unilateral cochlear implant was compared with performance using both a unilateral implant and a CROS microphone system worn on the opposite site (CI-CROS). Speech understanding using the AzBio sentence was evaluated in quiet, with speech presented at 0° and 270° azimuth in the horizontal plane. Speech understanding in noise was performed with speech at 0°, and noise at 0°, 90° and 270°. **Results:** A significant gain in speech understanding using CI-CROS compared to the unilateral CI alone was found in quiet, when speech was presented at 270° (average improvement of 5-20 %, $p < 0.01$). Participants also demonstrated statistically significant improvement using CI-CROS compared with the unilateral CI alone when noise was presented at 90° and speech at 0° (average improvement of 3-11 %, $p < 0.01$). **Conclusions:** Adding a contralateral microphone to a unilateral cochlear implant resulted in a significant improvement in speech understanding in different conditions. This method could provide a greater cost/benefit ratio than bilateral CIs and be a potential improvement for those who are not candidates for bilateral CIs.

1:29

A Comparison of Two Methods of Endoscopic Dilatation of Acute Subglottic Stenosis Using a Ferret Model

Kyle J. Tubbs, MD, Gainesville, FL; William O. Collins, MD, Gainesville, FL; Rodrigo C. Silva, MD, Gainesville, FL; Harvey E. Ramirez, DVM, Gainesville, FL; William L. Castleman, DVM PhD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current endoscopic techniques of subglottic dilatation and gain more understanding of the effects of balloon dilatation on the subglottic tissue.

Objectives: Balloon dilatation has gained acceptance as a first line treatment of acute subglottic stenosis (SGS), but its effects on the subglottic tissue remain largely unknown. We aimed to develop an animal model of acute SGS using completely endoscopic techniques. Once developed, this model was used to compare the immediate effects of balloon dilatation and endotracheal tube dilatation on the subglottic tissue. **Study Design:** Prospective randomized animal study. **Methods:** Acute SGS was induced in a total of ten ferrets by endoscopic cauterization of the subglottic mucosa with silver nitrate. After 48-72 hours of observation, eight animals were randomized to undergo subglottic dilatation with either a 5mm balloon or endotracheal tubes of increasing diameter. These eight ferrets were euthanized within ten minutes after dilatation. The other two ferrets served as controls and were euthanized following observation only. The larynx from each ferret was harvested, and the subglottis was examined histologically by a pathologist blinded to the treatment arms. **Results:** Acute SGS was induced in all ten ferrets using the endoscopic technique. Both balloon and endotracheal tube dilatation resulted in comparable improvement in the subglottic airway diameter. A decreased thickness of submucosa/lamina propria was seen in the balloon dilatation group. **Conclusions:** Acute SGS can be reliably induced in ferrets using endoscopic techniques. Multiple dilatation methods can be used to relieve acute obstruction. Balloon dilators seem to improve airway patency, in part, by decreasing the thickness of the submucosa and lamina propria. Further research is needed to determine how this impacts later stages of wound healing and final outcomes.

1:36

Quantifying the Effect of Age on Pediatric Post-Tonsillectomy Hemorrhage

Sandra Saint-Victor, MD, Miami, FL; Zorik Spector, MD, Boynton Beach, FL; David L. Mandell, MD, Boynton Beach, FL; David J. Kay, MD MPH, Boynton Beach, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the significance of age as

a risk factor for pediatric post-tonsillectomy secondary hemorrhage, quantify the magnitude of that risk, and discuss its clinical implications.

Objectives: To determine whether or not a patient's age is a significant preoperative risk factor for post-tonsillectomy secondary hemorrhage in children and to quantify the magnitude of that risk if it is significant. **Study Design:** Case control study with contingency table and logistic regression analysis to calculate significance and odds ratios. **Methods:** All tonsillectomies performed by three fellowship trained pediatric otolaryngologists from 2005-2010 were identified. All patients experiencing any secondary postoperative bleeding, regardless of severity or management, were identified. The 91 cases were matched with 151 controls who underwent tonsillectomy by the same surgeon on the same day as an identified case. All charts were reviewed for the patients' birth dates and surgery dates, and the exact ages at the time of surgery were calculated. The two groups were then compared statistically. **Results:** A comparison of the mean ages of the two groups showed that the patients experiencing post-tonsillectomy hemorrhages (cases) were significantly older than the control patients ($p=0.0022$). Logistic regression analysis revealed that for every increase in age by one year, the hemorrhage risk increased by 1.1 times ($p=0.0025$, 95% confidence intervals 1.032 - 1.162). Contingency table analysis indicated that children 11 years of age and older had nearly double the risk of bleeding compared to younger children (odds ratio 1.98, $p=0.0381$, 95% confidence intervals 1.04 - 3.79). **Conclusions:** The risk of post-tonsillectomy secondary hemorrhage is significantly increased in older children compared to younger ones.

1:43 Lymphatic Malformations of the Upper Airway
Scott M. Rickert, MD, New York, NY; Maguy Diallo, New York, NY; Teresa O, MD, New York, NY; Milton Waner, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss lymphatic malformations of the upper airway, understand their potential distribution in the airway, identify areas of concern for airway compromise, and compare potential treatment options.

Objectives: To characterize the anatomic distribution of segmental lymphatic malformations of the upper airway and to describe indications for treatment modalities. **Study Design:** Retrospective chart review. **Methods:** A 10 year (1999-2009) retrospective chart review of patients with lymphatic malformations was performed at a tertiary care center. Patients with upper airway lymphatic malformations were identified. The anatomic distribution of lymphatic malformations within the upper airway and the treatment course of each patient were reviewed. **Results:** 161 patients were identified with lymphatic malformations. 16 (9.9%) lymphatic malformations directly affected the upper airway. Date of diagnosis ranged from birth to 5 years of age. 16 (100%) patients had lymphatic malformation involvement of the oropharynx, while 11/16 (68.8%) and 9/16 (56.3%) had involvement of the oral cavity and hypopharynx/supraglottis respectively. None were identified with glottic or subglottic involvement. 15/16 (93.8%) patients required medical or surgical intervention during the treatment period. 10/16 (62.5%) patients had tracheotomies performed for airway compromise shortly after birth. All those with tracheotomies had oral cavity involvement. Further treatment varied depending on location and severity: 3 patients were treated with steroids, 6 patients were treated with sclerotherapy (4 with OK432, 2 with Bleomycin, 2 with Doxycycline), and 5 were treated surgically with CO2 laser. 2 of those treated with sclerotherapy were later treated with CO2 laser. **Conclusions:** Lymphatic malformations of the upper airway are rare. A high percentage of upper airway lymphatic malformations involve the oral cavity (62.5%) and oropharynx (68.8%). None of the lymphatic malformations involved the glottis or subglottis. Treatment can vary and should take into consideration specific pattern of involvement.

1:50 Incidence and Implication of Vocal Fold Paresis following Neonatal Cardiac Surgery
Karuna Dewan, MD, Houston, TX; Vicki L. Owczarzak, MD, Houston, TX; Elena Ocampo, MD, Houston, TX

Educational Objective: The participant will become familiar with the incidence of vocal cord paresis following congenital cardiac surgery and be able to use this information for improved informed consent.

Objectives: To study the incidence and implications of vocal cord paresis following congenital neonatal cardiac surgery. **Study Design:** Cohort study. **Methods:** All neonates who underwent median sternotomy for cardiac surgery from May 2007 to May 2008 were evaluated. Patients who had cardiac via thoracotomy were excluded from this review. Flexible laryngoscopy was performed to evaluate vocal fold function after extubation. Swallow evaluation and a modified barium swallow study were performed prior to initiating oral feeding if the screening was abnormal. **Results:** A total of 101 neonates underwent cardiac surgery during the study period. The 76 neonates who underwent median sternotomy participated in the study. Fifteen (17.6%) had vocal cord paresis. Almost 27% of the patients with aortic arch surgery had TVCP while only 4.1% of the patients with non-aortic arch surgery developed TVCP ($P=.02$). The patients from both surgical groups with TVCP had significant morbidity related to swallowing and nutrition ($P=0.01$) and required longer postsurgical hospitalization ($P=0.02$). **Conclusions:** The reported incidence of VCP following cardiac surgery ranges between 1.7% and 67% depending on the type of surgery and the weight of the infant at the time of surgery. In our cohort, 17.6% had TVCP. Surgery requiring aortic arch manipulation had a higher incidence of complications and required longer hospitalizations. This information may influence selection of surgical approach and will provide information to improve informed consent, to manage postoperative expectations by identifying patients who are at higher risk for complications.

1:57 Q&A

2:00 - 2:45 **PANEL: VASCULAR ANOMALY UPDATE**
Moderator: Scott C. Manning, MD*, Seattle, WA
Panelists: Stephen F. Conley, MD*, Milwaukee, WI
Carol J. MacArthur, MD*, Portland, OR
Anna H. Messner, MD*, Stanford, CA
Robert F. Yellon, MD*, Pittsburgh, PA

2:45 - 3:15 **Break with Exhibitors/Poster Viewing**

CONCURRENT SESSION II -- HEAD & NECK, LARYNGOLOGY Americana 2

Moderator: Gayle E. Woodson, MD*, Springfield, IL

1:15 **Oromandibular Dystonia: Long Term Management with Botulinum Toxin**
Catherine F. Sinclair, MD, New York, NY; Lowell Gurey, MD, New York, NY; Andrew Blitzer, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the rationale for use of botulinum toxin in the treatment of oromandibular dystonia, including injection techniques and possible pitfalls learnt from over 30 years experience with this disorder.

Objectives: To review the long term management of patients with oromandibular dystonia (OD) treated using botulinum toxin.
Study Design: Retrospective chart review at a clinical research center. **Methods:** Between 1988 and 2011, 82 patients with a diagnosis of oromandibular dystonia were treated with botulinum toxin. Data was collected on patient demographics, disease characteristics and long term treatment outcomes. Differences in management between an earlier published series of the first 20 OD patients treated with botulinum toxin at this center and subsequent patients were analyzed. **Results:** Patients were more commonly female (72% vs. 28%) with an average age at first botulinum treatment of 56.6 years. Mean number of treatment was 9.1 (± 9.1). Median time between treatments was 3 months (range 0 - 9.2). Overall, 64.6%, had the jaw closing form of OD (JCOD) which was associated with a preferential deviation to one side in 47.2%. These patients received initial injections to masseter +/- temporalis; lateral pterygoid (LP) was injected for associated lateral jaw deviation. Medial pterygoid injections were rarely utilized (4.9%). For jaw opening OD (JOOD), injections were initially administered to LP muscles, with the addition of anterior digastric for ongoing symptoms. When compared with patients in the older series, significantly more patients since 1988 had treatments to lateral pterygoid ($p < 0.0001$) and the anterior digastric ($p = 0.032$) in accordance with an increase in the diagnosis of jaw opening OD. **Conclusions:** Long term treatment of OD with botulinum toxin provides good symptom control. Injections can be titrated by dose and injection site to address the predominant muscle groups involved.

1:22 **Malignant Melanoma Induces Migration and Invasion of Adult Mesenchymal Stem Cells**
Tammara L. Watts, MD PhD, Galveston, TX; Ruwen Cui, BA, Galveston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to explain cancer stem cell theory and discuss the role of adult stem cells in the pathogenesis of melanoma.

Objectives: Chemotactic signals responsible for stem cell homing to tumor sites are active areas of investigation. Malignant melanoma is an aggressive metastatic neoplasm with varying phenotypic expression. Therefore, we sought to further understand how stem cells may play a role in the pathophysiology of melanoma. **Study Design:** The following human cell lines were used as the model to investigate the effect of melanoma on migration of adult stem cells: malignant melanoma (A375), normal primary melanocytes, and adult mesenchymal stem cells (hMSC). **Methods:** The Boyden chamber assay was used to study migration and invasion of hMSCs in response to conditioned A375 media. ELISA assays were used to screen chemokines of interest to determine the physiologic relevant concentrations of growth factors secreted by A375. RT-PCR was used to determine if mRNA for cognate growth factor receptors were present on the hMSCs and A375 cell lines. **Results:** The human melanoma cell line A375 induced significant migration of adult mesenchymal stem cells (48%) compared to normal melanocytes (11%; $p < 0.001$). Peak migration of hMSC's occurred 24 hours following exposure to conditioned melanoma media compared to later time points. To identify candidate growth factors that may underline the migration of hMSC's an ELISA approach was used to screen growth factors of interest including VEGF, FGF-2, and SDF- α . Of those screened, FGF-2 was found to be the most abundantly secreted chemokine in A375 conditioned media. Physiologic relevant concentrations of FGF-2 (50 pg/ml) caused migration of hMSCs comparable to conditioned melanoma media. Reverse transcriptase PCR confirmed the presence of FGF-2 receptor mRNA in both hMSCs and A375 cell lines. In addition to inducing migration of hMSCs, conditioned melanoma media also caused invasion of hMSC's (26%) through the basement membrane using the matrigel Boyden chamber assay. However, conditioned melanoma media did not cause significant invasion of normal melanocytes (4%) when compared to controls (9%; $p < 0.05$). **Conclusions:** Taken together, these data suggest that the stem cell microenvironment may play an important role in the malignant potential of melanoma, and future studies will be directed toward identifying candidate growth factors secreted by melanoma that may underline these processes and serve as potential therapeutic targets.

1:29 The Role of Otolaryngologists in Anterior Approaches to the Cervical Spine: A Review of 193 Consecutive Cases

Saral Mehra, MD MBA, New York, NY; Thomas E. Heineman, New York, NY; Frank P. Camissa, MD, New York, NY; Federico P. Girardi, MD, New York, NY; Andrew A. Sama, MD, New York, NY; David Ivan Kutler, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participant should understand the role of otolaryngologists in complicated anterior approaches to the spine and know the incidence of subjective and objective complications.

Objectives: To review the indications and outcomes for otolaryngologist involvement in anterior approaches to the cervical spine.

Study Design: Retrospective cohort study. **Methods:** An analysis of all consecutive patients undergoing cervical fusion in which the anterior approach was performed by a single head and neck surgeon at an academic institution over four years. **Results:** A total of 193 consecutive cases with patients of median age 56 years were included. Spinal levels approached were from C3 to T1. Twelve (6.2%) were right sided approaches. Seventy-four cases (38%) were revision procedures, six patients (3.1%) had prior thyroidectomy, 187 cases (97%) were multi-level, 63 (33%) involved C3 exposure, 15 (8%) involved T1 exposure, and 69 (36%) involved plate removal. Twenty-nine patients (15%) sought ENT followup for postoperative complaints, including dysphagia (n=26, 13%), hoarseness or voice complaints (n=12, 6.2%), and odynophagia (n=15, 7.8%). Objective findings on flexible laryngoscopy and/or stroboscopy included vocal cord paralysis (n=1, 0.52%), vocal cord paresis (n=2, 1.0%), and superior laryngeal nerve damage (n=1, 0.52%). Six patients had evaluations of swallowing including FEESST and/or videoesophagram with 3 showing difficulty in vallecular residue management, and one at risk for aspiration. There were no significant associations between preoperative or surgical characteristics and complications. **Conclusions:** Otolaryngologists play a critical role in performing the anterior approach for spine surgeons in multi-level, high or low level, and revision spinal fusion procedures with an acceptable rate of complications that they are uniquely equipped to diagnose and manage.

1:36 Retropharyngeal Node Dissection during Transoral Robotic Surgical Therapy of OP SCCA: Implications for Surgery as Primary Therapy

Eric J. Moore, MD*, Rochester, MN; Ardan Ebrahimi, MD, Rochester, MN (Presenter); Kerry D. Olsen, MD*, Rochester, MN; Dan L. Price, MD, Rochester, MN; Jan L. Kasperbauer, MD*, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to make a determination on when to dissect the retropharyngeal nodes for oropharyngeal squamous cell carcinoma, have a clear idea of the technique of the dissection, and be able to reliably and safely execute the procedure.

Objectives: The retropharyngeal (RP) nodal group is estimated to be involved in metastasis of oropharyngeal squamous cell carcinoma (OP SCCA) up to 20% of the time. This study was performed to evaluate the incidence of RP node metastasis in surgically treated OP SCCA, the morbidity of RP node dissection, and the efficacy of using methylene blue to aid in detection of RP nodes.

Study Design: Prospective review of RP nodal dissection in 20 patients undergoing neck dissection during surgical therapy of OP SCCA. **Methods:** Twenty patients undergoing neck dissection as part of transoral robotic surgical therapy of OP SCCA also underwent retropharyngeal node dissection. The tonsillar area was injected with methylene blue in 10 patients prior to the dissection to evaluate the efficacy of this technique in nodal identification. **Results:** Retropharyngeal lymph nodes were identified in all 20 patients, and average of 3 RP lymph nodes were removed per patient. The retropharyngeal lymph nodes were involved with metastatic SCCA in 4 patients (20%). In all of these patients, nodal metastasis was present in other nodal basins. Methylene blue dye did aid in the detection of lymph nodes, but it did not increase the nodal yield. RP lymph node dissection did not increase the morbidity of therapy. **Conclusions:** The RP lymph node basin is involved in OP SCCA metastasis, and dissection of this area should be considered during surgical therapy of the neck, particularly if surgery is being considered as the only treatment modality.

1:43 The Preauricular Infratemporal Fossa (ITF) Approach for Advanced Malignant Parotid Tumors

Brent Jason Bencoter, MD, Maywood, IL; John P. Leonetti, MD*, Maywood, IL; Sam J. Marzo, MD*, Maywood, IL; Rick W. Borrowdale, MD, Maywood, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the utility of the preauricular infratemporal fossa approach in the management of patients with advanced malignant parotid tumors.

Objectives: 1) To demonstrate the surgical technique involved in the preauricular infratemporal fossa (ITF) approach; 2) to outline the clinical indications for use of this technique; and 3) to present our results in using this approach in 159 patients with malignant parotid tumors. **Study Design:** This was a retrospective chart review of 159 patients treated at a tertiary care, academic medical center following internal review board approval. **Methods:** A comprehensive medical records review was performed for all patients with malignant parotid tumors who underwent a preauricular ITF approach between July 1988 and July 2010. **Results:** The most common presenting symptoms were pain and trismus while the presence of a parotid mass and facial paralysis were the most common clinical signs. Mucoepidermoid and adenoid cystic carcinoma accounted for 63% of the tumors and perineural invasion was found in nearly 71% of the patients. Despite negative surgical margins in 92% of the patients, local or regional tumor recurrence was found in 17% of the cases. The mean followup time was 12.8 years. **Conclusions:** The preauricular ITF approach should be utilized in the surgical extirpation of advanced malignant parotid neoplasms. This technique provides proximal facial nerve identification, internal carotid artery protection, and negative tumor margins at the skull base (92%).

1:50 WILLIAM W. MONTGOMERY, MD RESIDENT RESEARCH AWARD (3rd Place Eastern Section)
Waiting for Thyroid Surgery: A Prospective Cohort Study of Psychological Morbidity and Determinants of Health Associated with Long Wait Times for Thyroid Surgery
 Antoine Eskander, HBS Sc MD, Toronto, ON Canada; Jeremy L. Freeman, MD, Toronto, ON Canada; Lorne E. Rotstein, MD, Toronto, ON Canada; Anna M. Sawka, MD PhD, Toronto, ON Canada; Jonathan C. Irish, MD MSc, Toronto, ON Canada; David P. Goldstein, MD MSc, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to understand patient psychological morbidity during the thyroid surgical wait period and associated clinical and sociodemographic factors. Furthermore, participants will understand the distinct role of surgery in changing patients' health related quality of health.

Objectives: Uncertainty during the interval between initial assessment and thyroid surgery can be psychologically devastating. This study examines psychological morbidity in patients awaiting thyroid surgery and investigates whether anxiety is related to the length of time on the waiting list and various clinical and sociodemographic factors. **Study Design:** A prospective cohort study preoperatively assessed patients cross-sectionally at various wait times. A randomly selected subgroup was also assessed postoperatively. **Methods:** Adult patients on the wait list for thyroidectomy received four psychological morbidity questionnaires by mail: the Impact of Events Scale - Revised (IES-R), the Illness Intrusiveness Ratings Scale (IIRS), the Perceived Stress Scale (PSS) and the Hospital Anxiety and Depression Scale (HADS). We examined preoperative measures to determine whether anxiety relates systematically to length of wait, fine needle aspiration biopsy results, uncertainty about the timing of surgery, and other clinical and sociodemographic factors. **Results:** We achieved a 54% response rate over a 3 year period; 179 patients provided complete data. At survey completion, responders had waited an average of 122 (± 86) days. Most considered the wait to be long or too long (73%). Overall, respondents reported substantial pre-treatment psychological morbidity with high IES-R, IIRS, PSS, and HADS scores, but wait times for surgery did not correlate significantly with stress or anxiety as indicated by any of the instruments. Postoperative anxiety decreased significantly in all psychological morbidity measures except the IIRS. **Conclusions:** Patients awaiting thyroid surgery consider their wait too long, have significant psychological morbidity, and long wait times for surgery, but we found no evidence that psychological morbidity is related to wait times.

1:57 Q&A

2:00 - 2:45 PANEL: PARATHYROID SURGERY - WHAT THEY DIDN'T TEACH YOU
Moderator: Jesus E. Medina, MD*, Oklahoma City, OK
Panelists: David L. Steward, MD*, Cincinnati, OH
 Jeffrey M. Bumpous, MD*, Louisville, KY
 David J. Terris, MD*, Augusta, GA

2:45 - 3:15 Break with Exhibitors/Poster Viewing

3:15 - 5:25 SCIENTIFIC SESSION

Americana 1 & 2

3:15 - 4:15 PANEL: POINT/COUNTERPOINT - TWO EXPERT TESTIMONIES
Moderator: David W. Eisele, MD*, San Francisco, CA

3:15 - 3:30 Changing Paradigms of Resident Training - A Good Thing?
 Bradley F. Marple, MD, Dallas, TX (in favor) vs Paul A. Levine, MD*, Charlottesville, VA (opposed)

3:30 - 3:45 Open vs. Endoscopic Treatment of Zenker's
 Albert L. Merati, MD*, Seattle, WA (open) vs Richard L. Scher, MD*, Durham, NC (endo)

3:45 - 4:00 Implantable Hearing Aids
 Moises A. Arriaga, MD*, Baton Rouge, LA (pro) vs. Peter A. Weisskopf, MD*, Phoenix, AZ (con)

4:00 - 4:15 Oropharyngeal Cancer - ChemoXRT vs. Surgery
 Randal S. Weber, MD*, Houston, TX (nonsurgical) vs. Wendell G. Yarbrough, MD*, Nashville, TN (surgical)

Thursday

4:15 - 5:15 **HOW I DO IT - NOT WHEN AND WHY, JUST HOW (4" videos)**

Moderator: Michael G. Stewart, MD*, New York, NY

Transaxillary Thyroid Surgery

Jeffery Scott Magnuson, MD*, Birmingham, AL

Frontal Drill-Out

Lanny Garth Close, MD*, New York, NY

Functional Rhinoplasty

Wm. Russell Ries, MD*, Nashville, TN

Endoscopic Management of RRP

C. Gaelyn Garrett, MD*, Nashville, TN

Salivary Gland Infusion Techniques

Henry T. Hoffman, MD*, Iowa City, IA

Transnasal Esophagoscopy

Gregory N. Postma, MD, Augusta, GA

In-Office Laryngeal Surgery

Peak Woo, MD*, New York, NY

Cosmetic Rhinoplasty

Dean M. Toriumi, MD*, Chicago, IL

Laser Surgery for Supraglottic/OP CA

Bruce H. Haughey, MBChB, St. Louis, MO

Endoscopic Pituitary Surgery

Brent A. Senior, MD*, Chapel Hill, NC

TORS

Francisco J. Civantos, MD*, Miami, FL

Ossiculoplasty

George T. Hashisaki, MD*, Charlottesville, VA

5:15 **ADJOURN**

5:15 - 6:15 **MEET THE AUTHORS POSTER RECEPTION - Americana 3 & 4**

6:15 - 7:30 **VICE PRESIDENTS WELCOME RECEPTION - Americana Lawn**

FRIDAY, JANUARY 27, 2012

7:00 - 7:50 **Business Meetings**
Southern Section - Poinciana 3
Western Section - Poinciana 2

8:00 - NOON CONCURRENT SCIENTIFIC SESSIONS

8:00 **Announcements by Vice Presidents**

CONCURRENT SESSION I -- HEAD & NECK, PLASTICS Americana 1

Moderator: Jeffrey H. Spiegel, MD*, Boston, MA

8:05 **Diagnostic Modalities for Distant Metastasis (DM) in Head and Neck Squamous Cell Carcinoma (HNSCC): Are We Changing Life Expectancy?**
Matthew E. Spector, MD, Ann Arbor, MI; Steven B. Chinn, MD MPH, Ann Arbor, MI; Andrew J. Rosko, BS, Ann Arbor, MI; Carol R. Bradford, MD*, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that despite advanced diagnostic modalities for distant metastasis in head and neck cancer, life expectancy after diagnosis of distant metastasis remains unchanged.

Objectives: To determine if the method of DM diagnosis (CT, MRI, PET) alters life expectancy in HNSCC. **Study Design:** Retrospective. **Methods:** 170 patients (mean age 59.1; M:F 135:35) with HNSCC who developed DM were reviewed. The main outcome measures were the method of DM diagnosis and time from DM diagnosis to death while controlling for clinical parameters (age, gender, tobacco/alcohol status, primary tumor site, initial TNM stage, number and site of DM, administration of palliative chemotherapy). **Results:** Tumor subsites were: 40 oral cavity, 75 oropharynx, 36 larynx, 10 hypopharynx, 9 unknown primary. 13.5% (23/170) of patients had distant metastasis at presentation; the remaining 147 patients were diagnosed with DM at a median of 324 days from diagnosis. Although patients diagnosed with DM by PET scan were more likely to have multiple DM sites ($p=0.03$), there were no differences in life expectancy in patients who were diagnosed with or without PET scan (median 168 vs 193 days, $p=0.3$). There were no differences in life expectancy based on age, gender, site of primary tumor, or number/site of DM. The use of palliative chemotherapy resulted in a significantly longer life expectancy (median 285 vs 70 days, $p=0.001$). Of the patients who received palliative chemotherapy (85/170), there was a trend when comparing patients with oropharyngeal vs laryngeal primary tumors (median 333 vs 195 days, $=.11$). Previous chemotherapy did not predict response to palliative chemotherapy ($p=0.85$). **Conclusions:** Although PET scan is more likely to diagnose multiple DM sites, there was no difference in survival. Palliative chemotherapy continues to extend life expectancy in patients with DM from HNSCC and may be more effective in oropharyngeal cancers.

8:12 **Recurrence Rates of Non-Melanomatous T1 Skin Lesions of the Head and Neck—Is There a Role for Watchful Waiting When Margins Are Positive?**
Justin W. Douglas, MD MS, Morgantown, WV; Daniel J. Merenda, MD, Morgantown, WV; Jing L. Sun, BS, Morgantown, WV; Charles E. Haislip, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to consider clinical observation for low risk non-melanomatous lesions that have an initial positive margin on wide local excision.

Objectives: Determine if close clinical observation of low risk, incompletely excised non-melanomatous skin lesions leads to a higher recurrence rate. **Study Design:** Four hundred ninety-two ($N=492$) patients with T1 non-melanomatous skin lesions of the head and neck that were removed by wide local excision (WLE) and analyzed by permanent section margin analysis were enrolled in this study, retrospectively. The mean age was 61 years old. Males enrolled were 484, and females were 8. The mean lesion size was 1.2 cm. The mean followup time was 3.7 years. Those with positive margins were either re-excised/re-analyzed for clear margins or they were followed with close observation. Of those patients who were re-excised and retained a positive they were offered radiation. If the patient refused radiation, they were included in the study and followed for clinical recurrence. **Methods:** These three groups were followed up with clinical exam and recurrence rates were compared. **Results:** The pathologic diagnoses were 387 basal cell carcinomas (BCC) and 105 squamous cell carcinomas (SCC). 232 BCC and 63 SCC had a positive initial margin and 105 BCC and 37 SCC underwent re-excision, respectively. Of those not re-excised 0% BCC and 3.85% SCC had recurred through the followup interval. **Conclusions:** There seems to be a role for close clinical observation of non-melanomatous skin lesions with a positive margin at initial WLE.

8:19 **Aesthetic Outcomes: Traditional Thyroidectomy Compared to Minimally Invasive Nonendoscopic Thyroidectomy**

Matthew R. Garrett, MD, Columbus, OH; Doug D. Massick, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the benefits and limitations of nonendoscopic minimally invasive thyroid surgery and appreciate the factors that contribute to patient satisfaction regarding scar outcome.

Objectives: Minimally invasive thyroid surgery has gained significant attention for reported benefits such as reduced postoperative pain, shorter hospital stay, and improved cosmesis. Other reports however suggest that patient satisfaction is not statistically related to the length of the thyroidectomy scar. In this study, we compare outcomes and aesthetic results in patients with traditional thyroidectomy incisions (≥ 5 cm) versus those with minimally invasive (≤ 4 cm) thyroidectomy incisions with validated scar assessment tools. **Study Design:** Prospective nonrandomized study of consecutive patients undergoing thyroid surgery via both traditional and nonendoscopic minimally invasive techniques by a single surgeon. **Methods:** Sixty total patients were enrolled. Thirty underwent a traditional approach with a mean incision length of 5.7 cm, and 30 underwent minimally invasive nonendoscopic thyroidectomy with a mean incision length of 3.5 cm. Three assessment tools, the Patient Scar Assessment Questionnaire, Vancouver Scar Scale, and the Patient and Observer Scar Assessment Scale were used to assess both patient and independent observer perception of postoperative scars. Patients underwent evaluation at 1 and 6 months postoperatively. Data regarding demographics, extent of surgery, operative time, and complications were also noted. **Results:** Both groups were matched in age, gender, and extent of surgery. Minimally invasive techniques demonstrated slightly longer operative time (68 vs 83 minutes $p 0.024$). With all three scar assessment tools, both patient reported domains and observer reported domains failed to demonstrate statistical significance between traditional and minimally invasive techniques at one and six months postoperatively. **Conclusions:** Minimal access thyroid surgery is a safe and feasible alternative to conventional thyroid surgery, but incision length may not correlate to patient's perceived cosmetic outcome and scar satisfaction.

8:26 **Ex Vivo Electromechanical Reshaping of Costal Cartilage in the New Zealand White Rabbit Model**

Karam W. Badran, BSc, Irvine, CA; Cyrus T. Manuel, BSc, Irvine, CA; Curtis Waki, Irvine, CA; Dmitriy E. Protsenko, PhD, Irvine, CA; Brian J.F. Wong, MD PhD*, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that electromechanical reshaping (EMR) can be used to alter the shape of costal cartilage and is an animal model that can be used to study innovative methods to reshape costal cartilage.

Objectives: To determine the effective EMR dosimetry parameters for shape change and cell viability in the ex vivo rabbit costal cartilage model. **Study Design:** This is a preclinical ex vivo animal study combined with computer modeling to guide electrode placement and polarity. **Methods:** Rabbit costal cartilages ($n=12$) were secured in a jig that recreated the shape of the rabbit auricle framework. Finite element modeling was used to determine the initial electrode geometry, polarity, spacing, and pilot dosimetry parameters (7V 3 min). Porcine costal cartilage ($n=21$) was first utilized to narrow the range of possible dosing parameters. Parametric analysis was performed to determine the effect of voltage and application time on tissue shape change. A reduced parameter set of voltage-time pairs were identified. Next, rabbit rib cartilage was reshaped varying voltage and application time to identify the lowest parameters to produce acceptable shape change mimicking native auricular cartilage. Acceptable qualitative shape change was determined on a five point Likert scale by three individuals separate from the study, with one way general linear analysis of variance (ANOVA) calculated. Confocal microscopy with live/dead cell viability analysis determined the degree of injury and the distribution of live and dead cells. **Results:** The minimum acceptable deformation of rabbit costal cartilage was found at 4V 3 min and 3V 4 minutes. Viability analysis of cartilage reshaped at 4V 3 min. demonstrates cell injury extending 2 mm away from each electrode with viable cells found between the electrodes. **Conclusions:** The EMR parameters of 4V 3 minutes demonstrates appropriate shape change producing grafts that resemble the native auricle and contains the viable cells adequate for clinical evaluation. The rabbit auricular reconstruction model is feasible.

8:33 **Analysis of Cartilage Graft Mechanical Behavior following PDS Plate Application**

Michael Robert Kinzinger, BA, Cleveland, OH; Christian Conderman, MD, Irvine, CA; Cyrus T. Manuel, BS, Irvine, CA; Dmitriy E. Protsenko, PhD, Irvine, CA; Brian J.F. Wong, MD PhD*, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the mechanical properties of a cartilage graft following PDS plate application.

Objectives: Polydioxanone (PDS) plates are useful for stabilizing cartilage in septorhinoplasty. This study characterizes the mechanical properties and behavior of a PDS cartilage composite graft and address how many sutures are to achieve optimal stiffness. **Study Design:** Experimental study. **Methods:** To evaluate the impact of suture number, polystyrene sheets (PS) were first used as a cost effective proxy for PDS. Each PS was secured using 2, 3, 4 (square), and 5 (quincunx) sutures to porcine costal cartilages (1x5x20mm). Mechanical analysis was performed flexing each specimen in single cantilever beam geometry. The effective elastic modulus (E_f) for native cartilage, PS, and PDS (0.15 and 0.25 mm) alone, E_f for cartilage samples with/out PS plates, and 0.15 and 0.25 mm PDS composite cartilage grafts were calculated. **Results:** E_f of native cartilage, 0.15, 0.5 mm PDS, and PS were 17,

450, 690, and 170 MPa, respectively. Using PS, E_f for 2, 3, 4, and 5 sutures were 42, 42, 39, and 40 MPa, respectively. E_f for 0.15 and 0.5 mm PDS composite cartilage grafts (2 sutures) were 43 MPa and 140 MPa. **Conclusions:** The use of more than two sutures to secure plates resulted in only marginal gains in stiffness. E_f did not differ between suture configurations, thereby making the simple two suture linear configuration optimal. Using either 0.15 or 0.5 mm PDS plates resulted in a substantial increase E_f of the aggregate structure, with the use of 0.5 mm providing a marginal increase relative to published data on requirements for structural cartilage grafting.

8:40 Use of CT Guided Navigation in Orbit Trauma Repair

Brian T. Andrews, MD, Kansas City, MO; Neil Tanna, MD MBA, New York City, NY; James P. Bradley, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinical application, technique, efficacy, and safety of using CT guided navigation during orbital trauma repair.

Objectives: Orbit trauma is a common injury and often requires surgical repair to restore anatomic position of the eye and adequate function. Even in experienced hands, injury to the eye or periorbital contents may occur. The use of CT guided navigation is a modality used to decrease intraoperative complications and has become standard of care in most neurosurgical and many head and neck procedures. With small modifications its use can be expanded to craniofacial trauma in hopes of reducing perioperative complications as well. **Study Design:** A retrospective chart review was performed. **Methods:** All patients who underwent surgical repair of an orbit injury using CT guided navigation were included. Preoperative, perioperative, and postoperative medical records and radiographic images were reviewed. **Results:** Five patients who underwent seven orbit procedures were included (two patients had bilateral injuries). All seven procedures were performed without complication. CT navigation was used to correctly identify the posterior orbit bony shelf as well as the correct position of the orbital floor implant on this shelf after it was inserted. **Conclusions:** CT guided navigation is a useful modality in safely performing orbital trauma surgery. Its use may further be expanded in the treatment of craniofacial trauma in the near future.

8:47 The Support of the Nasal Sidewall in Rhinoplasty: An Anatomic Study

Dhave Setabutr, MD, Hershey, PA; Fred G. Fedok, MD, Hershey, PA; Sohrab Sohrabi, MD, Hershey, PA; Shana Kalaria, BS, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss normative values of nasal support structures and predict anatomy that warrants the use of middle vault grafts in rhinoplasty.

Objectives: Nasal bone length is commonly referenced in the rhinoplasty literature. Short nasal bone length has been suggested to predispose to a greater risk of middle vault collapse after rhinoplasty. We report on normative measurements of nasal bones and associated structures and the application of such data to rhinoplasty. **Study Design:** Cadaveric study. **Methods:** Using thirty-three adult cadavers, common external nasal landmarks were identified and measured to approximate the dimensions of the nasal bones and upper lateral cartilages. These clinically relevant surface landmarks were correlated to direct measurements of dissected nasal bones and the upper lateral cartilage in ten of these cadavers. **Results:** The average measured length of a nasal bone was 23.9 mm; the average measured length of the upper lateral cartilage was 18.3 mm. Measurements obtained via external landmarks were 16.7 mm ($p < 0.0001$) and 12.80 mm ($p = 0.019$) respectively. The average external length was statistically significant for being 24.5% shorter for nasal bones and 37.5% longer for the upper lateral cartilages when compared to their internal measurement counterparts. On average the nasal bones contributed to 0.518 of the middle vault nasal sidewall. **Conclusions:** The average length of the adult nasal bone is 23.9 mm while that of the upper lateral cartilage is 16.7 mm. The relationships of the accepted external landmarks to the underlying anatomic structures were established using a t-test. This normative data will generate useful parameters when evaluating the rhinoplasty patient.

8:54 Q&A

9:00 - 10:00 PANEL: CUTANEOUS MALIGNANCIES AND LOCAL FLAP RECONSTRUCTION FROM SMALL TO ALL

Moderator: Stephen S. Park, MD*, Charlottesville, VA

Panelists: William W. Shockley, MD*, Chapel Hill, NC
Dean M. Toriumi, MD*, Chicago, IL
John S. Rhee, MD MPH, Milwaukee, WI
Brian J.F. Wong, MD*, Irvine, CA

10:00 - 10:30 Break with Exhibitors/View Posters

**CONCURRENT SESSION II -- RHINOLOGY, SLEEP, LARYNGOLOGY
Americana 2**

Moderator: John F. Pallanch, MD*, Rochester, MN

8:05 The Interarytenoid Spatial Relationship: Accuracy and Inter-Rater Reliability for Determining Sidedness in Cases of Unilateral Adductor Paresis

Ahmed S. Sufyan, MD, Indianapolis, IN; Todd J. Wannemuehler, BS, Indianapolis, IN; Stacey L. Halum, MD*, Indianapolis, IN

1/27/2012

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the sidedness in cases of unilateral TA/LCA paresis.

Objectives: When adductor vocal fold paresis manifests without obvious motion impairment, identifying the paretic side can be challenging. While increased vocal fold waveform amplitude (floppiness) on videostroboscopy may be helpful, it has been shown to have low inter-rater reliability. We have found the inter-arytenoid spatial relationship (IASR) can often accurately be used to predict the sidedness of EMG determined unilateral adductor [thyroarytenoid/lateral cricoarytenoid (TA/LCA)] paresis. The goal of this study was to determine if a series of otolaryngology residents could learn to assess the IASR on videostroboscopy, and use the IASR to identify the side of EMG documented adductor paresis with high accuracy and inter-rater reliability. **Study Design:** Otolaryngology resident population surveys. **Methods:** Ten residents were given videostroboscopy images on abduction/adduction from 10 consecutive patients with EMG documented unilateral TA/LCA paresis and asked to identify the paretic side in a pre-test. The IASR was then conceptually introduced to the otolaryngology residents in a brief presentation. Post-testing was then performed and used to assess EMG based accuracy and inter-rater reliability. **Results:** Before the IASR presentation, otolaryngology residents accurately identified the paretic side in 63% (95% CI 56% to 70%) of cases. In the post-test session, the residents accurately identified the paretic side in 93% (95% CI 87% to 99%) of cases, and inter-rater reliability was 0.873. **Conclusions:** The IASR may be useful in determining sidedness in cases of unilateral TA/LCA paresis. Further studies are needed to determine the sensitivity and specificity of the IASR for determining sidedness of unilateral TA/LCA paresis with intact mobility.

8:12 Incentive Spirometry for the Tracheostomy Patient

Gregg H. Goldstein, MD, New York, NY; Alfred-Marc C. Illoreta, MD, New York, NY; Bukola Ojo, BS, New York, NY; Benjamin D. Malkin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the indications, efficacy and feasibility of incentive spirometry for patients who have undergone a tracheostomy procedure.

Objectives: To determine the feasibility of developing and using a customized incentive spirometer device for patients who have undergone a tracheostomy procedure. **Study Design:** An IRB approved prospective case series was performed. **Methods:** Patients were eligible for participation if they were over 18 years old and had a new tracheostomy. Spirometry exercises were performed using a protocol adapted from the American Academy of Respiratory Care guidelines. Patient data was recorded including age, gender, tobacco use, surgical procedure, time under general anesthesia, length of hospital stay and time until ambulation. The details of the spirometry exercises were also recorded including the days of device use, sessions per day, attempted breaths per session, maximal volume of inspired air and any complications that occurred. **Results:** An incentive spirometer was adapted for use with tracheostomy patients and received an investigational device exemption by the FDA. A total of 10 patients were enrolled, with a mean age of 60 years. Sixty percent were current or former tobacco users, the mean anesthesia time was 9 hours and 70% underwent a microvascular free flap reconstruction. Patients used the incentive spirometer for a mean of 1.6 days during the postoperative period, averaging 3.3 sessions per day and 6.8 breaths per session. The device was well tolerated by patients and there were no complications associated with its use. **Conclusions:** This study supports the feasibility of using a customized incentive spirometer for tracheostomy patients and establishes a safety profile for the device to be used in future outcomes studies.

8:19 Quantitative Airway Analysis during Drug Induced Sleep Endoscopy for Evaluation of Sleep Apnea

Ryan C. Borek, BS, Philadelphia, PA; Erica R. Thaler, MD*, Philadelphia, PA; Christopher Kim, BA, Philadelphia, PA; Jeff E. Mandel, MD, Philadelphia, PA; Richard J. Schwab, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss a technique for quantitatively measuring the change in airway caliber during drug induced sleep endoscopies for evaluation of sleep apnea.

Objectives: To describe a method of quantitatively measuring state dependent changes in airway caliber at multiple anatomical levels during drug induced sleep endoscopy for evaluation of severe sleep apnea. **Study Design:** Case series. **Methods:** Patients underwent drug induced (propofol) sleep endoscopy as part of a nonrandomized prospective trial assessing a patients' candidacy for transoral robotic surgery intervention for sleep apnea. The sleep endoscopy videos were analyzed and images of the retroglossal and retropalatal areas were captured during an initial state of light sedation and again in a state of sleep. These images were then

analyzed using computer aided imaging analysis to measure the percent change in airway area as a result of drug induced sleep induction. **Results:** We analyzed 19 sleep endoscopy videos from patients with severe obstructive sleep apnea (AHI: 41.5 ± 23.6 events/hour) who were being evaluated for surgical intervention. 18 out of the 19 patients had images available for analysis of the retropalatal region and all 19 patients had images available in the retroglossal region. The patients demonstrated a $79.2 \pm 21.7\%$ ($P < 0.001$) reduction in the retropalatal airway area with sleep induced endoscopy with 7/18 patients manifesting a 100% reduction in that region. In the retroglossal region the patients demonstrated a $52.5 \pm 30.7\%$ ($P < 0.01$) reduction in airway area and 1 patient had a 100% reduction. **Conclusions:** Patients undergoing drug induced sleep endoscopy were shown to have significant reductions in airway area at multiple regions with propofol. This method can be used to quantitatively measure state dependent upper airway changes, which could potentially then be used as a means for improving surgical outcomes in patients with sleep apnea.

8:26 Comparison of CFTR and Ciliary Beat Frequency Activation by the CFTR Modulators Genistein, VRT532, and UCCF-152 in Primary Sinonasal Epithelial Cultures

Bryant T. Conger, MD, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL; Shaoyan Zhang, PhD, Birmingham, AL; Daniel F. Skinner, BS, Birmingham, AL; Eric J. Sorscher, MD, Birmingham, AL; Steven M. Rowe, MD MPH, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the flavonoid genistein's ability to activate transepithelial chloride transport and understand its importance as a therapeutic candidate to activate mucociliary clearance in chronic rhinosinusitis.

Objectives: Pharmacologic activation of mucociliary clearance (MCC) represents a reasonable therapeutic strategy in patients afflicted with chronic rhinosinusitis (CRS). Drug discovery efforts have identified small molecules that activate CFTR, including potentiators under development for treatment of cystic fibrosis (CF). However, the properties of CFTR modulators and their effects on ciliary beat frequency (CBF) have not been evaluated in sinonasal epithelium. **Study Design:** In vitro study. **Methods:** Primary human sinonasal epithelial (HSNE) cultures were used to compare stimulation of CFTR mediated Cl⁻ conductance and ciliary beat frequency (CBF) by the CFTR modulators genistein, VRT-532, and UCCF-152. **Results:** HSNE cultures were analyzed using pharmacologic manipulation of ion transport (Δ ISC - expressed as microA/cm²) and high speed digital imaging (CBF). Genistein activated CFTR dependent anion transport (genistein - 23.42 ± 1.05) in the absence of forskolin greater than VRT-532 (8.83 ± 0.44 , $p < 0.001$), UCCF-152 (4.24 ± 0.33 , $p < 0.001$) and DMSO vehicle control (0.82 ± 0.03 , $p < 0.001$). Maximal stimulation of CFTR (potentiator + forskolin (100 nM) was similar between groups (genistein: 32.07 ± 1.69 ; VRT-532: 32.11 ± 1.37 ; UCCF-152: 29.17 ± 2.35) indicating a consistent ion transport phenotype between cultured cells. All potentiators activated CBF (under submerged conditions) compared to baseline and were significantly greater than cells treated with vehicle control (genistein: 1.52 ± 0.02 fold over baseline; ($p < 0.05$); VRT-532: 1.38 ± 0.16 ($p < 0.05$); UCCF-152: 1.44 ± 0.02 ($p < 0.05$) versus DMSO: 1.27 ± 0.01). **Conclusions:** The degree of CBF stimulation was not dependent upon the magnitude of Cl⁻ secretion, suggesting a threshold of activation may be required to augment cilia beating. The flavonoid genistein robustly activates transepithelial Cl⁻ transport and represents an excellent therapeutic candidate to activate MCC in CRS.

8:33 Sinus Anatomy Associated with Inadvertent Cerebrospinal Fluid Leak during Functional Endoscopic Sinus Surgery

Chase M. Heaton, MD, San Francisco, CA; Andrew N. Goldberg, MD*, San Francisco, CA; Steven D. Pletcher, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize anatomic variations in skull base anatomy that may predispose the surgeon to inadvertent cerebrospinal fluid leak during functional endoscopic sinus surgery.

Objectives: Anatomic variations in skull base anatomy may predispose the surgeon to inadvertent skull base injury with resultant cerebrospinal fluid (CSF) leak during functional endoscopic sinus surgery (FESS). Our objective is to compare preoperative sinus imaging of patients who underwent primary FESS with and without CSF leak to elucidate these variations. **Study Design:** In this retrospective case control study, nine patients with CSF leak following primary FESS for chronic rhinosinusitis (CRS) from 2000-2011 were identified and compared to randomly selected patients who underwent preoperative imaging for FESS for CRS. **Methods:** Measured variables were obtained from preoperative CT images. Specific attention was paid to anatomic differences in cribriform plate and fovea ethmoidalis heights compared to stable anatomic landmarks in the coronal plane and the skull base angle in the sagittal plane. Mean values of leak variables were compared to their control counterparts. **Results:** Measurements of the skull base angle showed a statistically significant difference with the angle of CSF leak patients being greater than that of the control group. In the coronal view, a low cribriform height relative to fovea height was noted in cases of CSF leak and was statistically different. Other measurements demonstrated a trend but did not reach statistical significance. **Conclusions:** A steep skull base angle in the sagittal plane and a low cribriform height relative to the fovea ethmoidalis in the coronal plane predispose the surgeon to CSF leak during primary FESS. Preoperative review of imaging with specific attention paid towards these anatomic variations may help to prevent iatrogenic CSF leak.

Friday

8:40 Mapping the Frontal Sinus Ostia Using Virtual Endoscopy
Amy C. Dearing, MD, Rochester, MN; John F. Pallanch, MD*, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how virtual endoscopy can be used preoperatively in surgical planning. Participants will also be able to make a prediction of which opening in a frontal recess is most likely the frontal sinus ostium.

Objectives: 1) To determine the relative location of the frontal sinus opening to other frontal cells using virtual endoscopy; and 2) to assess if the relative location of the frontal sinus ostium can be predicted. **Study Design:** Retrospective analysis of high resolution CT scans from 50 adult patients without frontal sinus disease or previous sinus surgery. **Methods:** Using virtual endoscopy software, 100 frontal recesses were mapped for the presence and relative position of the frontal sinus ostium to the following cells: agger nasi (ANC), frontal bullar, frontal cells type 1, 2 and 3, supraorbital ethmoid, suprabullar and intersinus septal cells. **Results:** ANC and frontal type 3 cells were present in 92% and 45% of frontal recesses respectively. All other cell types were prevalent 25% or less. 50% of recesses had two rows of cells anterior to posterior (AP), and the frontal opening was anterior in 52%. When there were 3 rows of cells AP (39%), the frontal opening was in the center 64%. 35% of recesses had 2 rows of cells medial to lateral (ML), and the frontal opening was medial 80% of the time. When there were 3 rows of cells ML (45%), the frontal opening was in the center 56% of the time. **Conclusions:** The frontal sinus recess is variable and complex. Virtual endoscopy can be used to analyze the frontal recess and assist in presurgical planning. While there is variability in the cells present in the frontal sinus, the relative position of the frontal sinus ostium to other frontal cells can be predicted.

8:47 Effect of Surfactant (S) Irrigation versus Hypertonic Saline (HS) Irrigation on Olfaction following Endoscopic Endonasal Surgery
Alexander A. Farag, MD, Chapel Hill, NC; Charles S. Ebert, MPH MD, Chapel Hill, NC; Brent A. Senior, MD*, Chapel Hill, NC; Adam M. Zanation, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the adverse effects as well as efficacy of surfactant irrigations in their ability to relieve sinonasal symptoms in the early and late postoperative period.

Objectives: To compare the efficacy and tolerability of hypertonic nasal saline irrigations to surfactant irrigations. **Study Design:** A prospective single blind randomized controlled trial. **Methods:** 51 consecutive adult candidates for endonasal surgery were prospectively randomized into S and HS irrigation groups, irrigating three times a day with their respective solutions. Outcomes were measured using the SNOT-22 and RSOM-31 as well as a PEA smell threshold and UPSIT tests. Such instruments were administered preoperatively and over three postoperative visits in a 4 month period as well as at 6 months and 1 year. **Results:** Both S and HS irrigation groups showed significant decreases in scores for both the SNOT-22 and RSOM-31 over time ($p < 0.0001$), but no difference was seen between the two groups ($p = 0.5, 0.8$) PEA thresholds at three months showed a greater decrease in smell thresholds for S patients (21%), when compared to HS patients (7.6%). Smell thresholds for patients that continued to use the solution appears to maintain these trends. The S group reported significantly more side effects (50% v 4%, $p = 0.0002$) and had more patients stop the solution (19% v 0%). **Conclusions:** When comparing to preoperative baseline, a decrease in smell was three times higher in the S vs HS patient groups. A higher rate of side effects were seen with S irrigation compared to HS, however, when tolerated both appeared to have similar efficacy for sinonasal symptoms.

8:54 Q&A

9:00 - 10:00 PANEL: MAKING SENSE OF CHRONIC RHINOSINUSITIS
Moderator: Robert C. Kern, MD*, Chicago, IL
Panelists: Ralph B. Metson, MD*, Boston, MA
Brent A. Senior, MD*, Chapel Hill, NC
Stilianos E. Kountakis, MD PhD*, Augusta, GA
Timothy L. Smith, MD MPH*, Portland, OR

10:00 - 10:30 Break with Exhibitors/View Posters

CONCURRENT SESSION I -- PEDIATRICS, OTOTOLOGY Americana 1

Moderator: Marlan R. Hansen, MD*, Iowa City, IA

10:30 Techniques for Revision Cochlear Implantation following Internal Auditory Canal Insertion
Selena E. Heman-Ackah, MD MBA, New York, NY; David R. Friedmann, MD, New York, NY; Susan B. Waltzman, PhD, New York, NY; Maura K. Cosetti, MD, New York, NY; John T. Roland, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe a technique for revision

cochlear implantation following internal auditory canal insertion.

Objectives: In pediatric patients with congenital malformations of the inner ear, anatomic anomalies may predispose to internal auditory canal (IAC) insertion of the cochlear implant electrode. Revision procedures for removal and replacement of cochlear implant electrodes following internal auditory canal insertion are fraught with potential danger including the theoretical potential for injury to vasculature within the IAC upon explantation, repeat insertion into the IAC and cerebrospinal fluid leak. The objective of this presentation is to describe a technique for revision cochlear implantation following IAC insertion to minimize the potential associated risks.

Study Design: Case series. **Methods:** A retrospective review was performed of all patients who underwent revision cochlear implantation for IAC insertion between June 2009 and July 2011. **Results:** Four patients referred from outside institutions were included. Electrodes were safely removed in all cases without complication. Fluoroscopy was utilized to visual electrode progression during insertion; complete intracochlear insertion was accomplished in all cases. A detailed description of the operative technique will be described. In all cases, cochlear implant performance improved following revision. **Conclusions:** The technique for revision cochlear implantation following IAC insertion described within this series provides a valuable option for reimplantation which has been demonstrated to be effective in preventing repeat internal auditory canal insertion, confirms appropriate insertion intraoperatively, and improves cochlear implant performance postoperatively.

**10:37 FRANCIS LEDERER, MD RESIDENT RESEARCH AWARD (2nd Place Middle Section)
Cochlear Implantation in Infants Younger than 12 Months of Age**

Jennifer N. Phan, MD, Indianapolis, IN; Richard T. Miyamoto, MD*, Indianapolis, IN; Derek M. Houston, PhD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss safety issues regarding early cochlear implantation and compare language outcomes of early implanted infants versus later implanted children.

Objectives: Assess safety and language outcomes in children receiving cochlear implants (CIs) at less than 12 months of age versus those implanted between 12-24 months of age. **Study Design:** Retrospective analysis of data collected on children receiving CIs at or before 24 months of age. **Methods:** In study 1, the type and frequency of surgical and anesthetic complications were recorded for 17 infants implanted between 6-12 months of age (early group) and 56 children implanted between 12-24 months of age (late group). In study 2, the Peabody Picture Vocabulary Test (PPVT) and Preschool Language Scale (PLS) receptive and expressive language tests, administered to participants at regular intervals pre- and post-implantation, were reviewed. Test scores were compared across chronological age between 15 infants in the early group and 73 children in the late group. **Results:** In study 1, there was no significant difference between the frequency of surgical complications between the early and late groups, and there were no intraoperative anesthetic complications in either group. In study 2, the overall performance on the PPVT was higher for the early group versus the late group, $p=0.046$. Scores on the PLS were higher for the early group than the late group. The differences were statistically significant for the expressive language component ($p=0.001$) and approached statistical significance for the receptive language component ($p=0.056$). **Conclusions:** Preliminary evidence suggests that cochlear implantation is safe for 6 to 12 month olds and provides improved language outcomes compared to children implanted at 12-24 months of age. A larger, prospective study is needed to confirm these findings.

10:44 Prevention of Gentamicin Induced Cell Death with the Mitochondria Targeted Antioxidant MitoQ
Carolyn P. Ojano-Dirain, PhD, Gainesville, FL; Patrick J. Antonelli, MD*, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the potential use of the mitochondria targeted antioxidant MitoQ as a means of preventing aminoglycoside induced hearing loss.

Objectives: Antioxidants have been shown to protect against aminoglycoside induced hearing loss (AIHL). Mitoquinone (MitoQ) is a mitochondria targeted derivative of the antioxidant ubiquinone. MitoQ is attached to a lipophilic triphenylphosphonium (TPP) cation, which enables its accumulation inside the mitochondria several hundred-fold over the untargeted antioxidant. Thus, MitoQ represent a promising and novel therapeutic approach for AIHL. The objectives of this study were to determine if MitoQ attenuates gentamicin induced apoptotic cell death and to determine if MitoQ adversely impacts aminoglycoside antimicrobial efficacy. **Study Design:** Prospective and controlled. **Methods:** Antibiotic efficacy and minimum inhibitory concentrations (MICs) of gentamicin against three strains each of *S. aureus* and *P. aeruginosa* were evaluated with and without MitoQ using disk zone tests and macrodilution methods. Apoptotic cell death was assessed by measuring caspase-3 activity in untreated HEI-OC1 cells and cells exposed to 50 μM gentamicin for 24 h, with and without a 24-h pre-incubation with 1 μM each of MitoQ, idebenone (an untargeted ubiquinone) or decylTPP (positive control). **Results:** Gentamicin MICs for *P. aeruginosa* were not affected by MitoQ at pharmacological levels. MICs for *S. aureus* were enhanced by MitoQ. Cell viability was significantly lower in the gentamicin treated cells. A significant increase in caspase-3 activity was observed in cells treated with gentamicin or with idebenone+gentamicin ($p=0.005$). Pre-incubation with 1 μM MitoQ decreased the gentamicin induced apoptosis of HEI-OC1 cells ($p=0.002$) but not pre-incubation with 1 μM idebenone. **Conclusions:** MitoQ attenuates gentamicin induced apoptotic cell death in HEI-OC1 cells and does not interfere with gentamicin antibiotic efficacy. MitoQ holds promise as a means of preventing aminoglycoside induced hearing loss and vestibular dysfunction.

Friday

10:51 Fabrication of a Function Human Middle Ear Model

Alex E. Bell, BS, Cincinnati, OH; Vasile E. Nistor, PhD, Cincinnati, OH (Presenter); Ravi N. Samy, MD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the value of a physical middle ear model.

Objectives: Despite a large number of middle ear prostheses being available, surgical outcomes are still not favorable. Five years post-surgery, 58% of patients still have conductive hearing loss greater than 20 dB. In order to improve surgical outcomes, a clearer understanding of what is required for effective surgical repair is needed. The goal is to have a mechanically functional physical model that can be manipulated by the surgeon to simulate their proposed method for repair and its results. Currently, no such model exists, but recent advances in materials, imaging techniques, and fabrication methods have the potential to change this situation. The goal of this project is to take advantage of these emerging technologies and create an anatomically and functionally accurate middle ear model. **Study Design:** Prospective, artificial model creation. **Methods:** Our laboratory has successfully fabricated a 20:1 scaled up model of the ossicular chain. Model ossicles, based on MicroCT scan of cadaveric temporal bone, were rapid prototyped in a plaster compound and resin coated to increase hardness. An ossicular chain was built from these components and dry tested with a mechanical wave generator driving the malleus. Vibratory output was measured with a tri-axial accelerometer attached to the stapes' footplate. **Results:** We observed a high coefficient of functional coherence (>0.8) at frequencies up to 220 Hz. **Conclusions:** The observed frequency response correlates well with the expected reduction in frequency response for our scaled-up model. Models such as this one provide good test bench for practicing ossiculoplasty skills in the temporal bone laboratory.

10:58 Optimal Inner Ear Pharmacotherapy Delivery Method

Ana H. Kim, MD, New York, NY; Clare Dean, BS, Baltimore, MD; Linda Mattiace, PhD, Valhalla, NY; Anne Sollas, MA, Valhalla, NY

Educational Objective: At the conclusion of this presentation, the participants should become familiar with the retrocochlear auditory pathway and the specific methods of pharmacotherapy delivery into the inner ear.

Objectives: Determine the optimal pharmacotherapy delivery method specific to the retrocochlear auditory structures. **Study Design:** Original scientific investigation. **Methods:** Prospective study to assess the efficiency of three methods of delivery of Fluoro-Gold (FG), a retrograde tracer in delineating the retrocochlear auditory pathway using CBA mice, a normal hearing strain of mice. FG was delivered either intratympanic (IT), intracochlear (IC), or through the round window (RT). Five days post FG injection, mice were sacrificed for cell counts in the cochlear nucleus (CN), superior olivary complex (SOC), and the lateral lemniscus (LL). **Results:** Neurons in the CN and SOC were abundantly labeled by FG in all three injection methods. However, IT method was the most reproducible and specific. The average cell numbers for the CN, SOC, and LL were 851 ± 121 , 2629 ± 367 , and 112 ± 30 , respectively. The cell counts for IC and RW injection methods were inconsistent. One out of the five IC injected mice had specific or clean results. Cell counts for the single mouse with clean IC staining in the CN, SOC, and LL were 177, 1839, and 56, respectively. Similarly, two out of the five RW injected mice had clean results, while the rest were nonspecific. The average cell counts for the two clean mice in the CN, SOC, and LL were 723.5, 2173.5, and 131.5, respectively. **Conclusions:** The IT injection method produced results in reproducible, specific staining of cells along the retrocochlear auditory pathway compared to RW or IC route of delivery.

11:05 Continuous Impedance Measurement Tool during Electrode Insertion

J. Thomas Roland Jr., MD*, New York, NY; Abbas A. Anwar, MD, New York, NY; Chin-tuan A. Tan, PhD, New York, NY; Shaun A. Kumar, Sydney, NSW Australia; Mario A. Svirsky, PhD, New York, NY; Paul A. Carter, PhD, Sydney, NSW Australia

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the acquisition of continuous electrode insertion impedance data.

Objectives: This pilot study details the use of a software tool that uses continuous impedance measurement during electrode insertion, as a way to assess and optimize electrode position and reduce insertional trauma. **Study Design:** Experimental study with human cadaveric cochleae and real time data acquired on several live patients during electrode insertion. **Methods:** A prototype program has been developed and data to be presented include our current results with the prototype software as well as new results obtained with a new version of the software that displays impedance measurements graphically in real time. New studies are performed with various electrodes in human cadaveric temporal bones and several live surgeries. Electrode position is evaluated with real time fluoroscopic analysis. **Results:** Several electrode designs were evaluated with the new software system and data was obtained during electrode insertion with fluoroscopic guidance. Impedance changes were observed with various scalar positions. Real time data acquisition was possible during live cochlear implant surgeries. The results reveal that the system is capable of obtaining meaningful data. **Conclusions:** This new tool is capable of acquiring impedance measurements during electrode insertion and this data may be useful to guide surgeons to achieve optimal and atraumatic electrode insertion. This may also be used to guide robotic electrode insertion.

11:12 Q&A

11:20 - 12:15 PANEL: AURAL REHABILITATION - WHEN, WHY AND HOW**Moderator:** M. Jennifer Derebery, MD*, Los Angeles, CA**Panelists:** Thomas J. Balkany, MD*, Miami, FL
David S. Haynes, MD*, Nashville, TN
Herman A. Jenkins, MD*, Aurora, CO
Samuel H. Selesnick, MD*, New York, NY**CONCURRENT SESSION II -- SLEEP, GENERAL
Americana 2****Moderator:** Anna H. Messner, MD*, Stanford, CA**10:30 Thyroidectomy Outcomes: A National Perspective**

Rishi Vashishta, BSc, Washington, DC; Lina Lander, ScD, Omaha, NE; Edward Shin, MD, New York, NY; Rahul K. Shah, MD*, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) identify and report normative data for thyroid surgery; and 2) discuss opportunities for improvement in outcomes for thyroidectomy.**Objectives:** To examine national trends and outcomes of patients undergoing thyroidectomy. **Study Design:** Analysis of a national inpatient care database. **Methods:** The Nationwide Inpatient Sample 2009 was searched using ICD-9-CM codes for unilateral thyroid lobectomy, partial thyroidectomy, and total thyroidectomy. Data extraction included patient demographics, hospital characteristics, and associated diagnoses. **Results:** 11,862 patients underwent thyroidectomy in 2009 in the United States. The average age was 52.98 years (SD=16.41). Mean length of stay was 2.97 days (SD=6.88) and total charges for all patients was \$39,236 (SD=\$73,679); private insurance or HMO was the primary expected payer in over half the cases. Seventy-three patients (0.62%) died during hospitalization, with a mean age of 65.48 years (SD=15.19), length of stay of 13.86 days (SD=15.16), and total charges of \$218,855 (SD=\$191,977). Two-thirds of patients were Caucasian; 74% were female. Over 90% of patients were admitted and discharged routinely, and 80% of surgeries were elective. Fifty-five percent of patients underwent total thyroidectomy; 31.8% underwent unilateral lobectomy. Tracheostomy was required in 2.4% of all patients and 30.1% of patients that died during hospitalization. The most commonly diagnosed thyroid disorders included nontoxic nodular goiter (36.4%), malignant neoplasm (30.7%), benign neoplasm (11.2%), acquired hypothyroidism (8.5%), thyrotoxicosis (8.4%), and thyroiditis (8.1%). Although the majority of cases were conducted at large teaching hospitals in urban centers, no socioeconomic or regional differences were observed. **Conclusions:** Reporting of normative data for thyroidectomy facilitates national and institutional comparison; further investigation of mortalities will yield potential for quality improvement interventions. Relatively, hospitalizations for patients undergoing thyroidectomy currently require significant resource utilization.**10:37 Comparison of Ultrasound and CT Measurements of Upper Airway Diameter**

Mark S. Bianchi, MD, New Haven, CT; Michael D. Otremba, BA, New Haven, CT (Presenter); John D. Millet, BA, New Haven, CT; Richa A. Wardhan, MBBS, New Haven, CT; Benjamin L. Judson, MD, New Haven, CT

Educational Objective: At the conclusion of this presentation, the participants should be able to compare ultrasound to CT for evaluating the upper airway and will be able to discuss advances in ultrasound technology that enable its novel use in obtaining full axial images of the pharyngeal air column. Participants will also be able to describe the utility of ultrasound for evaluating disorders such as obstructive sleep apnea.**Objectives:** The aim of this study is to demonstrate the use of ultrasound for assessing the pharyngeal airway and to compare ultrasound to CT for measuring pharyngeal airway diameter. **Study Design:** Ten subjects who have had prior CT imaging of the pharyngeal airway will undergo cervical ultrasound. CT and ultrasound measurements will be made by radiologists blinded to the other modality and compared. **Methods:** Airway diameter will be measured in anterior-posterior and lateral planes using the tip of the epiglottis as a vertical reference point. Low frequency Doppler and dynamic swallowing images will be used during ultrasound to confirm the location of the posterior pharyngeal wall. Correlation between ultrasound and CT measurements will be evaluated by linear regression analysis and Bland-Altman plots will be performed to assess agreement between modalities. **Results:** Imaging of the posterior pharyngeal wall and thus the full circumference of the pharyngeal airway from an anterior transducer position will be demonstrated. We hypothesize that there will be no difference in airway diameter measurements between ultrasound and CT.**Conclusions:** With improvement in ultrasound technology we are able to demonstrate axial images of the pharyngeal airway and subsequently measure its diameter. Measurements are hypothesized to be comparable to those obtained using CT. This study suggests an expanded role for ultrasound in evaluating the pharyngeal air column in disorders such as obstructive sleep apnea.

10:44 The Growing Geriatric Otolaryngology Patient Population: A Study of 131,700 Consecutive New Patient Encounters

Francis X. Creighton Jr., BS, Atlanta, GA; Stanislav M. Poliashenko, BS, Atlanta, GA; Melissa M. Statham, MD, Atlanta, GA; Peter J. Abramson, MD, Atlanta, GA; Michael M. Johns, MD, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss changing trends in geriatric and its impact on otolaryngology.

Objectives: America's rapidly changing demographics are expected to have a profound impact on the future practice and scope of medicine in the United States. Presently there is little literature addressing the effects these demographic changes will have on the practice of otolaryngology. This report aims to investigate the direct effect changing demographics is having and will have on the practice of otolaryngology. **Study Design:** Medical records for 131,070 consecutive new patients from a multi-site, comprehensive general otolaryngology practice were reviewed from 2004-2010 for information on patient age, diagnosis, and year of presentation. **Methods:** Patients were stratified into age groups and diagnoses were stratified into subspecialty categories. Changes in age groups, changes in subspecialty diagnoses, and most frequent diagnoses over each year were determined. Chi-squared analysis was used to determine statistical significance. **Results:** The geriatric population composed 14.9% of all patients. In comparison, pediatrics accounted for 14.3% of all patients. Geriatric patients showed a statistically significant increase from 14.3% to 17.9% from 2004 to 2010. Predictive analysis showed that almost 30% of all patients seen by 2030 would be over the age of 65. The most common pathologies seen in geriatric patients were also different from that of other age groups. **Conclusions:** The demographics of patients are changing with an increasing proportion of geriatric individuals being seen by otolaryngologists. These data highlight the importance in broadening the education of otolaryngologists in the care of geriatric patients.

10:51 Social Networking and Professionalism in Otolaryngology Residency Applicants

J. Blake Golden, MD, Birmingham, AL; Larissa Sweeny, MD, Birmingham, AL; Benjamin Bush, MS, Birmingham, AL; William R. Carroll, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss physician exposure through social networking sites, its potential impact on the doctor-patient relationship, and the frequency of this issue in otolaryngology residency applicants.

Objectives: To assess compliance with ACGME standards of professionalism among otolaryngology residency applicants with publicly searchable Facebook profiles. **Study Design:** Case series. **Methods:** Applicants to an otolaryngology residency program were searched by name on the Facebook website. Names with multiple matches were narrowed by available information until the correct individual was identified. Searches were performed in a manner that would not allow access to restricted information, thus showing only what would be accessible to a public search. Four reviewers evaluated all available profiles and generated a professionalism score. These scores were collated with NMRP data and match results to identify significant associations. **Results:** Of the 234 applicants to our institution, 119 (51%) had Facebook profiles. Of these, 85 profiles contained information beyond simple demographics. Eleven percent of the applicant profiles contained pictures or text that at least one reviewer felt could be perceived as unprofessional. There were 6 profiles whose content was felt to be concerning, and only one profile which contained clear violations of professional boundaries. Professionalism score did not correlate with whether or not the applicant matched, was interviewed, or received a place on the rank list. Age, gender, marital status, and USMLE step 1 score also did not correlate with a lower professionalism score. Our series included 55% of applicants that matched into US otolaryngology residencies. **Conclusions:** Publicly available Facebook profiles with questionable content exist for 11% of otolaryngology applicants in this series. This does not affect applicants' match outcomes nor is it predicted by any data available on the applicants' applications.

10:58 Sex and Dreams: An Evaluation of Unusual and Unexpected Outcomes of Sleep Surgery

John D. Prosser, MD, Augusta, GA; Carrie M. Bush, MD, Augusta, GA; Tanima Jana, MD, Augusta, GA; Jimmy J. Brown*, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the pathophysiology of how obstructive sleep apnea affects both sexual activity and dream/nightmare recall. Describe the frequency and varied changes reported by patients following surgery for obstructive sleep apnea.

Objectives: To examine the incidence of the alteration in sexual activity and dream/nightmare recall following surgical treatment of obstructive sleep apnea and correlate them with Epworth sleepiness scale and polysomnography results. **Study Design:** Retrospective analysis of validated survey results. **Methods:** Patients diagnosed with OSA who were unable to comply with CPAP therapy and underwent site specific surgical treatment over the past year were asked to participate. They were given a questionnaire comprised of the questions from the Epworth sleepiness scale, brief sexual function index, and the dream recall frequency scale; all validated questionnaires. **Results:** Thirty patients were identified. Current survey response rate is 25%, although data collection is ongoing. The mean age is 42 years and 85% of participants are male. Epworth score averages 11 after surgery. 33% of patients noted a significant change in dream/nightmare recall following surgical treatment. This was independent of Epworth sleep scale or CPAP compliance. Patients who noted this change tended to have greater preop AHIs. Another 30% noted a change in sexual activity following surgery, most noting improvement based on increased energy. Half of patients noted a change in sleeping position

directly attributed to surgery. 83% of patients reported improved energy following surgery and half of patients reported breathing better during the day. **Conclusions:** Surgical therapy is effective at increasing energy and improving CPAP compliance in patients with obstructive sleep apnea. Changes in dream/nightmare recall as well as changes in sexual activity occur in a significant number of patients and preoperative counseling is indicated.

11:05 Comparison of Drug Induced Sleep Endoscopy and Lateral Cephalometry in Obstructive Sleep Apnea
Jonathan R. George, MD MPH, San Francisco, CA; Sooyoun Chung, DDS, San Francisco, CA; Andrew N. Goldberg, MD MSCE*, San Francisco, CA; Ib Nielsen, DDS, San Francisco, CA; Arthur Miller, DDS, San Francisco, CA; Eric J. Kezirian, MD MPH*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the application of two methods of preoperative evaluation for sleep apnea—drug induced sleep endoscopy and lateral cephalometry—and critically appraise their relationship.

Objectives: The goal of presurgical OSA evaluation is to accurately characterize pattern of upper airway obstruction in order to develop an individualized treatment plan. The most commonly used options include lateral cephalometry and drug induced sleep endoscopy (DISE). The primary aim of this study was to compare these two methods by comparing differences in cephalometric measurements across subgroups defined by involved structures evaluated on DISE. **Study Design:** A cross-sectional study was performed consisting of patients seen in consultation for sleep surgery. Patients included in this study had an apnea-hypopnea index of greater than 5, were intolerant to CPAP, and were interested in surgery. **Methods:** DISE was performed on all patients. DISE videos were analyzed with respect to structure involved and degree of obstruction. The VOTE method for characterization of DISE was used (velum, oropharyngeal lateral walls, tongue, epiglottis). Lateral cephalometric measurements were calculated in all patients. Primary outcomes for this study included lateral cephalometry measurements and degree of obstruction of VOTE structures measured on DISE. Statistical tests were used to evaluate the relationship between DISE and lateral cephalometry. **Results:** 68 patients were evaluated. Statistically significant associations were found between: airway 2 and epiglottis ($p=0.04$), airway 5 and tongue ($p=0.02$), airway 6 and tongue ($p=0.03$), and U1PP and velum ($p=0.001$). **Conclusions:** This the first study of associations between lateral cephalometry and DISE. Some important associations were noted, but a broad lack of associations between these two methods demonstrates that these two methods are not well enough associated to inform surgical planning when used together.

11:12 Q&A

11:20 - 12:15 PANEL: MAKING SENSE OF SLEEP APNEA
Moderator: Kathleen L. Yaremchuk, MD*, Detroit, MI
Panelists: Erica Robb Thaler, MD*, Philadelphia, PA
Ashutosh Kacker, MD*, New York, NY
Michael Friedman, MD*, Chicago, IL

12:30 - 2:00 RESIDENT BOWL (lunch available) - Americana 1
Moderators: David M. Barrs, MD*, Scottsdale, AZ
Michael E. Hoffer, MD*, San Diego, CA
Albert L. Merati, MD*, Seattle, WA

12:30 Afternoon recreation

Free evening

SATURDAY, JANUARY 28, 2012

7:00 - 7:50 **Business Meetings**
Eastern Section - Poinciana 2
Middle Section - Poinciana 3

8:00 - 12:30 SCIENTIFIC SESSIONS

8:05 - 10:00 CONCURRENT SCIENTIFIC SESSIONS

CONCURRENT SESSION I -- HEAD & NECK, LARYNGOLOGY, RHINOLOGY Americana 1

8:00 **Announcements by Vice Presidents**

Moderator: Gady Har-El, MD*, New York, NY

8:05 **Hypoxia Induced VEGF Production by Human Squamous Cell Carcinoma Is Modulated by Nitric Oxide Synthase Inhibition**

Amelia K. Clark, BA, New York, NY; Seunghee Kim-Schulze, PhD, New York, NY; Ilyse E. Acosta, New York, NY; Andrew G. Sikora, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the potential contribution of inflammatory signaling to release of vascular endothelial growth factor in the hypoxic tumor microenvironment.

Objectives: To investigate the ability of pharmacologic inducible nitric oxide synthase (iNOS) inhibition to modulate hypoxia induced release of VEGF, an angiogenic and immunomodulatory factor associated with tumor progression and metastasis in head and neck squamous cell carcinoma (HNSCC). **Study Design:** VEGF levels were measured in human HNSCC cell lines cultured under normoxic or hypoxic conditions in the presence or absence of the selective iNOS inhibitor L-NIL. Parallel studies were performed using cobalt chloride (CoCl₂), a known hypoxia mimetic that stabilizes the hypoxia induced transcription factor HIF-1 α . **Methods:** SCC9 and SCC25 cells were cultured in vitro under normal oxygen tension or in an airtight chamber containing 94% N₂, 5% CO₂, and 1% O₂ to achieve hypoxia. In some experiments, CoCl₂ was added to the media to induce hypoxia chemically. Cells cultured under hypoxic or normoxic conditions were treated with L-NIL, and VEGF levels in the supernatant were measured by ELISA. **Results:** Cells cultured up to 24 hours under hypoxic conditions experienced a nearly two-fold increase in VEGF production. Treatment with L-NIL reduced VEGF production to normoxic baseline levels in a dose dependent manner. Simulated hypoxia with CoCl₂ induced VEGF in a dose dependent manner, which was also attenuated by L-NIL. **Conclusions:** These data are consistent with a role for tumor derived nitric oxide as a mediator of hypoxia induced VEGF release in the tumor microenvironment. The ability of L-NIL to suppress VEGF release in response to CoCl₂ suggests that interaction between iNOS and hypoxic signaling occurs at the level of HIF-1 α or further downstream. Our findings suggest iNOS directed targeted therapy may be a potential strategy to reverse the deleterious effects of hypoxia in the tumor microenvironment.

8:12 **A Retrospective Analysis of BRAF V600E Mutation and Its Diagnostic Implications in 99 Total Thyroidectomy Specimens**

Joseph J. Rousso, MD, New York, NY; Jean-Paul P. Azzi, MD, New York, NY; E. Ashlie Darr, MD, New York, NY; Angela A. Vong, BSc, Valhalla, NY; Jan J. Geliebter, PhD, Valhalla, NY; Edward J. Shin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the benefits of testing for V600E mutation in patients with thyroid masses and compare this to existing diagnostic methods.

Objectives: The role of BRAF V600E mutation in papillary thyroid cancer has been examined extensively. However, clinical and diagnostic use of V600E mutation has not been well studied. We examine BRAF V600E mutation and its influence on tumor invasiveness, TNM staging, and specificity for papillary thyroid cancer. **Study Design:** Retrospective analysis of extensive pathologic and clinical data on 99 thyroid specimens, in addition to available preoperative fine needle aspiration. **Methods:** 99 thyroidectomy samples were obtained. Preoperative fine needle aspiration (FNA), V600E mutation status, final pathology, patient and tumor characteristics were examined. Pathology specimens were scored according to a tumor invasiveness scale. 55 of these were found to have the V600E mutation while the remaining 44 were BRAF wild type (WT) variants. Comparisons were made to find correlations between papillary thyroid cancer (PTC), invasiveness, TNM stage, patient sex, size of lesions, and multifocality of lesions. **Results:** 55 of 99 specimens were found to have the V600E mutation. Examination of the preoperative FNA in those with V600E mutation revealed 52 of 55 consistent with papillary thyroid cancer. Statistical analysis performed by Fischer's exact test showed statistically

significant correlation between the V600E mutation and invasiveness of papillary thyroid cancer ($p=.045$). Furthermore, V600E positivity was found to be significantly associated with the presence of PTC when compared to WT ($p=.0004$). A correlation, that was not statistically significant ($P=.052$), was observed between V600E mutation and lymph node metastasis. There was no correlation of BRAF V600E mutation with early or late TNM staging. **Conclusions:** The BRAF V600E mutation is highly specific for papillary thyroid cancer. Knowledge of this mutation status on preoperative FNA may aid in preoperative patient discussions and operative decision making. Prospective clinical trials using preoperative FNA analysis for V600E looking at feasibility and cost effectiveness should be considered.

8:19 G. SLAUGHTER FITZ-HUGH, MD RESIDENT RESEARCH AWARD (3rd Place Southern Section)
The Effect of Alcohol Abuse and Alcohol Withdrawal on Short-Term Outcomes and Cost of Care after Head and Neck Cancer Surgery
Dane J. Genther, MD, Baltimore, MD; Christine G. Gourin, MD MPH*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the effect of alcohol abuse and alcohol withdrawal on in-hospital mortality, complications, length of stay, and costs in patients undergoing ablative operations for head and neck cancer.

Objectives: To determine the relationship between alcohol abuse and in-hospital mortality, postoperative complications, length of stay, and costs in head and neck cancer (HNCA) surgery. **Study Design:** Retrospective cross-sectional study. **Methods:** Discharge data from the Nationwide Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality (AHRQ) for 92,312 patients who underwent an ablative procedure for a malignant oral cavity, laryngeal, hypopharyngeal, or oropharyngeal neoplasm in 2003-2008 was analyzed. Associations between variables were analyzed using cross-tabulations, multivariate logistic regression, and multinomial logistic regression modeling. **Results:** Patients who abused alcohol were more likely to have advanced comorbidity, more likely to undergo major surgical procedures, and more likely to require medical care at another facility or home health care after discharge. Postoperative complications occurred in 11% of cases, with wound complications comprising 44% and postoperative infection comprising 22% of complications. Alcohol withdrawal symptoms (AWS) were associated with an increased incidence of postoperative complications (25%) compared to patients who abused alcohol (14%) and patients without alcohol abuse (7%; $P<0.001$). After controlling for all other variables, there was no significant association between alcohol abuse or AWS and in-hospital mortality or postoperative infection; however, AWS was associated with an increased risk of wound complications ($OR=1.9$, $P=0.001$) and was associated with significantly increased length of hospitalization and hospital related costs. **Conclusions:** Alcohol withdrawal is associated with an increase in wound complications, length of hospitalization, and hospital related costs in HNCA surgical patients. Aggressive prophylaxis against the development of AWS in patients who abuse alcohol is warranted.

8:26 LESTER A. BROWN, MD RESIDENT RESEARCH AWARD (2nd Place Southern Section)
Resveratrol Enhances Airway Surface Liquid Depth by Increasing CFTR Channel Open Probability
Angela C. Blount, MD, Birmingham, AL; Carmel M. McNicholas, PhD, Birmingham, AL; Shaoyan Zhang, PhD, Birmingham, AL; Daniel F. Skinner, BS, Birmingham, AL; Eric J. Sorscher, MD, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the method by which resveratrol acts as a potent chloride secretagogue and its implications as a possible therapeutic intervention in treating sinus disease.

Objectives: Using Cl⁻ secretagogues to improve mucociliary transport in sinus disease represents a novel therapeutic strategy. Previous investigations indicate the polyphenolic molecule resveratrol promotes CFTR mediated Cl⁻ transport. The objectives of the present study were to investigate resveratrol's effects on channel open probability (P_o) and determine whether this translates to hydration of airway surface liquid (ASL). **Study Design:** In vitro study. **Methods:** Well characterized primary murine nasal septal epithelial (MNSE) cells and HEK293 cells heterologously expressing CFTR were investigated using the patch clamp technique to obtain single channel recordings under non-phosphorylating conditions. Effects on ASL depth (in μM) were measured using confocal laser scanning microscopy. **Results:** In inside out patches from apical membranes of MNSE cells, in the absence of ATP and PKA, resveratrol stimulated a ~ 9 pS chloride channel consistent with CFTR. This observation was confirmed in HEK293 cells heterologously expressing CFTR where resveratrol application increased CFTRINH-172 sensitive channel activity. Activity resulted in a significant increase in ASL depth (7.1 ± 0.43 vs. 5.1 ± 0.23 , control) confirming that resveratrol hydrates the ASL in sinonasal epithelium. **Conclusions:** These findings indicate resveratrol is a potent Cl⁻ secretagogue that hydrates ASL in sinonasal epithelium by increasing channel P_o . Clinical trials utilizing resveratrol as a therapeutic intervention to increase mucociliary transport and ASL hydration in sinus disease are planned.

8:33 Endoscopic Endonasal Access to the Circle of Willis and Basilar Artery: A Clinical Case Series and Anatomic Classification System
Adam M. Zanation, MD, Chapel Hill, NC; Brian D. Thorp, MD, Chapel Hill, NC; Kibwei A. McKinney, MD, Chapel Hill, NC; Matthew G. Ewend, MD, Chapel Hill, NC; Anand V. Germanwala, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential advantages,

current limitations and anatomic classification for access to pathology that involves the intradural vasculature during endonasal skull base surgery.

Objectives: To describe the feasible approaches and understand the anatomy of the Circle of Willis during endonasal skull base surgery. **Study Design:** A case series at a tertiary academic center. **Methods:** Sixteen patients had endoscopic endonasal skull base tumor surgery that involved direct dissection of the Circle of Willis. Standard pituitary surgery with transsellar medial cavernous dissections was excluded from this series. **Results:** All portions of the Circle of Willis can be approached and dissected during endoscopic endonasal surgery. In 3 patients the entire posterior (basilar tip to PCAs) and anterior (ACAs) intracranial circulations were dissected for tumor removal. There was one arterial injury from the ACAs that was controlled intraoperatively, an immediate postoperative pseudoaneurysm was noted and embolized without permanent sequelae. An anatomic classification system is proposed for access to the Circle of Willis via a ventral approach. The angle of the Circle is tangential to the vertical plane of the skull by approximately 30 degrees. Due to this, the approach to the anterior circulation must be done via significantly different plane than the posterior circulation. This directly influences the location and size of the endonasal craniotomy needed. **Conclusions:** Endoscopic endonasal skull base surgery of tumors that involve the Circle of Willis is feasible and safe but not without risk. Management of intradural arterial bleeding must be anticipated. Our anatomic classification system allows for a better understanding of the bone sinonasal dissection needed to approach lesions depending on their involvement with different portions of the Circle of Willis.

8:40 Laser vs. Stapler: Outcomes in Endoscopic Repair of Zenker Diverticulum
Stewart I. Adam, MD, New Haven, CT; Boris Paskhover, MD, New Haven, CT; Clarence Takashi Sasaki, MD*, New Haven, CT

Educational Objective: At the conclusion of this presentation, the participants should be able to better compare and discuss the different modalities for Zenker diverticulum repair and the variable outcomes associated with them.

Objectives: To analyze a single surgeon's experience with endoscopic CO2 laser and stapler repair of Zenker's diverticulum (ZD), by comparing dysphagia and regurgitation outcomes. **Study Design:** A retrospective chart review of 148 patient charts. **Methods:** Medical records of all patients receiving endoscopic repair of ZD with either CO2 laser (61 patients) or stapling (67 patients) were reviewed. Additional data included demographics (age and sex), size (cm), preoperative and postoperative symptoms, need for revision, and complications for each method. Symptoms of dysphagia were graded based on a modified FOIS 1-4 scale (1 - normal intake and 4 - severely limited). Regurgitation was also graded on a 1-4 scale (1 - no regurgitation and 4 - aspiration events). **Results:** We noted no difference in patient age or defect size (laser 3.26cm, stapler 3.53cm). Significant differences were noted in return trips to the OR for failed procedures (laser 0, stapler 10%, p-value=.009), length of stay (laser 3.19 days, stapler 1.29 days, p-value <.001), time to PO (laser 3.01 days, stapler 1.22 days, p-value <.001). Improvement for both laser and stapler from preoperative to postoperative scales was significant (p-values <.001 & <.001). Laser dysphagia and regurgitation scores showed greater improvement when compared to stapler scores (p-values <.001 and <.001). **Conclusions:** Both endoscopic treatment methods were effective. CO2 laser had greater improvement values and lower complication rates than the stapler. There was a tradeoff, as stapler had less time to PO and shorter hospital stay.

8:47 Head and Neck Cancer in Transplant Recipients: For Better or Worse?
Robert H. Deeb, MD, Detroit, MI; Saurabh Sharma, MD, Gainesville, FL; Meredith A. Mahan, MS, Detroit, MI; Atsushi Yoshida, MD, Detroit, MI; Vanessa G. Schweitzer, MD*, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the relationship between solid organ transplantation and the subsequent development of head and neck cancer, including cutaneous malignancies, salivary gland malignancies and mucosal malignancies of the upper aerodigestive tract.

Objectives: The development of malignancy following long term immunosuppressive therapy for organ transplantation is a well described phenomenon. Though the benefit of organ transplantation is generally believed to outweigh the risk of cancer development, the potential for aggressive malignancies in this patient population certainly deserves consideration. We sought to characterize our institution's experience with the development of head and neck cancer following solid organ transplantation. **Study Design:** Retrospective review. **Methods:** All patients in our institution who underwent a solid organ transplant with subsequent development of a head and neck malignancy, including cutaneous cancers of the head and neck, from the years 1990 to present, were evaluated. Patients were stratified according to cancer type, location, stage and survival and compared to our institution's tumor registry. **Results:** Ninety-five patients with a history of organ transplantation are identified who developed a head and neck cancer. Among the mucosal malignancies, there are no statistically significant differences in age, gender, stage, or survival status at 5 years. However, there are significantly less patients alive at 1 year who had a history of transplantation. Among patients with cutaneous malignancies over 50% of the patients were noted to have multiple malignancies. **Conclusions:** The development of head and neck cancer following organ transplantation is rare. However, these patients have been found to be less likely to survive past one year when compared to their non-transplant counterparts. Patients who develop head and neck malignancies following organ transplantation warrant aggressive treatment as this diagnosis may portend a poor prognosis.

8:54 Q&A

9:00 - 10:00 PANEL: CONTEMPORARY SURGICAL NEUROLARYNGOLOGY

Moderator: Lucian Sulica, MD*, New York, NY
Panelists: Joel H. Blumin, MD*, Milwaukee, WI
Mark S. Courey, MD*, San Francisco, CA
Norman D. Hogikyan, MD*, Ann Arbor, MI
Karen B. Zur, MD, Philadelphia, PA

10:00 - 10:30 Break with Exhibitors/Poster Viewing

CONCURRENT SESSION II--HEAD & NECK, OTOTOLOGY Americana 2

8:00 Announcements by Vice Presidents

Moderator: Willard C. Harrill, MD*, Hickory, NC

8:05 Otological Neomycin Exposure in Children with Non-Intact Tympanic Membranes

Juan M. Hincapie Castillo, Gainesville, FL; Patrick J. Antonelli, MD*, Gainesville, FL; Almut G. Winterstein, PhD, Gainesville, FL; Dandan Xu, MS, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants will be able to discuss the incidence of neomycin exposure in a population of patients where its use is not advised.

Objectives: Although contraindicated, neomycin otological preparations (NOPs) may be administered to children with non-intact tympanic membranes (NITMs), such as tympanostomy tubes (TTs) or TM perforations. The goal of this study was to assess the magnitude of NOP exposure in children with NITMs. **Study Design:** Retrospective drug utilization study. **Methods:** Medicaid claims data (years 1999—2006) from 29 states for children ages 0-18 were analyzed to identify new cases of TT placement or TM perforation. Cases were followed for 12 months to determine use of NOPs. **Results:** Of the 300,510 children with NITMs, NOPs were prescribed in 33,740 (11% NITM). Non-toxic agents (ofloxacin or ciprofloxacin) were used in 45%. In 25%, NOPs were prescribed at the day of initial NITM diagnosis, 61% and 78% within the first 3 or 6 months, respectively. NOP utilization decreased from 23% in cases diagnosed in 1999 to 5% in 2005 ($p < 0.0001$). **Conclusions:** Many children with NITMs receive exposure to agents with potential ototoxicity, despite the availability of safer alternatives. Further study is necessary to determine why NOPs continue to be prescribed in the presence of NITMs and if such exposure is associated with ototoxicity.

8:12 Audioprofile and Antioxidant Enzyme Genotypes in Presbycusis

Simon I. Angeli, MD*, Miami, FL; Xue Z. Liu, MD PhD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize the different audiometric patterns of presbycusis; 2) understand the association between presbycusis and inherited susceptibility to oxidative stress; and 3) recognize the role of antioxidants in some types of presbycusis.

Objectives: Audiometric patterns have been shown to indirectly provide information regarding the pathophysiology of presbycusis and be useful in the phenotyping of hereditary deafness. The objective of this study is to investigate the association between specific audiometric patterns and polymorphisms of antioxidant enzymes that have been linked to presbycusis. **Study Design:** Hospital based cohort study of adults with presbycusis. **Methods:** All subjects underwent a clinical evaluation including otoscopy and completed questionnaires regarding ototoxicity and noise exposure. Pure tone threshold audiometry was obtained and subjects' audiograms were classified into specific patterns. DNA was extracted from blood and the polymorphisms of GSTT1, GSTM1, NAT2*5A, NAT2*6A/B, NAT2*7A/B, and NAT2*14A/B were analyzed by PCR. **Results:** The audiometric patterns that were more prevalent in our cohort were high frequency steeply sloping or HFSS (32%), high frequency gently sloping or HFGS (31%) and flat (27%), with other patterns being rare. We did not find a statistical significant effect of gender, age, degree of ototoxicity/noise exposure, and ear side on the audiometric pattern or genotype. Subjects with mutant alleles for NAT2*5A and GSTT1 were more likely to have a HFSS audiogram than subjects with the wild type genotype. **Conclusions:** The association between the HFSS audiogram pattern and antioxidant enzyme polymorphisms suggests a region specific susceptibility to oxidative stress in the cochlea. This finding opens the door to pharmacogenetic interventions that may ameliorate the progression of hearing loss in individuals with susceptible audiotypes and genotypes. Further studies of audioprofiles with larger sample sizes may be needed to establish phenotype-genotype correlations in presbycusis.

- 8:19 Transmastoid Semicircular Canal Occlusion: A Safe and Highly Effective Treatment for Benign Paroxysmal Positional Vertigo and Superior Canal Dehiscence**
Jason A. Beyea, MD PhD, London, ON Canada; Sumit K. Agrawal, MD, London, ON Canada; Lorne S. Parnes, MD*, London, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the relative merits of the middle fossa and transmastoid approaches to superior canal plugging in superior semicircular canal dehiscence syndrome; explain the transmastoid approach to superior and posterior canal plugging; and discuss alternative surgical and nonsurgical treatments for BPPV and superior canal dehiscence.

Objectives: Transmastoid occlusion of the superior semicircular canal in superior semicircular canal dehiscence syndrome (SSCD) and the posterior semicircular canal in intractable benign paroxysmal positional vertigo (BPPV) will produce complete resolution of preoperative symptoms. **Study Design:** Retrospective review. **Methods:** Sixteen patients with SSCD and 65 patients with intractable BPPV who underwent canal occlusion were reviewed. All patients underwent occlusion of the affected semicircular canal through a transmastoid approach. **Results:** Preoperative symptoms (vestibular - 13 patients, pulsatile tinnitus - 2 patients, or hyperacusis - 1 patient) were greatly improved or completely resolved in 15 of the 16 SSCD patients who underwent transmastoid occlusion of the superior canal. Hearing was preserved in 14 patients and improved in 2 patients. Vestibular symptoms were resolved in all intractable BPPV patients who underwent transmastoid occlusion of the posterior canal. One patient had a late recurrence of atypical BPPV. Almost all BPPV patients with normal preoperative hearing have an initial transient postoperative hearing loss which, when tested for, is usually a mild to moderate mixed loss. Delayed SNHL was noted in three patients, one loss was profound while two were mild. **Conclusions:** The transmastoid approach to canal plugging is successful in the treatment of symptoms in both SSCD and intractable BPPV and is a familiar approach for the otologist. This is a viable alternative to the middle fossa approach for SSCD, thereby avoiding a craniotomy. Transmastoid is the definitive approach for posterior canal occlusion.

- 8:26 A Prospective, Double Blinded, Controlled Trial Evaluating Wound Drainage and Postoperative Complications with EVICEL Fibrin Sealant Use in Thyroidectomy**
Wasef K. Muzaffar, BS, Charleston, SC; Ryan Reddy, MD, Charleston, SC; M. Boyd Gillespie, MD, Charleston, SC; Shaun Nguyen, MD, Charleston, SC; Eric J. Lentsch, MD, Charleston, SC; Joshua D. Hornig, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the value of using a fibrin sealant, EVICEL, during thyroidectomies.

Objectives: Surgical tissue adhesives have established a role as valuable adjuncts in promoting hemostasis and atraumatic tissue union in a wide variety of operative applications. Previous studies indicate that fibrin sealant may decrease time to drain removal, length of hospital stay, and prevalence of postoperative complications for patients undergoing thyroid surgery. None of the previous studies adequately blinds staff during application of sealant nor examines their role in affecting hospital course and patient outcomes. **Study Design:** A prospective, randomized, controlled double blind study of EVICEL versus a saline control. HIPAA compliant study was IRB approved; formal consent was obtained. **Methods:** Ongoing study with 120 patients undergoing thyroid surgery will be enrolled. This study determines the following variables at standard postoperative intervals: postoperative wound drain output, time to drain removal, postoperative pain, rates of complication incidence, and length of hospital stay. **Results:** Current preliminary data show a 52% decrease in total JP drain output ($P = 0.066$), a 41% decline in length of time to drain removal ($P = <0.001$), 24% reduction in length of hospital stay ($P = 0.113$), and a 32% drop in reported pain ($P = 0.165$) for the EVICEL group vs. saline control. **Conclusions:** EVICEL fibrin sealant utilization in thyroidectomy can be linked to a reduction in drain outputs, time to drain removal, postoperative pain, and length of hospital stay. These results could support the routine use of EVICEL to decrease healthcare costs and improve patient outcomes.

- 8:33 The Relationship between Depressive Symptoms, Quality of Life, and Swallowing Function in Head and Neck Cancer Patients One Year after Definitive Therapy**
Brian M. Lin, BA, Baltimore, MD; Heather M. Stamer, MA CCC-SLP, Baltimore, MD; Christine G. Gourin, MD MPH*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effect of depression on long term subjective QOL and function.

Objectives: To determine the incidence of depression in head and neck cancer (HNCA) patients following definitive treatment and the effect of depression on head and neck specific measures of quality of life and function. **Study Design:** Prospective cohort analysis. **Methods:** Two hundred forty-six patients were evaluated with the Beck Depression Inventory Fast-Screen (BDI-FS), University of Washington Quality of Life (UW-QOL), Voice Handicap Index (VHI), and MD Anderson Dysphagia Inventory (MDADI) questionnaires. Patients with a preexisting diagnosis of depression were excluded. **Results:** Complete 1 year post-treatment data was available for 46 patients with HNCA, with depression identified in 9 patients (20%). On multivariate analysis, depression was significantly associated with poorer global UW-QOL ($\beta = -40.3$, $p < 0.001$) and overall MDADI scores ($\beta = -21.8$, $p = 0.038$), but had no association with VHI scores, after controlling for all other clinical variables including initial treatment modality. BDI-FS scores were significantly correlated with global UW-QOL ($r = -0.7$, $P < 0.001$) and overall MDADI scores ($r = -0.5$, $P = 0.0045$), and global UW-QOL correlated significantly

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with overall MDADI scores ($r=0.4$, $P=0.0166$). After controlling for BDI-FS, MDADI and VHI scores, only depression was associated with global UW-QOL score ($\beta=-30.5$, $p=0.019$). **Conclusions:** The high incidence of depressive symptoms observed in HNCA patients persists at 1 year following definitive therapy, is independent of primary treatment modality, and is associated with poorer global QOL and MDADI scores. While depression and swallowing are highly correlated, depression has a greater effect on QOL than swallowing scores, suggesting that early identification and aggressive treatment of patients with depressive symptoms is warranted to maximize post-treatment QOL.

8:40 Inhibition of Fibroblast Reduced Head and Neck Cancer Growth by Targeting FGFR

Larissa Sweeny, MD, Birmingham, AL; Zhiyong Liu, PhD, Birmingham, AL; William P. Lancaster, MD, Charleston, SC; Justin Hart, Birmingham, AL; Yolanda E. Hartman, BS, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of fibroblast in head and neck squamous cell carcinoma and potential implications for targeted therapy.

Objectives: The etiology of head and neck squamous cell carcinoma (HNSCC) is complex and the role of carcinoma associated fibroblast and endothelial cells in head and neck cancer is unknown. We investigated these relationships by blocking fibroblast growth factor receptor (FGFR) with PD173074. **Study Design:** Pre-clinical investigation. **Methods:** HNSCC cell lines (FADU, OSC19, Cal27, SCC1, SCC5, SCC22A), fibroblast (HS27) and endothelial cells were treated alone and in co-culture with a range of physiological concentrations of PD173074 and assessed for proliferation. Mice bearing established HNSCC xenografts were treated with PD173074 (12 mg/kg) and tumor histology was analyzed for stromal composition, proliferation (Ki67 staining) and apoptosis (TUNNEL staining). **Results:** In vitro, inhibition of FGFR with PD173074 reduced proliferation of fibroblast (HS27) by 70% and endothelial cells by 30% compared to untreated controls. However, HNSCC cell proliferation was not affected by inhibition of FGFR. When co-cultured with fibroblasts, HNSCC cells proliferation increased by 15-80% ($p<0.01$). In vivo, HNSCC xenografts demonstrated increased growth in the presence of fibroblasts ($p<0.001$). Additionally, treatment of mice bearing HNSCC xenografts with PD173074 resulted in significant growth inhibition ($p<0.001$). Furthermore, those tumors from mice treated with PD173074 had a smaller stromal component, decreased proliferation and increased apoptosis. **Conclusions:** Targeting the FGFR pathway in head and neck cancer lead to decreased HNSCC growth in vivo and in vitro. Inhibition of carcinoma fibroblast may provide potential therapeutic benefit.

8:47 Extracapsular Dissection for Benign Parotid Tumor Dissection: A Meta-Analysis

W. Greer Albergotti, BA, Charleston, SC; Shaun A. Nguyen, MD, Charleston, SC; Johannes Zenk, MD, Erlangen, Germany; M. Boyd Gillespie, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss potential outcomes and complications of extracapsular dissection; and 2) identify appropriate patients for surgical technique.

Objectives: Recent studies suggest that extracapsular dissection is an option for the resection of some benign parotid tumors. This study investigates complication rates and efficacy of the use of extracapsular dissection (ECD) versus superficial parotidectomy (SP) for the treatment of primary benign parotid neoplasms. **Study Design:** Meta-analysis. **Methods:** An Ovid/Medline search was performed. Search terms included parotid neoplasms and extracapsular dissection or ECD or capsule. 110 papers were returned. Of these 15 papers were found to meet the review criteria. An additional 7 articles were identified by review of references. A meta-analysis of these articles was performed. **Results:** The papers evaluated a total of 3755 patients who met the inclusion criteria. Tumor recurrence occurred in 30/1493 (2.0%) ECD cases and in 10/323 (3.1%) SP cases; odds ratio 0.482 (95% CI: 0.204 - 1.136). Transient facial nerve palsy occurred in 116/1721 (6.7%) ECD cases and in 93/386 SP cases (24%); odds ratio 0.268 (95% CI: 0.183 - 0.394). Permanent facial nerve palsy occurred in 28/1326 (2.1%) ECD cases and in 11/276 (4.0%) of SP cases; odds ratio 0.416 (95% CI: 0.155 - 1.114). Frey's syndrome occurred in 31/1058 (2.9%) of ECD cases and in 67/351 (19%) of SP cases; odds ratio 0.133 (95% CI: 0.0822 - 0.216). **Conclusions:** Meta-analysis of historical data suggests that extracapsular dissection has a similar recurrence rate as superficial parotidectomy with fewer postoperative complications and may be considered as an alternative surgical modality for certain benign parotid neoplasms.

8:54 Q&A

9:00 - 10:00 PANEL: LESSONS FROM CHALLENGING CASES IN HEAD AND NECK CANCER

Moderator: Christine G. Gourin, MD FACS*, Baltimore, MD

Panelists: Dale H. Brown, MD*, Toronto, ON
Timothy M. McCulloch, MD, Madison, WI
Brian Nussenbaum, MD*, St. Louis, MO

10:00 - 10:30 Break with Exhibitors/Poster Viewing

**10:30 - 12:30 SCIENTIFIC SESSION
Americana 1 & 2**

- 10:30 - 10:35** **Poster Award Presentations (by Vice Presidents)**
- 10:35 - 11:05** **INVITED SPEAKER:**
Ethical Issues Embedded in Disaster Relief: Are You Up To It?
Anna M. Pou, MD, New Orleans, LA
- 11:05 - 12:25** **PANEL: WISDOM AND EXPERIENCE: VIEWING THE PAST AND THE FUTURE**
Moderator: Paul R. Lambert, MD*, Charleston, SC
Panelists: Jonas T. Johnson, MD*, Pittsburgh, PA
Rodney P. Lusk, MD*, Omaha, NE
Harold C. Pillsbury, MD*, Chapel Hill, NC
Roger L. Crumley, MD MBA*, Irvine, CA
- 12:25** **Introduction of Vice Presidents-Elect by Section Vice Presidents**
Michael E. Hoffer, MD*, San Diego, CA *Western Section*
Paul R. Lambert, MD*, Charleston, SC *Southern Section*
Robert C. Kern, MD*, Chicago, IL *Middle Section*
Steven D. Schaefer, MD*, New York, NY *Eastern Section*
- 12:30** **ADJOURN**

POSTER SESSION

Allergy/Rhinology

S1. Chronic Invasive Fungal Sinusitis of the Skull Base

Abib A. Agbetoba, MD, New York, NY; Satish Govindaraj, MD, New York, NY; Joshua B. Bederson, MD, New York, NY; Janet C. Rucker, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to explain and discuss the optimal management for chronic invasive fungal sinusitis of the skull base, as well as appreciate the ability of this rare disease to present in a chronic atypical fashion.

Objectives: Rhinocerebral mucormycosis is a rare and rapidly progressive infectious entity known to cause life threatening invasive disease in immunocompromised patients. We present a case report of an extremely rare and atypical presentation of chronic invasive mucormycosis involving the skull base. **Study Design:** This case report will review and discuss the workup, management, and followup of a 57 year old diabetic male who presented with a paucity of initial clinical and nonspecific exam findings that caused a delay in both diagnosis and appropriate therapeutic intervention. **Methods:** The case notes and imaging of the patient were reviewed and a literature search was done using PubMed, Medline, and various available texts and journals. **Results:** The patient underwent an extensive combined endoscopic and transcranial resection confirming extensive clival and adjacent skull base disease. Aggressive surgical management combined with intravenous antifungal therapy has yielded an improvement in both radiographic and clinical disease. **Conclusions:** Given the slow clinical progression of CIFS detection of the offending agent can often be elusive. Prompt diagnosis continues to remain key in minimizing the morbidity and mortality of this destructive disease. Intraoperative frozen sections and fungal stains may offer an opportunity for more prompt diagnosis and appropriate intervention.

S2. Management of Sinonasal Complications after Endoscopic Orbital Decompression for Graves' Orbitopathy

Jastin L. Antisdell, MD, Saint Louis, MO; Divya Gumber, BS, Saint Louis, MO; Raj Sindwani, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the frequency of sinonasal complications after endoscopic orbital decompression for Graves' orbitopathy; and 2) discuss techniques for dealing with these complications.

Objectives: Endoscopic orbital decompression (EnOD) has proven to be safe and effective for the treatment of Graves' orbitopathy, however complications do occur. Although the literature focuses on orbital complications, sinonasal complications including post-obstructive sinusitis, hemorrhage, and cerebrospinal fluid (CSF) leak can also be challenging to manage. This study examines the incidence and management of sinonasal complications in these patients. **Study Design:** Retrospective review. **Methods:** Clinical data, surgical findings, and postoperative outcomes of patients who underwent EnOD for Graves' disease between 2005 and 2010 were reviewed. The incidence and management of postoperative sinonasal complications requiring an intervention were examined. **Results:** The study group consisted of 50 consecutive patients: 12 males and 38 females with an average age of 47.9 years (SD=12.9). Incidence of significant sinonasal complications was 14% (7/50): with 1 patient experiencing CSF leak, 2 with postop hemorrhage, and 4 with obstructive sinusitis refractory to medical therapy and requiring surgery. The maxillary sinus was the most commonly involved and was managed using the mega-antrostomy technique. In cases of frontal sinusitis, an endoscopic transaxillary approach was utilized to avoid injury to decompressed orbital contents. Two of the patients with postop sinusitis had an underlying history of chronic rhinosinusitis. All complications were successfully managed without sequelae. **Conclusions:** Sinonasal complications following EnOD are uncommon. In the setting of a decompressed orbit, even routine types of postoperative issues can be challenging and require additional considerations. Successful management of postoperative sinusitis related to outflow obstruction may require more extensive approaches and novel techniques.

S3. The Effect of Antimicrobial Photodynamic Therapy on Human Ciliated Respiratory Mucosa

Merrill A. Biel, MD PhD*, Minneapolis, MN; John W. Jones, MD, Minneapolis, MN; Lisa Pedigo, BS, Bothell, WA; Nicolas Loebel, PhD, Bothell, WA; James Balcom, MBA, Bothell, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe antimicrobial photodynamic therapy and its effect on sinus ciliated respiratory epithelium.

Objectives: Chronic recurrent sinusitis (CRS) is one of the most common chronic conditions in the United States. There is a significant subpopulation of CRS patients who remain resistant to cure despite rigorous treatment regimens including surgery, allergy therapy and prolonged antibiotic therapy. Antimicrobial photodynamic therapy (aPDT) is a noninvasive non-antibiotic broad spectrum antimicrobial treatment. Our previous in vitro studies demonstrated that aPDT reduced CRS polymicrobial biofilm and planktonic bacteria and fungi by >99.9% after a single treatment. Prior to human treatment however, aPDT treatment must be demonstrated to not result in histologic damage to the sinus ciliated respiratory epithelium. The objective of this study was to demonstrate the safety of aPDT treatment on a living human ciliated respiratory mucosal model (EpiAirway). **Study Design:** Ex vivo tissue culture study. **Methods:** A study of aPDT treatment of EpiAirway™ was performed. Treatment groups included a non-treatment control, laser light alone, photosensitizer alone and therapeutic photosensitizer and light combination (aPDT). At completion of treatment, the

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EpiAirway™ tissue was fixed in 10% formalin, paraffin embedded, sectioned, H&E stained and mounted. All samples were blinded and microscopically examined by a human pathologist to assess any effect of aPDT on the tissue, cilia or mucosal glands. The results were correlated with the treatment parameters. **Results:** The EpiAirway™ histologic study demonstrated no histologic alteration of the respiratory cilia, mucosal epithelium or mucosal glands in any of the treatment groups. **Conclusions:** aPDT is a safe treatment for CRS resulting in no histologic alteration of human ciliated respiratory mucosa as is found in the human sinuses.

S4. Endoscopic Resection of Encephaloceles Using a Bipolar Microdebrider

Joseph David Brunworth, MD, Irvine, CA; Raj Sindwani, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to state the advantages and potential pitfalls of using a bipolar microdebrider for resection of sinonasal encephaloceles.

Objectives: Options for the control of bleeding during endoscopic resection of encephaloceles are limited by the contraindication to monopolar cautery and the ergonomics of available instruments. Innovations in microdebrider design now permit bipolar coagulation while also suctioning and shaving tissue. The purpose of this study was to report our initial experience with the use of this technology in endoscopic encephalocele resection, and to evaluate its safety and applicability in endoscopic skull base surgery. **Study Design:** Chart review. **Methods:** Patient demographics, intraoperative parameters and surgical outcomes were analyzed of patients who underwent endoscopic resection of encephaloceles using a bipolar-equipped microdebrider (PK Diego®, Gyrus ACMI-ENT Division, Bartlett, TN). **Results:** Six patients were included. The average age of patients was 56.2 years and 4 were females. Preoperative CSF leaks were present in 3 patients. Encephalocele locations were: ethmoid roof (4), cribriform (1), and sphenoid sinus (1). Intrathecal dye and surgical navigation were used in all cases. Encephaloceles were resected to the skull base with bleeding controlled along the way using the bipolar microdebrider. Multilayered skull base reconstruction was then performed. Lumbar drains were used in 5/6 patients. There were no complications. Mean hospital stay was 2.5 days (range, 1 to 4 days). No postoperative CSF leaks or neurological sequelae were encountered, and no patients required revision surgery. Average followup was 13 months. Level of Evidence: 4. **Conclusions:** The bipolar microdebrider offers the advantages of expeditious tissue removal, continuous suction, and cautery in one instrument. A variety of angled blades enhances the ability to remove tissue and control bleeding along the skull base.

S5. Miller Fisher Variant of Guillain-Barre Syndrome Masquerading as Acute Sphenoid Sinusitis with Orbital Apex Syndrome

Amit B. Chaudhary, BA, Newark, NJ; Tekchand E. Ramchand, BA, Newark, NJ; Arjuna B. Kuperan, MD, Newark, NJ; James K. Liu, MD, Newark, NJ; Jean A. Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify and describe the rare clinical presentation of the Miller Fisher variant of Guillain-Barre syndrome. They should understand its potentially life threatening complications if not correctly diagnosed and the most appropriate treatment modalities.

Objectives: To describe through a case report the rare clinical presentation of the Miller Fisher variant of Guillain-Barre syndrome. To understand how to accurately identify this disease process early, provide efficacious treatment modalities, and avoid serious complications. **Study Design:** Case report. **Methods:** Case report and literature review. **Results:** A 45 year old female with a preceding URI presented with a two day history of bilateral CN VI ophthalmoplegia, ataxia, mild hand numbness, and headaches. A paranasal sinus CT and MRI scan revealed complete left sphenoid sinus opacification. Suspecting orbital apex syndrome as a result of acute sphenoid sinusitis, an endoscopic left sphenoid sinusotomy was performed and revealed only inflamed respiratory mucosa. Postoperatively she developed progressive ophthalmoplegia of all extraocular muscles bilaterally and left facial weakness; a peripheral neuropathy was suspected and a CSF lumbar puncture revealed elevated protein in the absence of leukocytes confirming the diagnosis of the Miller Fisher variant of Guillain-Barre syndrome. She was treated with intravenous immunoglobulins and all symptoms except for the left CN VI palsy resolved within four days at which time she was discharged. **Conclusions:** Acute bilateral abducens nerve palsy is highly suggestive of the Miller Fisher variant of Guillain-Barre syndrome, although unilateral palsy is uncommonly reported. It is important to be aware of this unique neurologic finding in order to avoid unnecessary surgical interventions that ultimately render the required treatment with intravenous immunoglobulins or plasmapheresis dilatory; these delays can result in potentially fatal complications such as respiratory failure if outside of a closely monitored setting.

S6. Radiographic Analysis of Posterior Ethmoid Sinus Height: Establishment of Normal Values

Philip G. Chen, MD, Charlottesville, VA; Thuy V. Ho, BA, Charlottesville, VA; Spencer C. Payne, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the importance of posterior ethmoid sinus height. The participant should also be able to discuss the normal values and when a patient falls outside of the norm.

Objectives: An established landmark in endoscopic posterior ethmoidectomy is the transition point from the horizontal to the vertical basal lamella of the middle turbinate. However, the location of this point—which translates into the posterior ethmoid height—has yet to be established. We sought to establish norms regarding the angle from the floor of the nose, the distance from the floor to this point, and the distance from the transition to the skull base. **Study Design:** Retrospective review. **Methods:** The radiology database was reviewed over a 3 month period for CT scans of the sinuses by two independent reviewers. Subjects were excluded if under 18 years old, prior sinus surgery, poor quality, ethmoid inflammation, or trauma on either side. **Results:** 97 CTs out of 178 were used

including 57 males and 40 females. Angle from the nasal floor at the nasal vestibule to the transition point was 46.86 (right) and 47.87 (left) degrees. Vertical distance from the floor to the transition was 28.47 (SD = 2.94) and 28.66 mm (SD = 2.93 mm) on the right and left, respectively. Distance from the transition to the ethmoid roof was 17.38 (SD = 2.73) on the right and 17.26 mm (SD = 2.72 mm) on the left. **Conclusions:** This study establishes normal values for the angle from the nasal vestibule to the transition point of the basal lamella and the distances from this point to the nasal floor and skull base. These measurements serve as useful guidelines in planning sinus surgery.

S7. The Association between Supraorbital Ethmoid Air Cells and Orbital Proptosis in Patients with Chronic Rhinosinusitis

Brett T. Comer, MD, Augusta, GA; Stilianos E. Kountakis, MD PhD*, Augusta, GA; Nathan W. Kincaid, BS, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the association between supraorbital ethmoid air cells (SOE) and orbital proptosis.

Objectives: Orbital proptosis is a known possible complication in patients with chronic rhinosinusitis (CRS). This study is undertaken to determine the association of sinus anatomy and anatomic variants with the predisposition for such a complication. **Study Design:** Analysis of prospectively collected data. **Methods:** All adult patients with orbital proptosis were identified from a prospectively collected database at a tertiary institution. These were compared with a series of randomly selected patients diagnosed with chronic sinusitis that had undergone sinus computed tomography. The presence or absence of SOE cells was noted and compared between the two groups. Statistical analysis was performed using the chi squared test. **Results:** Sixteen patients with orbital proptosis were identified, of which all but one had SOE cells present, causing or contributing to the proptosis. Of the 50 patients with CRS but without proptosis, only 13 had SOE cells present and 37 patients did not (chi squared=22.8, $p=1.8 \times 10^{-6}$). **Conclusions:** Supraorbital ethmoid cells appear to be highly associated with an increased risk of orbital proptosis in patients with CRS. Further anatomic studies are required to further delineate this association.

S8. WITHDRAWN--Allergic Fungal Sinusitis and Sublingual Immunotherapy

Brent R. Driskill, MD, Camp Lejeune, NC; Jonathan M. Melzer, MD, Portsmouth, VA (Presenter); Timothy L. Clenney, MD, Portsmouth, VA; Eric M. Gessler, MD, Portsmouth, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the pathogenesis of allergic fungal sinusitis, the current standard treatments, and the potential advantage of using sublingual therapy as supplemental therapy.

Objectives: Allergic fungal sinusitis (AFS) is a noninvasive, noninfectious cause of sinusitis. Patients with AFS develop allergic and immunologic responses to common, ubiquitous fungi present in the paranasal sinuses. Fungal species most commonly implicated in AFS are from the dematiaceous fungi and include *Bipolaris*, *Curvularia*, *Exserohilum*, and *Alternaria* sp (2). Despite standard treatment modalities, which typically include surgery and medical management of allergies, patients still have a high recurrence rate. Subcutaneous immunotherapy has been successfully used as adjuvant treatment for AFS (1). Evidence exists to support the use of SLIT as a safe and efficacious method of treating allergies. No studies, to our knowledge, have assessed the utility of SLIT in the management of AFS. **Study Design:** Retrospective case series. **Methods:** Ten patients were examined and outcomes of interest in this study included evidence of radiographic improvement on CT scans, changes in MRASST classes and IgE levels, subjective improvement in quality of life, and adverse events related to SLIT. **Results:** Seventy percent of patients showed a reduced allergic response to one or more fungal allergens. Sixty percent of patients who received followup imaging showed improvement in Lund Mackay scores with no adverse events. **Conclusions:** Sublingual immunotherapy appears to be a safe and efficacious adjunct to the management of AFS. The majority of patients on SLIT exhibited improved Lund Mackay scores and/or reduced allergic response to fungal antigens. There were no adverse effects noted during the administration of SLIT.

S9. Hemostasis with Topical 1:1000 Epinephrine in FESS: One Surgeon's First Year Experience

Robert W. Frank, BS, Little Rock, AR; Marcus W. Moody, MD, Little Rock, AR

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the safety profile of concentrated 1:1000 topical epinephrine as it is used for hemostasis in FESS.

Objectives: 1) Review one surgeon's first year of experience using concentrated topical epinephrine (1:1000) for hemostasis in functional endoscopic sinus surgery (FESS) with standard inhalational anesthetic techniques; 2) establish epinephrine's safety in this application; and 3) report one patient who experienced hypertension and tachycardia when using topical 1:1000 epinephrine. **Study Design:** Retrospective review of patients undergoing functional endoscopic sinus surgery by the lead investigator from January 1, 2009, to December 31, 2009. **Methods:** Records of patients undergoing functional endoscopic sinus surgery by the lead investigator from January 1, 2009, to December 31, 2009, were reviewed. Among other measures, percent changes in intraoperative blood pressure and heart rate were calculated and compared to accepted values for induction agent alone. Adverse cardiovascular events were recorded. **Results:** 83 patients, 19-87 years old were studied. Anesthesia was induced with propofol and maintained with sevoflurane. Average percent changes from baseline blood pressure at 30 and 60 minutes and at the end of surgery were -16.78%, -18.36% and -18.40%, respectively. Percent changes in pulse at these intervals were -6.48%, -4.71% and -0.93%, respectively.

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These changes fall within reported ranges resulting from propofol use alone. Two patients (2%) with history of atrial fibrillation experienced temporary atrial fibrillation intraoperatively. One patient experienced hypertension from 110/50 to 217/155 and tachycardia from 60 to 115 but responded well to epinephrine withdrawal and intravenous medications. **Conclusions:** Hemodynamic changes associated with topical 1:1000 epinephrine fall within expected ranges of anesthetic agents alone. No adverse cardiovascular events occurred, though epinephrine's contribution to hypertension and tachycardia in one patient remains unclear. These results support evidence demonstrating concentrated topical epinephrine's safety in FESS, but further study and caution are advised.

S10. Sinonasal Exostoses: A New Diagnostic Entity Related to Irrigations for Topical Drug Delivery

Timothy M. Haffey, MD, Cleveland, OH; Raj H. Sindwani, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participant should be able to 1) explain sinonasal exostoses as a diagnostic entity; 2) recognize endoscopic and radiographic findings associated with sinonasal exostoses; 3) appreciate sinonasal exostoses as a complication of cold irrigations in patients who have had sinus surgery; and 4) identify topical sinonasal medications requiring refrigeration as a possible causative agent in sinonasal exostoses and counsel patients accordingly.

Objectives: 1) To describe sinonasal exostoses and present our experience with this unusual and avoidable complication of topical irrigations; and 2) to identify commonly used topical sinus medications which require refrigeration, and to alert physicians to the need for appropriate instruction on their usage. **Study Design:** Case series. **Methods:** Retrospective chart review. We reviewed the clinical presentation, radiology and pathology of sinonasal exostoses. **Results:** There were six patients with sinonasal exostoses (SE) evaluated for chronic rhinosinusitis (CRS) between 2005 and 2011. All had undergone previous sinus surgery. Patients had all used refrigerated nasal irrigations with a variety of topical medications (including mupirocin, gentamicin and amphotericin) for an average of 2.5 years before SE were identified. Multiple small bony lesions of varying diameters were seen most commonly in the posterior maxillary sinus, but the ethmoid and sphenoid sinuses were also involved. No patients had any lesions involving the frontals. Biopsies were consistent with exostosis. Lesions did not show any resolution over time, even when cold irrigations were discontinued. None of the patients required surgical intervention. **Conclusions:** Sinonasal exostoses are a new diagnostic entity apparently related to the use of cold solutions for nasal irrigation in operated patients. Akin to exostoses of the external auditory canal, this process is likely a periosteal reaction to chronic exposure of sinus cavities to cold solutions. With the growing trend of treating sinonasal disease with topical medications, the incidence of these recently described lesions is likely to rise. Clinicians should be aware of the dangers of cold nasal irrigations and counsel patients accordingly.

S11. Presentation and Clinical Significance of Sinonasal Respiratory Epithelial Adenomatoid Hamartoma (REAH)

Karen A. Hawley, MD, Cleveland, OH; Sheila Pabon, BS, Cleveland, OH; Aaron P. Hoschar, MD, Cleveland, OH; Raj Sindwani, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the different clinical presentations of REAH and the approach to diagnosis and management.

Objectives: Sinonasal respiratory epithelial adenomatoid hamartoma (REAH) is a benign glandular proliferation with ciliated epithelium. Little is known about REAH, with only a few published case reports appearing since its original description in 1995. Classically described as an isolated polypoid lesion arising from the nasal septum, more recent descriptions also suggest that REAH can occur among nasal polyps. We report the largest experience with REAH to date, and aim to better understand and characterize this unique entity. **Study Design:** Retrospective review. **Methods:** All cases of REAH diagnosed between 2006 and 2011 were reviewed. Clinical presentation, histologic and radiographic features, and operative findings were examined. **Results:** There were 41 patients, 16 females and 25 males, with a mean age of 55.3 years (range 23-83). Most cases of REAH (31/41, 76%) were found in association with another pathologic process (polyposis, adenoiditis, HHT, and malignancy). Of these, REAH occurring among diffuse polyposis (84% of cases) represented the large majority. The average Harvard CT stage for this cohort was 3.2 and interestingly 19% of them also had Samter's triad. The other presentation of REAH (10/41, 24%) was an isolated sinonasal mass. In cases of isolated REAH, the majority of lesions (70%) were noted to be originating from the superior septum/olfactory clefts. Workup included CT, MRI, and biopsy. All lesions were subsequently resected endoscopically. **Conclusions:** Isolated REAH, which clinically mimics a neoplasm, appears to be a different clinical entity than the more common form encountered in association with nasal polyps and inflammation. Further investigation into the etiology and clinical significance is needed.

S12. Endoscopic Resection of Maxillary Ameloblastoma

Kunal S. Jain, MD, Syracuse, NY; Parul Goyal, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the advantages and limitations of an endoscopic approach to resection of maxillary ameloblastomas.

Objectives: Ameloblastoma is the most common epithelial odontogenic tumor. The traditional treatment for maxillary ameloblastoma is maxillectomy with wide margins. This report describes the role of endoscopic resection of maxillary ameloblastoma. Endoscopic resection can minimize the morbidity associated with surgical treatment of maxillary ameloblastoma. **Study Design:** Case report. **Methods:** A 43 year old female with a maxillary ameloblastoma underwent combined transnasal endoscopic and transoral resection. The tumor filled the left maxillary sinus and extended into the left nasal cavity and nasopharynx. The sinonasal portion

of the tumor was resected endoscopically. Removal of the medial wall of the maxillary sinus endoscopically allowed for resection of the majority of the tumor filling the maxillary sinus. The site of tumor origin along teeth numbers 14, 15, and 16 was identified endoscopically. A drill was used endoscopically to outline a resection margin along the areas of tumor origination. A limited transoral resection was then performed to resect the involved teeth and surrounding margin. The size of the maxillectomy defect was very limited, allowing for primary closure and obviating the need for reconstruction. **Results:** The tumor was able to be resected with clear surgical margins. The sinonasal region and the oral area have healed very well without any oronasal fistulas. Followup has shown an excellent functional outcome without any tumor recurrence. **Conclusions:** In appropriate cases, endoscopic transnasal surgery for odontogenic maxillary tumors is less invasive and can reduce the morbidity associated with traditional maxillectomy. The transoral resection can be limited to resection of the involved teeth and any necessary margin.

S13. Comparison of Endoscopic Transsellar and Expanded Skull Base Approaches: Is there an Increased Risk of Postoperative Cerebrospinal Fluid Leak?

Arjuna B. Kuperan, MD, Newark, NJ; Mark E. Friedel, MD MPH, Newark, NJ; James K. Liu, MD, Newark, NJ; Jean A. Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation the participants should be able to compare the transsellar and extended endonasal approaches for tumors of the anterior skull base and determine if either harbors a greater incidence of postoperative CSF leakage if using similar defect reconstruction techniques.

Objectives: To describe the surgical technique for the transsellar versus extended endonasal approaches and defect reconstruction of intraoperative high flow CSF leaks. To compare the incidence of postoperative CSF leakage for each approach given similar reconstruction methods. **Study Design:** Retrospective review. **Methods:** We performed a retrospective analysis on patients who underwent endoscopic skull base surgery with findings of intraoperative high flow CSF leaks between December 2008 and March 2011. Repair materials, surgical approach, incidence of postoperative CSF leaks, and demographic data were collected. **Results:** Thirty-one endoscopic transsellar skull base and dural defects with intraoperative high flow CSF leaks (group I) were repaired with a pedicled nasoseptal flap (PNSF) and 23 endoscopic expanded skull base defects with intraoperative high flow CSF leaks (group II) were repaired with a PNSF. No postoperative CSF leaks occurred in group I. One delayed postoperative CSF leak was encountered in group II leading to 4.3% leak rate in that group. The incidence of postoperative CSF leakage was not significantly different between the two groups ($p > 0.05$). Our overall postoperative CSF leak rate in this series using a PNSF was 1.8%. **Conclusions:** Although prior studies have found an increased risk of postoperative CSF leak with endoscopic expanded endonasal skull base approaches, our data did not confirm this trend. The potential risk of postoperative CSF leaks associated with larger defect created through EEA can be offset by multilayered closures with a PNSF and meticulous surgical technique.

S14. Endoscopic Caldwell-Luc Approach for Infratemporal Fossa Access: A Cadaveric Feasibility Study

Arjuna B. Kuperan, MD, Newark, NJ; Senja T. Tomovic, MD MPH, Newark, NJ; Mark E. Friedel, MD, Newark, NJ; James K. Liu, MD, Newark, NJ; Jean A. Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the endoscopic Caldwell-Luc approach to the infratemporal fossa and the anatomic exposure provided. They should be able to discuss the anatomy of the infratemporal fossa and compare the advantages and disadvantages of the endoscopic approach.

Objectives: Using cadaveric dissection we describe the endoscopic Caldwell-Luc approach to the infratemporal fossa. We demonstrate the surgical technique used, anatomic access provided, and limitations and advantages encountered with the endoscopic approach. **Study Design:** Cadaveric dissection with photodocumentation. **Methods:** Cadaveric dissection with photo and video documentation was used to perform the surgical steps to provide endoscopic access to the ITF via the Caldwell-Luc route. Visualization and ease of surgical manipulation were subjectively assessed. **Results:** Using 4 cadaver heads (8 sides), the surgical technique and steps required to perform an endoscopic Caldwell-Luc approach to the ITF were clearly demonstrated. The endoscopic Caldwell-Luc approach provided adequate access, visualization, and surgical maneuverability to most areas of the ITF in all anatomic specimens. **Conclusions:** The endoscopic Caldwell-Luc approach can be used to access most areas of the ITF with adequate visualization and satisfactory surgical maneuverability. This approach can be combined with other endoscopic ITF approaches when additional surgical freedom is warranted.

S15. Preoperative Virtual Surgery to Optimize Nasal Airflow

Stanley W. McClurg, MD, Columbus, OH; Francis J. Sheer, MS, Columbus, OH; Samir N. Ghadiali, PhD, Columbus, OH; Subinoy Das, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand and demonstrate the fundamentals behind the application of virtual surgery for preoperative optimization of nasal airflow.

Objectives: Surgical correction is a common therapeutic approach for patients with nasal obstruction. Current paradigms to preoperatively assess these patients are subjective and not standardized, making it difficult to predict which cases will have poor outcomes after surgery. A novel technique that allows a surgeon to perform preoperative virtual surgery and calculate objective airflow measurements would allow for improved preoperative planning and optimization of such surgical procedures. **Study Design:** Case control

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study. **Methods:** A comprehensive software program to perform virtual surgery and nasal airflow analysis was developed and underwent pilot testing on two patients with nasal obstruction. Briefly, three dimensional nasal anatomic models were reconstructed from computed tomography images. The data sets were manipulated to virtually remove areas of anatomic obstruction within a virtual surgical planning system. Computational fluid dynamics analysis was then conducted and specific nasal airflow resistances were calculated. The resulting data sets were optimized via nasal airflow maximization algorithms and airflow parameters were calculated both pre-treatment and post-treatment. **Results:** Our first patient demonstrated significant reductions in calculated nasal airflow resistance after oxymetazoline was applied. The preintervention and postintervention overall nasal airflow resistances were 0.246 and 0.088 Pa*s*mL⁻¹, respectively. Our second patient underwent virtual surgical analysis prior to her planned operation. The overall nasal airflow resistances were 0.129 (preop), 0.078 (virtual surgery), and 0.064 (postop) Pa*s*mL⁻¹. **Conclusions:** We developed a novel technique to preoperatively perform virtual surgery on nasal airways of patients with obstruction. This technique may optimize the surgical intervention with objective airflow analysis and create a personalized surgical approach for each patient.

S16. Balloon Dilation of the Eustachian Tube in a Cadaver Model: Feasibility, Learning Curve and Potential Barriers

Edward D. McCoul, MD MPH, New York, NY; Ameet Singh, MD, Washington, DC; Vijay K. Anand, MD*, New York, NY; Abtin Tabaei, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the steps of balloon dilation of the eustachian tube and discuss the potential barriers to successful completion.

Objectives: The surgical management options for eustachian tube dysfunction have historically been limited. The goal of the current study is to evaluate the feasibility, learning curve and potential barriers for balloon dilation of the eustachian tube (BDET) as an alternative treatment modality. **Study Design:** Prospective, preclinical trial of BDET in a cadaver model. A novel balloon catheter device was used for eustachian tube dilation. **Methods:** Twenty-four BDET procedures were performed by three independent rhinologists with no prior experience with the procedure (8 procedures per surgeon). The duration and number of attempts of the individual steps and overall procedure were recorded. Endoscopic examination of the eustachian tube was performed after each procedure, and the surgeon was asked to rate the subjective difficulty on a 5 point scale. **Results:** Successful completion of the procedure occurred in each case. The overall mean duration of the procedure was 284 seconds and a mean number of 1.15 attempts were necessary to perform the individual steps. The mean subjective procedure difficulty was somewhat easy. Statistically shorter duration and subjectively easier procedure were noted in the second compared to the first half of the series, indicating favorable learning curve. Linear fissuring within the eustachian tube lumen without mucosal disruption (9 procedures, 37%) and with mucosal disruption (5 procedures, 21%) were noted. The significance of these physical findings is unclear. **Conclusions:** Preclinical testing of BDET is associated with favorable duration, learning curve and overall ease of completion. Clinical trials are necessary to evaluate safety and efficacy.

S17. Cadaveric Study of Skull Base Dural Thickness and Body Habitus

Andrea E. Potash, MD, Iowa City, IA; Martin K. Potash, MD, Iowa City, IA; Lucy H. Karnell, PhD, Iowa City, IA; Erin K. O'Brien, MD, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss whether there is a correlation between BMI or weight and dural thickness.

Objectives: Postsurgical cerebrospinal fluid (CSF) leaks create significant morbidity and mortality for skull base patients. While idiopathic intracranial hypertension, one cause of spontaneous CSF leaks, is associated with elevated body mass index (BMI), the role of obesity is undefined. In addition, there is little information on the normal thickness of the dura at the skull base. Our objective was to identify risk factors for potential postoperative CSF leak by determining possible associations between dural thickness and gender, age, neck circumference, height, weight, or BMI. **Study Design:** At the time of autopsy, the petrous apex dura and underlying bone of 20 cadavers were harvested. **Methods:** Dural thickness was measured by two separate pathologists at its thinnest and thickest points in the specimen. Correlational analyses were then performed to compare dural thickness with gender, age, neck circumference, height, weight, and BMI. **Results:** Gender, neck circumference, height, weight, and BMI were not associated with dural thickness for either the thinnest or thickest measurements. The association of age with dura approached significance (p=0.06), with older subjects tending to have thinner areas of dura. Multiple regression analysis of the independent association of patient factors with minimum dural thickness found no significant correlation. **Conclusions:** While neither BMI nor weight was correlated with dural thickness, increasing age may be associated with thinner dura. Additional studies are needed to determine if the tendency for older patients to have thinner areas of dura is statistically significant in larger samples of subjects.

S18. Hormonal Predisposition for Pyogenic Granuloma of the Nasal Cavity

Roheen P. Raithatha, MD, New York, NY; Ashutosh S. Kacker, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify etiologic factors of pyogenic granuloma.

Objectives: To review our experience with pyogenic granuloma (PG) to determine if any underlying hormonal changes contribute to its etiology. **Study Design:** Retrospective chart review. **Methods:** Clinical records of twelve patients who underwent surgical exci-

sion for PG from 2005 to 2011 were reviewed for age, sex, location of mass, clinical presentation, and underlying medical problems to look for possible etiologic factors. **Results:** Twelve patients with 13 PGs (one male patient had bilateral PGs) were identified. There were 8 females (66.67%) and 4 males (33.33%). All patients presented with epistaxis, had a mass on nasal endoscopy, and underwent subsequent surgical removal. Final pathology confirmed pyogenic granuloma. We found that 2 out of 4 males (50%) had an underlying hormonal issue (1 had prostate cancer and was taking Lupron; 1 had hepatocellular carcinoma causing liver failure and was awaiting liver transplant). The male with bilateral PGs had a history of rhinoplasty with a dorsal filler injection. The other male had no medical problems. Five out of the 8 females (62.5%) had underlying hormonal changes (1 from oral contraceptives, 2 from pregnancy, and 2 from receiving infertility treatment [1 of which developed 2 recurrences]). The remaining 3 (37.5%) females had no underlying medical problems. **Conclusions:** A total of 7 out of 12 (58.33%) patients had an underlying hormonal issue that likely contributed to their PGs while 1 had dorsal filler injections from a rhinoplasty. Only four out of 12 (33.33%) had no underlying medical problems. It appears that there is hormonal predilection for the development of pyogenic granuloma.

S19. The Effects of Maxillary Sinus Accessory Ostia on Mucosal Ciliary Area

Marcus D. Shaffer, MD, Morgantown, WV; Hassan H. Ramadan, MD*, Morgantown, WV; Diane Schwegler-Berry, MS, Morgantown, WV; Jonathan Franks, MS, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the association between accessory ostia of the maxillary sinuses and mucosal disease.

Objectives: The aim of this study was to determine if the presence of maxillary sinus accessory ostia could be used as an indicator of the state of the maxillary sinus mucosa independent of sinus opacification on CT scans. **Study Design:** Prospective observational study. **Methods:** 18 maxillary sinuses from 10 patients with chronic maxillary sinusitis were evaluated. Endoscopic examination determined the presence or absence of an accessory os for each maxillary sinus. Group A included sinuses without accessory ostia. Group B included sinuses with accessory ostia. Scanning electron microscopy was used to evaluate the mucosa of each sinus to determine ciliary area (percentage of mucosal surface covered by cilia). Coronal CT scan was evaluated for each sinus using Min's method. Analysis of covariance was used to determine if group B (accessory ostia group) showed a trend toward decreased ciliary area independent of level of opacification on coronal CT scan. **Results:** Group A included 6 sinuses. Group B included 9 sinuses. 3 sinus biopsy specimens were damaged in processing and unable to be analyzed. When controlling for Min's, group A showed 75.0% average ciliary area, while group B showed 23.7%. This difference was statistically significant ($p=0.0084$). **Conclusions:** This small sample suggests the presence of maxillary sinus accessory ostia may in fact be associated with increased mucosal disease independent of CT findings. We feel expanding the study to a larger sample size is an appropriate next step to further investigate this concept.

S20. A Case of Pneumocephalus Secondary to Sphenoid Sinus Barotrauma after Air Travel and Review of Literature

Mona M. Shete, MD, Memphis, TN; Sandeep Samant, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand mechanism of sinus barotrauma, diagnosis and treatment.

Objectives: 1) Describe a rare case of sphenoid sinus barotrauma after air travel resulting in pneumocephalus; and 2) review presentation, pathology and management of sinus barotrauma. **Study Design:** Case report. **Methods:** A woman with a prior history of head trauma presented with pneumocephalus after recent air travel due to sphenoid sinus barotrauma. A pertinent review of the literature is presented. **Results:** The paranasal sinuses communicate with ambient air to compensate for barometric pressure changes. Blocked sinuses of patients with sinusitis lead to a buildup of positive pressure during airplane ascent. As the barometric pressure decreases, air cannot escape from the sinus ostia resulting in a relative positive pressure. Air can then flow along the path of least resistance into the cranial cavity leading to injuries such as pneumocephalus, meningitis, and orbital emphysema. Bone defects in the sinus wall resulting from trauma or surgical injury enable passage of air to intracranial compartment. Hyperpneumatization of sphenoid sinuses in some individuals may predispose them to spontaneous pneumocephalus. **Conclusions:** This is a first case report of sphenoid sinus barotrauma resulting from civilian aviation causing clinically significant pneumocephalus.

S21. VICE PRESIDENT'S RESIDENT RESEARCH AWARD (2nd Place Western Section)

Respiratory Epithelial Adenomatoid Hamartoma (REAH), an Unusual Benign Entity in the Sinonasal Tract

Darshni Vira, MD, Los Angeles, CA; Sunita Bhuta, MD, Los Angeles, CA; Marilene B. Wang, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the definition of REAH as well as its basic histology and treatment.

Objectives: 1) To understand the definition of REAH; 2) to understand the association between REAH and chronic sinusitis and nasal polyposis; and 3) to describe the histology and management of REAH. **Study Design:** Retrospective review. **Methods:** Retrospective review in a tertiary academic medical center of patients with findings of REAH on pathologic examination after endoscopic sinus surgery over a 10 year period. Age, sex, location, associated findings, radiographic features, and recurrences were reviewed. **Results:** 54 patients with REAH who underwent endoscopic sinus surgery were identified between January 2000 and May 2011. The ratio of disease between males and females was equal, and the average age at diagnosis was 52. While the majority of

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cases had findings of REAH within the sinuses, 8 (15%) were present as isolated masses within the nasal cavity. Available preoperative CT scans were reviewed (n=35), which revealed no distinguishing features that confirmed REAH. 24 (44%) were associated with an allergic type of chronic sinusitis and 9 (17%) were associated with nasal polyposis. There were 2 (3.7%) recurrences, with no recurrences following repeat surgery. The average followup was 3.8 years. **Conclusions:** REAH is a benign entity characterized by abnormal glandular proliferation of the surface ciliated respiratory epithelium, admixed with goblet cells with no atypia or metaplastic change, rimmed by a thick basement membrane. It can present as an isolated mass within the nasal cavity or as an incidental finding in patients with chronic sinusitis. Nasal polyposis and allergic sinusitis can also be associated with REAH. Recurrences are rare with complete excision being essentially curative.

Facial Plastic & Reconstructive

- S22. Conservative Management of an Isolated Cricoid Cartilage Fracture Resulting from Low Energy Blunt Trauma**
Todd E. Falcone, MD, Boston, MA; Timothy D. Anderson, MD, Burlington, MA; Annie S. Lee, MD, Burlington, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the workup of acute laryngeal trauma and to identify which patients may benefit from conservative management.

Objectives: To describe a case of an acute cricoid cartilage fracture managed conservatively. **Study Design:** Case report. **Methods:** We describe a case of a 22 year old male who presented to the emergency department with hoarseness and anterior neck pain after sustaining a blow to his neck by his skateboard. He had no stridor and was not in respiratory distress. Fiberoptic exam demonstrated mild bilateral arytenoid edema but no evidence of exposed cartilage, mucosal tears, or hematoma. Computed tomography of the neck showed a displaced cricoid cartilage fracture with dislocation of the cricoarytenoid joint and discontinuity of the anterior cricoid ring. He was admitted to the intensive care unit and received intravenous steroids, cool mist humidification, and vigilant airway observation including repeat fiberoptic laryngoscopy. His pain and hoarseness improved and he was discharged on hospital day four without surgical intervention. **Results:** Protocols from landmark studies in acute laryngeal trauma conclude that most traumatic injuries be managed by intubation or surgical approaches including panendoscopy, neck exploration, and tracheostomy. These cases describe injuries resulting almost entirely from high energy blunt trauma such as gunshot wounds, stab wounds, or motor vehicle accidents. Our case highlights an isolated cricoid cartilage fracture as a result of a low energy blunt force trauma, which was managed conservatively. **Conclusions:** In some cases of isolated cricoid cartilage fractures resulting from low energy blunt trauma, conservative management may offer a viable alternative to surgical treatment.

- S23. Piriform Aperture Widening with Intranasal Z-Plasty for Refractory Nasal Valve Surgery**
Ethan B. Handler, MD, Oakland, CA; Charles W. Shih, MD, Oakland, CA; Jennifer B. Do, MD, Oakland, CA; Shivan H. Amin, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe and perform another technique to help with nasal valve collapse which addresses the anatomical bony obstruction from a narrowed piriform rim.

Objectives: Nasal valve collapse is recognized as one cause of nasal airway obstruction. Generally, the head of the inferior turbinate, the septum, and the caudal edge of the upper lateral cartilage is considered the narrowest part of inspiration. Furthermore, soft tissue laxity of the nasal vestibule and flimsy lower and/or upper lateral cartilages can collapse during inhalation. A multitude of surgical techniques to expand the nasal valve are available but often fail to maintain lateralization of the collapsing soft tissue due to a narrowed bony piriform aperture. We present a powerful technique to widen the narrowed or collapsing nasal valve which is useful for treating patients failing traditional nasal valve surgery or who have inherent narrowing of the bony piriform aperture. **Study Design:** Case series/review. **Methods:** An incision is made anterior to the head of the inferior turbinate along the bony piriform rim. The periosteum is elevated and a rongeur used to widen the bony rim. Next, oblique incisions are made from the ends of the initial incision to create a standard intranasal z-plasty. The lateralized soft tissue is then secured along the incisions using plain gut suture. **Results:** Thus far, 3 patients have undergone this procedure after other commonly used operations have failed to relieve nasal congestion and nasal valve collapse. All patients have expressed satisfaction with their improvement of symptoms. **Conclusions:** Piriform aperture widening with intranasal z-plasty appears to be a promising technique in the armamentarium for addressing nasal valve collapse, especially in those patients where previous approaches have failed.

- S24. The Role of Ancillary Cosmetic Procedures in Facial Reanimation Surgery**
Lauren A. Hansen-Welches, MD, Indianapolis, IN; Christopher Lee, BS, Indianapolis, IN; Taha Z. Shipchandler, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to determine if the addition of ancillary cosmetic procedures to facial reanimation surgery enhances symmetry and function.

Objectives: To determine if the addition of ancillary cosmetic procedures to facial reanimation surgery enhances symmetry and function. **Study Design:** This study examines the addition of cosmetic ancillary procedures to traditional techniques used in facial paralysis reanimation surgery. Outcomes in patients undergoing reanimation procedures alone versus those receiving cosmetic ancillary procedures are examined to assess if the addition of these procedures improve symmetry and function. **Methods:** Institutional

review board approval was obtained from our institution. Over the past five years, patients were included who underwent facial paralysis reanimation surgery and those who underwent cosmetic procedures in addition to facial reanimation surgery. Traditional facial reanimation procedures were implanted based on individual patient needs and whether paralysis was partial or complete. Results were assessed based on ideal facial aesthetic calculations between the two groups in addition to independent observer evaluation.

Results: Independent observers rated overall outcomes as more favorable in patients undergoing cosmetic procedures at the time of facial reanimation compared to outcomes for patients undergoing facial reanimation alone. Right and left facial aesthetic units were more symmetric in those patients who underwent additional cosmetic procedures at the time of facial reanimation. **Conclusions:** The data supports implementing cosmetic procedures at the time of facial reanimation. Qualitatively, facial outcomes were more favorable as scored by independent observers. Moreover, facial aesthetic calculations quantitatively demonstrate improved results. Taken together, these data suggest that addition of cosmetic procedures at the time of facial reanimation enhances symmetry and function.

S25. Tracheostomal Reconstruction Using the Supraclavicular Artery Island Flap

Joshua M. Levy, MD MPH, New Orleans, LA; Adil A. Fatakia, MD, New Orleans, LA; Paul L. Friedlander, MD, New Orleans, LA; Ernest S. Chiu, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the benefits of the supraclavicular arterial island flap for tracheostomal reconstruction. The surgical techniques and benefits associated with this new application will be presented.

Objectives: Reconstruction of tracheostomal defects following oncologic procedures represents a difficult surgical challenge. Successful reconstruction of this vital structure can be challenging due to complex anatomy, communication with respiratory mucosa, persistent mucopurulent drainage, compromised wound healing due to previous irradiation and local infection. We describe a novel approach for reconstruction of tracheostomal defects in four consecutive patients using a pedicled supraclavicular arterial island (SAI) flap. **Study Design:** Case series and review of the literature. **Methods:** Prospective study of four consecutive patients receiving the musculocutaneous SAI flap for tracheostomal reconstruction following tumor extirpation at a single academic institution. **Results:** All flaps were harvested in less than one hour with primary closure of all donor sites. There were no complications or donor site morbidity, with patients reporting an aesthetically satisfying outcome. **Conclusions:** The SAI flap is a versatile reconstructive option that is easily harvested with a reliable pedicle and minimal donor site morbidity. While it has already been established as a reliable tool for local skull base and craniofacial reconstruction, its utility is now extended to the reconstruction of tracheostomal defects. The excellent color match, harvest within 1 hour, lack of microsurgical anastomosis, and absence of donor site morbidity make this an excellent reconstructive option for patients requiring tracheostomal reconstruction.

S26. Prominent Pilar Tumors of the Scalp: Diagnosis, Treatment and Outcomes

Vartan A. Mardirossian, MD, Boston, MA; John H. Romanow, MD, Burlington, MA; Basim J. Jamal, DMD, Boston, MA; Josenia Tan, MD, Boston, MA; Scharukh M. Jalisi, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to consider pilar tumors as a part of the differential diagnosis of scalp lesions, be aware of their malignant potential and be able to choose reconstructive options after their complete resection.

Objectives: The purpose of this case series of pilar tumors is to increase the awareness of otolaryngologists towards these rare scalp lesions. We discuss different strategies for their complete resection and local reconstruction. The outcomes 6 months after surgery are also reported and compared. **Study Design:** Two cases of large pilar tumors of the scalp are described, including their evolution, diagnostic workup, treatment strategies and reconstructive options. The patients have been followed for 6 months after surgery to evaluate the esthetic and functional results after two alternative methods of reconstruction. **Methods:** Extensive use of photograms of the lesions, histology with detailed description of the macroscopic and microscopic findings characteristic of these lesions. Comparison of two different approaches of extirpation and reconstruction with reference to the results at 6 months after surgery. The data are supported by diagrams, pre- and postoperative photos. **Results:** The esthetic and functional results after the surgery followed by reconstruction are displayed. The possible diagnostic and treatment algorithms of these lesions are discussed. **Conclusions:** Otolaryngologists should have a high yield of suspicion in front of scalp lesions with the characteristic appearance of pilar tumors and should be aware of their malignant and metastatic potential. Different resection and reconstructive options are available.

S27. Type and Frequency of Revision Surgeries following Open Surgery of the Anterior Cranial Base

Jon-Paul Pepper, MD, Ann Arbor, MI; Mahdi Shkukani, MD FACS, Detroit, MI; Erin L. McKean, MD FACS, Ann Arbor, MI; Stephen E. Sullivan, MD FACS, Ann Arbor, MI; Lawrence J. Marentette, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the type and frequency of revision surgeries required after long term followup in patients who undergo open resection of anterior skull base lesions. Possible predictive factors of frontal bone flap loss are discussed.

Objectives: Describe the type and frequency of revision procedures following open anterior skull base surgery. Special emphasis is placed on procedures performed for ophthalmologic and cosmetic complaints, including frontal bone flap loss due to osteoradionecrosis.

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sis or bone resorption. **Study Design:** Retrospective, single institution. **Methods:** A retrospective review of 131 patients who underwent transglabellar/subcranial surgery for lesions of the anterior skull base between 1995 and 2009. All variables were analyzed using univariate logistic regression, with a Fisher's exact test for binary variables. The main outcome measures were frontal bone flap loss and the total number of revision surgeries. Simple odds ratios were generated for all significant predictors. **Results:** Of the original study sample (n = 131), a total of 34 patients underwent 75 revision surgeries. The range of procedures was from 1 to 7. The most common type of revision procedure was oculoplastic (23 procedures), followed by cranioplasty (20 procedures), and functional endoscopic sinus surgery (15 procedures). A total of 8 patients (6.1%) suffered significant bone flap loss following frontal bone flap osteomyelitis. The total followup period was 47.27 months. The use of adjuvant radiation was a significant predictor of frontal bone flap osteomyelitis ($p = 0.011$, OR = 10.571). **Conclusions:** This analysis represents one of the first long term followup studies following open surgery of the anterior cranial base. The morbidity of the procedure is generally acceptable; the use of adjuvant radiation is a key predictor of significant postoperative deformity.

S28. Reconstruction of Large Palatal Defects Using the Anterolateral Thigh Adipofascial Flap

Peter C. Revenaugh, MD, Cleveland, OH; Joseph Scharpf, MD, Cleveland, OH; Michael A. Fritz, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the anatomy and harvest of the anterolateral thigh (ALT) adipofascial flap; and 2) understand the utility of the ALT adipofascial free flap in reconstruction of large palate defects.

Objectives: To describe the use of the anterolateral thigh (ALT) adipofascial free flap in palatal reconstruction. **Study Design:** Technique description. **Methods:** A 59 year old female presented with an enlarging palatal mass. Imaging revealed a 4x3x3.5 cm lesion involving the hard and soft palate, extending into the nasal cavity and maxillary sinus. Biopsy revealed pleomorphic adenoma and resection with primary reconstruction was recommended. **Results:** Complete excision resulted in a defect that included the entire hard palate except tooth bearing alveolus, inferior septum and over one half of the soft palate. Primary reconstruction was performed with an ALT adipofascial flap. The flap pedicle was anastomosed to the facial vessels via a minimal access incision at the facial notch. The patient was ambulating on postoperative day one, discharged on day two and her postoperative course was uneventful. At 7 months postoperatively, there is complete mucosalization of the reconstructed palate, nasal floor, and septum with normal velopharyngeal and nasal function. **Conclusions:** Use of ALT adipofascial flap is an effective method of palatal reconstruction. This flap provides the advantages of low morbidity, widely variable flap size, ease of harvest, and neomucosalization. Given these benefits, ALT adipofascial flaps appear to be ideal for reconstruction of large palate defects following tumor extirpation and merit early consideration for addressing recurrent fistulas not amenable to local reconstruction.

S29. Patient Preferences in Print Advertisement Marketing for Plastic Surgery

Akshay Sanan, BS, Chestnut Hill, MA; Candace A. Quinn, BA, McLean, VA; Jeffrey H. Spiegel, MD*, Chestnut Hill, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify which characteristics of a print advertisement most effectively pique the interest of patients and potential patients selecting a plastic surgeon.

Objectives: To evaluate the variables, designs and presentation that make plastic surgery advertisements successful and well received based on patient preferences. **Study Design:** Cross-sectional survey from individuals meeting demographic and socioeconomic criteria, who expressed interest in plastic surgery in the future or who had previously had plastic surgery. **Methods:** 400 individuals from 10 major metropolitan areas with active interest in plastic surgery were given a survey through an online agency that showed them 5 significantly different advertisements from plastic surgeons throughout the country. The participants were then asked a series of questions to assess the verity, quality, marketability and asked to assign a grade to the advertisement. Quality was evaluated by soliciting open ended feedback from the survey participants on features of the advertisement, as recent literature suggests the importance of this technique. **Results:** Our study demonstrated specific characteristics that should be considered when designing compelling print advertisements to market a plastic surgery practice. **Conclusions:** Factors including emotions felt while reading, unique qualities of the advertisement, list of procedures performed, use of models versus actual patients, and pictures of the plastic surgeons all contribute to the overall perception of the advertisement. There may not be a prototypical advertisement which appeals to every prospective patient, but certain features of advertisements have been shown to be more marketable to the majority of individuals. Our study scientifically evaluates the effectiveness of print advertising in attracting potential patients.

S30. Incidence of Keloid and Risk Factors (RF) in the Head and Neck (H&N)

William G. Young, MD, Detroit, MI; Paul D. Judge, MS, Detroit, MI; Maria J. Worshum, PhD, Detroit, MI; Christine L.M. Joseph, PhD MPH BSc, Detroit, MI; Lamont R.D. Jones, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the incidence of keloid formation for skin incisions completed in the head and neck region and discuss how race, age, and gender influence this risk.

Objectives: Describe the incidence and RF of keloid formation in H&N. **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review of an insurance plan's patients from 2005 to 2009 with skin incision procedures in the H&N. ICD9 701.4 identified patients with keloids in the H&N. A univariate analysis tested the independent associations between demographic characteristics (DC), age, sex, and race and the incidence of a keloid, using a Fisher's Exact test. Frequencies and rates were reported

across age groups (0-19, 20-39, 40-59, and 60+). A multiple logistic regression predicted each DC on the incidence of keloid. Odds ratios and 95% confidence intervals were reported and considered significant at $p < 0.05$. **Results:** 6,692 patients were in the surgical group of which twenty had a keloid within the H&N. The 0.8% rate for African Americans (AA) is significantly higher than 0.1% for Caucasians and 0.2% "other" race ($p=0.003$). There was no significant sex difference ($p=0.824$). Patients with keloids were younger ($p=0.021$). The association between race and incidence of keloid when controlling for age and sex was statically significant ($p = 0.001$). In African Americans, the odds of getting a keloid were 7.1 times that of Caucasians with no statistically significant association with age and sex. **Conclusions:** Keloid formation in the H&N was lower than that reported in the literature. After adjusting for age and gender, the odds of getting a keloid for AA was 7.1 times that of Caucasians.

General/Clinical Fundamentals

S31. Professionalism and the Importance of Culture

Brandon C. Baugh, BS, Toledo, OH; Nitya Moothathu, BA, Toledo, OH; James F. Kleshinski, MD, Toledo, OH; Reginald F. Baugh, MD, Toledo, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the importance of culture in the attainment of professionalism in graduate medical education programs.

Objectives: Professionalism is a personal transformation of self that occurs during one's medical education and is integral to the transformation of a layperson into a physician. A large amount of effort has been spent in the development of tools to teach and measure professionalism. Despite this fact, the rating tools of professionalism employed in residency programs are often ineffective. Most generate quantitative results that do not provide much practical information. **Study Design:** The perceptions and attitudes towards professionalism vary among residents, nursing personnel and faculty at each individual institution. We evaluate these differences as well as the role that gender, age or experience might play in the assessment of professionalism. **Methods:** A cross-sectional survey was conducted with clinical faculty, medical residents and nursing staff at a midwestern tertiary medical center engaged in graduate medical education. It was composed of nine vignettes on unprofessional behavior, based upon the American Board of Internal Medicine's "Project Professionalism". **Results:** No differences were found regarding attitudes and opinions between staff, nursing personnel and medical residents. This gives additional validity to the inclusion of nursing personnel in the assessment of professionalism in medical education. The importance of culture and socialization in professionalism is highlighted. Subset analysis provides support for the concept of incomplete professionalism. **Conclusions:** During medical education, various factors affect the development of professionalism. It is important to identify these factors and create assessment tools that examine the individual components of professionalism. Creating a clear understanding of professionalism will help guard against adverse generational, cultural and other influences on professionalism.

S32. Thyroglossal Duct Cyst Presenting as a Thyroid Nodule

C. Ron Cannon, MD*, Flowood, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate and treat a thyroglossal duct cyst contained within the thyroid gland.

Objectives: Thyroglossal duct cyst may present from the tongue base to the manubrium but presenting as a mass within the thyroid isthmus is very unusual. This presentation will heighten suspicion of this pathology and outline a diagnostic and therapeutic plan. **Study Design:** Retrospective case study. **Methods:** An elderly female presented with a mass within the thyroid isthmus, FNA found squamous cells suspicious for malignancy. Imaging studies indicated the lesion was confined to the thyroid isthmus. **Results:** A thyroid isthmusectomy was performed with excision of the nodule and histologic findings of a thyroglossal duct cyst. As there was no involvement of the hyoid bone, a Sistrunk procedure was not performed. The patient has had no recurrence of the cyst. **Conclusions:** Findings of squamous cells within a thyroid isthmus mass should suggest the possibility of an intrathyroidal thyroglossal duct cyst. Surgical excision of the mass and hyoid bone if involved is curative.

S33. Sinonasal Osteoblastoma and Postoperative Hemorrhage, a Preventable Complication of Functional Endoscopic Sinus Surgery

Alexander J. Caten, BS, New Orleans, LA; Joshua M. Levy, MD MPH, New Orleans, LA (Presenter); Paul L. Friedlander, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants will discuss the increased risk of hemorrhage associated with sinonasal osteoblastoma. Diagnostic criteria and indicated procedures will be demonstrated.

Objectives: Osteoblastoma represents a benign calcified tumor with fewer than twenty cases reported affecting the sinonasal airway. Osteoblastoma primarily affects individuals aged 10-30 with 40-50% of cases affecting the vertebral column. Although these tumors are clinically benign, they are highly vascular and commonly treated with preoperative embolization to prevent intraoperative bleeding and hematoma formation. **Study Design:** Case report with a review of the literature. **Methods:** We report a case of a 63 year old male with a history of Samter's triad and six prior functional endoscopic sinus surgeries who presented with nasal obstruction for six months. A subsequent computed tomographic scan revealed a 3.0 x 1.6 cm calcified mass originating from the left middle

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turbinate, with associated nasal polyposis and pansinusitis. Repeat functional endoscopic sinus surgery with image guidance was attempted, but was complicated by altered anatomy and heavy bleeding. Postoperatively, the patient suffered from incessant epistaxis, ultimately requiring fluoroscopic embolization of both descending palatine and sphenopalatine arteries. **Results:** Histological examination of the specimen revealed sheets of osteoblasts and bony trabeculae with osteoblastic rimming characteristic of osteoblastoma. A review of the literature revealed no prior association between Samter's triad and osteoblastoma. **Conclusions:** Sinonasal osteoblastoma should be considered when an obstructive calcified mass is detected in the sinonasal airway. A high level of clinical suspicion is necessary to prevent the increased risk of hemorrhage associated with the excision of this vascular tumor, which may require preoperative embolization.

S34. An Algorithm to Approach Bilateral Parotid Enlargement

Si Chen, New York, NY; Benjamin C. Paul, MD, New York, NY (Presenter); David Myssiorek, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the disease entities that cause bilateral parotid enlargement; and 2) use a question based algorithm to improve diagnosis of bilateral parotid enlargement.

Objectives: 1) Describe the disease entities that cause bilateral parotid enlargement; and 2) use a question based algorithm to improve diagnosis of bilateral parotid enlargement. **Study Design:** Literature review, algorithm construction. **Methods:** A PubMed search for bilateral and parotid showed 764 results. Of these, 60 relevant papers were reviewed to compile a list of 28 disease processes that cause bilateral parotid enlargement. For each lesion, the incidence, history and physical examination were compiled in a matrix. This format allowed for grouping of disease processes. Based on these groupings, an algorithm was constructed to resourcefully reduce the differential diagnosis of bilateral parotid disease. **Results:** A total of 28 disease entities were reviewed. The disease processes were initially subgrouped into 5 categories based on etiology: infectious, neoplastic, autoimmune, sialadenosis, iatrogenic, and other. After reviewing the matrix, it was clear that grouping diseases based on specific history and physical findings limits the differential diagnosis. The most important factors included disease incidence, timing of onset, nodular or diffuse presentation, pain, and erythema. With this algorithm, the differential diagnosis can be limited from 28 to 7 or fewer likely diagnoses for a given presentation. **Conclusions:** Bilateral parotid disease has a wide differential diagnosis with an expanding number of available tests. An algorithm, based solely on data obtained from the history and physical in the first encounter, may reduce the differential and may aid the clinician in deciding on further workup and treatment. The proposed algorithm is a retrospective model which requires further randomized testing in clinical practice to validate.

S35. Rosai-Dorfman Disease in Bilateral Nasal Cavities

Eugenia G. Chu, MD, Washington, DC; Neda Ahmadi, MD, Washington, DC; Christopher P. Mesick, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss Rosai-Dorfman disease characteristics, clinical presentation, and treatment options.

Objectives: Rosai-Dorfman disease (RDD) otherwise known as sinus histiocytosis with massive lymphadenopathy is a condition first described by Rosai and Dorfman in 1969. This disease is rarely found in the nasal cavity with most case reports only documenting a unilateral mass. We report a rare case of bilateral nasal cavity masses that was found to be consistent with RDD on pathology. We also review current literature outlining the main treatment options. **Study Design:** A 27 year old female presented with bilateral nasal cavity lesions and a history of an enlarging left neck mass. Core needle biopsies and excisional biopsy of the neck mass was negative for lymphoma. Diagnosis was only made after bilateral nasal biopsies were found to have histiocytosis consistent with RDD. **Methods:** N/A. **Results:** Literature review showed that no consensus exists regarding treatment recommendations. Most cases are benign however, extranodal disease suggests more aggressive disease. Treatment is individualized on a case by case basis. Treatment options include corticosteroids, alkylating agents, alkaloids, and radiation. Long term followup is highly recommended due to recurrence and possibility of major organ complications. **Conclusions:** No established therapeutic guidelines are currently used to treat RDD. This disease entity presents a potential diagnostic challenge and should be considered in the differential when encountering patients with nasal masses and reactive lymphadenopathy.

S36. Temporary Stabilization during Revision Mandibular Fracture Repair

Megan L. Durr, MD, San Francisco, CA; Ruwan Kiringoda, MD, San Francisco, CA (Presenter); Andrew N. Goldberg, MD MSCE*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate a novel technique for temporary stabilization during revision mandibular fracture repair and discuss the advantages of this technique.

Objectives: To describe a novel technique for temporary stabilization during revision mandibular fracture repair. **Study Design:** Clinical case series. **Methods:** A novel technique for temporary intraoperative stabilization using a reconstruction bar at the inferior aspect of the mandible will be described. This series will discuss two patients who underwent revision mandible repair with this novel technique. **Results:** Two patients, ages 42 and 53 years old, were included in our case series. One patient had HIV and HCV, and both patients had a history of intravenous drug use. One patient had a parasymphiseal and contralateral body fracture, and the second patient had a mandibular body and contralateral subcondylar fracture. Both patients underwent open reduction internal fixation (ORIF) with maxillomandibular fixation (MMF). One patient remained in MMF postoperatively for approximately 3 weeks. Both

patients developed non-union of the mandible and underwent revision mandible repair an average of 45 days following the initial ORIF. A novel technique of temporary intraoperative stabilization was used, with a reconstruction bar joining the inferior edge of the mandible on either side of the fracture line to stabilize the mandible during the revision repair. This technique eliminates the need to place the patient in temporary MMF. All patients recovered well postoperatively and had stable mandibles at their last followup appointment. **Conclusions:** Temporary stabilization with a reconstruction bar at the inferior edge of the mandible is a novel technique for revision mandible repair. We feel that this procedure decreases operative time by eliminating the need for temporary MMF.

S37. Rare Presentation of a Postauricular Hibernoma with Literature Review

Alphi P. Elackattu, MD, Boston, MA; Vartan Mardirossian, MD, Boston, MA (Presenter); Anand K. Devaiah, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the presentation, pathophysiology, and treatment of a hibernoma.

Objectives: To describe the rare presentation of a hibernoma in the neck. **Study Design:** Case report. **Methods:** Review of patient chart with accompanying literature search. **Results:** Pathology demonstrated hibernoma on standard H&E stain. **Conclusions:** Hibernomas are rare tumors that can occur almost anywhere on the body and rarely occur in the head and neck. Although benign, these tumors can cause discomfort to warrant surgical excision. In review of the literature, these are rare and present challenges in histologic diagnosis as well as in imaging given their metabolic activity. Clinicians should be aware of these as part of the differential diagnosis, despite their rare presentation in the head and neck.

S38. Renal Metastasis and Regional Lymph Node Involvement of Follicular Thyroid Carcinoma: A Case Report and Review of Literature

Yan W. Ho, MD, New York, NY; Vijay K. Mukhija, MD, New York, NY; Nancy S. Tarlin, MD, Elmhurst, NY; Benjamin D. Malkin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the presentation and clinical course of follicular thyroid carcinoma, and the various patterns of metastasis when it occurs. Participants should understand the need for a multidisciplinary approach to treating patients with local and/or distant metastasis.

Objectives: To describe an unusual case of a patient with follicular thyroid carcinoma with multiple regional and distant metastases, including one to the kidney. **Study Design:** Case report and literature review. **Methods:** Pertinent information was extracted from the medical record, including the patient's history, physical exam, operative findings, pathology reports and radiology studies. A PubMed search was performed for reports of similar cases in the English literature. **Results:** The patient is a 50 year old woman who underwent a total thyroidectomy and bilateral selective neck dissection (II-IV, VI). Pathology revealed follicular carcinoma replacing both thyroid lobes with bilateral metastatic disease and she was treated with 150 mCi of iodine-131. Subsequent imaging studies showed metastatic disease to the lungs, sacrum and kidney. She underwent a laparoscopic right radical nephrectomy to rule out a second primary tumor with pathology showing a 2.5 cm follicular carcinoma metastasis. A second dose of iodine-131 was administered, as the metastases had decreased in size after the first treatment. A literature review identified that follicular carcinoma rarely metastasizes to the kidney, with only 13 cases having been reported. These patients varied in their presentation and management but in most cases treatment involved total thyroidectomy, nephrectomy and possible radioactive iodine ablation. This case represents the first report of a patient with synchronous bilateral nodal disease and distant metastasis to the kidney. **Conclusions:** Follicular thyroid carcinoma metastasizes in 10-15% of cases, but renal metastases are rare. A multidisciplinary approach to treatment is necessary; no standard treatment plan is totally effective.

S39. Development of a Performance Checklist for Simple Suture Placement

Gia E. Hoosien, MD, Miami, FL; Brian S. Jewett, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the objective assessment of competence for performance of the simple interrupted suture.

Objectives: Lacerations and soft tissue injuries are common, and simple wound closure is an important technical skill for health care providers. To date, there are no validated assessment tools for placement of a simple suture. The research objective is to develop a performance checklist for simple suture placement and complete a pilot validation of the tool. **Study Design:** Pilot validation study. **Methods:** The Delphi method was employed to develop a performance checklist for simple suture placement based on consensus expert opinion. Volunteer participants performed simple suture placement; video recordings were reviewed by a panel of experts, allowing assessment using the consensus checklist. Participants also completed self-evaluation forms before and after suture placement. **Results:** In the pilot validation of the newly developed checklist, the inter-rater agreement showed good consensus among expert faculty panel. For the checklist score, Cronbach's alpha = 0.998. For the global competence score, Kappa = 0.92. The pilot study also demonstrated good construct validity. Higher experience level correlated with better performance. Higher checklist scores showed a Spearman's rho = 0.89. Higher global competence score showed a Spearman's rho = 0.97. Self reported confidence increased after single suture placement p = 0.0285. **Conclusions:** A performance checklist for simple suture placement was developed using the Delphi method. The checklist proved valid and reliable when examining video recordings of simple suture placement by volunteer participants.

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S40. Tracheotomy Complicated by Mediastinal Abscess

Nancy Jiang, MD, New York, NY; Benjamin D. Malkin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential for infectious complications from a tracheotomy, including mediastinal abscess.

Objectives: To describe the first reported case of an isolated mediastinal abscess after tracheotomy. **Study Design:** Case report and literature review. **Methods:** Pertinent information was extracted from the medical record, including the patient's history, physical exam, operative findings and hospital course. A PubMed search was performed for reports of similar cases in the English literature. **Results:** The patient is a 43 year old man who presented with severe respiratory distress from idiopathic tracheal stenosis; he required an emergent tracheotomy, which was performed without intraoperative complications. On postoperative day 9, the patient developed fevers of unknown etiology that subsequently persisted despite empiric treatment with broad spectrum antibiotics. On postoperative day 14, a CT scan of the neck and chest demonstrated a mediastinal abscess. The patient underwent bronchoscopy and video assisted thoracoscopic surgery for drainage of the abscess; thereafter, his fevers resolved. A literature search failed to identify any cases of an isolated mediastinal abscess complicating a tracheotomy. **Conclusions:** Postoperative infectious complications from tracheotomy that have been reported in the literature include tracheitis, mediastinitis, necrotizing fasciitis, osteomyelitis of the clavicle and mediastinal abscess due to direct extension from a paratracheal abscess or infected tracheostomy stoma site after decannulation. However, this is the first reported case of an isolated mediastinal abscess that developed after tracheotomy without any concomitant infection in the neck. Although rare, development of an abscess after tracheotomy can occur and awareness of this potential complication is needed to avoid delays in diagnosis.

S41. Retrospective Chart Review: Immediate Complications Related to Anesthesia in Patients Undergoing Uvulopalatopharyngoplasty Surgery for Obstructive Sleep Apnea

Ashutosh Kacker, MD*, New York, NY; Benjamin A. Talei, MD, New York, NY (Presenter); Anne E. Cossu, MD, New York, NY; Ralph L. Slepian, MD, New York, NY

Educational Objective: At the end of this presentation, the participants should have a greater understanding of the anesthetic risks associated with patients undergoing corrective surgery for sleep apnea.

Objectives: To analyze the perioperative risks and complications in patients undergoing corrective surgery for obstructive sleep apnea. Operative, induction, and emergence issues will be assessed individually and with temporal relation to anesthetics administered. **Study Design:** Retrospective chart review of patients with documented OSA who underwent uvulopalatopharyngoplasty with or without septoplasty between 1/2009—1/2010 at a specific institution. Anesthesia, operative, clinical, and recovery records were collected and reviewed for complications and risk factors. **Methods:** A comprehensive chart review was performed via electronic medical record, reviewing the perioperative course of 35 patients undergoing UPPP identified by CPT coding. Review included clinical history, polysomnography, indications, anesthesia records, and perioperative complications and risks. These were defined as any adverse event delaying or compromising surgery or recovery along with risk to patient safety. Criteria included but were not limited to difficult intubations, reintubations, postoperative pulmonary edema, postoperative desaturations and need for CPAP. Postoperative oxygen was not included. Data were stratified into: intubation needs/technique, visibility (McCormack and Mallampati), reintubation, induction and supplemental drugs, neuromuscular blockade and reversal, maintenance drugs, pain medications, BMI and overall anesthesia risk (ASA). **Results:** No significant adverse events such as need for reintubation, prolonged intubation or postoperative pulmonary edema were noted. Patients who were difficult to intubate demonstrated no increase in risk in this study sample.

Conclusions: Patients undergoing corrective surgery for OSA and airway obstruction are considered to be at increased risk of perioperative complications. Review of 35 patients at a single institution in a one year time period failed to show any significant adverse outcomes.

S42. Current Diagnosis and Management Patterns for Acute Sore Throat in the United States

Sang W. Kim, MD, Boston, MA; Neil Bhattacharyya, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the patterns of diagnosis and management for acute sore throat in adult and pediatric ambulatory primary care setting in the United States.

Objectives: Compare diagnosis and management patterns for acute sore throat for adults and children in the United States. **Study Design:** Cross-sectional study of outpatient clinics in the United States. **Methods:** From the National Ambulatory Medical Care Survey 2006-2008, office visits with a primary diagnosis of acute pharyngitis (ICD-9 code, 462.0), acute tonsillitis (463.0) or streptococcal sore throat (34.0) were extracted. Clinical data regarding fever at presentation, diagnostic procedures (throat culture and rapid streptococcal testing) performed and medicines (oral antibiotics and analgesics) recommended were determined. **Results:** There were 8.6±1.2 million adult and 19.7±1.5 million pediatric visits with primary diagnosis of acute sore throat. Children were significantly more likely to present with fever in association with acute sore throat compared to adults (13.0% versus 5.6% respectively; odds ratio, 2.5; p=0.006). In contrast, utilization rates of throat cultures were statistically similar between groups (17.3% and 13% for pediatrics and adults, respectively, p=0.262). Rapid strep testing was also more common among children (38.5% versus 28.8%), though not statistically significant (p=0.226). There were no differences in analgesic recommendation rates (24.2% and 20.7%; p=0.439), pediatric patients were less slightly likely to be treated with oral antibiotic therapy (63% versus 70%; p=0.251). Amoxicillin

was the most commonly prescribed antibiotic for both groups. **Conclusions:** These data highlight relatively similar diagnosis and treatment patterns for acute sore throat between adults and children. Recognition of such outpatient management patterns is important for otolaryngologists seeing recurrent sore throat referrals and for development of clinical guidelines.

S43. WITHDRAWN—Otolaryngologic Manifestations of Relapsing Polychondritis

Cody A. Koch, MD PhD, Rochester, MN; Nicole M. Tombers, BS, Rochester, MN; Oren F. Friedman, MD, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation and otolaryngologic manifestations of relapsing polychondritis and its treatment.

Objectives: The objective of the study is to describe the presentation, sites of involvement, clinical course and treatment of the otolaryngologic manifestations of relapsing polychondritis. **Study Design:** Retrospective review. **Methods:** The medical record of all patients diagnosed with relapsing polychondritis from January 1976 to December 2010 at a single institution were reviewed following approval from the institutional review board. **Results:** One hundred and ninety-four patients were diagnosed with RP during the time period studied. The mean age at diagnosis was 50 years (range 11-82 years) with males being affected comparably to females (80 males, 114 female, $p > .05$). Twelve cases of RP were considered secondary to a pre-existing autoimmune disease (ulcerative colitis = 5, myelodysplastic syndrome = 4, leukemia = 2, systemic lupus erythematosus = 1). Auricular chondritis was the most common presentation of the disease occurring in 88% of patients, followed by nasal septal chondritis in 37% of patients and respiratory involvement in 28% of patients. The most common treatment for RP was systemic corticosteroids used in 93% of patients while 63% of patients required additional immunosuppressives, most commonly methotrexate (46%). No patients died of their disease during the study period. **Conclusions:** Relapsing polychondritis is a systemic autoimmune disease with frequent and variable otolaryngologic manifestations. Treatment of RP can be effectively treated with systemic corticosteroids but may require additional immunosuppressives to be effective.

S44. Effect of Annual Temporal Bone Course on Achievement of Competency in Mastoidectomy

Kulsoom Laeeq, MD, Baltimore, MD; Scott A. Infusino, BA, Westport, CT; David A. Diaz Voss Varela, MD, Baltimore, MD; Howard W. Francis, MD, Baltimore, MD; John P. Carey, MD, Baltimore, MD; Nasir I. Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the significance of skills laboratory for achieving competency in the operating room. We will also explain the importance of smaller more frequent skill labs or simulation courses.

Objectives: The purpose of this study was to determine the educational value of a mastoidectomy temporal bone lab by comparing the difference between the operating room mastoidectomy scores of the residents before and after the laboratory course. **Study Design:** Cross-sectional validation study. **Methods:** Fourteen residents from our otolaryngology residency program were evaluated in the operating room (OR) during their otology rotations using a previously published and validated cortical mastoidectomy tool between 2007 and 2011. Depending on the time of their rotation in the academic year, residents were assigned to six 2-month groups, with group 1 starting in July, the beginning of the academic year. The temporal bone lab course was conducted each year in January and February with groups V and VI having their otology rotation after the lab course. The difference between the operating room scores were calculated with Fisher's Protected Least Significance Difference (PLSD) test. **Results:** The average operating room scores of the groups that had their otology rotations before the temporal bone course (I-IV) were lower (checklist=2.8, global=3.0) than the groups (V-VI) that had the rotations after the course (checklist=3.5, global=3.3). The difference between the groups was statistically significant between group VI and all the other groups ($p < 0.05$). **Conclusions:** Our results show that teaching hospitals should have more frequent laboratory courses for improvement as well as retention of surgical skills. This can be achieved with smaller supplemental courses throughout the educational year or the frequent use of virtual reality simulation.

S45. Incomplete Nasal Tripod; The Consequences of Columellar-Septal Necrosis

Benjamin C. Paul, MD, New York, NY; Sujana S. Chandrasekhar, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) review the support structures of the nasal tip; and 2) discuss the outcome of columellar-septal necrosis.

Objectives: 1) Review the support structures of the nasal tip; and 2) discuss the outcome of columellar-septal necrosis. **Study Design:** Case report and literature review. **Methods:** A 55 year old male with longstanding nasal cocaine abuse had acute epistaxis. Examination revealed a mild saddle nose deformity with an absent columella and cartilaginous nasal septum. Diffuse septal crusting and sanguineous ooze was controlled with silver nitrate cautery. **Results:** Cocaine vasoconstriction leads to perforation through ischemic necrosis and is also theorized to produce a hypoxic, microaerophilic environment suitable for anaerobic infection, which may cause adjacent soft tissue necrosis. In this case, both the medial crura and cartilaginous nasal-septum were absent. Inherent nasal tip ptosis and instability was expected; however, on frontal and superolateral view, nasal tip depression was negligible. On lateral and base view, the columella and anterior septum were notably absent. Scar tissue bridging the lateral cartilages formed an arch, possibly providing strength to the nasal tip. Functionally, the nasal tip was hypermobile with sluggish recoil. Absent anterior endonasal anatomy made the nasal valves inconsequential; however, laminar airflow was disrupted leading to excess dryness, crusting, and epistaxis. **Conclusions:** If adjusting one leg of a tripod alters the apex, then the loss of one leg should dramatically impact

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the nasal tip. This case highlights the strength of the lateral cartilages and the role of tissue healing in maintaining nasal patency and aesthetic after cocaine induced columellar-septal necrosis. To prevent recurrent epistaxis and improve support, a composite repair is required. Ultimately, this reconstruction should be delayed until all destructive behavior has ceased.

S46. Management of Hyoid Bone Fractures: A Systematic Review

Tekchand Ramchand, BA, Newark, NJ; Senja Tomovic, MD, Newark, NJ; Arjuna B. Kuperan, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to explain and discuss management of hyoid bone fractures.

Objectives: Fractures of the hyoid bone are rare occurrences, mainly caused by strangulation/asphyxiation injuries, or by sports/motor vehicle accidents. As a result of their rarity, proper treatment guidelines are not in place for dealing with such injuries. In this study, a systematic literature review was conducted with the goal of identifying the optimal management approach for patients with fracture of the hyoid. **Study Design:** Systematic review. **Methods:** PubMed and Google Scholar databases were searched for case studies on patients diagnosed with fracture of the hyoid bone. Full text articles were obtained, and the medical treatment used in each case was determined. **Results:** A total of 12 detailed case studies were obtained. No randomized controlled trials regarding treatment of hyoid fractures were found. In 11 of the 12 cases, conservative management of the hyoid fracture was utilized, which included airway protection, diet changes, and rest/observation. In 1 of the 12 cases, an aggressive approach was used, which involved the surgical band wiring of the fractured hyoid. In all cases, patients' symptoms were alleviated with treatment, and the fracture was healing on followup. **Conclusions:** Conservative management was successful in 91.67% of the cases reviewed. Both yielded the same positive results for patients. Consequently, we recommend conservative management as the initial strategy for patients with hyoid bone fracture. Aggressive approach should be reserved for complications or worsening of symptoms.

S47. The Otolaryngology Hospitalist Model

Matthew S. Russell, MD, San Francisco, CA; David W. Eisele, MD FACS*, San Francisco, CA; Andrew H. Murr, MD FACS*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinical practice model for the otolaryngology hospitalist.

Objectives: To define a new clinical practice paradigm involving the development of an otolaryngology hospitalist practice. **Study Design:** Retrospective administrative database review. **Methods:** Based on a pilot period from 2008-2009 that established the viability of the practice paradigm, a consortium model of an otolaryngologist hospitalist practice was developed. Billing records, including CPT and ICD-9 codes, were reviewed to evaluate the number and type of consultations and surgeries that were generated from this practice model from 2009-2010. **Results:** Two hundred ninety-seven new inpatient consultations were staffed, excluding ED and acute care consultations. Adult and pediatric consultations were represented. The most common diagnoses were respiratory failure (15%), epistaxis (9%), sinusitis (8%), dysphonia (8%), stridor/glottic edema (6%). Infectious/inflammatory conditions accounted for 39% of the underlying etiologies. Service breakdown was strongest in general/pediatrics (39%), laryngology (29%), and rhinology (19%) with some oncology/endocrine (6%) and otology (7%) represented. Twenty-six percent of consultations involved a procedure or surgical intervention. The most common CPT codes included endoscopic sinus, laryngoscopy, and tracheotomy. Consultations were predominantly coded at level 3 (43%) and level 4 (32%). Reimbursement was significantly impacted by payer mix.

Conclusions: To our knowledge, ours is the first full-time otolaryngology hospitalist model in the United States. The position was developed out of a service need at our tertiary care academic medical center with high volume clinical demands and a need for significant interservice collaborations. The breadth and variety of the practice is reported to allow potential consideration and dissemination of this new model.

S48. Mucoepidermoid Carcinoma Ex Pleomorphic Presenting as a Parapharyngeal Space Mass

Mike C. Sheu, MD, New York, NY; Benjamin C. Paul, MD, New York, NY (Presenter); Benjamin R. Roman, MD, New York, NY; Gady Har-El, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss mucoepidermoid carcinoma ex pleomorphic; and 2) describe a novel presentation of mucoepidermoid carcinoma ex pleomorphic as a parapharyngeal space mass.

Objectives: 1) To review mucoepidermoid carcinoma ex pleomorphic; and 2) to describe a novel presentation of mucoepidermoid carcinoma ex pleomorphic as a parapharyngeal space mass. **Study Design:** Case report and literature review. **Methods:** A 71 year old male presented with a left level II neck mass gradually enlarging over several months. An MRI with gadolinium as well as PET-CT confirmed a left level II neck mass and revealed a 3x2cm mass in the left parapharyngeal space inseparable from the deep parotid lobe. Needle aspiration of the level II mass showed metastatic squamous cell carcinoma. In the operating room, excision of an encapsulated parapharyngeal mass and left selective lymph node dissection was performed. Frozen sections reported possible non-small cell carcinoma. **Results:** The final pathology of the parapharyngeal mass revealed a high grade mucoepidermoid carcinoma clearly arising from a pleomorphic adenoma nodule. The level II node was determined to be metastatic mucoepidermoid carcinoma.

Due to this tumor's high grade nature with predominant epidermoid component, the initial fine needle aspiration of the metastatic neck mass gave a false diagnosis of squamous cell carcinoma. **Conclusions:** This case describes a rare tumor with a novel presentation and challenging diagnostics. Mucoepidermoid carcinoma ex pleomorphic is sparsely described in the literature and has yet to be described as a parotid mass with parapharyngeal extension. The diagnostic challenge presented in this report allows for both a review of parapharyngeal masses as well as for a deeper understanding of mucoepidermoid carcinoma ex pleomorphic. Through continued reporting of uncommon diseases, diagnosis and treatment will improve.

S49. Implementation of Ethics Grand Rounds in an Otolaryngology Department

Andrew G. Shuman, MD, New York, NY; Andrew R. Barnosky, DO, Ann Arbor, MI; Charles F. Koopmann, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the basic principles relevant to clinical medical ethics in otolaryngology, and apply them towards the development of a departmental case based clinical ethics curriculum.

Objectives: To create a case based curriculum designed to teach and discuss the tenets of clinical medical ethics within an otolaryngology department. **Study Design:** Survey based study in an academic otolaryngology department. **Methods:** Case based departmental ethics grand rounds were implemented on a quarterly basis within an academic department of otolaryngology. One hour sessions were designed to utilize challenging cases volunteered by clinicians within the department to create a forum for discussion and education about clinical medical ethics. A survey was administered to participating clinicians to measure the impact of the intervention. **Results:** Five grand rounds were held over 16 months from 2009 to 2011, with four to six cases presented per session. Sessions were well attended and received, with broad coverage of topics and lively discussions. The mean survey score was 18 (median 19, SD 2) out of a maximum possible score of 20. When asked if the sessions helped to advance their skills and comfort within the field of medical ethics, 100% of respondents agreed or strongly agreed. A total of 86% of respondents agreed or strongly agreed that the sessions would change how they practiced medicine in a way that would benefit their patients. **Conclusions:** It is feasible to successfully implement case based ethics grand rounds within an otolaryngology department. Participants demonstrated a gratifying level of approval and a stated desire to implement the principles learned within their clinical practice.

S50. Transoral Robotic Lingual Tonsillectomy as a Treatment Option for Severe OSA Patients with Lingual Tonsil Hypertrophy

Chelsey J. Smith, MD, Oklahoma City, OK; Nilesh R. Vasan, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the possibility of using the transoral robotic approach for a lingual tonsillectomy as the primary treatment modality in OSA patients with lingual tonsil hypertrophy.

Objectives: Lingual tonsil or base of tongue hypertrophy can be a cause of obstructive sleep apnea (OSA) but has proven to be difficult to address surgically because of the inability to access this area of the oropharynx satisfactorily. This study investigates transoral robotic lingual tonsillectomy (TORLT) using the da Vinci Si robot in patients with severe OSA as a surgical option that provides a simple minimally invasive surgical technique for lingual tonsillectomy and improves OSA symptoms. **Study Design:** This is a case series of three patients. **Methods:** Three patients with lingual hypertrophy and associated severe OSA were assessed with preoperative polysomnography and sleep fiberoptic nasolaryngoscopy. Following TORLT these patients underwent repeat polysomnography and nasal endoscopy after full recovery from the procedure. The pre and postoperative polysomnography data such as AHI, average oxygen saturation, sleep latency, and CPAP titration were compared for each patient, as well as postoperative nasal endoscopy. Video/still photodocumentation of each procedure was obtained. **Results:** Polysomnographic data for all three patients revealed significant improvement for OSA after TORLT. No patient required a tracheostomy for this operation. The transoral robotic surgical technique is described and illustrated. **Conclusions:** TORLT may be the key to relieving OSA symptoms in patients with lingual tonsil/base of tongue hypertrophy that has otherwise been difficult to manage. Transoral robotic surgery allows both the ability to navigate difficult anatomic spaces such as the oropharynx and provides a minimally invasive surgical option in OSA patients with lingual tonsil hypertrophy.

S51. Global Academic Partnerships: Improving Surgical Care in Africa through Research, Education and Establishment of Residency Training Programs

Jessica K. Smyth, MD, Chapel Hill, NC; Carol G. Shores, MD PhD, Chapel Hill, NC; Anthony G. Charles, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how the development of long term relationships between US academic medicine institutions and medical facilities in resource poor countries can contribute to research efforts and facilitate significant improvement in management and outcome of surgical disease.

Objectives: Surgical disease remains a ranking killer of the world's poor. The most vital missing element is the presence of qualified surgeons. By developing a partnership with a medical facility in Malawi, our academic institution has made strides toward improving delivery of surgical care in this resource poor country through research, trauma and cancer registries, education, and the establishment of a surgical residency training program. **Study Design:** Descriptive. **Methods:** Academic surgeons from our institution, a

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Norwegian university and a Swedish institution operate, educate, and have participated in the development of both a general surgery and an orthopedic residency training program in Malawi. US medical students and residents on research rotations have had a continuous presence in Malawi. The resident facilitates continuity of care, provides educational support for the Malawian house staff, and performs research. A trauma registry and a cancer registry were established to characterize the patient population presenting to the hospital. The information gathered from the trauma registry assisted the department of surgery in becoming certified as a training site for Malawian general surgeons. Additionally, the registries enable research to be directed so that meaningful and cost effective therapeutic intervention programs can be developed. **Results:** Based on the registries, research is focused on road traffic accidents, cervical and esophageal cancer, as well as Burkitt's lymphoma and HIV related malignancies. **Conclusions:** The academic model is the key to improving care for poorest populations with the long term goal of developing a partnership with the medical establishment in Africa.

S52. Post-Adenoidectomy Epidural Abscess and Osteomyelitis

Steven M. Sperry, MD, Philadelphia, PA; Noam A. Cohen, MD PhD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe retropharyngeal abscess as a potential complication after adenoidectomy; in addition, they should be able to recognize the signs and symptoms, and describe a timely diagnostic workup if this complication is suspected.

Objectives: To report a case of an adult post-adenoidectomy retropharyngeal space abscess, which developed into an epidural abscess and vertebral osteomyelitis; and, to review the current knowledge in the literature of this rare complication. **Study Design:** Case report. **Methods:** Description of a case and review of pertinent literature. **Results:** A 50 year old male who underwent adenoidectomy for nasopharyngeal obstruction developed progressive neck pain and stiffness, with a retropharyngeal abscess identified and drained 8 weeks postop. On subsequent imaging, the abscess was found to extend as deep as the epidural space at C2, and this developed into osteomyelitis of C1-2. It resolved with appropriate antibiotic treatment over a 4+ month period. Review of the literature indicates that this is a rarely reported complication following adenoidectomy. **Conclusions:** A post-adenoidectomy retropharyngeal space abscess is a rare complication. An appropriate level of concern should be employed to identify this complication, with the utilization of CT or MRI with contrast, in order to initiate treatment as soon as possible and avoid potentially more severe involvement of the vertebrae and spinal cord.

S53. Tympanic Membrane Light Reflex: Meaningful?

N. Wendell Todd, MD MPH*, Atlanta, GA; Avani P. Ingley, MD, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to know that the tympanic membrane light reflex, whether present or absent, is an indicator of how the tympanic membrane is oriented relative the external ear canal—not an indicator of ear health.

Objectives: Address the hypothesis that presence of light reflex correlates with the large mastoid size indicator of healthy middle ears; and, conversely, that absence correlates with the small mastoid indicator of childhood otitis media. The question is important because many physicians and texts consider presence of a light reflex to indicate a healthy middle ear. **Study Design:** Postmortem material analysis. **Methods:** On digitized photographs of 82 tympanic membranes (of 41 crania), the light reflex of the tympanic membrane was categorized as present vs. absent. Mastoid size was quantitatively assessed radiographically. **Results:** In the studied clinically normal ears, light reflex presence vs. absence did not correlate with mastoid size. **Conclusions:** Neither the absence or the presence of the tympanic membrane light reflex is an indicator of the ear's otitis health. Rather, the light reflex indicates how the tympanic membrane is oriented relative the external ear canal.

S54. Fourth Branchial Sinus Communication with the Esophagus: A Rare Occurrence

Richard J. Vivero, MD, Miami, FL; John Wood, MD, Miami, FL; Zoukaa B. Sargi, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation and management of fourth branchial cysts, including the rare communication with the esophagus.

Objectives: 1) To discuss relevant clinical and surgical findings of fourth branchial cleft anomalies; and 2) to report a rare manifestation of fourth branchial sinus communication with the esophagus. **Study Design:** Case series. **Methods:** Two patients were identified in a tertiary care level university practice. Patients were diagnosed based on clinical presentation and diagnostic imaging consistent with fourth branchial anomaly. Transcervical surgical excision of the lesion was performed in both cases without complication. **Results:** Patient 1 (male, age 25) and patient 2 (female, age 15) presented with recurrent neck infections. Patient 1 was noted to have a cystic neck mass with submucosal tract into the esophagus. Patient 2 was noted to have a cystic neck mass with an opening in the left piriform sinus, which communicated with the esophagus distally. The cystic neck masses were removed en toto, and the esophageal communication was repaired. Patients 1 and 2 resumed oral diet in 2 and 5 days, respectively. The recurrent laryngeal nerve was preserved during the course of dissection, and normal vocal fold mobility was maintained. **Conclusions:** Fourth branchial cleft anomalies are rare occurrences, which may present as recurrent neck infections. The sinus tract lies in close proximity to the recurrent laryngeal nerve. Care must be taken to identify esophageal involvement to ensure appropriate management at time of resection. Patients are able to resume an oral diet early in the recovery period.

S55. Lingual Abscess Presenting as Unilateral Base of Tongue Swelling

Christina J. Yang, MD, New Orleans, LA; Paul L. Friedlander, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the presentation, evaluation, microbiology, and treatment of lingual abscess.

Objectives: Lingual abscess is a rare clinical entity. Early recognition and treatment are paramount. We review the presentation, evaluation, microbiology, and treatment of lingual abscess. **Study Design:** Case report and literature review. **Methods:** Case presentation and literature review of lingual abscess. **Results:** A thirty-two year old white male with history of wisdom tooth extraction one month prior presented to the emergency department with a two week history of sore throat and three days of progressive odynophagia and dysphagia, worsening despite outpatient antibiotic therapy and steroids. On physical exam, including flexible fiberoptic laryngoscopy, right base of tongue swelling, a hot potato voice, and a patent airway were appreciated; there was no drooling, stridor, or respiratory distress. CT scan revealed a 2cm rim enhancing mass of the right base of tongue consistent with abscess. He was taken to the operating suite for emergent incision and drainage after securing the airway. The endotracheal tube and Penrose drain were removed on postoperative day one, and he had complete resolution of abscess with oral antibiotics, confirmed by serial examination and subsequent MRI. He remains asymptomatic three months later. **Conclusions:** Lingual abscess is an uncommon clinical entity associated with oral trauma. Diagnosis may therefore be difficult and aided by ultrasound, CT, or MRI. Treatment centers on securing the airway, drainage of the abscess, and antimicrobial therapy directed toward aerobic and anaerobic oral flora. There have been no associated deaths in the antibiotic era.

S56. Refractory Epistaxis Resulting from Internal Carotid Artery (ICA) Pseudoaneurysm: A Case Report and Review of Literature

Soroush Zaghi, MD, Los Angeles, CA; Bob Armin, MD, Los Angeles, CA; Marilene B. Wang, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss incidence, risk factors, disease course, and treatment options for refractory epistaxis due to a pseudoaneurysm of the internal carotid artery.

Objectives: To describe a rare case of refractory epistaxis due to a pseudoaneurysm of the petrous ICA following radiation therapy. **Study Design:** Case report and review of literature. **Methods:** Review of literature on PubMed from 1990—present. **Results:** A 54 year old woman presented with copious right sided epistaxis of 5 hours' duration. She had sought prior treatment for recurrent unilateral epistaxis multiple times over a 3 month period and had undergone right sphenopalatine artery ligation. Her past medical history was notable for nasopharyngeal carcinoma with radiation therapy 11 years prior. Recent MRI did not demonstrate tumor recurrence. Angiography of the right internal maxillary artery distribution revealed a pseudoaneurysm of the petrous ICA. Sequential coil embolization of the pseudoaneurysm resolved the epistaxis. Literature Review: ICA pseudoaneurysm is a rare sequela following traumatic facial injury, sinonasal surgery, deep neck space infection, and even more rarely following radiation therapy. A total of 116 cases of internal carotid artery pseudoaneurysm were identified in the literature review. These cases were associated with trauma (n=68), infection (n=18), iatrogenic (n=16), spontaneous dissection (n=8), radiation therapy (n=3), tumor invasion (n=2), pregnancy (n=1). **Conclusions:** ICA pseudoaneurysm is an uncommon complication of XRT in patients with nasopharyngeal carcinoma. Optimal management demands rapid recognition, but prompt diagnosis of cavernous ICA pseudoaneurysm is often a clinical challenge. Because this problem is related to skull base osteoradionecrosis, it may present as a long term complication of radiation therapy. Otolaryngologists should be aware of this possible etiology in patients with refractory epistaxis and a history of previous radiation.

Head & Neck**S57. Transorbital Robotic Skull Base Surgery: A Preclinical Study**

Randall A. Bly, MD, Seattle, WA; Thomas S. Lendvay, MD, Seattle, WA; Diana C.W. Friedman, PhD, Seattle, WA; Blake Hannaford, PhD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss current endoscopic approaches to the skull base, understand what studies have been done using robotics on the skull base, and discuss the current challenges in robotic skull base surgery.

Objectives: 1) Demonstrate feasibility of a novel surgical approach to the anterior skull base and brain that utilizes a transorbital endoscopic technique and robotic assistance; and 2) determine which components of the system can be designed to optimize surgical access and whether da Vinci and RAVEN II robots permit operation through multiportal approaches with the current size of their arms and instruments. **Study Design:** Feasibility study on cadaver specimens to evaluate a new surgical approach. **Methods:** The da Vinci robot was used on a dry cadaver skull to perform surgical tasks using transorbital ports. The angles in the robotic arms and different configurations of the tools and endoscope were tested. The RAVEN II robot was applied to cadaver head specimens to perform a transorbital pituitary resection. Instrumentation was tested for feasibility using the transorbital ports. **Results:** The study demonstrated feasibility of a transorbital and transnasal endoscopic approach to access the anterior skull base and brain using robotic surgical arms. The pituitary was visualized and two-handed dissection was capable. Angles between the robotic arms were as wide as 80 degrees, overcoming prior limitations of robotic skull base surgery described as the narrow funnel effect.

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Conclusions: Transorbital robotic assisted skull base surgery is feasible, as tested with pituitary resections in cadavers. The addition of transorbital portals widened the angle possible between robotic arms. Future studies will improve surgical instrument design and modify the system to allow access to lesions otherwise treated with an open surgical approach.

S58. Solitary Fibrous Tumors of the Head and Neck: Diagnostic and Therapeutic Challenges

Sarah N. Bowe, MD, Columbus, OH; Paul E. Wakely, MD, Columbus, OH; Enver Ozer, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the diagnosis and therapeutic management of solitary fibrous tumor of the head and neck.

Objectives: Solitary fibrous tumors (SFT) are generally benign spindle cell neoplasms of mesenchymal origin. Originally a thoracic lesion, their presence in extrapleural sites can be a diagnostic challenge due to its microscopic resemblance to other spindle cell tumors. They are usually treated successfully by complete excision. Overall, SFT of the head and neck is quite rare, with less than 200 reported in the literature since 1991. The purpose of this study was to augment the reported cases of head and neck SFT and evaluate the tumor regarding pertinent diagnostic features, management, and outcomes. **Study Design:** We conducted a retrospective chart review on all cases of solitary fibrous tumor of the head and neck from the pathology database between 1991 and 2011.

Methods: We present the largest case series (thirteen) along with a thorough literature review. **Results:** The clinical, radiologic, and pathologic features are presented, as well as management and outcomes. We compare our series to those reported in the previous publications of head and neck SFT between 1991 and 2011, including a specific focus on cases with recurrence and metastatic potential. **Conclusions:** Solitary fibrous tumors of the head and neck are incredibly rare and those with more aggressive behavior even more so. Diagnosis is often difficult and not definitive until complete histologic and immunohistochemical evaluation. In most cases, complete surgical excision is the only necessary treatment. Although in patients with positive surgical margins or malignant components, adjuvant postoperative radiation may be beneficial. Regardless, all patients require close clinical followup over several years.

S59. Platybasia and the Relationship of the Odontoid to the Palatal Line

Kevin M. Burke, MD, San Francisco, CA; Ivan H. El-Sayed, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) introduce the palatal line (line drawn parallel to the plane of the palate) as an anatomic reference point for transnasal or transoral endoscopic access to the cranio-cervical junction; and 2) demonstrate that platybasia creates an increase in the height of the odontoid above the palatal line.

Objectives: The purpose of this study is to introduce the palatal line, defined as the best fitting straight line drawn parallel to the horizontal axis of the hard palate, as a radiographic reference point for endoscopic access to the cranio-cervical junction, and to ascertain whether platybasia creates an increase in the height of the odontoid above the palatal line. **Study Design:** Retrospective cohort study. **Methods:** CT or MRI images were reviewed in patients diagnosed with chronic rhinosinusitis or platybasia. The height of the odontoid relative to the palatal line and the anterior skull base angle were measured on a mid-sagittal image using Philips Isis software. The height of the odontoid relative to the palatal was compared between the two groups using a student's t-test. The relationship between anterior skull base angle and odontoid height relative to the palatal line was analyzed with linear regression.

Results: Patients with platybasia had a significantly higher height of the odontoid relative to the palatal line ($p < 0.001$). No linear relationship existed between skull base angle and height of the odontoid above the palatal line in either group ($x = 0.17$, $x = 0.11$).

Conclusions: Platybasia patients have a higher odontoid height relative to the palatal line. However, a linear relationship does not exist between odontoid height and anterior skull base angle. Variability exists in the relative position of the odontoid to the palatal line. Therefore, surgical access to the odontoid should be tailored to the patient's anatomy and should include consideration for a transnasal, transoral or combined endoscopic approach.

S60. Comparison of Surgical Approaches to Tumors of the Oropharynx

Benjamin D. Bush, BS, Birmingham, AL; John W. Frederick, BS, Birmingham, AL; Larissa Sweeny, MD, Birmingham, AL; William R. Carroll, MD, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL; J. Scott Magnuson, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to better compare oncological and functional outcomes between the mandibulotomy and transcervical approach for resection of oropharyngeal tumors.

Objectives: Compare the outcomes of patients with squamous cell carcinoma of the oropharynx who underwent resection with mandibulotomy compared to a transcervical resection without mandibulotomy. **Study Design:** Retrospective review. **Methods:** A retrospective review of patients ($n = 69$) undergoing tumor resection of the oropharynx was performed at a tertiary care facility from March 2003 to December 2010. Oncological and postoperative complication outcomes of the patients who underwent mandibulotomy were compared to those who underwent transcervical approach. **Results:** In the study population, 54% underwent mandibulotomy ($n = 37$; mean age of 59) and 46% underwent a transcervical approach ($n = 32$; mean age of 57). A trend towards more complications requiring surgical intervention in the mandibulotomy group (35%; $n = 13$) compared to transcervical approach (22%; $n = 7$; $p = 0.12$) was observed. Mandibulotomy patients required an average of 0.75 additional surgeries to manage complications, whereas transcervical patients required 0.25 surgeries ($p = 0.05$). The most common complication in the mandibulotomy group was bone exposure with 19%

(n=7) at the site of the osteotomy. Positive margin status was similar between the two cohorts with 22% (n=8) of the mandibulotomy patients and 28% (n=9) of the transcervical patients (p=0.54). There was no statistical difference in the disease free survival, overall survival, hospital stay, or PEG tube retention time. **Conclusions:** Oncologic outcomes were similar in the two groups but a trend toward a higher rate of postoperative complications in patients undergoing mandibulotomy was seen. This suggests the transcervical approach may be more advantageous than mandibulotomy for head and neck oncologic surgery.

S61. Functional and Cosmetic Outcomes in Endocrine Surgery

Carrie M. Bush, MD, Augusta, GA; Michael C. Singer, MD, Augusta, GA; John D. Prosser, MD, Augusta, GA; David J. Terris, MD*, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the functional and cosmetic outcomes in a minimally invasive and remote access endocrine surgery practice.

Objectives: Endocrine surgery has evolved to include minimally invasive and remote access approaches. Objective outcome differences between traditional and minimally invasive techniques are comparable. Our aim is to determine the subjective functional and cosmetic outcomes based on patient perception in a contemporary minimally invasive and remote access practice. **Study Design:** Prospective cohort. **Methods:** A 14 item questionnaire based on previously validated surveys was created to assess the functional and cosmetic expectations and outcomes of endocrine surgery patients. Patients who presented for pre and postoperative visits within our practice were asked to complete the questionnaire. Data was examined via SPSS software and Wilcoxin-Rank analysis. **Results:** 30 participants were enrolled in the study. The mean age was 49.3 ± 17 years and 27/30 (90%) were female. 63% were preoperative and 37% were postoperative. Postoperative patients were noted to have a significantly better sense of overall health (p=0.035) and better satisfaction with personal appearance (p = 0.021). There were no differences in pain, swallowing and voice between pre and postoperative patients. Both pre and postoperative patients (66%) indicated that they consider the type of scar they will have when making medical decisions. **Conclusions:** Endocrine surgery patients harbor cosmetic concerns that affect their choices in medical treatment. Patients report high satisfaction with both health and appearance following endocrine surgical intervention.

S62. Bizarre Parosteal Osteochondromatous Proliferation: The First Case in the Dorsal Nose

Sergio S. Cervantes, MD, Phoenix, AZ; Michael L. Hinni, MD, Phoenix, AZ; Matt B. Mors, BS, Phoenix, AZ; Ryan L. Kau, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss bizarre parosteal osteochondromatous proliferations and their ability to present in the head and neck region. Participants will also be better able to compare this lesion with osteochondroma.

Objectives: Bizarre parosteal osteochondromatous proliferations (BPOP) are rare, benign lesions usually found in the hands and feet. **Study Design:** Since first described by Nora in 1983, there have been just three published reports of these lesions occurring in the head and neck region. **Methods:** We report a case of a 53 year old woman presenting with a bizarre parosteal osteochondromatous proliferation in the dorsal nose region, a previously unreported site. **Results:** Initial misdiagnosis led to recurrence of the lesion and a second procedure to remove it. Treatment was done by simple excision. **Conclusions:** It is important for head and neck surgeons to understand the possible sites for bizarre parosteal osteochondromatous proliferations in order to correctly diagnose, treat, and prevent its high recurrence rate.

S63. Analysis of Recurrence and Survival in Primary Parotid Malignancies with and without Facial Nerve Involvement

Steven B. Chinn, MD, Ann Arbor, MI; Matthew E. Spector, MD, Ann Arbor, MI; R. Daniel Peters, BS, Ann Arbor, MI; Carol R. Bradford, MD*, Ann Arbor, MI; Gregory T. Wolf, MD, Ann Arbor, MI; Mark E. Prince, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how primary parotid malignancies involving the facial nerve affects prognosis and to further explain the controversy of facial nerve sacrifice in these patients.

Objectives: To determine if facial nerve involvement and sacrifice is prognostic in patients undergoing surgery for common primary parotid malignancies. **Study Design:** Retrospective. **Methods:** 76 patients (mean age, 48.4 years M:F 35:41) between 1991-2010 with common primary parotid malignancies were identified. The main outcome measures were overall survival (OS), disease specific survival (DSS), and disease free interval (DFI) while controlling for clinical parameters: preoperative nerve function, presence of clinical nerve involvement (none, close/attached, gross), nerve sacrifice, age, sex, adjuvant therapy, TNM stage, and margin status. **Results:** The facial nerve was involved in 41% (11/27) of acinic cell, 63% (10/16) of adenoid cystic, and 52% (17/33) of mucoepidermoid cancers (p=0.38). Overall, 57% (44/76) received postoperative radiation. There were significant survival differences when stratifying by T-class (p=0.02), N-class (p=0.002), and sex (p=0.01). Overall, when comparing patients with nerve sacrifice (NS) versus nerve preservation (NP), DSS (p=0.01) and DFI (p=0.004) demonstrated significant improvement in the NP group. Controlling for patients with intact preoperative nerve function and postoperative radiation, comparison of NP versus NS demonstrated OS to be marginally better (p=0.053). Controlling for type of nerve involvement, OS also showed marginal improvement (p=0.06). Subset analyses of patients with nerve involvement showed no difference in survival when comparing NS versus NP groups. Comparing

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patients with nerve involvement and NP versus patients without nerve involvement and NP showed no differences in survival.

Conclusions: Gross tumor invasion may necessitate facial nerve sacrifice, however, nerve preservation in patients with close/attached tumors had similar survival outcomes as patients without nerve involvement. There may be a select subset of patients with favorable outcomes after nerve preservation surgery; however additional investigations to define these patients are warranted.

S64. Primary Thyroid Lymphoma in the Setting of Hashimoto's Thyroiditis: A Case Report and Review of the Literature

Beth A. Colombo, BA, Worcester, MA; Elizabeth A. Guardiani, MD, Washington, D.C.; Bruce J. Davidson, MD FACS, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation, pathophysiology, diagnosis, and treatment of primary thyroid lymphomas as well as the role of rituximab in the chemotherapeutic regimen.

Objectives: To present a case of primary thyroid lymphoma in the setting of Hashimoto's thyroiditis and to review the relevant literature. **Study Design:** Case report and literature review. **Methods:** The patient chart was reviewed and a literature search was performed. **Results:** A 57 year old man with a three month history of Hashimoto's thyroiditis presented with a rapidly enlarging neck mass, dysphagia, and shortness of breath intermittently when lying flat. CT showed a 7 x 4.7 x 9 cm hypodense, heterogeneous thyroid mass causing tracheal deviation. There were multiple enlarged and necrotic lymph nodes levels II through VI with additional nodes in the superior mediastinum. Subsequent FNA was nondiagnostic. In the OR, the surgeons excised a superficial lymph node in the right posterior neck and performed a core needle biopsy of the thyroid using ultrasound guidance; pathology from both combined with a further staging workup showed stage IIE diffuse large B cell lymphoma (DLBCL). A review of the literature revealed that the majority of patients with primary thyroid lymphoma have evidence of Hashimoto's disease. The prognosis and treatment depend on the stage and histologic subtype of lymphoma. For DLBCL, multimodality therapy with rituximab and chemotherapy (CHOP) with or without radiation is the standard treatment approach. **Conclusions:** In conclusion, primary thyroid lymphoma is a rare malignancy that can occur in the setting Hashimoto's thyroiditis. Although the efficacy of rituximab in the treatment of thyroid lymphoma has yet to be elucidated in large scale studies, it is a promising addition to the treatment of aggressive thyroid lymphoma.

S65. Body Mass Index and Thyroid Disease Prevalence from 1988-1994 to 2007-2008 in the United States

E. Ashlie Darr, MD, New York, NY; Guo-pei Yu, PhD, New York, NY; Nancy Y. Lee, MD, New York, NY; Helen Yoo Bowne, MD, New York, NY; Stimson P. Schantz, MD*, New York, NY; Edward Shin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the prevalence of thyroid disease and its relationship with the trend toward increasing obesity.

Objectives: Obesity has been recognized as a risk factor for thyroid cancer and its rate has doubled in the U.S. since the 1980s. However, its influence on the increased trend of thyroid cancer and thyroid disease during the same time period remains unclear. The objective of this study was to examine the association between body mass index (BMI) and thyroid disease prevalence over the last 20 years. **Study Design:** Cross-sectional study. **Methods:** Using the National Health and Nutritional Examination Survey data, we analyzed 40155 participants aged 12 years or older, to examine thyroid disease prevalence among 1988-1994, 1999-2002 and 2007-2008 cohorts according to BMI. Robust Poisson model was used to adjust for potential confounders. **Results:** The obesity rate increased from 22.9% in 1988-1994 to 32.1% in 2000-2008. Five year cumulative prevalence rate of thyroid disease increased by 99.2% during the past 20 years, which was 1.24% in 1988-1994 and 2.54% in 2007-2008, after adjustment for age, gender and race. Increased prevalence was seen in all but the lowest BMI levels. The increase was largest in BMI 20.1-25.0 (normal weight, 229.4%) while it was moderate in BMI 25.1-30.0 (overweight, 79.9%) and in BMI>30 (obese, 51.8%). Thyroid disease prevalence was also found to increase with increased BMI in each time period (all p<0.05). **Conclusions:** Obesity and thyroid disease prevalence both have significantly increased with time in the U.S. population. However, thyroid disease prevalence has increased significantly among people with normal weight as well. Further study is required to elucidate the relationship between BMI and thyroid disease.

S66. Primary Sclerosing Paraganglioma of the Thyroid: A Case Report

Raj C. Dedhia, MD, Pittsburgh, PA; John Evankovich, BS, Pittsburgh, PA; Jacinthe Chenevert, MD, Pittsburgh, PA; Mitchell Tublin, MD, Pittsburgh, PA; Jonas T. Johnson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the entity "sclerosing paraganglioma" and explain its radiographic and pathologic characteristics.

Objectives: Paragangliomas are neuroendocrine tumors derived from extra-adrenal paraganglionic cells of the autonomic nervous system. Paragangliomas of the thyroid are rare with only 28 cases reported in the literature. To our knowledge, the sclerosing paraganglioma variant, characterized by marked stromal sclerosis and hyalinization, has not been reported presenting as a primary thyroid mass. **Study Design:** Case report. **Methods:** The patient is a 36 year old female with a history of a 1 cm vagal schwannoma followed with serial MRI's presenting with a new solitary 2.5 cm enhancing soft tissue mass in the left thyroid. **Results:** Ultrasound examination of the thyroid revealed a hypoechoic, hypervascular, malignant appearing mass, and FNA was insufficient for diagnosis, revealing lesion of undetermined significance and indeterminate molecular testing. A diagnostic left thyroid lobectomy was performed and pathology revealed a lesion consistent with a sclerosing paraganglioma. **Conclusions:** Sclerosing paragangliomas are rare tumors, and a case involving a primary thyroid mass has not been reported in the literature. While the sclerosing variant has features

suggestive of malignancy, the true incidence is unknown given the rarity of their presentation.

S67. Nasal Septal Adenoid Cystic Carcinoma: Case Report and Review of the Literature

Anthony G. Del Signore, MD, New York, NY; Jaymarc Iloreta, MD, New York, NY; Eunice Park, MD, New York, NY; William Lawson, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation and diagnostic workup for adenoid cystic carcinoma (ACC) affecting the nasal septum, as well as treatment strategies available for its management.

Objectives: 1) Understand the presentation and diagnostic workup for adenoid cystic carcinoma; and 2) be able to discuss the unique and distinguishing features of adenoid cystic carcinoma. **Study Design:** Case report and review of the primary literature.

Methods: We present a case of a 70 year old female with complaints of blurred vision for several months. An MRI was performed at an outside hospital showing a 1.5 cm lesion on the middle superior septum. Nasal endoscopy revealed a spherical enlargement of the middle superior septum primarily on the right. A biopsy was performed and ACC was diagnosed. A PET CT obtained was pertinent for a localized increased FDG uptake (SUV max 3.7) in the anterior nasal septum measuring 1.8cm. Considering these findings the patient underwent a right lateral rhinotomy and subtotal septectomy with the recommendation to receive postoperative radiation therapy. **Results:** The surgical specimen was consistent with adenoid cystic carcinoma without bony or cartilaginous invasion and revealed clear margins. Review of the literature revealed that this entity is exceedingly rare, with only 3 described cases reported in the English literature, and the only one that presented with visual disturbances. **Conclusions:** Adenoid cystic carcinoma of the septum is a rare entity, as discovered in our literature search. Although rare, it should be considered in the differential diagnosis of a nasal septal mass. Treatment options should include wide local excision and postoperative radiation treatment.

S68. Intraoperative Recurrent Laryngeal Nerve Monitoring in Thyroid Surgery. Is it Worth the Cost?

Adil A. Fatakia, MD MBA, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate their understanding of the intraoperative laryngeal monitoring system. They should also be able to discuss all costs that are encompassed in intraoperative monitoring. Finally, comparison of the overall cost of intraoperative monitoring and time saved using the system should allow viewers to come to their own conclusion regarding the cost effectiveness of intraoperative nerve monitoring in thyroid surgery.

Objectives: To assess the cost effectiveness of intraoperative recurrent laryngeal nerve monitoring in thyroid surgery. **Study Design:** Retrospective chart review and review of duration of surgery from a single surgeon with and without utilization of intraoperative nerve monitoring in thyroid surgery. **Methods:** To assess the cost effectiveness of the monitoring system we compared the duration of total thyroidectomies and thyroid lobectomies from a single surgeon with and without the aid of intraoperative nerve monitoring. The means and medians of the data were compared before and after implementation of monitoring system. Using this data as well as standard OR costs/minute at our institution, differences in operating room costs were calculated. The differences in OR cost was then compared to cost of intraoperative monitoring. **Results:** Median (mean) 55 lobectomy without NIM=81 (78) mins; 21 lobectomy with NIM=82 (84) mins; 33 total thyroid without NIM=106 (102) mins; 10 total thyroid with NIM=84 (92) mins. EMG Contact ETT - \$285; Prass Stimulator Probe - \$510 bx/5 = \$102 ea; OR Costs - Level 2 - \$2,908 first 15 minutes; \$783 every 15 after that.

Conclusions: The cost effectiveness of intraoperative nerve monitoring at our institution is inconclusive. The time advantage when performing lobectomies did not meet the cost of the system. However, when comparing total thyroidectomies, both the mean and median data showed a cost advantage with the use of intraoperative monitoring. While previous literature has proven distinct advantages in using the intraoperative monitoring system in revision and malignant thyroid surgery, there is no record of cost analysis. Our data, while limited in power, is the first of its kind to our knowledge.

S69. Hypopharyngeal Paraganglioma: A Case Report and Review of the Literature

Tova C. Fischer, MD, New York, NY; Vikas Mehta, MD, New York, NY; Mark L. Urken, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the nature, development, and histologic characterization of neuroendocrine tumors of the head and neck, as well as be able to discuss the difference between and compare paraganglioma and other tumors of neural crest origin.

Objectives: Paragangliomas are rare, highly vascular, and predominately benign neoplasms of neural crest origin. In the head and neck, they usually develop from the carotid body, jugulotympanic, or vagal paraganglia. Rare cases of laryngeal paragangliomas have been reported; these tumors are believed to arise from the superior or inferior laryngeal paraganglia that course with the superior or recurrent laryngeal nerves, respectively. To date, only two cases of paragangliomas in the hypopharynx have been reported. We present an additional case of a hypopharyngeal paraganglioma and a review of the literature concerning laryngopharyngeal paragangliomas. **Study Design:** Case report and review of the literature. **Methods:** We present the case of a 51 year old woman with 2 months of odynophagia, dysphagia and hoarseness that was found to have a hypopharyngeal paraganglioma. **Results:** The patient underwent embolization and successful resection of the hypopharyngeal mass via a lateral thyrotomy approach. Pathologic analysis, including microscopy and immunohistochemistry, confirmed the presence of a paraganglioma. **Conclusions:** The proper histopathologic identification of these tumors is tantamount to guiding treatment as they can easily be confused with more aggressive

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neuroendocrine neoplasms. The preferred operative approach is preoperative embolization with a lateral thyrotomy in order to minimize patient morbidity. We present the third documented case of a hypopharyngeal paraganglioma and the first in the English literature.

S70. Anti-CD147 Inhibits Proliferation by Down Regulation of EGFR in Cutaneous Squamous Cell Carcinoma

John W. Frederick, BS, Birmingham, AL; Larissa Sweeny, MD, Birmingham, AL; Yolanda E. Hartman, BS, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to have a better understanding of CD147 and its role in cutaneous squamous cell carcinoma.

Objectives: Investigate the molecular pathway behind anti-CD147 treatment in cutaneous squamous cell carcinoma (cSCC). **Study Design:** Pre-clinical investigation. **Methods:** Cutaneous squamous cell carcinoma cell lines, Colo-16, SRB-1, and SRB-12, were treated with a range of chimeric anti-CD147 mAb (0, 50, 100, 200 µg/mL) doses or transduced with a small interfering RNA (siRNA) against CD-147. In vitro cell proliferation, migration, and protein expression was then quantified. **Results:** In response to anti-CD147 mAb treatment, there was a significant decrease in proliferation, with an average of 78% of control (P-value for Colo-16, SRB-1, and SRB-12: 0.06, 0.06, 0.003). The wound assay demonstrated a decrease in cell migration, averaging a 43% reduction in closure when compared to untreated (P-value for Colo-16, SRB-1, and SRB-12: < 0.001). Colo-16 cells silenced for CD147 expression demonstrated similar reduction in proliferation and delay wound closure. In vitro phenotype in response to anti-CD147 therapy resulted in reduction in EGFR expression. A significant decrease in EGFR expression by immunofluorescence and western analysis was observed in response to loss of CD147 signaling, which was mirrored by a decrease in downstream expression of BAD and AKT. **Conclusions:** Loss of CD147 function results in a suppression of the malignant phenotype in vitro which may be a result of decreased EGFR expression and AKT pathway activation.

S71. Disfigurement Perception, Quality of Life, and Mental Health in the Post-Treatment Head and Neck Cancer Patient

Christopher Edward Fundakowski, MD, Miami, FL; Enrique Perez, MBA, Miami, FL; Angelica Melillo, BA, Miami, FL; Rachel Libby, BA, Miami, FL; Christina Pozo, PhD, Miami, FL; Zoukaa Sargi, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the relationships between observer rated disfigurement, patient rated measure of body apperception, and quality of life measures.

Objectives: Evaluate the relationship of body image perception, disfigurement, and anxiety/depression with quality of life one year after treatment in head and neck cancer patients. **Study Design:** Cross-sectional study, academic, tertiary referral center. **Methods:** One hundred patients (n=100) with a diagnosis of head and neck cancer at least one year status post completion of definitive therapy completed a series of patient administered intake questionnaires (demographic/medical history/cancer variables, Functional Assessment of Cancer Therapy [FACT, FACT-HN], Washington Quality of Life Survey, Hospital Anxiety and Depression Survey [HADS], and measure of body apperception [MBA]). A single physician completed an observer rated disfigurement scale for all patients (n=100) at the time of enrollment. **Results:** Patients with higher scores for body integrity and appearance reported both lower quality of life (p=0.0001) and higher anxiety/depression scores (p=0.0001). This correlation was noted to be strongest in Hispanics. Patients treated with surgery had higher anxiety/depression scores than nonsurgical therapy. Patients with the highest anxiety/depression scores did not correlate to the highest physician rated disfigurement scores. **Conclusions:** One year post cancer treatment, patients who place greater value on personal appearance and a sense of body integrity are noted to have lower quality of life scores and increased levels of anxiety/depression. The most anxious/depressed patients in this group were not the most physically disfigured, but placed high emphasis on importance of body integrity/appearance. Therefore a high index of suspicion needs to remain for all post treatment head and neck patients, not only the most physically disfigured.

S72. Oropharyngeal Squamous Cell Carcinoma Presenting as a Humerus Mass

David J. Gerth, MD, Memphis, TN; Glenn B. Williams, MD, Memphis, TN; Michael G. Martin, MD, Memphis, TN; Robert K. Heck Jr., MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the typical natural history of oropharyngeal squamous cell carcinoma (OPSCC) and the change in its pathophysiology caused by the rise in HPV associated OPSCC.

Objectives: Discuss this unusual presentation of oropharyngeal squamous cell carcinoma (OPSCC) and its relation to the changing trends in natural history of OPSCC due to HPV (human papillomavirus). **Study Design:** Case report. **Methods:** Biopsy of a humerus mass proved to be SCC. A full head and neck evaluation revealed a base of tongue mass, which was positive for SCC as well. Immunohistochemical analysis was performed on both specimens, including cytokeratin, p63, and p16. **Results:** Immunohistochemistry performed on both the humerus and the base of tongue lesion revealed that both lesions were SCC, positive for cytokeratin 5/6, p63, and p16. **Conclusions:** HPV positive OPSCC has a unique pathophysiology, as demonstrated by this case report. Further investigation into the pathogenesis of HPV positive OPSCC is needed to elucidate the mechanisms of this unusual clinical behavior.

S73. Utility of PET-CT Imaging in the Surgical Management of Cervical Lymph Nodes in Recurrent Laryngeal Cancer

Mark R. Gilbert, MD, Pittsburgh, PA; Barton F. Branstetter IV, MD, Pittsburgh, PA; Seungwon Kim, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the relative merits of PET-CT imaging in the preoperative evaluation of cervical nodal disease in recurrent laryngeal cancer.

Objectives: Standard therapy for laryngeal cancer involves either surgery or, more commonly in advanced laryngeal cancer, radiation with or without chemotherapy for organ preservation. Patients with recurrence are then offered salvage laryngectomy with bilateral neck dissection; however there are multiple complications of neck dissection in the previously irradiated neck, including poor wound healing and increased potential for fistula. PET/CT may have the ability to spare some of these patients from the morbidity of unnecessary neck dissections if it can reliably exclude recurrent nodal disease. The purpose of our study was to determine whether preoperative PET/CT could correctly predict which patients with locally recurrent laryngeal cancer had additional nodal disease.

Study Design: Retrospective review. **Methods:** A review of our head and neck tumor registry revealed 269 patients with recurrence of laryngeal cancer over a more than 20 year period. Out of this pool, we identified 15 patients who had PET/CT scans prior to neck dissections for recurrent laryngeal cancer. **Results:** Five patients with negative neck pathology had accurate PET/CT reads (100% specificity). Similarly, seven patients that had a PET/CT read positive for cervical disease all had pathologically positive nodes (100% PPV). However, three patients who had PET/CT reads that were negative had positive nodal pathology, giving a sensitivity of 70% and a 62.5% NPV. **Conclusions:** We believe that this false negative rate is too high to warrant deferring neck dissection based on PET/CT, and we recommend that patients who are clinically N0 for recurrent laryngeal cancer be offered neck dissection along with salvage laryngectomy.

S74. Xanthogranulomatous Sialadenitis of the Parotid Gland: A Clinical and Radiographic Mimic of Malignancy

Lori M. Guillot, MS, New Orleans, LA; Christian P. Hasney, MD, New Orleans, LA; Christina J. Yang, MD, New Orleans, LA; Enrique Palacios, MD, New Orleans, LA; Philip J. Daroca, MD, New Orleans, LA; Paul L. Friedlander, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical, radiographic, and histopathological features of xanthogranulomatous sialadenitis, a rare disorder that can mimic malignancy.

Objectives: We aim to describe the clinical, radiographic, and histopathological features of a rare benign disease of the parotid: xanthogranulomatous sialadenitis. **Study Design:** Case report. **Methods:** A retrospective chart review of a patient who was diagnosed with xanthogranulomatous sialadenitis after undergoing a parotidectomy. **Results:** A patient presented with a parotid mass and marginal mandibular nerve weakness suspicious for malignancy. Although the fine needle aspiration was inconclusive, computed tomography images revealed a right parotid lesion with irregular, spiculated borders and heterogeneous density. The patient underwent a total parotidectomy with facial nerve presentation. Final pathology revealed xanthogranulomatous sialadenitis. Several weeks after surgery, the patient regained complete facial nerve function. **Conclusions:** Xanthogranulomatous sialadenitis is a rare, benign condition of the parotid gland. The clinical, cytological, and radiographic presentation may mimic malignancy. Though rare, the astute clinician should consider xanthogranulomatous sialadenitis in the differential diagnosis of parotid lesions with aggressive features.

S75. Contemporary Recognition of Primary Thyroid Lymphoma

Brian L. Hendricks, BS, Cincinnati, OH; Christine H. Heubi, MD, Cincinnati, OH; David L. Steward, MD*, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the importance of open biopsy when exploring a differential that includes primary thyroid lymphoma.

Objectives: To address current methods for the recognition and diagnosis of primary thyroid lymphoma in patients with a rapidly growing thyroid mass, including the shortcomings of fine needle aspiration biopsy (FNAB). **Study Design:** Chart review. **Methods:** Case series and literature review. **Results:** Four patients who presented with a rapidly growing thyroid mass over the past year were found. Three patients were diagnosed with thyroid lymphoma and one with anaplastic thyroid carcinoma (ATC). The first patient had FNAB that revealed atypical follicular cells, ultimately requiring isthmusectomy for a diagnosis of diffuse large B cell lymphoma (DLBCL). A second patient had an intraoperative aspirate which was suspicious for non-Hodgkin's lymphoma, requiring wedge resection to reach the diagnosis of DLBCL. Our third patient was diagnosed with mantle cell lymphoma by use of endotracheal biopsy, without the use of FNAB. The fourth patient was diagnosed with ATC by surgical biopsy. Upon literature review, one study of the diagnosis of thyroid lymphoma by FNAB demonstrated a positive predictive value of 97.1%. However, the rate of false-negatives has varied from 12.5%-40% across several studies. **Conclusions:** The reported high specificity of FNAB adds apparent value to a positive specimen, but the inconsistent results and overall poor sensitivity suggest that the majority of patients with a rapidly growing thyroid mass should ultimately undergo surgical biopsy. Given that thyroid lymphoma patients treated with chemoradiation have demonstrated an overall 5 year survival of 50-90%, it is important to realize the limitations of FNAB and consider open biopsy in any patient in which thyroid lymphoma is in the differential.

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S76. Chronic Invasive Aspergillosis of the Skull Base

Kenneth C. Iverson, MD, Augusta, GA; C. Arturo Solares, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss chronic invasive aspergillosis of the skull base and the treatment option of oral antifungal therapy.

Objectives: The objective of this case presentation is to discuss a case of chronic invasive aspergillosis of the skull base in a non-immunocompromised patient treated conservatively with oral antifungal medication. **Study Design:** Case report. **Methods:** A case of chronic aspergillosis of the skull base presenting as a skull base mass and treated conservatively at a tertiary referral, academic medical center was reviewed and described. **Results:** An 82 year old non-immunocompromised male presented with right occipital pain and a skull base mass to the head and neck tumor board. Nasopharyngoscopy and imaging demonstrated a right nasopharyngeal mass with extension to the clivus. Surgical biopsy revealed chronic invasive aspergillosis. Due to the patient's advanced age and poor cardiopulmonary health, he was treated conservatively with oral voriconazole and followed for one year. Serial imaging and nasopharyngoscopy over the course of a year demonstrated resolution of the nasopharyngeal and clival mass. **Conclusions:** Chronic invasive aspergillosis of the nasopharynx and skull base in a non-immunocompromised patient can be treated conservatively with oral antifungals.

S77. Primary Squamous Cell Carcinoma of the Lung Presenting as a Submandibular Gland Mass

Kenneth C. Iverson, MD, Augusta, GA; Lana L. Jackson, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss a rare presentation of primary squamous cell carcinoma of the lung in a submandibular gland mass.

Objectives: The objective of this case presentation is to present a rare case of primary squamous cell carcinoma of the lung presenting as a submandibular gland mass. **Study Design:** Case report. **Methods:** A rare case of lung squamous cell carcinoma presenting as a submandibular gland mass at a tertiary referral, academic medical center was reviewed and described. **Results:** A 70 year old male presented with a right sided submandibular mass for which fine needle aspiration was performed and found to contain poorly differentiated carcinoma favoring squamous cell carcinoma. Preoperative neck imaging revealed a left clavicular mass that was sampled with fine needle aspiration during the right neck dissection and demonstrated morphologically identical cells to the submandibular specimen and features consistent with a lung primary. Direct laryngoscopy demonstrated no head and neck primary, and further imaging revealed a left lower pulmonary lobe mass and widely metastatic disease. **Conclusions:** Infraclavicular metastases to the submandibular gland parenchyma are rare but may occur and should be considered if no evidence of head and neck primary is found.

S78. Methods for Early Oral Cancer Detection: A Meta-Analysis

Jon P. Jennings, BA, Charleston, SC; Shaun A. Nguyen, MD, Charleston, SC; Terry A. Day, MD, Charleston, SC; M. Boyd Gillespie, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss common techniques for early oral cancer detection; and 2) determine the relative effectiveness of early oral cancer detection methods compared to the gold standard of tissue biopsy.

Objectives: Determine the effectiveness of early oral cancer detection methods compared to the gold standard of tissue biopsy. **Study Design:** Systematic review and meta-analysis. **Methods:** A search of the Cochrane database and Medline (2001-2011) was performed. Papers meeting inclusion were available in the English language, had greater than 10 patients in the study, and compared the method of detection technique to incisional tissue biopsy. **Results:** Seventeen articles evaluating early oral cancer detection methods were included. The papers evaluated a total of 2188 oral cavity sites in 1379 patients. The methods of oral cancer detection included vital staining techniques (8 studies), light refraction methods (10 studies), and brush biopsy (1 study). The overall weighted sensitivity and specificity for early detection methods combined was 82% (95% C.I., 75-92%) and 68% (95% C.I., 55-82%) respectively. The positive predictive value was 60% (95% C.I., 54-79%), whereas the negative predictive value was 78% (95% C.I., 65-91%). Among detection methods, vital staining techniques compared most favorably to tissue biopsy. **Conclusions:** Current early detection methods are subject to a high rate of false negatives and positives and therefore are not a substitute for tissue biopsy. The cost of the techniques may only be justified in situations where tissue biopsy is not immediately available or when the best site to biopsy is not readily apparent by visual inspection alone.

S79. Transoral Robotic Surgery to Resect Skull Base Tumors via Transpalatal and Lateral Pharyngeal Approaches

Grace G. Kim, MD, Chapel Hill, NC; Adam M. Zanation, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential advantages and current limitations in using transoral robotic surgery to access the skull base.

Objectives: To discuss feasible approaches using transoral robotic surgery (TORS) to access the skull base and describe a novel approach for nodal dissection in the retropharyngeal space. **Study Design:** A case series at a tertiary academic center. **Methods:**

The da Vinci Robotic Surgical System (Si) was used for complete resection of four skull base tumors. Two pleomorphic adenomas in the parapharyngeal space, one pleomorphic adenoma in the infratemporal fossa and one metastatic papillary thyroid cancer node in the high retropharyngeal nodal basin were resected. A transpalatal approach was used to access the infratemporal fossa (n=1) and retropharynx (n=1). Lateral pharyngotomies were performed to access parapharyngeal spaces (n=2). All mucosal incisions were closed primarily. **Results:** TORS allowed for visualization of the internal carotid arteries and cranial nerves and adequate exposure for complete resection in all patients. There were no intraoperative arterial injuries or other complications. Postoperatively, one patient experienced an episode of transient Horner's syndrome which resolved spontaneously. There were no cranial neuropathies and no cases with velopharyngeal insufficiency. All patients regained normal swallowing function within 5 days of surgery. Postoperative imaging (MRI in 3 patients and I-123 in 1 patient) confirmed complete resection. No cases of recurrence were found within short followup (8-14 months). Advantages, limitations and specific surgical pearls from this series will be discussed. **Conclusions:** Novel approaches using transoral robotic surgery offers potential for safe and successful resection of skull base tumors. Future advances will include new technology and better understanding of skull base anatomy via the TORS approaches.

S80. Diagnostic Considerations in Metastatic Breast Carcinoma to the Masseter Muscle: A Case Report
 Yeunjung Kim, BS, Miami, FL; Richard J. Vivero, MD, Miami, FL; Jason M. Leibowitz, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss diagnostic considerations in metastatic breast carcinoma to the masseter muscle.

Objectives: Metastatic breast carcinoma to the masseter muscle is extremely rare, with only 2 reported cases in the literature. A 60 year old Hispanic woman was diagnosed with infiltrating breast carcinoma in May 2002. She further developed metastatic lesions to the face, bone, and liver and was treated with radiation therapy. Five years later the patient presented with progressively enlarging facial mass, which was confirmed to be breast carcinoma in the masseter muscle. **Study Design:** N/A. **Methods:** N/A. **Results:** N/A. **Conclusions:** Diagnosis of metastatic lesions in the masseter muscle can be especially challenging. We discuss the value of different diagnostic modalities in diagnosis of this rare lesion.

S81. A Case Report of Invasive Squamous Cell Carcinoma (SCC) Arising in a Verrucous Carcinoma (VC)
 Adam J. Kimple, PhD MS, Chapel Hill, NC; Myriam Loyo, MD, Baltimore, MD; Jason Y.K. Chan, MBBS, Baltimore, MD; Young Kim, MD PhD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential for invasive SCC arising within VC and treatment options for VC arising in the glottis.

Objectives: VC is typically a well differentiated, slow growing, noninvasive variant of SCC that is characterized by exophytic growth of keratinizing epithelium. There are several case reports of malignant transformation of VC following radiotherapy; however, only one report exists of transformation de novo in the head and neck. Here we report an additional patient who was found to have invasive SCC arising in VC. **Study Design:** Case report. **Methods:** Patient is a 58 year old male who has a 40 pack year smoking history and a 2 year history of an exophytic laryngeal lesion. A direct laryngoscopy demonstrated that the exophytic mass extended laterally to the left arytenoid and inferiorly to the cricoid cartilage. CO2 laser with excision at that time revealed a VC. **Results:** For definitive management of this lesion, the patient underwent a total laryngectomy and left selective neck dissection (II-IV) with pathology demonstrating an invasive SCC arising within a VC. **Conclusions:** While an uncommon occurrence, our case report of invasive SCC arising out of a non-irradiated VC lesion is a poignant reminder that rigorous attention must be paid to the histological examination of VC lesions and one must be cognizant of the possible malignant transformation of this classically noninvasive lesion as the diagnosis of invasive SCC within a VC lesions will alter management.

S82. Transoral Robotic Surgery (TORS) for Resection of a Lingual Thyroglossal Duct Cyst (TGDC)
 Adam J. Kimple, PhD MS, Chapel Hill, NC; Steven J. Eliades, MD PhD, Baltimore, MD; Jeremy D. Richmon, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss a novel surgical procedure for the excision of lingual TGDC.

Objectives: TGDC is the most common midline mass in the upper part of the neck. It is classically removed using the Sistrunk procedure, an open procedure that includes removal of the hyoid bone and possibly a portion of the base of tongue. Purely lingual TGDCs are rare and classically treated by either formal Sistrunk procedure or transoral endoscopic resection. These lesions lend themselves favorably for a transoral robotic surgical resection. We report the first described excision of a lingual TGDC using TORS. **Study Design:** Case report. **Methods:** A TORS resection of a TGDC presenting as a base of tongue mass in a 45 year old woman is reported. **Results:** A 45 year old woman was referred for complaints of sore throat, globus and throat clearing. Flexible fiberoptic laryngoscopy revealed a 2 x 1.5 cm cystic appearing mass, left of midline in the vallecula. The mass was suspected to be a vallecular cyst. The mass was removed in its entirety robotically via a transoral approach. The patient tolerated the procedure without complications and was discharged on POD#1 tolerating a liquid diet. Histological examination demonstrated a cyst lined by ciliated columnar epithelium consistent with a TGDC. **Conclusions:** To our knowledge this is the first report of a TORS resection of a lingual

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TGDC. These are rare presentations for TGDCs and lend themselves favorably to a transoral robotic approach. We believe this is the least invasive method to manage these lesions.

S83. Case Report of a Radiographically Occult Foreign Body in the Retropharynx: A Diagnostic Surprise

Anita Konka, MD MPH, Brooklyn, NY; Joshua B. Silverman, MD PhD, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how large foreign bodies in the retropharynx may remain occult and appreciate how history, physical exam, and imaging are used to guide the diagnosis and management of a retropharyngeal foreign body that is undetectable on plain film radiography.

Objectives: To present an unusual case of a large penetrating plastic foreign body in the retropharynx and discuss how CT imaging was used to guide diagnosis and surgical exploration. **Study Design:** Case report with brief literature review. **Methods:** We present the pertinent history and physical examination, discuss radiographic images, and describe surgical technique and intraoperative findings. **Results:** We present the first reported case of an impacted toothbrush in the retropharynx. A 27 year old male with schizoaffective disorder presented to the ER with odynophagia, dysphagia and left neck pain. He reported ingestion of a toothbrush in an attempt to cause bodily harm. Fiberoptic exam showed a left oropharyngeal bulge without gross evidence of mucosal violation. Routine PA and lateral plain films were negative for foreign body, pneumothorax or subcutaneous emphysema. CT imaging revealed an 11 cm foreign body wholly impacted in the retropharyngeal soft tissues. The patient underwent surgical exploration and intraoral removal of an 11cm plastic toothbrush handle from the retropharynx. **Conclusions:** Accurate and timely diagnosis and treatment of a retropharyngeal foreign body is critical to preventing complications such as retropharyngeal abscess and mediastinitis. Initial workup should include history, physical exam and radiography. When clinical suspicion for an impacted foreign body remains high despite negative plain films, CT imaging can be used to detect otherwise occult plastic foreign bodies in the retropharynx and guide surgical exploration. To our knowledge, this case describes the largest reported occult plastic foreign body to be removed from the retropharynx without complications.

S84. Incidental Recurrent Laryngeal Nerve Schwannoma: Treatment Considerations for this Asymptomatic Finding

Shayanne A. Lajud, MD, Boston, MA; Linda N. Lee, MD, Boston, MA; Harrison W. Lin, MD, Boston, MA; William C. Faquin, MD PhD, Boston, MA; Michael T. Jaklitsch, MD, Boston, MA; Paul Konowitz, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical, radiographic, and histopathologic features of recurrent laryngeal nerve schwannoma, as well as the workup and treatment considerations for this rare, often asymptomatic, entity.

Objectives: To review the presentation, natural history, and diagnosis of recurrent laryngeal nerve (RLN) schwannomas, and to consider the implications of various treatment options. **Study Design:** Case report and literature review. **Methods:** Retrospective review of a case of recurrent laryngeal nerve schwannoma. Surgical, radiographic, and histopathologic findings are shown and discussed. **Results:** A 56 year old woman presented with elevated serum calcium and parathyroid hormone level consistent with primary hyperparathyroidism. A sestamibi scan was equivocal. Ultrasound revealed a left inferior parathyroid adenoma, as well as an incidental second neck mass. Magnetic resonance imaging characterized a 7.5x3.5x3.5 cm mass in the lower neck extending into the mediastinum. Fiberoptic nasolaryngoscopy showed normal vocal cord function. She underwent successful excision of a left parathyroid adenoma. Further exploration revealed a mass arising from the left RLN. Careful dissection with RLN monitoring allowed for delivery of the mass from the mediastinum and complete resection with nerve preservation. However, at the termination of dissection, only distal stimulation of the RLN resulted in vocal cord movement. Histopathology was consistent with a schwannoma. The patient has persistent vocal cord paresis eight months postoperatively and vocal cord augmentation is planned. **Conclusions:** Schwannomas of the RLN are extremely rare tumors. This is the first case reported in the English otolaryngology literature. Treatment of incidentally found, often asymptomatic schwannomas must be thoughtfully approached with the patient. Given malignant potential, complete surgical excision is the diagnostic and therapeutic treatment of choice. Despite nerve preservation with careful surgical technique, vocal cord paralysis remains a potential complication of tumor resection.

S85. A Case of Renal Cell Carcinoma Metastasis to the Parotid Gland

Claire M. Lawlor, BS, Boston, MA; Richard O. Wein, MD FACS, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the unusual presentation and management of renal cell carcinoma that has metastasized to the parotid gland.

Objectives: To review the presentation and management of renal cell carcinoma metastatic to the parotid gland. **Study Design:** Retrospective chart review. **Methods:** Case report and review of the literature. **Results:** Distant metastasis to the parotid gland is rare. Renal cell carcinoma (RCC) is a neoplasm with a unique metastatic potential to spread to nearly every organ system in the body. There have been 30 reported cases of RCC metastasis to the parotid gland in the English literature. We present a case of a 71 year old male with a parotid mass noted 4 years after undergoing a nephrectomy for RCC. The patient underwent a right superficial parotidectomy with facial nerve monitoring. Pathology yielded metastatic renal cell carcinoma with negative margins. **Conclusions:** While RCC should not be high on the otolaryngologist's differential for all parotid gland masses, it should be considered when patients have a history of RCC. Unfortunately, due to tumor's ready ability to metastasize, the parotid can be the initial clinical pres-

entation of the malignancy. A thorough workup should be performed, as solitary parotid metastases are rare in the literature and other occult sites may coexist. Due to the limited number of cases reported in the literature, clinical outcomes are difficult to predict.

S86. Sebaceous Carcinoma of the Scalp with Rare Involvement of Nodal Metastasis

Brian J. Lawton, MD, Shreveport, LA; Songlin Zhang, MD, Shreveport, LA; Cherie A. Nathan, MD*, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the risk factors of sebaceous carcinoma of the scalp presenting with lymphatic metastasis; and 2) understand the role of PET imaging in these rare tumors.

Objectives: 1) To understand the risk factors of sebaceous carcinoma of the scalp presenting with lymphatic metastasis; and 2) to understand the role of PET imaging in these rare tumors. **Study Design:** Case report. **Methods:** An 83 year old white male presented with a rapidly enlarging 8 cm scalp mass and lymphadenopathy. Biopsy revealed sebaceous carcinoma. CT and PET scans revealed the mass and nodal metastasis. Excision of the lesion with rotational flap closure and posterolateral neck dissection was performed. **Results:** Following excision of the lesion, pathology revealed perineural and lymphovascular invasion and a single occipital lymph node was positive. The patient declined postoperative radiation because of his debilitated condition, but subsequent followup has not revealed any evidence of disease. **Conclusions:** Most sebaceous carcinomas occur in the ocular area, but extraocular sebaceous carcinomas are even rarer. Only seven case studies of sebaceous carcinoma of the scalp have been reported with metastasis to lymphatics noted in one other patient. According to the SEER database for the reported cases of sebaceous carcinoma of the scalp and neck, only 1.7% presented with known regional LN involvement. Of the 7 case reports the only other definite LN met was from a 1cm lesion, suggesting that nodal metastasis is not predictive of size of the primary and PET scans may play a role in this disease.

S87. Customization of the Voice Prosthesis for the Enlarged Tracheoesophageal Puncture: Results of a Prospective Trial

Jan S. Lewin, PhD, Houston, TX; Katherine A. Hutcheson, PhD, Houston, TX; Denise A. Barringer, MS, Houston, TX; Lindsay E. Croegaert, Houston, TX; Asher Lisec, BS, Houston, TX; Mark S. Chambers, BS DMD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the effectiveness of prosthetic customization to prevent leak around the voice prosthesis in laryngectomized patients with an enlarged tracheoesophageal puncture.

Objectives: Customization of the tracheoesophageal voice prosthesis (TVP) is often preferred over surgical closure to prevent aspiration around the TVP in laryngectomized patients with an enlarged tracheoesophageal puncture (TEP), but has not been thoroughly evaluated. Our objective was to evaluate the effectiveness of the addition of an enlarged tracheal and/or esophageal collar to the TVP in patients with leakage around an enlarged TEP. **Study Design:** Single institution prospective trial. **Methods:** A prospective trial was conducted. Immediate effectiveness was defined by the absence of leakage around the TVP immediately after placement. Long term success was defined by the prevention of adverse events related to leakage during the study period. Events that defined failure included: permanent gastrostomy dependence, aspiration pneumonia, and/or surgical TEP closure. Six patients who died of disease were not evaluable for long term outcomes. **Results:** Twenty-one patients with enlarged TEP were enrolled (2003-2006). Insertion of a customized TVP was unsuccessful in 1 patient; 145 customizations were performed in the remaining 20 patients (median: 3.5) during the trial period. Seventy-seven percent (112/145) of customizations prevented leakage immediately after TVP insertion. The most common adverse event was dislodgement of the prosthesis or the collar alone in 18% (26/145) of customized TVP placements. Long term success was achieved in 80% (12/15) of evaluable patients who avoided permanent gastrostomy, aspiration pneumonia, and surgical TEP closure. **Conclusions:** Prosthetic customization offers an effective method to control leakage around the TVP in patients with an enlarged TEP, thereby avoiding surgical closure in this high risk population while preserving tracheoesophageal voice restoration.

S88. Distinct Epidemiologic Characteristics of Oral Tongue Cancer Patients

Ryan J. Li, MD, Baltimore, MD; Wayne M. Koch, MD*, Baltimore, MD; Carole Fakhry, MD MPH, Baltimore, MD; Christine G. Gourin, MD MPH*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to compare epidemiologic characteristics that differ between the subsites of oral cavity cancer. Participants should be able to discuss potential differences in the clinical management of distinct populations at risk for cancer.

Objectives: Oral tongue cancer may have a distinct epidemiological profile from other mucosal neoplasms of the oral cavity. We sought to further define the demographic characteristics associated with oral tongue cancer to determine if unique characteristics exist compared to other oral cavity cancers. **Study Design:** A cross-sectional analysis of patients with a diagnosis of oral cancer was performed using a state database. **Methods:** Discharge data from a state database was queried to perform a cross-sectional analysis of oral cancer cases treated surgically from 1990 through 2009. **Results:** A total of 1,688 oral cancer cases comprised the study population with 719 (42.6%) of cases involving the oral tongue. Tongue cancer comprised 31.6% of oral cancers in black patients and 44.1% of oral cancer in white patients (p=0.011). Racial and gender disparities in oral tongue cancer were identified for age at diagnosis, with significantly fewer black patients under 40 years of age (3.8%) compared to whites (11.3%, P=0.006) and significantly

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more females older than 65 years of age (43.4%) compared to males (30.8%, $P=0.001$). After controlling for all other variables, oral tongue cancer patients were significantly less likely to be over 40 years of age ($OR=0.40$, $p<0.001$), black ($OR=0.54$, $p=0.001$), have Medicare payor status ($OR=0.68$, $p=0.008$) and advanced comorbidity ($OR=0.27$, $p<0.001$), in contrast to other oral cancer subsites. **Conclusions:** The racial and socioeconomic qualities of oral tongue cancer patients differ significantly from other oral cancers. This younger, healthier subgroup of oral cancer patients demonstrates a distinct population at risk for cancer.

S89. The Effect of Diabetes Mellitus on Short-Term Outcomes and Cost of Care after Head and Neck Cancer Surgery

Ryan J. Li, MD, Baltimore, MD; Jeremy D. Richmon, MD, Baltimore, MD; Christine G. Gourin, MD MPH*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to identify patient and healthcare system related factors that influence short term outcomes after head and neck cancer surgery. Participants should be able to discuss the effect of diabetes mellitus on outcomes after head and neck cancer surgery and counsel patients during surgical planning.

Objectives: To examine the effect of diabetes mellitus on postoperative complications, length of hospital stay, cost of care, and short term mortality in head and neck cancer patients, utilizing a large nationwide inpatient database. **Study Design:** Cross-sectional analysis of head and neck cancer surgical patients from a nationwide database. **Methods:** A cross-sectional analysis of 92,312 patients who underwent an ablative procedure for a malignant oral cavity, laryngeal, hypopharyngeal or oropharyngeal neoplasm in 2003-2008 was performed using discharge data from the Nationwide Inpatient Sample. **Results:** Postoperative complications occurred in 11% of cases, with wound complications comprising 44% and postoperative infection comprising 22% of complications. Wound complications were associated with pedicled or free flap reconstruction ($OR=2.0$, $P<0.001$), major surgical procedures ($OR=4.2$, $P<0.001$) and advanced APR-DRG severity of illness scores ($OR=3.2$, $P<0.001$), after controlling for other variables. Advanced comorbidity, urgent/emergent admission, neck dissection, flap reconstruction, hypopharyngeal tumors, Medicaid payor status and major surgical procedures were significantly associated with greater length of hospitalization as well as increased hospital related costs, while Medicare and self-pay payor status and laryngeal tumors were also associated with increased length of hospitalization. No significant association was observed for diabetes, with or without complications, with in-hospital mortality, postoperative complications, length of hospitalization or hospital related costs. However, among patients undergoing flap reconstruction, diabetes was associated with an increased odds of in-hospital death ($OR 2.43$, $P=0.022$). **Conclusions:** Diabetes does not appear to result in an increased incidence of postoperative complications in HNCA surgery; however, in patients undergoing flap reconstruction, diabetes is associated with increased short term mortality.

S90. Subjective and Objective Measures of Dysphagia in Head and Neck Cancer: The Effect of Depression

Brian M. Lin, BA, Baltimore, MD; Heather M. Starmar, MA CCC-SLP, Baltimore, MD; Christine G. Gourin, MD MPH*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the results of subjective and objective measurements of dysphagia in head and neck cancer patients and discuss the influence of depression on subjective results.

Objectives: There is a high incidence of depression in head and neck cancer (HNCA) patients, which is associated with worse perception of quality of life (QOL) and swallowing. We sought to determine if depression was associated with worse swallowing function on objective swallowing evaluation. **Study Design:** Prospective cohort analysis. **Methods:** Two hundred forty-six patients were evaluated with the Beck Depression Inventory Fast-Screen (BDI-FS), University of Washington Quality of Life (UW-QOL) and MD Anderson Dysphagia Inventory (MDADI) questionnaires. Patients who underwent instrumental swallowing evaluation comprised the study population, with swallowing assessed using the Penetration Aspiration Score (PAS). Patients with a preexisting diagnosis of depression were excluded. **Results:** Complete data was available for 46 patients. Depressive symptoms were identified in 15%, with abnormal PAS scores present in 7%. There was a significant correlation between global UW-QOL and overall MDADI scores ($r=0.4$, $P=0.0065$), global UW-QOL and BDI-FS scores ($r=-0.4$, $P=0.0031$), and overall MDADI and BDI-FS scores ($r=-0.3$, $P=0.0257$). No correlation was found between PAS scores and overall MDADI ($r=0.2$, $P=0.1308$), BDI-FS ($r=-0.1$, $P=0.6171$), or global UW-QOL scores ($r=-0.1$, $P=0.4252$). Multivariate analysis demonstrated a significant association between BDI-FS scores and global UW-QOL ($\beta=-5.1$, $P=0.031$) but no significant association was found between PAS scores and MDADI, global UW-QOL, or BDI-FS scores, after controlling for all other variables. **Conclusions:** Depression negatively impacts subjective perception of global QOL and swallowing, but depression and subjective swallowing scores do not correlate with objective swallowing assessment, emphasizing the need for early intervention in patients with depressive symptoms to maximize QOL.

S91. Intramuscular Hemangioma - Presentation of an Unusual Neck Mass

Miguel E. Mascaró, MD, Brooklyn, NY; Krishnamurthi Sundaram, MD*, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate and explain the clinical presentation and radiographic findings of these lesions, giving the audience the ability to adequately discuss the outcomes and possible complications associated with the treatment of choice for this unusual neck mass.

Objectives: Intramuscular hemangiomas pose a difficult challenge in the head and neck region due to their deep location. We report the case of an intramuscular hemangioma deep within the origin of sternocleidomastoid. The objective of the study is to demonstrate

the clinical presentation, radiographic and histologic findings, treatment, possible complications, and outcome of the case presented. **Study Design:** Case report. **Methods:** A 24 year old male who presented with a slow growing mass in the supraclavicular region for 2 years' duration. The patient had incisional biopsy of this mass at another institution, which showed this to be a hemangioma. The patient was subsequently referred to our institution for definitive treatment. He underwent embolization and subsequently taken to the operating theatre for excision of the mass. **Results:** A large mass was felt within the origin of the sternocleidomastoid just superior to the clavicular head. The mass was dissected from all surrounding structures while preserving the integrity of the SCM. Pathology revealed it to be an intramuscular hemangioma. Followup has revealed no recurrence, and there was no morbidity associated with the procedure. **Conclusions:** Intramuscular hemangiomas are exceedingly rare - seen more commonly in the pediatric population within the masseter muscle. A multidisciplinary approach aids in successful treatment of these lesions deep within the musculature of the neck. The differential diagnosis for a neck mass is expansive; radiologic examination is key in this particular case. The treatment of choice is local excision.

S92. Unusual Neck Mass

Miguel E. Mascaró, MD, Brooklyn, NY; Krishnamurthi Sundaram, MD*, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the clinical and radiologic presentations of osteolipomas in the head and neck, thereby being able to correlate how these unusual neck masses may be included in the differential diagnosis.

Objectives: Osteolipomas of the head and neck are extremely rare. We report the case of an osteolipoma independent of bone tissue in the left supraclavicular fossa. The objective of the study is to review the literature, differential diagnosis and pathologic findings associated with osteolipomas of the head and neck. **Study Design:** Case report. **Methods:** A 58 year old female presented with a six month history of a non-tender, fixed mass in the left supraclavicular area. The mass had areas of varying solidity - from soft through firm. Computed tomography revealed numerous areas of calcification; differential diagnosis included lipoma versus liposarcoma versus dermoid. FNA was nonconclusive. The patient was subsequently brought for excision of this mass. **Results:** One large mass was found in the supraclavicular fossa overlying the sternocleidomastoid muscle. With the aid of electrocautery the mass was carefully removed from all surrounding structures which were noted to be extremely adherent. A followup did not show recurrence of the lesion nor any evidence of neurological deficits. Pathology revealed the mass to be an osteolipoma. **Conclusions:** We report a case of osteolipoma in the supraclavicular fossa. Osteolipomas are extremely rare histologic variants of lipomas believed to arise after longstanding lipomas undergo osseous metaplasia. There are fewer than 10 reported cases in the literature over the last decade. Clinicians must realize that osteolipomas in the head and neck region may mimic other neoplasms, both in clinical and radiologic presentation. Local excision is the treatment of choice.

S93. Hepatocellular Carcinoma Metastasis to the Skull Base: A Case Report and Literature Review

Ryan K. Meacham, MD, Memphis, TN; Alok T. Saini, BS, Memphis, TN; Merry E. Sebelik, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss infraclavicular metastases to the skull base with an emphasis on hepatocellular carcinoma (HCC).

Objectives: Present an overview of infraclavicular metastases to the skull base with an emphasis on hepatocellular carcinoma (HCC). **Study Design:** Case report and review of the literature. **Methods:** The chart was reviewed of a patient presenting with HCC metastasis to the skull base. The literature was then reviewed for characteristics of all skull base metastases as well as those containing HCC. **Results:** A 53 year old male presented with left facial swelling, facial numbness, hearing loss, and diplopia. He was found to have a mass originating in the sphenoid sinus eroding through the skull base and extending inferiorly into the infratemporal fossa and parapharyngeal space. Sphenoid sinus biopsy showed findings consistent with HCC, and he was subsequently found to have multiple liver masses. He received palliative chemotherapy. Literature search of infraclavicular metastases to the paranasal sinuses revealed the maxillary sinus is most frequently involved (33% of cases) followed by the sphenoid (22%), ethmoid (14%) and frontal (9%) sinuses. In 22% of cases, multiple sinuses are involved. The most common tumor sites to disseminate to this region are the kidney (40%), lung (9%), breast (8%), thyroid (8%) and prostate (7%). The remaining 28% of cases include multiple miscellaneous sites. HCC in the paranasal sinuses is exceedingly rare and has been reported in only 10 cases, none of which were in North America. **Conclusions:** Infraclavicular metastases to the skull base are varied in origin. HCC to the skull base is exceedingly rare, but must be considered in the differential diagnosis.

S94. Sialolipoma of the Parotid Gland: Case Report with Literature Review Comparing Major and Minor Salivary Gland Sialolipomas

Ryan K. Meacham, MD, Memphis, TN; Sohail Qayyum, MD, Memphis, TN; Merry E. Sebelik, MD, Memphis, TN; Nadeem Zafar, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the theories of etiology of sialolipomas, and compare major and minor salivary gland sialolipomas in regards to their manner of presentation, mode of treatment, and their histopathological differences.

Objectives: To describe sialolipoma of the parotid gland and review the literature for current theories of etiology, manner of presenta-

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tion, treatment, prognosis, and differences between presentations within major and minor salivary glands. **Study Design:** Case report with literature review. **Methods:** The clinical chart was reviewed of a 69 year old male that presented with sialolipoma of the parotid gland. The literature was reviewed to discover presentation patterns, treatments, and prognosis of sialolipomas that have previously been reported in the literature. Analysis was performed comparing differences and similarities of sialolipoma within major and minor salivary glands. **Results:** Including our case, a total of 35 sialolipomas have been reported, 18 found within major salivary glands and 17 within minor salivary glands. Major gland sialolipomas most often presented in the parotid gland (77%) and those from minor glands were most often in the palate (41%). Lesions were well circumscribed and contained mature fat admixed with benign salivary gland components. Ductal dilatation was found within 100% of minor salivary gland sialolipomas but only 28% of major salivary gland sialolipomas. Nerve entrapment has been noted only in major salivary glands (14%) whereas myxoid degeneration has been identified only in minor salivary glands (13%). Treatment is surgical excision. There have been no reports of recurrence. **Conclusions:** Sialolipoma is a rare tumor found within both major and minor salivary glands. They are most often found within the parotid gland and the palate. Diagnosis is made by key histological findings. Treatment is by surgical excision and prognosis is very good.

S95. A Population Based Analysis of Treatment Modality and Survival in Head and Neck Cancer over the Last 30 Years
Vikas Mehta, MD, Pittsburgh, PA; Guopei Yu, MD, New York, NY; Angela Vong, BS, Valhalla, NY; Stimson P. Schantz, MD*, New York, NY; Nancy Y. Lee, MD, New York, NY; Edward J. Shin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the changing trends in treatment modalities for head and neck squamous cell carcinoma (HNSCC) patients over the past three decades. The participants will also be able to compare the improvement in survival of patients treated with radiation alone, surgery alone and combined therapy.

Objectives: To examine different treatment modalities and the impact on survival of head and neck squamous cell carcinoma (HNSCC) patients over the past three decades. To test the hypothesis that changes in smoking rates, increased percentage of HPV related tumors and the advent of intensity-modulated radiation therapy has improved survival in HNSCC, especially in the oropharyngeal subsites. **Study Design:** Retrospective cohort analysis of the Surveillance, Epidemiology, and End-Results (SEER) database of the National Cancer Institute. **Methods:** SEER data focusing on HNSCC were used to design three cohorts: 1980-1984, 1990-1994, and 2000-2008. Different treatment modalities, nonsurgical treatment, surgery and radiation, and surgery alone, were examined and correlated with survival using the Kaplan Meier methods. **Results:** Five year survival consistently improved over time in patients who received radiation alone and combined modality treatments (49.5% $p < .001$ and 31.6% improvement $p < .001$, respectively) in contrast to surgery alone (5.6% change $p < .001$). Improved survival when utilizing radiation was especially pronounced in the HPV related subsites. However, in several of these subsites, surgery demonstrated improved 5 year survival in the 2000-2008 cohort when compared to radiation alone. An increasing trend for the use of radiation and combined modality treatments for oral and oropharyngeal SCCA over the last 30 years versus surgery alone was noted. **Conclusions:** Five year survival in HNSCC patients has improved over the last 30 years, most probably reflecting the advances in radiotherapy techniques, the use of chemotherapy and the increased prevalence of HPV related tumors.

S96. Locoregional Control of Tongue Base Adenoid Cystic Carcinoma with Primary Resection and Radial Forearm Free Flap Reconstruction: A Case Series
Joshua C. Meier, MD, Boston, MA; Derrick T. Lin, MD, Boston, MA; Kevin S. Emerick, MD, Boston, MA; Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate that locoregional control of tongue base adenoid cystic carcinoma with good functional outcomes can be achieved with modern ablative and reconstructive techniques.

Objectives: Although advanced base of tongue adenoid cystic carcinoma (ACC) is associated with distant metastatic disease and poor long term survival, successful locoregional control can have significant benefit. This study evaluates the efficacy and functional outcome of aggressive surgical resection with free flap reconstruction. **Study Design:** Retrospective case series. **Methods:** Three cases of locally advanced ACC of the base of tongue were retrospectively reviewed. **Results:** All patients underwent wide local excision of the primary tumor, neck dissection, radial forearm free flap reconstruction and adjuvant radiation therapy. Average primary tumor size was 3.7cm. Two patients had perineural invasion, and one had cervical lymph node metastases. Average followup was 37 months after finishing adjuvant radiation therapy (range 23 - 48 months). All gastrostomy and tracheotomy tubes were removed after treatment, and all patients are currently taking oral diets. All patients are alive without locoregional recurrence. One patient has biopsy proven metastatic ACC to the lung. Two others are under surveillance for small, asymptomatic pulmonary nodules. **Conclusions:** Traditional treatment of advanced ACC consists of primary surgical resection with adjuvant radiotherapy. Given the natural history of the disease, aggressive resection must be balanced with functional outcomes and a realistic appraisal of long term overall survival. This series demonstrates that patients with advanced tongue base ACC, at high risk for distant metastatic disease, can achieve locoregional control and have good functional outcomes with surgical resection and free tissue transfer.

S97. A Case of Congenital Agenesis of the Common Carotid Artery Associated with an Ectopic Parathyroid Adenoma Mimicking a Carotid Body Tumor

Clara M.C. Olcott, BS, Albuquerque, NM; Jason Y.K. Chan, MBBS, Baltimore, MD; Myriam Loyo, MD, Baltimore, MD; Young Kim, MD PhD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the variable locations of parathyroid glands and the importance and different modalities of preoperative imaging in localizing parathyroid adenomas.

Objectives: To present a unique case of congenital agenesis of the common carotid artery associated with a parathyroid adenoma in the parapharyngeal space, mimicking a carotid body tumor. Furthermore to highlight the diagnostic and technical dilemmas in managing ectopic parathyroid adenomas. **Study Design:** Case report and literature review. **Methods:** Case report of a 75 year old gentleman presenting with primary hyperparathyroidism, with initial 99mTc sestamibi scintigraphy study unable to localize an adenoma. A neck CT with IV contrast revealed a lesion in the left parapharyngeal space. This was presumed to be a possible carotid body tumor that was further characterized by angiography. **Results:** The operative plan was for a parapharyngeal space mass removal and possible 4 gland exploration. Intraoperative PTH normalized following removal of the parapharyngeal spaces mass adjacent to the external carotid artery, that was subsequently found to be a parathyroid adenoma. **Conclusions:** Ectopic parathyroid glands present diagnostic and technical challenges secondary to anomalies in embryological development. Our unique case of an ectopic parathyroid adenoma in the setting of aberrant carotid anatomy highlights the importance of preoperative imaging and an appropriate operative plan in preventing unsuccessful identification of a parathyroid adenoma.

S98. Disparities in Head/Neck Cancer: Assessing Delay in Treatment Initiation

Urjeet A. Patel, MD, Chicago, IL; Tara E. Brennan, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the nature of treatment delay for underserved patient populations, understand some of the causes of this delay, and understand and be able to discuss how this may impact on overall disparity of outcomes for head and neck cancer patients at different medical institutions.

Objectives: Disparities in outcome for head and neck cancer (HNC) treatment are related to diverse factors including tumor stage, socioeconomic status, and treatment compliance. Latency to initiation of therapy may contribute to worse outcomes for underserved populations. Our objective is to measure the interval from diagnosis of HNC to initiation of cancer treatment (DTI) and to identify factors that prolong DTI. **Study Design:** Retrospective review of 150 consecutive patients treated for squamous cell HNC at a tertiary care public hospital between 2005 and 2007. **Methods:** Patient charts were reviewed and relevant data extracted. Timelines were created demonstrating patient progress through treatment. Median times were calculated and bivariate statistical analysis performed (SPSS ver. 16). Patients with insufficient followup were excluded. **Results:** 100 patients were included. Median time to perform biopsy: 8 days; obtain final diagnosis: 14 days; complete staging scans: 18 days; discuss treatment plan: 23 days; initiate therapy: 56 days. Median DTI was 48 days. DTI is prolonged for patients receiving primary radiotherapy compared to surgical therapy, 57 vs. 30 days ($p < 0.001$). Early stage tumors experienced shorter DTI than late stage tumors, 38 vs. 57 days ($p = 0.02$). Presenting with outside biopsy demonstrating HNC also reduced DTI ($p = 0.03$). Obtaining a CT scan in the emergency department was not found to significantly affect DTI. **Conclusions:** DTI is prolonged among HNC patients in this study when compared to previously published treatment intervals. Advanced stage, primary radiotherapy, and need for biopsy prolonged DTI. Future studies should better identify causes of delay, and reduce latency for patients at highest risk for delay.

S99. Utility of Ultrasonography in Evaluating Vocal Cord Mobility after Thyroid and Parathyroid Surgery

Laura Pelaez, MD, New Orleans, LA; Rohan R. Walvekar, MD, New Orleans, LA; Daniel B. Noel, BS, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility in using ultrasound for the evaluation of vocal cord function following thyroid and parathyroid surgery.

Objectives: To determine the utility of ultrasonography (USG) in determining vocal cord function (VCF) following thyroid and parathyroid surgery. **Study Design:** Prospective, observational study. **Methods:** Patients undergoing thyroid and parathyroid surgery by a single surgeon at a tertiary care facility from January 2011 to date were included. Recurrent laryngeal nerve monitoring was used in all procedures. VCF was documented with preoperative fiberoptic laryngoscopy (FL). An immediate perioperative ultrasound examination was performed after extubation. VCF was documented as normal or abnormal. The ultrasonography performed by the attending surgeon or the ENT resident. Postoperative voice and FL in followup examination were documented. **Results:** Nine female patients with a mean age of 52.7 years (range, 34–75) underwent a total of 10 procedures. The procedures included parathyroidectomy (4/10), hemithyroidectomy (5/10), and total thyroidectomy (1/10). 30% were endoscopic video assisted and 70% were open procedures. The preoperative VCF was normal in all 10 patients. In 9 procedures, nerve was localized and stimulated intraoperatively. In one patient undergoing a total thyroidectomy, recurrent laryngeal nerves were identified but had erratic nerve stimulation. Bilateral VCF was normal and visualized without patient discomfort in all patients. The postoperative USG finding correlated with good voice quality and normal bilateral VCF on followup FL. **Conclusions:** USG provides a noninvasive and accurate estimate of VCF immediately after thyroid and parathyroid surgery. USG for VCF assessment is technically easy and can be easily adapted into the practice by physicians in various levels of training and experience.

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S100. Characteristics of Oncocytic Lipoadenoma of the Submandibular Gland

Seth E. Pross, MD, San Francisco, CA; Jolie L. Chang, MD, San Francisco, CA; Christine M. Glastonbury, MBBBS, San Francisco, CA; Annemieke Van Zante, MD, San Francisco, CA; David W. Eisele, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with oncocytic lipoadenoma and describe important clinical and radiographic findings used in diagnosis.

Objectives: To present a rare case of oncocytic lipoadenoma of the submandibular gland. We provide the first description of key radiographic features that suggest the diagnosis and review the clinical and pathologic features of this tumor. **Study Design:** Case report. **Methods:** Case report and literature review. **Results:** Oncocytic lipoadenoma is an extremely rare benign tumor of the salivary glands with very few cases reported in the literature. We present a case of a 70 year old woman with a two year history of a slowly enlarging submandibular mass without other symptoms. Magnetic resonance imaging showed interval growth of a noninvasive, fat containing lesion within the submandibular gland intermixed with areas of heterogeneously enhancing T1 signal. Fine needle aspiration biopsy showed oncocytic cells. The patient then underwent surgical resection of this lesion. Pathology showed a well encapsulated mass composed of a mixture of oncocytes in a glandular pattern and adipocytes consistent with oncocytic lipoadenoma. The lack of acinar components or myoepithelial proliferation and the adjacent normal submandibular gland tissue supported the diagnosis. **Conclusions:** Oncocytic lipoadenoma is a rare benign tumor of the salivary glands with only a few cases reported involving the submandibular gland. Specific radiographic features on MRI coupled with cytopathologic findings can aid the preoperative interpretation and diagnosis. This diagnosis remains an important consideration during the evaluation of salivary gland tumors.

S101. Transoral Robotic Submandibular Gland Removal

John D. Prosser, MD, Augusta, GA; Jimmy J. Brown, MD*, Augusta, GA; Clementino A. Solares, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the transoral approach to remove the submandibular gland and discuss the potential benefits of combining this approach with robotic technology.

Objectives: Submandibular gland excision is traditionally performed via a transcervical approach. While generally regarded as a relatively simple surgical procedure, several complications exist including injury to the marginal mandibular branch of the facial nerve, lingual nerve, hypoglossal nerve, facial artery and a visible neck scar. **Study Design:** The transoral route has the ability to eliminate a cervical scar and decrease risk to several structures. Coincident with the development of the transoral approach, robotic surgery has been gaining popularity in the operative management of early oral cavity, tonsil, and tongue base malignancies. **Methods:** Description of technique and case review. **Results:** A 51 year old female presented to our institution with a 15 year history of recurrent left submandibular gland sialoadenitis. She previously underwent a rhytidectomy with cervicoplasty and was interested in a transoral approach to avoid a cervical incision. Due to a small mandibular arch and limited access to the floor of mouth she underwent a transoral robotic submandibular gland excision without complication. **Conclusions:** Here we present a novel application of the da Vinci surgical robot for transoral removal of the submandibular gland, which is the first to be reported. This application allows transoral access in individuals who previously would have been poor candidates secondary to restricted access to the floor of mouth.

S102. Failed Organ Preservation Strategy for Adult Laryngeal Embryonal Rhabdomyosarcoma

Peter C. Revenaugh, MD, Cleveland, OH; G. Thomas Budd, MD, Cleveland, OH; John F. Greskovich, MD, Cleveland, OH; Joseph Scharpf, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the presentation and evaluation of a rare tumor of the larynx; and 2) describe the current treatment options and recommendations for adult laryngeal rhabdomyosarcoma.

Objectives: To present a case of embryonal rhabdomyosarcoma of the intrinsic laryngeal musculature and discuss the treatment of this rare tumor. **Study Design:** Case report and review of the literature. **Methods:** A 45 year old male presented with a 4 month history of hoarseness. A mass of the posterior glottis was noted on fiberoptic laryngoscopy. Computed tomography indicated a 1.5x2.5 cm laryngeal mass without cartilage involvement. Direct laryngoscopy and biopsy was consistent with embryonal rhabdomyosarcoma involving the interarytenoid muscle. A multidisciplinary tumor board recommended multimodality therapy including total laryngectomy. **Results:** The patient refused surgery and was treated based upon pediatric rhabdomyosarcoma protocols with induction chemotherapy consisting of vincristine, dactinomycin, and cyclophosphamide followed by combined chemoradiation. There was no noted response to chemotherapy and the patient was taken off protocol to increase radiation dose without chemotherapy. 15 weeks following radiation repeat biopsy revealed viable tumor. The patient currently is alive at 6 months post-treatment and continues to refuse surgery. **Conclusions:** Embryonal rhabdomyosarcoma involving the larynx is an extremely rare tumor usually seen in children. There have only been several adult cases reported to date and therefore treatment options are not well described. We present a case of chemoradiation failure in an adult with embryonal rhabdomyosarcoma refusing surgical intervention. Although pediatric tumors can be effectively treated with organ preservation strategies, adult tumors may have a poorer response. Based upon our experience and existing literature regarding adult embryonal rhabdomyosarcoma of the larynx, multimodality therapy including surgical resection should be the treatment of choice.

S103. Black Thyroid Syndrome

Tara L. Rosenberg, MD, Jackson, MS; Christine B. Franzese, MD FAAOA, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the incidence, causes, clinical considerations and histological features of the rare black thyroid syndrome.

Objectives: To review a case study of black thyroid syndrome and discuss its incidence, causes, clinical considerations and histological features noted in published literature. **Study Design:** Case report and literature review. **Methods:** The case of a seventy-five year old male who presented with a left thyroid nodule with calcifications and final diagnosis of multinodular goiter and black thyroid syndrome is reviewed. Clinical history, histology, and literature of previously reported cases of black thyroid syndrome are examined to allow for comparison and discussion of this rare diagnosis. **Results:** The patient's thyroid ultrasound revealed a 1.8 cm heterogeneous solid nodule containing several calcifications. Intraoperative findings during his total thyroidectomy included a diffusely black thyroid gland and a palpable left thyroid nodule. Histology revealed multinodular colloid goiter with cystic changes, fibrosis and osseous metaplasia, and other histological findings consistent with black thyroid. Postoperatively, the patient did well with an uncomplicated course. The patient's medical chart was further reviewed and indicated a prior history of Nocardia species pneumonia requiring several months of minocycline treatment. Review of the literature on this rare black thyroid syndrome revealed this association with minocycline use. **Conclusions:** The black thyroid syndrome is a rare pathological diagnosis that has unique histological features and an association with long courses of minocycline use. The exact pathophysiology and biochemical pathways of this diagnosis are still incompletely understood, but awareness of this disease process is important for appropriate counseling and education of patients.

S104. The Spectrum of Malignant Transformation: A Case Study of Concomitant Intraductal Papillary Mucinous Neoplasm, Extramammary Paget's with Invasion, and Dedifferentiated Papillary Thyroid Carcinoma

William R. Schmitt, MD, Rochester, MN; Michael Rivera, MD, Rochester, MN; Hossein Gharib, MD, Rochester, MN; Jan L. Kasperbauer, MD*, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the role of genomic instability in this patient with rare unrelated tumors, all found to be at different stages of malignant transformation at the time of presentation. An emphasis on transformation of papillary thyroid carcinoma will ensure applicability to the head and neck surgeon.

Objectives: The authors describe the concomitant presentation of three distinct rare neoplasms. This unusual constellation of tumors offers an opportunity to discuss common pathologic features and the role of genomic instability in carcinogenesis. **Study Design:** Case report. **Methods:** N/A. **Results:** A 65 year old male without history of radiation exposure presented with abdominal discomfort. CT disclosed a cystic pancreatic lesion, for which he was referred to our institution. Endoscopic ultrasound guided fine needle aspiration biopsy demonstrated intraductal papillary mucinous neoplasm (IPMN) and an inguinal rash was noted peri-procedurally. Biopsy of the lesion was concerning for pagetoid spread of carcinoma; a PET scan did not identify a genitourinary primary, but did show an intensely FDG avid right thyroid mass. The inguinal extramammary Paget's disease (EMPD) was resected to negative margins and harbored a small focus of invasive adenocarcinoma. The total thyroidectomy specimen consisted of poorly differentiated carcinoma arising in a background of papillary thyroid cancer (PTC). **Conclusions:** Among indolent tumors, PTC exhibits a high rate of genomic instability. Factors restricting progression towards more aggressive disease have not been identified. In the thyroid, BRAF is known to be common among and exclusive to PTCs and the poorly differentiated and anaplastic tumors arising from them. The molecular pathogenesis of invasion in EMPD has not been elucidated, owing to its rarity. Co-occurrence of IPMN and PTC has not been described, despite the tendency of both lesions to form papillary structures. This case illustrates rare synchronous tumors across the spectrum of malignant transformation, motivating further investigation of common molecular mechanisms.

S105. A Perioperative Pathway to Streamline Care for Renal Failure Patients Undergoing Parathyroidectomy

Michael C. Singer, MD, Augusta, GA; David J. Terris, MD*, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize some of the potential difficulties in managing renal failure patients undergoing parathyroidectomy and describe a perioperative protocol that might facilitate their care.

Objectives: Patients undergoing surgery for hyperparathyroidism secondary to renal failure often experience profound hypocalcemia following surgery necessitating prolonged inpatient management. In an effort to optimize their care and mitigate the severity of these sequelae our institution developed and implemented a multidisciplinary perioperative protocol. We describe this care pathway and early results. **Study Design:** Planned analysis of a prospectively implemented clinical care protocol with IRB approval. **Methods:** Communication between the nephrology, endocrinology, otolaryngology, transplant surgery, and social work services is facilitated by electronic distribution memoranda and direct notification of physicians. Preoperatively, patients are started on oral supplementation of 2-3 grams of calcium daily and administered 2 mcg of calcitriol intravenously during each dialysis session (if not contraindicated). Intraoperatively, a subclavian central line is placed by a transplant surgeon. Postoperatively, the patient is transferred to the nephrology service 24 hours after surgery; calcium and other electrolyte abnormalities are co-managed by the nephrology and endocrinology services. **Results:** Eight patients were enrolled in this pathway. All steps of the pathway were implemented in each patient, with a maximum length of stay of 7 days. Reduction of the burden of parathyroid tissue was achieved in all patients, and no major complica-

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tions occurred. **Conclusions:** A standardized treatment protocol and enhanced communication between services have improved the perioperative management of complex renal failure patients undergoing parathyroidectomy. Central line placement has facilitated phlebotomy and intravenous calcium supplementation. Promising early results appear to justify broader validation of this pathway.

S106. Thyrotoxic Periodic Paralysis: A Rare Indication for Thyroidectomy

Chaz L. Stucken, MD, New York, NY; Peter M. Vila, MS, New York, NY; Andrew G. Sikora, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the clinical entity of thyrotoxic periodic paralysis and the role that otolaryngologists play in the surgical management of this disease.

Objectives: Thyrotoxic periodic paralysis is a rare, life threatening complication of hyperthyroidism that is typically treated using medical management. In rare cases, patients require thyroidectomy. This is the first known case report of thyrotoxic periodic paralysis requiring thyroidectomy in the otolaryngology literature. We aim to educate otolaryngologists about this disease and its management. **Study Design:** Retrospective case report and literature review. **Methods:** Retrospective review of a case record at a tertiary medical center. Literature review using a PubMed search for thyrotoxic periodic paralysis. The reference sections of each of the relevant articles were also reviewed to find any additional pertinent studies. **Results:** A 36 year old South Asian man presented to a tertiary care center with shortness of breath and weakness. Physical examination was significant for 0/5 muscle strength in all extremities and slow extraocular movements. Laboratory findings revealed hypokalemia, hyperthyroidism, and elevated thyroid stimulating immunoglobulins. He was treated medically for hypokalemic thyrotoxic periodic paralysis. Over the course of the next year, he was treated with anti-thyroid medications, but had two more episodes of hypokalemic paralysis. The patient was referred to our clinic, and a total thyroidectomy was performed. Thyroid hormone replacement was started; the hospital course and subsequent followup were without complications. **Conclusions:** Thyrotoxic periodic paralysis is a rare, potentially life threatening condition that is most commonly found in Asian men. Most patients can be managed with medical therapy; occasionally, otolaryngologists play a role in managing the disease surgically by means of total thyroidectomy.

S107. Submandibular Duct Ligation in Rats: A Surgical Model of Induced Salivary Hypofunction for Cell Based Therapeutic Applications

Millie J. Surati, MD, Winston Salem, NC; Christopher A. Sullivan, MD, Winston Salem, NC; Shay Soker, PhD, Winston Salem, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the effects salivary duct ligation rodent salivary gland and assess a rodent disease model for use in salivary gland tissue engineering.

Objectives: To create an animal model of salivary gland hypofunction suitable for testing pre-clinical salivary cell replacement therapies. **Study Design:** Prospective interventional animal study. **Methods:** 36 adult male rats were randomized to age/sex matched control (C), permanent submandibular duct ligation (SDL-p), or temporary SDL (SDL-t) groups. SDL-p and SDL-t animals underwent ligation of the right submandibular gland. SDL-t animals underwent surgical reversal 10 weeks post-ligation. All animals underwent induced salivary flow volume collection pre-ligation, 10 weeks post-ligation, and 4, 8, and 12 weeks post-reversal. Bilateral submandibular glands were harvested and analyzed histologically. Acinar cell densities were calculated in all animals. **Results:** Pre-ligation saliva volumes were not statistically different between C, SDL-p, or SDL-t groups ($p > 0.05$). A statistically significant decrease in salivary flow volumes ($p < 0.05$) and acinar cell density ($p < 0.05$) was observed in SDL-p and SDL-t animals when compared to controls. No statistically significant difference in salivary volumes was observed between SDL-p and SDL-t animals ($p > 0.05$). In SDL-p and SDL-t animals, gross glandular atrophy without compensatory contralateral hypertrophy was observed. Key histopathologic findings in SDL-p and SDL-t animals were identical and included fibrosis and acinar cell loss with ductal preservation. **Conclusions:** Temporary ligation of a single submandibular gland causes durable salivary hypofunction and corresponding acinar cell loss in a rat when compared to C and SDL-p animals. Despite persistence of the ductal system, regeneration of functional salivary tissue did not occur in SDL-t animals. These data show that SDL-t is a suitable model for testing cell replacement strategies in rats.

S108. Extramedullary Plasmacytoma of the Uvula in a Patient with a Prior Conjunctival Plasmacytoma: Case Report

Christopher F. Thompson, MD, Los Angeles, CA; Vishad Nabili, MD, Los Angeles, CA; Marilene B. Wang, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the uvula and conjunctiva as extremely rare plasmacytoma subsites and discuss extramedullary plasmacytoma as a head and neck tumor with an unpredictable clinical course.

Objectives: To discuss the clinical presentation, prognosis and treatment of extramedullary plasmacytomas and present a rare case of a uvula plasmacytoma in a patient previously treated for a conjunctival plasmacytoma. **Study Design:** Case report with literature review. **Methods:** The PubMed database was searched from 1956 to 2011, limited to the English language, using the keywords: extramedullary, plasmacytoma, head, neck, uvula, and conjunctiva. **Results:** Extramedullary plasmacytomas are monoclonal proliferations of plasma cells. They comprise only 1% of head and neck tumors; however, over 80% are located in the upper aerodigestive tract. The sinonasal tract and nasopharynx are the most common subsites. To our knowledge only 1 uvula plasmacytoma and 8

conjunctival plasmacytomas have been reported. Treatment is surgery, radiation, or a combination. The ten year risk of developing multiple myeloma is up to 35%. We present a patient who had a history of a conjunctival plasmacytoma excised and presented 3 years later with a 1.5cm mass on the uvula. Biopsy revealed another plasmacytoma. The patient was treated with radiation and is disease free at four months post-treatment without evidence of multiple myeloma. **Conclusions:** Extramedullary plasmacytomas are often first diagnosed by otolaryngologists. Although rare, they should be included in the differential diagnosis of mucosal head and neck tumors. A multidisciplinary approach, including hematologists and radiation oncologists, is needed. Our case of two metachronous plasmacytomas in extremely rare soft tissue subsites emphasizes the need for clinical followup, so that second primaries or even multiple myeloma can be detected at an early stage.

S109. Minimally Invasive Access to the Posterior Cranial Fossa: An Anatomical Study Comparing a Retrosigmoidal Endoscopic Approach to a Microscopic Approach

Jason R. Van Rompaey, BS, Augusta, GA; Carrie A. Bush, MD, Augusta, GA; Brian J. McKinnon, MD, Augusta, GA; C. Arturo Solares, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the range surgical access that can be made available using a retrosigmoidal approach to the cerebellopontine angle. Participants should also have a greater understanding of the anatomy located in this region.

Objectives: The central location and complex neurovascular structures of the posterior cranial fossa make tumor resection in this region challenging. The traditional surgical approach is a suboccipital craniotomy utilizing a microscope for visualization. This approach necessitates a large surgical window and cerebellar retraction, which can result in patient morbidity. With the advances in endoscopic technology, minimally invasive access to the cerebellopontine angle can be achieved with minimal manipulation of uninvolved structures, reducing the complications associated with the suboccipital approach. **Study Design:** Anatomical study. **Methods:** An endoscopic approach was completed on anatomic specimens. To access the central structures of the posterior cranial fossa a retrosigmoidal approach was undertaken. A keyhole craniotomy was made in the occipital bone posterior to the junction of the transverse and sigmoid sinuses. The endoscope was advanced and photographs were obtained for review. The exposure was compared to that obtained with a microscope. **Results:** The endoscopic retrosigmoidal approach to the posterior cranial fossa provided increased exposure to the midline structures while minimizing the surgical window. The relevant anatomy was identified without difficulty. **Conclusions:** An endoscopic retrosigmoidal approach to the midline structures of the posterior cranial fossa is anatomically feasible. The morbidity associated with retraction of the cerebellum could possibly be avoided, improving patient outcomes. Retrosigmoidal endoscopy provides access to anatomical structures that were not possible using a microscope in a suboccipital approach. Further understanding of the endoscopic anatomy of the posterior fossa can allow for advances in cranial base surgery with improved safety and efficacy.

S110. Necessity of Parotidectomy and Neck Dissection in the Management of Conjunctival Melanoma

Darshni Vira, MD, Los Angeles, CA; Julianna Pesce, MD, Los Angeles, CA; David Elashoff, PhD, Los Angeles, CA; Maie St. John, MD PhD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the necessity of a parotidectomy and neck dissection in the management of conjunctival melanoma.

Objectives: 1) To review traditional techniques for the management of conjunctival melanoma; and 2) to assess the need for parotidectomy and neck dissection in the management of conjunctival melanoma. **Study Design:** Retrospective review. **Methods:** Retrospective review conducted in a tertiary academic medical center of patients diagnosed with conjunctival melanoma over a 20 year period. **Results:** 39 patients diagnosed with conjunctival melanoma were identified from January 1990 to December 2010. Followup varied from 2 to 201 months (median, 25 months). 16 (41%) had local recurrences at the primary site, two (13%) of which later presented with palpable masses within the parotid gland that were confirmed positive for regional metastatic disease after parotidectomy. One patient with parotid recurrence had a subsequent palpable mass in the ipsilateral neck; neck dissection confirmed metastatic spread. No patient had metastatic spread to the ipsilateral neck without initial spread to the parotid. The probability of disease free survival at 1, 2, and 5 years was 77, 68, and 50%, respectively. The probability of parotid free progression survival at 1, 2, and 5 years was 100, 96, and 90%, respectively. **Conclusions:** Conjunctival melanoma is a rare malignancy traditionally managed with aggressive local control. Staging parotidectomy with or without neck dissection has been heavily debated. Based on our review, parotidectomy needs to be undertaken only when high suspicion for metastatic spread is present, such as a palpable or radiographically evident mass. In addition, if there is no evidence of metastatic spread to the parotid gland, neck dissection is not required.

S111. Assessment and Incidence of Salivary Leak following Laryngectomy

Hilliary N. White, MD, Birmingham, AL; Joseph B. Golden, MD, Birmingham, AL; Larissa Sweeny, MD, Birmingham, AL; William R. Carroll, MD, Birmingham, AL; Jeffrey S. Magnuson, MD*, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to compare and evaluate primary

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versus salvage laryngectomy patients and predict the risk of pharyngocutaneous fistula formation. They will also be able to better discuss the role of a barium esophagram in evaluating these patients.

Objectives: To determine the incidence and risk factors of pharyngocutaneous fistula formation in patients undergoing either primary or salvage laryngectomies and evaluate the role of barium esophagram in these patients. **Study Design:** Retrospective cohort. **Methods:** Medical records of 259 patients that underwent total laryngectomy between 2003 and 2009 at our institution were reviewed. Risk factors for fistula formation were analyzed including primary treatment modality, comorbidities, and operative details including use of a free flap for closure, concurrent neck dissections, margin status, preoperative tracheostomy, among many others. The length of time until leak, postoperative swallow study results, and fistula management strategies were also assessed. **Results:** Fifty-five patients developed a pharyngocutaneous fistula (overall incidence 21%) in a mean time of 15.5 days (range from 4 to 105 days). Twenty of these patients underwent laryngectomy as their initial treatment modality and 35 had failed previous radiotherapy. A barium swallow performed at approximately one week after laryngectomy demonstrated a sensitivity of 26% with a specificity of 94%. Sixty-two percent of the fistulas healed with conservative measures only. **Conclusions:** Our data confirmed that previous radiotherapy and hypothyroidism, particularly in salvage laryngectomy patients, are important significant predictors of developing a postoperative pharyngocutaneous fistula. The use of a postoperative barium swallow in these patients can be useful, but was not found to be highly sensitive in predicting who will develop a clinically evident leak and should be used with caution.

S112. A Novel Approach to Addressing Head and Neck Cancer Care Disparities: A Partnership with the Community

Ryan D. Winters, MD, New Orleans, LA; Alex Caten, BS, New Orleans, LA; Lori Guillot, BS, New Orleans, LA; John M. Carter, MD, New Orleans, LA; Rizwan Aslam, DO, New Orleans, LA; Paul M. Friedlander, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe a novel approach to addressing cancer care disparities via partnership with community leaders in a historically underserved urban community.

Objectives: African American patients, especially those with complex medical problems such as head and neck cancer, have decreased survival and increased severity of disease at presentation when compared to Caucasian peers. Multiple explanations have been proposed, from patients' mistrust of the medical community to socioeconomic factors, however, we have undertaken a novel approach. Through a partnership with African American pastors/community leaders, we combine screening surveys and clinics at church events with education from the pulpit, utilizing pastors, physicians, and patient head and neck cancer survivors. **Study Design:** Prospective, observational. **Methods:** Teams of physicians and patient survivors visited each partner church for Sunday services, presenting an educational program regarding head and neck cancer after a formal introduction by the pastor. Head and neck cancer screening clinics were then conducted at church events, where questionnaires covering risk factors and barriers to care were prospectively collected. **Results:** Demographic data from the first five screening clinics (167 patients) are presented. 75% of patients were African American, and 57% belonged to a church. 52% were uninsured with another 22% Medicaid recipients. 51% had a primary physician. 28% did not complete high school. **Conclusions:** Both economic and social/cultural barriers to care likely exist, contributing to poorer outcomes in African Americans. Community partnerships between healthcare providers and community leaders may positively impact African American patients' access to and outcomes from treatment, and foster true multi-disciplinary care by actively involving patients and their communities.

S113. Squamous Cell Carcinoma of the Thyroid: Institutional Review and Increasing Awareness

Yu-Tung Wong, MD, Chapel Hill, NC; Rupali N. Shah, MD, Chapel Hill, NC; Scott V. Smith, MD, Chapel Hill, NC; Carol G. Shores, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the rare but clearly important entity of squamous cell carcinoma of the thyroid, will be cognizant of likely involvement of surrounding critical structures, and will be able to formulate a treatment plan (both surgical and medical) consistent with those recommended by a multidisciplinary tumor board for head and neck cancer.

Objectives: To identify the incidence, treatment and outcomes of primary squamous cell carcinoma of the thyroid (SCCaT) at a single institution, with comparison to the most recent literature. **Study Design:** Retrospective chart review and literature review. **Methods:** The head and neck cancer database at our institution was examined for SCCaT over the past five years and treatment modalities and available outcomes were identified and summarized. **Results:** Six total cases of SCCaT were identified over five years (2007 to 2011), and interestingly half have been in the past year. Of these cases, five were primary SCCaT while one was later identified as thymic carcinoma of squamous type. All cases exhibited tracheal compression, with four out of six cases showing tracheal lumen invasion. Four out of six cases also showed pulmonary metastasis early in diagnosis and were treated with primary chemoradiation, while two out of six showed locoregional disease only and underwent extensive surgical resection. Of these two, one recurred with distant metastasis 18 months after surgery. **Conclusions:** SCCaT accounts for 1% of total thyroid malignancies in the literature, and has historically carried a uniformly poor outcome over the first year of diagnosis regardless of treatment modality. As this pathological diagnosis rate has increased over the last year, our experience at our institution has benefited from the multidisciplinary tumor board in terms of planning aggressive surgical resection versus primary chemoradiotherapy. With greater awareness of this disease, we hope for advances to further the prognosis of this grim disease.

Laryngology/Bronchoesophagology

S114. Co-Culture of Muscle Stem Cells (MSCs) and Vagus Nerve (VN) Derived Motor Neurons: Tissue Engineering through Establishment of Neuromuscular Junctions

Neel K. Bhatt, MS, Indianapolis, IN; Khadijeh Bijangi-Vishehsaraei, PhD, Indianapolis, IN; Kelly K. Hiatt, MD PhD, Indianapolis, IN; Bryan R. McRae, MD, Indianapolis, IN; Moumita Naidu, MS, Indianapolis, IN; Stacey L. Halum, MD*, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how co-culturing muscle stem cells with vagus nerve derived motor neurons affects the development of neuromuscular junctions in vitro.

Objectives: The purpose of this study was to determine if muscle stem cells (MSCs) and vagus nerve (VN) derived motor neurons can be programmed to develop neuromuscular junctions in vitro, as this would be a key initial step toward establishing neuromuscular junctions in a tissue engineered larynx. **Study Design:** Basic science experiment using rat MSCs and VN derived motor neurons. **Methods:** Primary cultures of rat derived MSCs and VN motor neurons were generated and characterized independently. MSCs and VN motor neurons were co-cultured for six days in standard growth medium, with individual MSCs and VN motoneuron cultures maintained concurrently as age matched controls. Immunofluorescence was performed to identify neuron specific epitopes (beta-III tubulin and choline acetyltransferase) and MSC specific motor end plates (alpha-bungarotoxin), with motor neuron to motor endplate proximity confirming neuromuscular junction development. **Results:** MSCs co-cultured with motor neurons demonstrated neuromuscular junction formation as evidenced by immunostaining of motor neurons (beta-III tubulin and choline acetyltransferase) in contact with motor endplates (alpha-bungarotoxin). Increased beta-III tubulin and choline acetyltransferase staining in the co-cultured motor neurons relative to motor neuron controls suggested the co-culture microenvironment may promote motor neuron survival/outgrowth. **Conclusions:** This study is the first to demonstrate that MSCs and VN motoneurons can be successfully co-cultured in vitro with resultant neuromuscular junction formation. Such findings may ultimately translate into a means for establishing neuromuscular junctions in a tissue engineered larynx.

S115. New Technology Applications: Knotless Barbed Suture for Tracheal Resection Anastomosis

Carrie M. Bush, MD, Augusta, GA; John D. Prosser, MD, Augusta, GA; Michele P. Morrison, DO, Augusta, GA; Gregory N. Postma, MD, Augusta, GA; Paul M. Weinberger, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the different types of tracheal anastomoses, as well as discuss the corresponding benefits and limitations.

Objectives: Tracheal resection anastomoses are often under tension and can be technically challenging. New suture materials such as V-loc (barbed, knotless wound closure device) may offer advantages over conventional methods. The objective of this study is to determine if a running V-loc suture is of comparable tensile strength to conventional closure. **Study Design:** Biomechanical properties analysis. **Methods:** Fresh human cadaveric trachea were dissected and incised into segments. Anastomosis of adjacent segments was then performed with either submucosal interrupted 3-0 Vicryl or a running submucosal 3-0 V-loc suture. Anastomosed specimens were stretched to failure on an Instron force tension machine. Surgeon satisfaction was recorded by visual analog scale. **Results:** The tensile strength of 12 tracheal anastomoses was tested. Video documentation of V-loc suture technique and anastomosis failure was recorded. In both Vicryl (80%) and V-loc (100%) anastomoses, failure occurred at the membranous intercartilaginous region. In 20% of the Vicryl anastomoses the suture was noted to break prior to tissue failure. Anastomoses with V-loc suture tended to withstand greater tensile force (mean 59 N) compared to interrupted Vicryl (51 N) with $p=0.57$. On visual analog scale surgeons were more satisfied with V-loc suture closure (mean VAS 86 ± 1) compared to interrupted Vicryl closure (40.7 ± 5), paired t-test $p=0.003$. **Conclusions:** Tracheal anastomosis with running V-loc suture is a feasible alternative to conventional closure with interrupted Vicryl suture. Both methods of anastomosis resulted in equivalent tensile strength, with a tendency for V-loc suture to withstand greater force. V-loc suture also provided a surgical advantage by improved ease of use.

S116. Interarytenoid Botulinum Toxin Injection for Recalcitrant Vocalis Process Granuloma

Daniel S. Fink, MD, Boston, MA; Jihad Achkar, MD, Boston, MA; Ramon A. Franco, MD*, Boston, MA; Phillip C. Song, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to diagnose and treat vocalis process granulomas with current standard of care, as well as offer a novel technique for the treatment of recalcitrant granuloma.

Objectives: This study evaluated the role of botulinum toxin type A injected into the interarytenoid muscle in the treatment of recalcitrant vocal fold granulomas. **Study Design:** Retrospective clinical review at a tertiary care center. **Methods:** Six patients with vocalis process granulomas refractory to a variety of prior treatments including surgical resection, proton pump inhibitor therapy, and voice therapy underwent percutaneous injection of botulinum toxin type A into the interarytenoid muscle performed in an office setting. Doses ranged from 5-25 U in one to two injections. **Results:** One patient demonstrated no improvement, one demonstrated 90% improvement, and four patients demonstrated complete resolution of their granulomas. Three patients noted transient breathiness. There were no other side effects. All patients tolerated the injections without difficulty. **Conclusions:** Botulinum toxin injection into the interarytenoid muscle appears to be a safe and effective modality for treating recalcitrant vocal fold granuloma.

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S117. Subglottic Leiomyoma

Patrick J. Haas, MD, Jackson, MS; Byron K. Norris, MD, Jackson, MS; John M. Schweinfurth, MD*, Jackson, MS

Educational Objective: At the conclusion of this presentation, participants should be able to discuss soft tissue tumors of the subglottis and their management.

Objectives: To present a case of near complete obstruction of the subglottis and trachea by a leiomyoma. **Study Design:** Case report and literature review. **Methods:** Chart and literature review. Characteristic computed tomography, gross and pathologic images are demonstrated. **Results:** The patient presented with a 3 year history of worsening of her shortness of breath and decline in her mental status over the past few days. She had previously been diagnosed as having asthma and was found to have a large obstructing mass in the subglottis and superior trachea on CT scan and she required an emergent awake tracheostomy. Initial biopsies were suggestive but not diagnostic of leiomyoma. Endoscopic excision through a transcervical approach was performed.

Conclusions: Leiomyoma of the subglottis is an extremely rare clinical entity. Management should focus on establishing a safe airway and subsequent complete excision of the leiomyoma as recurrence is possible when sub-totally removed. This case illustrates the danger that so called benign masses may pose to the airway.

S118. Severe Dysphagia and Airway Obstruction from Diffuse Idiopathic Skeletal Hyperostosis (DISH)—Multidisciplinary Surgical Management by Neurosurgery and Otolaryngology

Tanima Jana, MD, Augusta, GA; Eyad Khabbaz, MD, Augusta, GA; Carrie M. Bush, MD, Augusta, GA; Nishant Bhatt, MD, Augusta, GA; Haroon F. Choudri, MD, Augusta, GA; Paul M. Weinberger, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the pathophysiology by which diffuse idiopathic skeletal hyperostosis (DISH) can cause severe dysphagia and potential airway embarrassment, and discuss modern multidisciplinary surgical management for severe, symptomatic cases.

Objectives: To review an example case of severe DISH with impingement on the aerodigestive tract. **Study Design:** Case review. **Methods:** The case of a seventy-two year old male who presented with dysphagia, neck pain and upper extremity weakness is reviewed. Clinical history, radiology, and preoperative video are presented. The literature is examined to investigate current recommendations for surgical management when confronted with aerodigestive involvement in cases of DISH. **Results:** Flexible laryngoscopy revealed a large obstructive posterior cervical mass just above the level of the epiglottis. The potential for a difficult airway was recognized during his otolaryngology evaluation. Functional endoscopic swallowing exam indicated significant oropharyngeal motility dysfunction and esophageal inlet obstruction. Computed tomography of cervical spine revealed diffuse idiopathic skeletal hyperostosis, most noted in the C2-C3 and C4-C5 region, along with multilevel spinal canal stenosis, most prominent at C3-C4, C4-C5, and C5-C6. A corpectomy with fusion was planned by neurosurgery, with otolaryngology providing airway support. Intraoperative video of the fiberoptic intubation demonstrates the value of multidisciplinary management for such patients. Postoperatively, the patient did well. **Conclusions:** DISH is an uncommon disease process that can present with aerodigestive symptoms. Early consultation and continued communication between neurosurgeons and otolaryngologists is essential for ensuring appropriate diagnosis and treatment and preventing unnecessary complications.

S119. Stem Cell Derived Tracheal Transplantation—Is an Ex Vivo Bioreactor an Absolute Requirement?

Tanima Jana, MD, Augusta, GA; John D. Prosser, MD, Augusta, GA; Gregory N. Postma, MD, Augusta, GA; Alexander M. Seifalian, MD, London, UK; Martin A. Birchall, MD, London, UK; Paul M. Weinberger, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the variety of treatment options for long segment tracheal stenosis and describe current and future paradigms for successful stem cell mediated tracheal transplantation.

Objectives: While many regimens exist for treatment of small segment tracheal stenosis, reconstruction of longer segments remains problematic. Recent advances in tissue engineering have allowed successful ex vivo transplantation of stem cell derived trachea in several human patients. These methods, however, have required specialized ex vivo tissue bioreactors currently unavailable outside of the original team's laboratories. Herein we describe a novel method of using a rotational flap based internal bioreactor to allow in vivo stem cell engraftment for the purpose of tracheal transplantation, in a rabbit model. **Study Design:** Experimental study using New Zealand White rabbits as an animal model. **Methods:** This is an ongoing study involving 6 experimental tracheas (implanted in 3 rabbits) and 2 control animals. For the experimental group, allogeneic cadaveric rabbit tracheas were decellularized per previous protocols. Each rabbit received one trachea from each group: group A tracheas were incubated overnight with peripheral blood stem cells harvested and treated per existing protocol, but with no ex vivo tissue bioreactor incubation and then implanted (described below). Group B tracheas were directly implanted within the supraspinatus muscle without stem cell incubation in hopes of attracting circulating peripheral blood stem cell engraftment directly. Implanted tracheas will be examined to determine stem cell engraftment and differentiation into chondrocytes in the implanted tracheas. **Results:** Will be available at the time of the meeting. **Conclusions:** Alternatives to the existing ex vivo tissue bioreactor may exist, potentially opening up the possibility of tracheal transplantation on a wide scale. This innovative approach holds great promise for future research and clinical implementation.

S120. Sports Related Laryngeal Trauma—The Case for Neck Protection

Jonathan M. Lee, MD, Philadelphia, PA; Kevin P. Leahy, MD PhD, Philadelphia, PA; Soo K. Abboud, MD, Philadelphia, PA; Natasha Mirza, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the diagnosis, management, and potential outcomes of sports related laryngeal trauma and to understand the need for the routine use of neck protective equipment in high risk sports.

Objectives: To review the diagnosis, management, and outcome of three cases of sports related laryngeal trauma and to advocate for the routine use of neck protective equipment in high risk sports. **Study Design:** We report three cases of sports related blunt trauma to the anterior neck resulting in significant laryngeal injury. **Methods:** We analyze and review the diagnosis, management, and outcome of each case of sports related laryngeal trauma. **Results:** Although external laryngeal trauma has declined overall since the widespread use of safety devices in automobiles, there has been a relative increase in sports related laryngeal trauma. Most often, sports related blunt trauma to the anterior neck occurs from a direct blow in contact sports such as football, or in the context of high velocity projectiles in sports such as baseball, hockey, and lacrosse. Such injuries can result in airway obstruction secondary to edema, hemorrhage, laryngospasm, vocal cord paralysis, fractures, and disruption of normal laryngeal anatomy. The primary goals of management of acute laryngeal injury include protection of the airway and preservation of the voice. **Conclusions:** In sports such as hockey and lacrosse, throat protectors are only mandatory for goalies, leaving the other field players at risk. Although such injuries are uncommon, given the potentially serious sequelae of laryngeal injury, we recommend the routine use of neck protective equipment for all athletes involved in high risk sports.

S121. Interarytenoid Schwannoma: Case Report and Literature Review

Ilya Y. Likhterov, MD, San Francisco, CA; Julina Ongkasuwan, MD, Houston, TX; Mark S. Courey, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the radiological, pathological, and clinical appearance of laryngeal schwannomas, as well as the techniques used during endoscopic resection of the mass as applicable to excision of laryngeal schwannomas in more common locations.

Objectives: Schwannomas are benign growths arising from nerve sheaths of peripheral and cranial nerves. 25% to 45% of schwannomas presents in the head and neck. Laryngeal schwannoma are extremely rare, accounting for less than 0.1% of all benign tumors of the larynx. In the literature, laryngeal schwannoma are described as arising from perineural Schwann cells of the internal branch of the superior laryngeal nerve and present more commonly in females. **Study Design:** We report the case of a 38 year old male presenting with six months of dysphonia. Indirect laryngoscopy revealed an interarytenoid submucosal lesion. The mass was identified on CT scan of the neck. The lesion was completely excised endoscopically with preservation of the overlying mucosa. Morphologic features and immunohistochemical staining pattern were consistent with schwannoma. **Methods:** N/A. **Results:** Eighty percent of laryngeal schwannomas present as submucosal masses in the aryepiglottic fold, and the other 20% are in the ventricular fold or vocal cords. No reports of interarytenoid schwannomas could be found in the English literature. **Conclusions:** This presentation reviews the radiological, pathological, and clinical appearance of this rare tumor in a location previously not described. The techniques used during endoscopic resection of the mass will be presented as they are applicable to excision of laryngeal schwannomas in more common locations.

S122. Proton Pump Inhibitor Therapy as a Disease Modifying Agent in Recurrent Respiratory Papillomatosis

Julien A. Norton, BS, Augusta, GA; Gregory N. Postma, MD, Augusta, GA; Aasif A. Kazi, BS, Augusta, GA; Ashli K. O'Rourke, MD, Augusta, GA; Paul M. Weinberger, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe indications for use of proton pump inhibitors (PPIs) in patients with recurrent respiratory papillomatosis.

Objectives: To determine interactions between gastroesophageal or extraesophageal reflux disease (GERD/EER) and proton pump inhibitor use, with recurrent respiratory papillomatosis (RRP) disease course. **Study Design:** Retrospective cohort study at a tertiary academic medical center. **Methods:** All patients treated for RRP from 1998-2011 at a single institution were identified. Patients were then divided into clinically aggressive versus nonaggressive disease. Aggressive disease was identified using parameters of: more than 4 surgical procedures within a 12 month span, distal spread of disease, or transformation to squamous cell carcinoma. Clinical and pathologic data were recorded in addition presence of comorbidities including GERD/EER and use of PPI therapy. **Results:** The majority of patients (59%) with RRP in our cohort reported a history of GERD and/or EER. Among patients with GERD/EER, 5/26 (19%) had aggressive disease compared to 8/18 (44%) without a history of GERD/EER (p=0.10 Fisher Exact test). When proton pump inhibitor (PPI) therapy was factored in, this relationship was clarified. All of the patients with GERD (26/26, 100%) were on PPI therapy. Among patients with no GERD history, 5/18 (28%) were on PPI therapy. There was a strong association between lack of PPI treatment and aggressive RRP. Eight out of thirteen (62%) patients not on PPI therapy had aggressive disease compared to 5/31 (16%) of patients on PPI therapy (p=0.009 by Fisher Exact test). **Conclusions:** There is an association between lack of PPI treatment and clinically aggressive RRP. All RRP patients with or without GERD or EER should be considered for PPI treatment, although such use is off label for PPIs.

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S123. Atypical Presentation of Laryngeal Tuberculosis in a Pediatric Patient

Chelsea A. Obourne, BS, Brooklyn, NY; Behrad B. Aynehchi, MD, Brooklyn, NY (Presenter); Boris L. Bentsianov, MD, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to be familiar with the presentation and management of laryngeal tuberculosis infection along with the procedural public health guidelines accompanying the diagnosis.

Objectives: Laryngeal tuberculosis (LTB) is uncommon and most often associated with a primary lung infection in immunocompromised adults. We describe an atypical presentation of isolated LTB in a pediatric patient. **Study Design:** Case study. **Methods:** Office and operating room (OR) endoscopic findings and management of this abnormality are described. Additionally, a review of the literature highlighting trends in presentation and management is presented. **Results:** A 15 year old otherwise healthy girl presented with hoarseness of acute onset, unchanging and lasting eight months. There was no associated dyspnea, dysphagia, upper respiratory infection, weight loss, night sweats, cough, hemoptysis, exposure history, recent travel, or immigration history. Fiberoptic examination in the office and direct microlaryngoscopy in the operating room revealed nonspecific friability and leukoplakia of the true vocal cords and interarytenoid area. Biopsy specimens returned as necrotizing tuberculous granulation. The patient was placed on antimicrobials with gradual improvement in voice and laryngoscopic findings. Initial and subsequent chest films were free of any lesions. **Conclusions:** In contrast to prior reports where pediatric patients with LTB presented with insidious dysphonia and odynophagia along with associated pulmonary pathology, onset of symptoms in this case occurred relatively acutely with no accompanying pulmonary or systemic manifestations. Despite this atypical presentation and relative lack of familiarity with procedural guidelines in managing this uncommon entity by otolaryngologists, reporting of diagnosed or suspected tuberculosis infection is mandated at multiple governmental health department levels. Consequently, this diagnosis must be considered in the interest of avoiding untoward outcomes for not only the patient, but the public as well.

S124. Posterior Glottic Bridge: A Case Series of a Rare Complication of Endotracheal Intubation

Tara L. Rosenberg, MD, Jackson, MS; Allison V. Jones, BS, Jackson, MS; John M. Schweinfurth, MD*, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the patient history, associated symptoms, treatment, and outcome of patients with a posterior glottic bridge.

Objectives: 1) To review three cases of posterior glottic bridges and discuss the patient history, associated symptoms, treatment, and outcome; and 2) to compare this case series to other cases in published literature. **Study Design:** Case series and literature review. **Methods:** The medical records of three patients presenting with posterior glottic bridges were reviewed and compared. Data collected included age, gender, length of intubation, associated symptoms, treatment, and outcome. Literature of previously reported cases was examined to facilitate comparison and discussion of this rare diagnosis. **Results:** Three patients with average age of 31.3 years were intubated for an average of 18.7 days. Two of the three patients were intubated after a motor vehicle collision. The most common symptoms were dysphonia, dyspnea on exertion, and cough. Treatment of the posterior glottic bridges was performed two months to three years from the initial intubation. All three patients were treated with lysis of the bridge using laryngeal micro-instruments with topical application of mitomycin-C. There has been no recurrence in followup. No patient required a tracheostomy. Review of the literature on this disease revealed similar patient history and outcome. **Conclusions:** Posterior glottic bridge is a rare complication of intubation, which can present with symptoms of dysphonia, dyspnea on exertion, and cough. Treatment is simple excision and is associated with low recurrence rate. Awareness of this disease, presentation and treatment is essential for appropriate diagnosis and management of these patients.

S125. Zenker Diverticulectomy: Technique Does not Affect Symptom Resolution

Rupali N. Shah, MD, Chapel Hill, NC; Keimun A. Slaughter, MD, Durham, NC; Benjamin Y. Huang, MD, Chapel Hill, NC; Robert A. Buckmire, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to compare and contrast the relative benefits, limitations, complications and symptomatic outcomes of each surgical technique.

Objectives: Zenker's diverticulum results from a herniation of pharyngeal mucosa through Killian's dehiscence. Surgical correction aims to improve symptoms of dysphagia by addressing the cricopharyngeus muscle. All surgical approaches have relative limitations. The standard transcervical surgical approach allows for definitive removal of the diverticulum, but is associated with longer hospital stays than endoscopic approaches. Endoscopic diverticulotomy approaches have a potentially higher risk of pneumomediastinum and perforation, and, by default leave a residual pouch. The objective of this study is to compare symptomatic outcomes among three techniques: transcervical diverticulectomy, endoscopic laser and endoscopic stapler-assisted diverticulotomy and to determine whether complete diverticulectomy or degree of party wall lysis corresponds to greater symptomatic improvement. **Study Design:** Retrospective chart analysis. **Methods:** A retrospective chart and radiographic analysis was conducted of patients undergoing diverticulum repair over the last 10 years at our institution. A followup validated questionnaire, eating assessment tool (EAT-10), was administered by phone to each patient. **Results:** Sixty patients were reviewed and grouped according to technique. Followup ranged from six months to ten years. Endoscopic stapler technique resulted in a significantly larger residual pouch than laser technique. There were two major complications in the endoscopic laser group and none in the endoscopic stapler and open technique groups. The mean hospital stay was significantly shorter for endoscopically repaired patients. All patients had excellent swallowing

outcomes with no significant difference in EAT-10 scores between groups. **Conclusions:** Operative technique for Zenker diverticulectomy and the size of the residual postsurgical pouch does not affect symptom resolution.

S126. Palatal Myoclonus: Algorithm for Management with Botulinum Toxin Based on Clinical Disease Characteristics

Catherine F. Sinclair, MD, New York, NY; Lowell Gurey, MD, New York, NY; Andrew Blitzler, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the clinical presentation and treatment options for palatal myoclonus.

Objectives: 1) To review the clinical characteristics and management of patients with palatal myoclonus; 2) to devise an algorithm for treatment with botulinum toxin based on presenting symptoms, clinical examination findings and involved muscle groups. **Study Design:** Retrospective chart review at a clinical research center. **Methods:** Between 2007 and 2011, 6 patients with a diagnosis of palatal myoclonus were assessed. Data was collected on patient demographics, disease characteristics and treatment outcomes. **Results:** Patients were more commonly male (66.7% vs. 33.3%) with an average age at diagnosis of 38.6 years. In 50% of patients, the myoclonus was first noted after a viral upper respiratory tract infection. Two-thirds of patients had been previously treated unsuccessfully with oral medications. Predominant presenting symptoms included clicking tinnitus (66.7%) or awareness of palatal movements with or without rhinolalia (33.3%). Clinical examination revealed isolated palatal movements in 50% and involvement of pharyngeal musculature in 50%. Palatal site for initial botulinum toxin injection depended on the predominant presenting symptom: for tinnitus, 2.5 units was injected transorally into the tensor veli palatini muscle at the level of the pterygoid hamulus/lateral soft palate; for palatal movements, the injection was placed medially on either side of the uvula. Dose and location of subsequent injections were tailored depending on response to toxin and location of subsequent observed maximal muscular contractions. **Conclusions:** Palatal myoclonus can present with tinnitus or patient perceived palatal movements. Management with botulinum toxin can be tailored to address the muscles contributing to the predominant presenting symptoms.

S127. Killian-Jamieson Diverticula: A True Contraindication to Endoscopic Diverticulotomy/Myotomy

Satyen S. Undavia, MD, Bronx, NY; Sumeet M. Anand, MD MSc FRCSC, New York, NY; Adam S. Jacobson, MD, New York, NY

Educational Objective: Killian-Jamieson (K-J) diverticula are rare hypopharyngeal defects. As in other forms of esophageal diverticulum (i.e. Zenker's), recent literature has described minimally invasive operative and office based endoscopic approaches to their management. We aim to define the only safe recurrent laryngeal nerve (RLN) sparing treatment approach for the K-J form of an esophageal diverticulum.

Objectives: Killian-Jamieson (K-J) diverticula are rare hypopharyngeal defects. As in other forms of esophageal diverticulum (i.e. Zenker's), recent literature has described minimally invasive operative and office based endoscopic approaches to their management. We aim to define the only safe recurrent laryngeal nerve (RLN) sparing treatment approach for the K-J form of an esophageal diverticulum. **Study Design:** Case report and literature review. **Methods:** We present a case of a 62 year old female with symptoms consistent with a Zenker's diverticulum. The patient was brought to the operating room and an attempt was made to endoscopically examine the pouch. Because of limited exposure and concern regarding the relationship of the diverticulum and the recurrent laryngeal nerve, an open approach was performed. Medical illustrations of our anatomical findings are shown. **Results:** During open operative dissection, the RLN was found to be adherent to and traversing cranio-caudally across the base of the diverticulum. Had we performed an endoscopic myotomy, the RLN would unquestionably have been sacrificed. **Conclusions:** Our experience illustrates that K-J diverticula should be managed exclusively with an open transcervical approach to avoid injury to the RLN. This is an imperative anatomical description that clarifies that endoscopic approaches should not be undertaken for the K-J variant and only attempted for true Zenker's diverticula.

S128. Management of Subglottic and Tracheal Stenosis Using CO2 Laser, Balloon Dilation, and Mitomycin C

Darshni Vira, MD, Los Angeles, CA; Dinesh K. Chhetri, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain our novel technique for managing subglottic and tracheal stenosis as well as be able to compare this method to traditional and newer techniques.

Objectives: 1) To understand traditional techniques for the management of subglottic and tracheal stenosis; and 2) to learn new endoscopic techniques and technologies for airway management, including laryngeal mask airway (LMA) intubation, flexible fiber based CO2 laser ablation, controlled radial expansion (CRE) balloon dilation, and topical mitomycin C application. **Study Design:** Retrospective review. **Methods:** Retrospective review of cases with isolated symptomatic subglottic and tracheal stenosis treated at a tertiary academic medical center over a 4 year period. All cases were treated with radial incisions using a flexible fiber based CO2 laser, CRE balloon dilation, and topical application of mitomycin C. The airway in patients without pre-existing tracheostomies was managed with LMA intubation, and the CO2 laser fiber was passed through a flexible bronchoscope. Number of dilations, period between dilations, decannulation rate, and operative times were reviewed. **Results:** 20 patients were identified who underwent the airway intervention over the study period. Average followup was 20 months. The etiologies of airway stenosis were intubation injury (n=9), autoimmune disease (n=4), or idiopathic (n=7). On average, two dilations about 6 months apart were performed. The average operative time was 71 minutes. Of the nine patients with pre-existing tracheostomies, seven (78%) were decannulated.

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Conclusions: Isolated subglottic and tracheal stenosis can be managed with long term success using newer endoscopic technologies such as flexible fiber based CO2 laser ablation, CRE balloon dilation, and mitomycin C application.

S129. Primary Tracheal Schwannoma: A Case Report and Review of the Literature

Timothy S. Wong, MD, Gainesville, FL; Neil N. Chheda, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize a patient with primary tracheal schwannoma and be familiar with endoscopic technique for resection.

Objectives: To present a case of a rare primary tracheal schwannoma at our institution and perform systematic review of the literature pertaining to previous cases of primary tracheal schwannoma. **Study Design:** Case report. **Methods:** Case report and review of literature. **Results:** A 42 year old female was referred to our institution for evaluation of a tracheal mass noted on a CT scan during the workup of newly diagnosed sarcoidosis. The patient initially presented with dyspnea and intermittent neck pain and was determined to have an obstructing tracheal mass. She was taken to the operating room for rigid bronchoscopy and endoscopic excision of the tracheal mass. Pathological analysis was consistent with schwannoma. Postoperatively her symptoms resolved and she currently has no evidence of recurrence of her tracheal schwannoma. **Conclusions:** Primary tracheal schwannoma is a rare entity with less than thirty reported cases worldwide. Dyspnea and wheezing are the most common presenting symptoms. Many different treatment methods have been described in the literature including both open and endoscopic methods. An endoscopic method using cold steel and microdebrider is described here and patient has remained recurrence and symptom free since her procedure.

Otology/Neurotology

S130. Vestibular Pneumolabyrinth following Temporal Bone Trauma

Eelam A. Adil, MD MBA, Hershey, PA; Melissa L. Dean, BSN, Hershey, PA; Soha N. Ghossaini, MD, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify symptoms and signs of perilymphatic fistula (PLF). They should also be able to identify vestibular pneumolabyrinth on a dedicated temporal bone CT scan. Participants should also be able to explain the audiologic findings in patients with PLF and discuss who may benefit from middle ear exploration.

Objectives: The purpose of this paper is to review clinical findings and outcomes of patients with vestibular pneumolabyrinth. To our knowledge, this is the largest case review reported in the literature. **Study Design:** Retrospective case review performed at a tertiary referral center. **Methods:** Eleven trauma patients with vestibular pneumolabyrinth were identified on a dedicated temporal bone CT scan from July 2005 to April 2010. Data regarding the mechanism of injury, type of temporal bone fracture, vertigo, tinnitus, hearing loss, cranial nerve palsies, intracranial complications, presence of CSF leak, need for intervention, and final disposition were analyzed. **Results:** All patients with pneumolabyrinth had an otic capsule violating fracture and most had an intracranial bleed (n=9). Most patients complained of hearing loss (n=9), while 3 complained of vertigo and 1 had tinnitus. Six patients had concomitant facial nerve palsies and 1 had an abducens nerve palsy. Most were managed with conservative observation. One patient had a middle ear exploration with perilymph fistula repair. Four patients passed away as a result of their injuries and 1 patient was discharged to rehab. **Conclusions:** Vestibular pneumolabyrinth is seen on less than 1% of dedicated temporal bone CT scans, but should be considered in patients with severe head trauma particularly those with otic capsule violating fractures. Patients with vestibular pneumolabyrinth most commonly complain of hearing loss. A majority have cranial nerve palsies. Most patients require no surgical intervention because their symptoms resolve spontaneously, but in those with intractable vertigo, middle ear exploration may be beneficial.

S131. Effect of an Intraoperative Perilymph Gusher on Cochlear Implant Performance in Children with Labyrinthine Malformations

Oliver F. Adunka, MD, Chapel Hill, NC; Holly F.B. Teagle, AuD, Chapel Hill, NC; Carlton J. Zdanski, MD, Chapel Hill, NC; Craig A. Buchman, MD*, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the functional consequences of an intraoperative perilymph gusher after cochlear implantation.

Objectives: To assess the effect of an intraoperative perilymph fluid gusher during cochlear implantation on speech perception abilities in pediatric patients with labyrinthine anomalies. **Study Design:** Tertiary care academic referral center. **Methods:** 70 subjects with labyrinthine malformations who received a cochlear implant were identified in our pediatric cochlear implant database. In 30 cases, an intraoperative perilymph fluid gusher was encountered during surgery. Fifteen children with GJB2 positive hereditary hearing loss served as controls. Multiple speech perception measures were obtained with the cochlear implant. The best score for each subject over time was determined as a speech reception index in quiet (SRI-Q). This index was compared among groups and malformation types. **Results:** The SRI-Q demonstrated overall good performance scores of cochlear implantation in children with incomplete partitioning/enlarged vestibular aqueduct (IP-EVA) type malformations. Children with hypoplastic malformations, on the other hand, showed variable outcomes with many children demonstrating only limited long term speech discrimination abilities. The presence or absence of a perilymph gusher did not significantly influence results after cochlear implantation. **Conclusions:** This

report documents the variable outcomes of pediatric cochlear implantation in children with inner ear malformations. More importantly, anatomical parameters such as the classification of the anomaly and the presence of a viable cochlear nerve seem to influence performance measures substantially. The presence of a perilymph gusher did not influence outcomes in both hypoplastic and IP-EVA type malformations.

S132. Facial Nerve Hemangioma: A Rare Case Involving the Vertical Segment

Neda Ahmadi, MD, Washington, DC; Kenneth Newkirk, MD, Washington, DC; Hung Jeffrey Kim, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the presenting symptoms of facial nerve hemangiomas (FNHs); 2) know the differential diagnoses of FNHs; 3) understand the imaging and histopathologic characteristics of FNHs; and 4) explain the management of these lesions and the controversies surrounding it.

Objectives: Facial nerve hemangiomas (FNH) are rare and benign intratemporal tumors. The geniculate ganglion (GG) is the segment of the facial nerve (FN) most commonly involved while vertical segment involvement is rare. The clinical presentation of these lesions varies depending on tumor location. Tumors located at the GG most commonly present with FN dysfunction and those involving the internal auditory canal present with progressive sensorineural hearing loss. The treatment of choice continues to be surgical excision. However, the timing, extent of excision and a determination of the need for FN sacrifice are all controversial. The goal of this study is to report a rare case of FNH involving the vertical FN segment and to discuss the clinical presentation, imaging and histopathologic characteristics, pathogenesis, and management of these rare lesions. **Study Design:** Retrospective chart review.

Methods: Case report and review of literature. **Results:** A 53 year old man presented with a 10 year history of right hemifacial twitching. Upon presentation, his right facial House-Brackmann grading score was V/VI. Magnetic resonance (MR) imaging demonstrated a gadolinium contrast T1 weighted enhancing lesion of the vertical FN segment, which had hyperintense MR signal on T2 weighted sequence. The patient underwent excision of the lesion and histopathologic examination demonstrated FNH.

Conclusions: FNHs are benign extraneural tumors that arise from the vascular plexuses surrounding the nerve. Lesions involving the vertical FN segment are extremely rare. We present a unique case of FNH involving the vertical segment. Despite being rare lesions, we believe that familiarity with the presentation and management of FNHs are imperative.

S133. Unilateral Cochlear Implant: Impact on Quality of Life Measured with the Glasgow Benefit Inventory

Hosam A. Amoodi, MD FRCS, Toronto, ON Canada; Adrienne W. Wong, MD, Toronto, ON Canada; David B. Shipp, MA FAAA Reg CASLPO, Toronto, ON Canada; Joseph M. Chen, MD FRCS, Toronto, ON Canada; Julian M. Nedzelski, MD FRCS*, Toronto, ON Canada; Vincent Y. Lin, MD FRCS, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the improvement in quality of life achieved by unilateral cochlear implant users as measured with the Glasgow Benefit Inventory. In addition, the participants should be able to understand the differences in benefit within different age groups of implant users.

Objectives: Cochlear implantation (CI) is now the standard of care in patients with profound sensorineural hearing loss. This study uses the validated Glasgow Benefit Inventory (GBI) to quantify the changes in quality of life (QOL) of adult cochlear implant users.

Study Design: Prospective, longitudinal study of 194 (CI) adult patients. **Methods:** A total of 194 postlingually deafened adult patients with unilateral CI who completed the GBI questionnaire were enrolled into the study. Mean patient age was 57 years (21-85 years old). The GBI was used to quantify the health benefit of CI. For subgroup analysis, the patients were divided into three groups according to their age at implantation: group I, 84 patients (< 55 years); group II, 67 patients (55-69 years); and group III, 44 adults (> 69 years). **Results:** The improvements in the total score (+39.5), general health subscore (+52.52) and social functioning subscore (+23.85) of the GBI were each statistically significant ($P < 0.001$). The improvement in physical subscore did not reach statistical significance. Although there were some differences in the improvement noted among the different age groups, it did not reach statistical significance. **Conclusions:** Majority of patients reported overall improvement in QOL after unilateral CI. These findings are consistent with those in the literature for CI and are comparable to other middle ear procedures. This study is the largest to demonstrate significant (QOL) benefit from unilateral CI as measured by the GBI. Moreover, it is unique in showing the differences in benefit within different age groups.

S134. Incidence of Lateral Rectus Palsy in Anterior Petrosectomy Approaches

Peter T. Anderson, MD, Cincinnati, OH; Ravi N. Samy, MD, Cincinnati, OH; Hwa J. Son, MD, Cincinnati, OH; Myles L. Pensak, MD*, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the incidence of lateral rectus palsy with anterior petrosectomy approaches; and 2) explain the anatomy of the petrous apex.

Objectives: To review the incidence of abducens nerve palsy in anterior petrosectomy/extended middle cranial fossa approaches performed for removal of disease or as a surgical corridor to the clivus, ventral brainstem, or other portions of the intracranial anatomy. This data is not well documented in the neurotology literature. **Study Design:** Retrospective chart review. **Methods:** Over the past 12 years, approximately 288 patients underwent anterior petrosectomy/petrous apicectomy/extended middle fossa approaches for a variety of lesions. Their charts and postoperative outcomes were reviewed. **Results:** Average age of patients in our study was 44.6 years (range of 6-85 years). 53.3% of our patients were male; 46.7% were female. Three patients suffered from

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postoperative lateral rectus palsy. **Conclusions:** Although approaches to the petrous apex can often be performed without significant morbidity, there is a risk of injury to the abducens nerve and resultant lateral rectus palsy. While the majority of the palsies are reversible, temporary, and not of significant consequence, it is important for the practicing neurotologist to know the petrous apex anatomy well and find ways to reduce the incidence of subsequent injury and morbidity.

S135. Challenges in Cochlear Implantation for Sudden Idiopathic Sensorineural Hearing Loss Associated with Neutrophilic Dermatitis (Sweet's Syndrome)

Behrad B. Aynehchi, MD, Brooklyn, NY; Matthew B. Hanson, MD, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of various autoimmune mechanisms for sensorineural hearing loss along with the indications and perioperative management of cochlear implants.

Objectives: Acute febrile neutrophilic dermatitis or Sweet's syndrome is a relapsing inflammatory autoimmune phenomenon infrequently associated with idiopathic bilateral sensorineural hearing loss, with two prior reports in the literature. We describe the evaluation and management of a patient presenting with this occurrence, including the unique challenges of placing a cochlear implant beneath an inflamed skin site. **Study Design:** Case study. **Methods:** The disease course with laboratory findings, imaging, photographic, and audiologic findings throughout management are presented. Additionally, a review of the literature highlighting trends in presentation and management is discussed. **Results:** A 49 year old woman with a two year history of Sweet's syndrome presented with profound bilateral sudden sensorineural hearing loss over a span of two days. The loss failed to improve with systemic and intratympanic steroids and the patient subsequently underwent placement of a cochlear implant. She then presented five days postoperatively with an abscess of the postauricular incision associated with an acute neutrophilic dermatitis flare that resolved with drainage and antimicrobials with continued proper functioning of the implant. **Conclusions:** As concluded in prior reports, the specific etiology for the hearing loss associated with Sweet's syndrome is uncertain, but generally appears to be autoimmune in nature. Similar to other causes of sensorineural hearing loss, hearing ability in these patients responds well to cochlear implantation. However, the unique relapsing inflammatory skin condition necessitates a higher level of vigilance for potential threats to implant viability. In addition to avoiding implantation during relapses, additional tools in addressing this issue include topical or systemic steroids, antibiotic prophylaxis, and meticulous hygiene.

S136. Change in Self-Reported Dizziness Handicap following Cartilage Cap Occlusion Surgery for Superior Canal Dehiscence

Jamie M. Bogle Moushey, AuD PhD, Jacksonville, FL; Larry B. Lundy, MD*, Jacksonville, FL; David A. Zapala, PhD, Jacksonville, FL; Amanda M. Copenhaver, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to describe variables that may predict reported dizziness handicap following surgery for superior canal dehiscence.

Objectives: To evaluate change in dizziness handicap following surgical intervention for superior canal dehiscence (SCD), and to explore possible variables that may influence dizziness handicap. **Study Design:** Prospective within subject design. **Methods:** Postsurgical Dizziness Handicap Inventory (DHI) questionnaires were sent to patients (n = 35) following cartilage cap occlusion surgical repair of SCD. Pre and postsurgical DHI questionnaires were compared (Wilcoxon signed rank test, p < 0.05). Retrospective chart review evaluated possible characteristics that could influence dizziness handicap. **Results:** All patients reported dizziness before surgery. Post-surgical DHI questionnaires were collected for 20 patients. Total DHI scores did not change significantly (pre: median 48, IQR 28 - 56; post: median 33, IQR 19 - 50) for the total group. Total scores for patients with moderate/severe handicap (> 36 DHI score; n = 14) demonstrated significant change (p = 0.008), while those with mild handicap (n = 6, < 34 DHI score) did not. Coexisting conditions, such as migraine, anxiety, and depression, were distributed similarly among those whose scores improved, worsened, or demonstrated no change in DHI scores. **Conclusions:** Dizziness handicap outcomes vary based on the level of presurgery DHI score. Patients with moderate/severe handicap preoperatively demonstrated significant improvement in their postoperative dizziness handicap scores, while those with mild handicap scores did not. Additional factors may influence presurgical reports of handicap, but it is unclear if these factors significantly influence postsurgical outcomes.

S137. Assessing the Current Trends of Otologic Surgery among Practicing Otolaryngologists in Canada: Is Otolaryngology Shifting Towards Tertiary Care Centers?

Stephen H. Chen, PhD, Toronto, ON Canada; Hosam Amoodi, MD FRCSC, Toronto, ON Canada; Joseph M. Chen, MD FRCSC, Toronto, ON Canada; Julian M. Nedzelski, MD FRCSC*, Toronto, ON Canada; Vincent Y. Lin, MD FRCSC, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the training experience and scope of otology practice amongst otolaryngologists in Canada.

Objectives: To examine the training experience in otology and assess the nature of current otology practices among otolaryngologists in Canada. **Study Design:** A cross-sectional study using both paper and web based questionnaires. **Methods:** Questionnaires were sent to all active otolaryngologists registered with the Canadian Society of Otolaryngology. Results were collated and analyzed.

Results: Over 160 otolaryngologists in Canada participated in the survey. Close to 90% of respondents completed their residency training in Canada while 22% completed further advanced fellowship training in otology. Approximately 56% and 39% of the otolaryngologists under the age of 55 perform ossiculoplasty and/or stapedotomy, respectively, while 82% and 71% of the otolaryngologists over the age of 55 perform these two procedures. Of the otolaryngologists under the age of 55 who perform stapedotomy, 55% are fellowship trained compared to 17% of otolaryngologists over 55 who are fellowship trained. Further, 41% of the otolaryngologists under the age of 55 who perform ossiculoplasty are fellowship trained compared to 21% of otolaryngologists over 55. **Conclusions:** There exists a diversity of training and practice in otology amongst otolaryngologists in Canada. There is a tendency for otolaryngologists over the age of 55 to have a wider scope of otology in their practice compared to their younger colleagues. However, of those younger otolaryngologists who perform otologic procedures, more are fellowship trained reflecting the perceived need for advanced training to perform these procedures.

S138. Bilateral Inverted Papilloma of the Middle Ear with Intracranial Involvement and Malignant Transformation: First Reported Case

Isaac F. Dingle, MBA, Charleston, SC; Nataalka D. Stachiw, MD, Charleston, SC; Paul R. Lambert, MD*, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the management of middle ear inverted papilloma, discuss the importance of aggressive surgical excision in locally destructive middle ear disease, understand the importance of identifying carotid canal wall dehiscence in middle ear surgery, and explain the role of radiation therapy in malignant transformation of inverted papilloma.

Objectives: By reporting a case of middle ear inverted papilloma (IP) with malignant transformation and reviewing literature on the subject we will be able to: 1) discuss the rarity of middle ear IP; 2) explain the proper management of this disease; and 3) identify surgical learning points in destructive middle ear disease. **Study Design:** A patient was discovered to have bilateral middle ear IP and a case report was planned. **Methods:** The medical records of the patient in discussion were reviewed. A literature review of middle ear, intracranial, and malignant transformation of IP was performed. **Results:** A patient with a completely resected right nasal cavity IP returned seven months postoperatively with hearing loss, bilateral aural fullness, and right sided facial weakness. Workup revealed middle ear IP and the patient underwent bilateral mastoidectomies with tympanoplasties. On both sides, the disease eroded the tegmen and was adherent to the underlying dura. The carotid canal was dehiscent in both middle ears. On the right, the tumor recurred two months after initial resection, with complete facial paralysis, dysequilibrium and trigeminal paresthesias. A right temporal bone resection with infratemporal fossa dissection and craniotomy was undertaken with neurosurgery. Tumor invaded through the dura into the temporal lobe, incased the internal carotid artery, and infiltrated the facial and trigeminal nerves. Pathology of the right temporal bone revealed malignant transformation to squamous carcinoma. **Conclusions:** Middle ear IP is a rare entity with potential for malignant transformation, carotid artery involvement and intracranial spread.

S139. Extensive Skull Base Cholesteatoma—A Novel Combined Surgical Approach

Terry R. Fleck, MD, Loma Linda, CA; Helen Xu, MD, Loma Linda, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the unique ways in which cholesteatoma may present and be able to outline the adequate workup and management of complex cholesteatomas with skull base extension.

Objectives: To better understand the unique ways in which cholesteatoma may present and to outline the adequate workup and management of complex cholesteatomas with skull base extension. **Study Design:** Case report with retrospective chart review. **Methods:** One patient with extensive skull base cholesteatoma reviewed. **Results:** 65 year old male with distant history of left canal wall down tympanomastoidectomy presented with two week history of painful occipital swelling and left otorrhea. CT of the temporal bone showed an occipital abscess with a soft tissue mass around the left occipital condyle and associated bony erosion. He was taken for a revision tympanomastoidectomy and skull base resection of cholesteatoma. Nine months later the patient returned with persistent occipital pain but no otorrhea. A repeat CT scan showed a soft tissue mass at the craniocervical junction involving the clivus and the occipital condyles. He subsequently underwent revision tympanomastoidectomy, transnasal endoscopic resection of the residual skull base cholesteatoma and occipital cervical fusion. **Conclusions:** Most often cholesteatomas will remain confined to the middle ear and petrous mastoid bone, however spread beyond this may occur due to the bone eroding capacity of cholesteatoma. This is believed to be the first case report with recurrent cholesteatoma spreading into the skull base requiring both traditional transmastoid as well as transnasal endoscopic approaches. Careful review of imaging studies and past history of cholesteatoma established the diagnosis prior to surgery and the addition of the transnasal endoscopic approach allowed for improved skull base access. Surgical management with wide exposure to remove all squamous epithelium is the key for cure.

S140. Simultaneous Management of Malleus Fixation during Stapedectomy for Otosclerosis

David R. Friedmann, MD, New York, NY; Ayaka Iwata, New York, NY; Anil K. Lalwani, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to make the definitive diagnosis of ossicular fixation during middle ear exploration. This case presentation and literature review should aid readers in the management of simultaneous malleus and stapes fixation and emphasize the importance of both confirming the diagnosis during middle ear exploration and ruling out other potential pathologies.

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Objectives: The definitive diagnosis of ossicular fixation is made by palpation of the ossicles during middle ear exploration. This case presentation reviews the management of simultaneous malleus and stapes fixation and emphasizes the importance of confirming the diagnosis during middle ear exploration. **Study Design:** Case report. **Methods:** Review of literature. **Results:** A 37 year old man presented with a long history of bilateral progressive hearing loss. Audiologic evaluation revealed bilateral conductive hearing loss with an air bone gap of 55dB on the left and 30dB on the right. CT of the temporal bone did not reveal foci of otospongiosis, ossicular fixation or other abnormality. Patient underwent left middle ear exploration with planned stapedectomy for presumed otosclerosis. Intraoperatively, fixation of the malleus and stapes footplate was noted. The malleus was immobile due to fixation at the anterior malleolar ligament and anterosuperior epitympanum. A single stage malleostapedotomy was performed with laser lysis of bony fixation of malleus and a small fenestra stapedectomy using a piston prosthesis. The postoperative audiogram at four weeks revealed complete closure of the left air bone gap. The literature suggests that combined malleus fixation and otosclerosis is extremely rare, often undiagnosed, and its treatment controversial with some authors advocating no treatment of malleus fixation.

Conclusions: The coincident finding of malleus fixation in otosclerosis is quite rare, and failure to diagnose and correct it would lead to suboptimal postoperative hearing results. This case reinforces the importance of independently palpating the mobility of each ossicle during middle ear exploration and demonstrates the efficacy of safely addressing both malleus and stapes fixation in a single stage operation.

S141. Congenital Muscular Torticollis and Saccular Dysfunction: A Case Report

Ashley M. Hallberg, AuD FAAA, Detroit, MI; Syed F. Ahsan, MD, Bloomfield Hills, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the application of identifying saccular dysfunction in cases of congenital muscular torticollis in order to possibly determine cause and to help in determining a treatment plan.

Objectives: To determine if saccular dysfunction plays a probable role in infants with congenital muscular torticollis (CMT). **Study Design:** Retrospective review. Saccular function was evaluated in an 18 month old infant with left sided CMT who was referred for evaluation of postural imbalance and observed nystagmus. **Methods:** Informed consent was obtained. cVEMPs were recorded to assess saccular function, caloric stimulation, positional and rotational testing were performed to evaluate other vestibular receptors. **Results:** Abnormal cVEMP findings were observed with a low amplitude response on the left, indicating left side saccular dysfunction. Caloric testing was symmetrical and rotational chair study revealed a normal pattern. Rotary torsional nystagmus upon right positional testing suggested a presence of positional vertigo presenting secondary to abnormal saccular function. **Conclusions:** We propose that saccular dysfunction plays a plausible role in infants with torticollis and is an important consideration when timely resolution of CMT is not obtained with treatment. Early awareness of abnormal saccular function in this population may help us understand the mechanisms leading to development of CMT and possibly help in developing appropriate treatment plans. Larger studies will be necessary to validate these findings but to the best of our knowledge, this is the first documented report of saccular dysfunction identified in an infant with CMT.

S142. The Effect of Diabetes on Hearing Loss

Derek J. Handzo, DO, Detroit, MI; Virginia S. Ramachandran, AuD, Detroit, MI; Brad A. Stach, PhD, Detroit, MI; Ed S. Peterson, PhD, Detroit, MI; Kathleen L. Yaremchuk, MD*, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss hearing loss found in non-diabetics, well controlled diabetics and poorly controlled diabetics in different age groups.

Objectives: Diabetic patients were identified as well or poorly controlled based on American Diabetes Association guidelines and audiograms were evaluated to determine if hearing loss was greater than age matched non-diabetic patients. **Study Design:** Retrospective chart review. **Methods:** This is a retrospective chart review of 990 patients that had audiograms performed between 2000 and 2008. Subjects were classified as diabetic controlled, diabetic non-controlled and non-diabetic groups. Subjects were also classified by gender and age category (<60, 60-75, >75). A three way analysis of variance (NOVA) was used to examine pure tone average (PTA), speech frequency PTA, high frequency PTA, and word recognition scoring (WRS). **Results:** There were statistically significant differences in hearing between non-diabetic (average PTA 14.8 ± 6.9 for <60 year old and 23.6 ± 8.9 for 60-75 year old females) and well controlled diabetic (20.0 ± 10.7, 27.0 ± 11.6) and poorly controlled diabetic (22.1 ± 14.2, 29.6 ± 13.2) females in the <60 and 60-75 age categories. P-values were < 0.01 for both age groups comparing controls to uncontrolled and <0.05 for controls verses controlled for the young females. This difference was not seen in the male patients. **Conclusions:** There was a statistically significant decrease in PTA in well and poorly controlled diabetic compared to non-diabetic females in the <60 and 60-75 age categories. Hearing loss in the male population was significantly worse in all age categories compared to females but did not demonstrate a decrease from well controlled or poorly controlled diabetics.

S143. Progression of Cisplatin Related Hearing Loss among Pediatric Cancer Survivors

Michael S. Harris, MD, Indianapolis, IN; Jaimie L. Gilbert, PhD, Bloomington, IN; Allison M. Yancey, MD, Indianapolis, IN; Akinbode Egbelakin, MBBS, Indianapolis, IN; Jamie L. Renbarger, MD, Indianapolis, IN; David B. Pisoni, PhD, Bloomington, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize factors associated

with hearing loss following cisplatin therapy for pediatric cancer; 2) be cognizant of the large degree of variability that exists in long term audiologic outcomes following cisplatin therapy for pediatric cancer; and 3) consider the possibility that some patients may demonstrate progression of hearing loss after completion of cisplatin therapy.

Objectives: Hearing loss is a well recognized but incompletely characterized complication of cisplatin therapy for childhood cancer. The objectives of this study were to characterize the degree of stability or progression of hearing loss from the time of completion of cisplatin treatment to late, post-cisplatin followup. **Study Design:** Retrospective cohort analysis with long term followup. **Methods:** Audiograms of 102 pediatric patients who had completed cisplatin therapy for neuroblastoma, osteosarcoma, hepatoblastoma, or germ cell tumors were scored using Brock's Hearing Loss Scale, a validated measure of cisplatin associated high frequency hearing loss. Demographic and treatment variables such as cumulative dose, dose adjustments, concurrent ototoxic medications, and disease status were compared across children who demonstrated hearing loss (Brock grade ≥ 1) and children who did not demonstrate hearing loss (Brock grade 0) following cisplatin treatment. A subset of this sample, consisting of 16 pediatric cancer survivors (mean age = 8.96 years-old; 3.38 years post-cisplatin treatment) were re-evaluated by pure tone audiometry to assess for stability or progression of hearing loss. **Results:** Forty-two percent (43/102) of pediatric cancer patients in our sample demonstrated hearing loss of any severity (Brock grade ≥ 1) following cisplatin therapy; 28% (29/102) demonstrated a threshold shift of ≥ 40 dB at 4,000 to 8,000 Hz (Brock grade ≥ 2) following cisplatin therapy. Factors associated with hearing loss in this sample included male gender ($P = 0.0003$), higher cumulative dose ($P = 0.03$), and younger age ($P = 0.02$). Progression of hearing loss from the end of therapy to the present was demonstrated in 5 of 16 children; stability of hearing loss from the end of therapy to the present was demonstrated in 11 of 16 children; and apparent improvement of hearing loss was demonstrated in 1 of 16 children. **Conclusions:** These findings reinforce age and cumulative dose as risk factors for development of cisplatin associated hearing loss and emphasize the importance of long term followup to monitor for progression of cisplatin associated hearing loss.

S144. Papillary Apocrine Cystadenoma of the External Auditory Canal: A Case Report

Katherine I. Johnson, MD, Omaha, NE; Gary F. Moore, MD*, Omaha, NE

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the histological features of papillary apocrine cystadenoma, describe the clinical and histologic features unique to this tumor and understand the clinical behavior of adnexal tumors with apocrine differentiation.

Objectives: 1) Identify the histologic features of papillary apocrine cystadenoma; 2) describe clinical and histologic features that differentiate this tumor from other adnexal tumors with apocrine differentiation; and 3) understand the clinical behavior of these benign tumors. **Study Design:** Case report with review of the literature. **Methods:** Chart review of a patient at a tertiary care neurotologist clinic with review of the English literature on adnexal tumors with apocrine differentiation. **Results:** There are a variety of adnexal benign tumors that demonstrate apocrine differentiation. To date, only 2 other cases of papillary apocrine cystadenoma arising from the external auditory canal exist in the literature. **Conclusions:** This is only the third case of papillary apocrine cystadenoma of the external auditory canal in the literature. They can present as a cystic mass in the external canal. They are benign, but may cause external otitis or hearing loss. Complete surgical excision is recommended.

S145. Dietary Nutrients Attenuate Events Related to Cell Death in the Inner Ear after Noise Insult

Debbie E. Joseph, MD, Gainesville, FL; Colleen G. Le Prell, PhD, Gainesville, FL; Dustin M. Lang, MS, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should have a better understanding of the mechanisms underlying the efficacy of antioxidants to protect tissues of the inner ear from noise induced pathology.

Objectives: Noise induced hearing loss is caused by damage to the sensory cells in the inner ear. Much of the damage to the sensory cells is induced by metabolic stress and related free radical production. Noise induced free radical production also triggers chemical cascades that result in caspase dependent apoptosis. Here, we describe changes in noise induced chemical events in ears from animals treated with beta carotene, vitamins C and E, and magnesium beginning 1 day prior to noise insult. **Study Design:** Guinea pigs were screened for normal threshold sensitivity at 4, 8, and 16 kHz using the sound evoked ABR, and after confirming normal thresholds, assigned to one of three experimental groups (saline treated unexposed controls; saline treated noise exposed controls; and antioxidant treated noise exposed experimental subjects). Saline/micronutrient treatments were administered one day prior to noise exposure, and on the day of noise exposure. After euthanasia, cochlear tissues were harvested and processed. **Methods:** Guinea pigs were exposed to 115 dB SPL octave band noise (centered at 4 kHz) for 4 hours and euthanized 4 hours or 35 days subsequent to noise insult; noise exposed control animals received saline and oral vegetable oil vehicle in the absence of nutrient additives. Immunocytochemical staining was performed on harvested cochlear tissue for expression of caspase 8 (right ears) as well as 3-nitrotyrosine (left ears). **Results:** We present immunocytochemical evidence indicating reduced 3-nitrotyrosine (3NT) production in the outer hair cells both 2 hours and 7 days post-noise. Caspase 8 was actively expressed 7 days post-noise in control animals, with reduced expression in treated animals. Preliminary data also indicate reduced translocation of endonuclease G (EndoG) after noise exposure in the treated animals. **Conclusions:** The data from control animals confirm other reports that free radicals are produced in the inner ear after noise insult and that caspase 8 and endonuclease G activation contributes to noise induced cell death. These data further our understanding of the mechanisms underlying the efficacy of antioxidants to protect tissues of the inner ear from noise induced pathology.

Posters

S146. RICHARD J. BELLUCCI, MD RESIDENT RESEARCH AWARD (2nd Place Eastern Section)

Influence of Hearing Loss on Income for Adults in the United States

David H. Jung, MD PhD, Boston, MA; Neil Bhattacharyya, MD FACS*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effects of hearing loss on income for US adults.

Objectives: To evaluate the effect of hearing loss (HL) on personal income for adults in the United States. **Study Design:** U.S. population based cross-sectional study. **Methods:** The population of patients with a coded diagnosis of HL was extracted from the 2006 and 2008 medical expenditure panel survey linked household and medical conditions files and compared against the population of patients without HL. Differences in employment, wages, total income, social security income, and family income as a percentage of the poverty line associated with HL were evaluated in multivariate regression models after adjustment for demographic and Charlson comorbidity variables. **Results:** An estimated 1.87±0.18 million adult patients were identified with a diagnosis of HL, with a mean age of 51.0 years and male predominance (54.7%). Patients with HL were more likely to be unemployed than those without (adjusted odds ratio, 2.2; p<0.001). The HL population earned a mean wage of \$23,481 ± 3,366, versus \$31,272 ± 517 for the non-HL population (net decrease in wages, -\$7791; p =0.02). Reported differences between those with and without HL in total income (\$29,259±3,333 vs. \$34,490±521; p=.114), social security income (\$918±321 vs. \$618±35; p=.350), and family income as a percentage of the poverty line (odds ratio for below poverty line with HL, 1.3; p=0.137) did not reach statistical significance. **Conclusions:** Adults with HL are more likely to be unemployed and on average earn significantly less wage income than adults without HL. Further work is needed to determine the potential impact of treatment on these differences.

S147. Role of Connexin (Cx) 43 and Hearing Loss: Possible Connection to Auditory Neuropathy

Ana H. Kim, MD, New York, NY; Linda Mattiace, PhD, Valhalla, NY; Anne Sollas, MA, Valhalla, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the presence of connexins in the inner ear and retrocochlear auditory pathway and their role in hearing loss.

Objectives: To determine the presence of connexin (Cx) 43, a gap junction protein that mediates cell to cell communication, along the retrocochlear auditory pathway. Our previous study showed Cx43 mutation resulting in premature hearing loss associated with disorganized auditory brainstem responses (ABR) waveform, while the organ of Corti structures (hair cells and supporting cells) remained intact. These findings suggest that Cx43 may play a role in the propagation of auditory signals in the retrocochlear pathway. **Study Design:** Original scientific research. **Methods:** CBA mice were injected with Fluoro-Gold (FG), a fluorescent retrograde neuronal tracer, sacrificed and processed for FG, Calbindin (calcium channel neuronal marker), and Cx43. Morphology and cell counts were performed at the level of the cochlear nucleus (CN), superior olivary complex (SOC), and lateral lemniscus (LL). **Results:** Examination of retrocochlear pathway revealed high levels of Cx43 immunoreactivity in the CN, SOC, and LL that overlapped with FG and Calbindin staining of neurons. The pattern of Cx43 immunoreactivity was distinctive from Cx26 and Cx30—two other well known Cxs associated with hearing loss. **Conclusions:** Cx43 is abundantly present in key retrocochlear centers (CN, SOC, and LL). The premature hearing loss observed with abnormal ABR waveforms in Cx43 mutant mice may be due to dyssynchrony of auditory signal rather than through dysregulation of cochlear potential.

S148. Fisch Class D Glomus Jugulare Treated with Subtotal Resection and Postoperative Proton Therapy: Case Report and Review of the Literature

Glenn W. Knox, MD JD*, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the role of proton therapy in the treatment of glomus jugulare; 2) explain the role of subtotal resection in the treatment of these tumors; and 3) compare this case to other similar cases.

Objectives: The objective of this study was to report a patient with a Fisch class D glomus jugulare treated with subtotal resection and postoperative proton therapy and to review the literature for similar cases. **Study Design:** Case report and literature review. **Methods:** A 61 year old Caucasian female presented with dizziness, ataxia, right sided facial weakness, pulsatile tinnitus and decreased hearing on the right for several months. MRI revealed a 3.5 x 1.5 x 2.6 cm enhancing lesion of the right temporal bone. The patient underwent preoperative embolization followed immediately by a subtotal excision of this tumor through a combined translabyrinthine/infratemporal approach. Pathology revealed paraganglionoma with 10% of the tumor cells positive for Ki67 stain. The patient did well postoperatively and underwent postoperative proton beam radiation fractionated to a total of 45 Gy. **Results:** A comprehensive review of the literature revealed only one other case in the medical literature involving subtotal resection of a large glomus tumor followed by proton beam radiation. **Conclusions:** 1) Proton beam therapy may be beneficial in the postoperative treatment of patients with subtotally resected large skull base glomus tumors; 2) prospective studies of this approach are indicated; and 3) comparison of similar patients undergoing conventional photon therapy would be useful.

S149. Auditory Brainstem Response Screening for Vestibular Schwannomas: A Systematic Review and Meta-Analysis

Paul D. Koors, BS, Richmond, VA; Leroy R. Thacker, PhD, Richmond, VA; Daniel H. Coelho, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the sensitivity

and specificity of the auditory brainstem response in screening for vestibular schwannomas and revisit its utility as a diagnostic tool for patients with clinically suspected vestibular schwannomas.

Objectives: The aim of this study is to evaluate the current role of auditory brainstem response (ABR) testing in the diagnosis of vestibular schwannomas (VS). **Study Design:** A systematic review of the literature and meta-analysis. **Methods:** Searches were conducted in PubMed, CINAHL, Biosis, Cochrane, Cambridge Scientific Abstracts, Web of Science, and EMBASE, supplemented by hand searches. From the studies chosen for final inclusion, relevant data were extracted and meta-analysis of pooled data was performed. **Results:** 623 studies were identified from which 41 met inclusion criteria for analysis (1978 to 2009) including 3153 patients. Pooled sensitivity for ABR detection of vestibular schwannomas was 93.4 (95% confidence interval [CI] 92.5 to 94.2, $P=0.0000$). For tumors less than 1 cm (8 studies, 176 patients) sensitivity was 85.8% (95% CI 80.6-90.1, $P=0.0116$). For tumors greater than 1 cm (6 studies, 251 patients) pooled sensitivity was 95.6% (95% CI 93.1-98.2, $P=0.0660$). Sensitivity of ABR to detect extracanalicular tumors was higher than for intracanalicular tumors, though pooled data were not statistically valid. Pooled specificity (8 studies, 2432 patients) was 82.0% (95% CI 80.5-83.6, $P=0.0000$). **Conclusions:** Although MRI remains the gold standard in diagnosing retro-cochlear pathology, current and future economic realities may preclude its widespread use. In light of the high sensitivity and specificity of ABR testing for VS, we strongly urge its reconsideration as a diagnostic screen for patients with clinically suspected VS.

S150. Balance Disorders in the Elderly: Epidemiology and Functional Impact

Harrison W. Lin, MD, Boston, MA; Neil Bhattacharyya, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the prevalence and impact of dizziness and balance disorders in the growing elderly population.

Objectives: Quantify the prevalence and determine the impact of dizziness and balance disorders in the elderly. **Study Design:** Cross-sectional analysis of a national database. **Methods:** The balance problems survey module of the 2008 National Health Interview Survey was examined, identifying cases of reported dizziness or balance problems in persons ≥ 65 years old. The prevalence of balance disorders, associated symptoms, and their impacts on self-reported functional limitations were determined. The related impact on daily activities for elderly persons with balance problems was quantified. Sex based differences in balance problems were determined. **Results:** Among 37.3 \pm 0.9 million elderly persons (mean age, 74.4 \pm 0.1 years; 56.9 \pm 0.9% female), 7.0 \pm 0.3 million persons (19.6 \pm 0.7%) reported a problem with dizziness or balance in the preceding 12 months. Balance problems included difficulty with: unsteadiness (37.8%), walking on uneven surfaces (18.8%), vertigo (16.1%), faintness (15.6%), walking upstairs (14.4%), and walking in the dark (9.2%). Prescription medication triggered the balance problem in 18.6%. Among the 48.8% of elderly persons with balance problems who sought care, 84.4%, 23.0%, 16.2% saw a general practitioner, neurologist, or otolaryngologist, respectively. Of this group, 24.7% reported that balance problems specifically prevented them from participating in activities including: exercise (59.4%), social events (45.7%), driving (45.1%), and work (32.9%). Females were more likely to experience balance problems than males (21.0% versus 17.7%, $p=0.025$). **Conclusions:** Approximately one in five elderly persons experiences annual problems with dizziness or balance. Given the significant prevalence and negative effect of balance problems on work, driving and exercise in the elderly, balance disorders merit special attention, particularly in the face of an aging population.

S151. Preliminary Findings for the Hearing Efficacy of the NYEEI Nonferromagnetic Stapes Prosthesis

Christopher J. Linstrom, MD*, New York, NY; Carol A. Silverman, PhD MPH, New York, NY; Julia B. Kieserman, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the issues and findings relating to MRI and safety of stapes prostheses used for stapedectomy and stapedotomy surgical procedures; 2) specify the 1995 guidelines of the Committee on Hearing and Equilibrium of the American Academy of Otolaryngology-Head and Neck Surgery relating to conductive hearing loss; and 3) explain the short term hearing outcomes for the NYEEI and Armstrong nonferromagnetic stapes prostheses.

Objectives: The NYEE piston provides a narrower diameter and completely nonferromagnetic stapes prosthesis alternative to other nonferromagnetic prostheses. The purpose was to determine the short term hearing efficacy of the NYEEI versus Armstrong prosthesis at 6 weeks postoperatively. **Study Design:** Retrospective review of records of primary stapedotomy procedures performed using the Armstrong or NYEEI piston between 2007 and 2010 by the senior author. **Methods:** Records were excluded if (a) the operative diagnosis was obliterative otosclerosis or congenital fixation, (b) the argon laser was not employed, or (c) stapes footplate drill-out occurred. The mean preoperative and postoperative air conduction (AC) thresholds, bone conduction (BC) thresholds; and air bone gaps (ABGs) were calculated using 500, 1000, 2000, and 3000 Hz in accordance with the 1995 AAO-HNS guidelines. The mean postoperative ABG PTA minus the preoperative ABG PTA yielded the change in mean ABG PTA. **Results:** Twenty-eight records ($n = 17$, NYEEI prosthesis; $n = 11$, Armstrong prosthesis) met study criteria. All ears had prosthesis length of 4.00 or 4.25 mm. The mean age did not differ significantly between prosthesis groups (t test for independent groups and equal variances, $P > .5$). The mean PTA change (preoperatively to postoperatively) did not differ significantly between prosthesis groups (t test for independent groups, equal variances, $P > .5$) for any audiologic measure. ANCOVA results (covariate was preoperative ABG PTA) confirmed absence of significant difference between groups in ABG PTA change. **Conclusions:** The NYEEI stapes piston is essentially similar to the Armstrong stapes piston in short term hearing outcome. Future long term efficacy research is needed.

Posters

S152. Transnasal Endoscopic Management of Patulous Eustachian Tube: A Cadaveric Analysis

R. Peter Manes, MD, New Haven, CT; J. Walter Kutz, MD, Dallas, TX; Brandon Isaacson, MD, Dallas, TX; Peter S. Batra, MD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the feasibility of a novel transnasal procedure to treat patulous eustachian tube.

Objectives: Patulous eustachian tube (ET) can result in abnormal transmission of sound from the pharynx to the middle ear (ME) via an abnormally patent ET. The objective of this study was to evaluate the technical feasibility of a reversible transnasal procedure for patulous ET using occluded silastic catheters to close the eustachian tube. **Study Design:** Prospective cadaveric analysis.

Methods: Ten sides were evaluated in 5 cadaver heads. Size 14, 16, and 18 gauge (G) catheters were occluded with bone wax to create a semi-rigid solid tube. They were placed endoscopically through the ET orifice to span the entire ET length. Proper placement in the ME was confirmed by tympanotomy. Each attempt was graded on a 4-point scale based on ease of placement: 3+, 2+, 1+, and 0. **Results:** The 16G was the easiest to place with the best fit and confirmed in the ME in 8 cases. The grading for the 10 sides was 3+ (4), 2+ (4), and 1+ (2). The 14G catheter was next easiest to place and observed in the ME in 7 cases. It generally had an extremely tight fit and propensity to impart mucosal trauma. The grading was 3+ (3), 2+ (4), 1+ (2), and 0 (1). The 18G was the most difficult to place and observed in the ME in 6 cases. The catheter was noted to displace easily due to a loose fit. The grading was 3+ (1), 2+ (5), and 1+ (4). Tympanic membrane or ossicular injury was not noted in any trial. **Conclusions:** This cadaveric data suggests that a semi-rigid catheter as a reversible procedure for management of patulous ET can be safely performed via the transnasal route. It serves to provide the requisite technical foundation for future human studies for this challenging entity.

S153. The Role of Social Media in Patient Motivation and Decision Making in Cochlear Implant Device Selection

Ted A. Meyer, MD PhD, Charleston, SC; Kara S. Davis, MD, Pittsburgh, PA; Wasef K. Muzaffar, BS, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the complex role played by social media in cochlear implant device selection.

Objectives: Cochlear implants represent a unique entity in healthcare as many patients engage in an active decision making role when choosing a device. Opinions of healthcare professionals, word of mouth of other CI users, and specific device characteristics have influenced patients' CI selection. Patient autonomy in device choice can be viewed as the patient as a consumer. In addition, the CI patient community often uses social media outlets (online forums, blog sites, Facebook, Twitter) to share personal experiences and opinions regarding device selection. Survey data exists in the current literature on CI selection processes; however, none utilize an online survey format or employed online communities and emerging social media for survey distribution to explore social media's impact in decision making. Therefore, we were interested in exploring how social media impacts decision making of CI users and how it compares with more traditional sources of information during device selection. **Study Design:** Based on existing literature and recent patient experiences, an online survey was developed to investigate the motivations and influences surrounding CI device selection and the followup experience post-implantation. **Methods:** The survey was distributed using social media such as Facebook, Twitter, and online CI forums. The survey was hosted on SurveyMonkey. **Results:** 54% of global participants have had a device two years or less, and 42% completed the survey on behalf of a minor. 20% reported choosing between at least three different manufacturers. 84% cited websites, a primary source of information followed by manufacturer's brochures (48%), and online communities (39%). 36% reported healthcare professionals as a primary source of information. Performance, followed by reliability, was the most important consideration, with appearance being less important. 93% of respondents reported being satisfied or very satisfied with their implant. **Conclusions:** Online resources, including social networking, for the decision making processes of CI users spans patients of all ages and from countries worldwide. Social media significantly impacts decisions made by patients, healthcare professionals, and manufacturers, and its impact will be much greater in the future.

S154. Combined Electrophysiological Intraoperative Monitoring of Hearing during Acoustic Tumor Removal

Krzysztof F. Morawski, MD PhD, Warsaw, Woj Mazowi Polska; Kazimierz K. Niemczyk, MD PhD, Warsaw, Woj Mazowi Polska; Rafal R. Brzezinski, MD, Warsaw, Woj Maz Poland; Aleksandra A. Hryciuk, MD, Warsaw, Woj Maz Poland; Fred F. Telischi, MD*, Miami, FL

Educational Objective: Analysis of audiological parameters being collected during intraoperative monitoring (IM) by transtympanic electrocochleography (TT-ECoChG) and auditory brainstem responses (ABR) measured simultaneously could provide some data to develop an effective model of prediction of postoperative hearing results following cerebellopontine angle tumor (CPAT) surgery.

Objectives: Analysis of audiological parameters being collected during intraoperative monitoring (IM) by transtympanic electrocochleography (TT-ECoChG) and auditory brainstem responses (ABR) measured simultaneously could provide some data to develop an effective model of prediction of postoperative hearing results following cerebellopontine angle tumor (CPAT) surgery. **Study Design:** Retrospective review of 35 patients with CPAT monitored intraoperatively using TT-ECoChG and ABR. **Methods:** Thirty-five patients with CPAT were operated using middle fossa approach. Pure tone average (PTA) from 0.5-, 1.0-, and 2.0-kHz were calculated pre and postoperatively (pre-op, post-op). TT-ECoChG needed 64-256 sweeps for effective IM while ABR 512-1024 sweeps. A specially developed by the authors software analyzed and collected all data online. The following parameters were recorded intraoperatively: ABR wave V latency, compound action potential amplitude (CAP-Amp) and latency (CAP-Lat). **Results:** CAP Amp, CAP

Lat and ABR wave V were online visualized. Readable and repeatable CAPs were always recorded while ABR wave V relatively often disappeared or morphology changes did not allow easy automatic analysis. To average and visualize CAP Amp and CAP Lat 4-6 seconds were needed, while ABR consumed usually 20-30 sec. Intraoperative changes of CAP Amp and CAP Lat corresponded faster and more sensitive to various intraoperative situations than ABR. The Spearman Correlation Test revealed that preoperative PTA, prolongation of post-op CAP Lat, ABR wave V, and ABR I-V interlatency value as well as CAP Amplitude reduction correlated with post-op PTA (R ranged from 0.48 to 0.51; $p < 0.005$). **Conclusions:** Some parameters of ABR and TT-EcochG measured during IM of hearing in near real time showed good correlation to postoperative hearing measures.

S155. Novel Case and Review of Duplicated Internal Auditory Canals

Angelia Smith Natili, MD, Galveston, TX; Harold S. Pine, MD, Galveston, TX; Roy O. Riascos-Castaneda, MD, Galveston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the symptoms associated with duplicated internal auditory canal, recognize the radiological signs of this condition, and compare the usual presentation to this novel case.

Objectives: Report a novel case presentation of duplication of internal auditory canals (IAC) and systematically review the available literature. **Study Design:** Case report and systematized review of the literature. **Methods:** A novel case report is outlined. A systematized review of the literature was performed to identify all reported cases of duplication of the IAC. This included four online database keyword searches on duplication and internal auditory canal, plus forward and backward tracking of all cited sources. **Results:** Case report: a 16 year old male presented with a fungal infection, tympanic membrane perforation, hearing loss, and Tullio's phenomenon. CT of the temporal bone revealed bilateral duplicated internal auditory canals. His infection cleared with application of gentian violet to the EAC, and the dizziness and hearing loss resolved. A systematic literature review was conducted that found 22 reported cases of duplicated IAC, always associated with hearing loss. Only 4 cases in the literature report bilateral duplicated IAC, and all four of these patients have profound SNHL. This is the first case report of this anomaly with normal hearing. **Conclusions:** This is the first case ever reported of duplicated IAC in a patient with normal hearing. Thirteen of 22 duplicated IAC cases have been reported in the last 5 years. An association likely exists between improvements in imaging modality, neuroradiologists' increasing detection, and more frequent reports of duplicated IAC.

S156. Extended Middle Fossa Approach in Acoustic Tumors - Searching of Correlates for Preservation of Neurological Functions

Kazimierz K. Niemczyk, Warsaw, Poland; Krzysztof K. Morawski, Warsaw, Poland; Barbara B. Jamróz, Warsaw, Poland; Robert R. Bartoszewicz, Warsaw, Poland; Antoni A. Bruzgielewicz, Warsaw, Poland

Educational Objective: At the conclusion of this presentation, the participants should be able to explain advantages and difficulties of extended middle fossa approach in acoustic tumors surgery.

Objectives: Nowadays gadolinium MRI provides enlarged possibilities for small tumor diagnosis. The aim of tumor treatment is not only its total removal but also a good preservation of patient's neurological functions. **Study Design:** The aim of the study was to analyze the results acoustic tumor removal by extended middle fossa approach (EMFA). The analysis was focused on aspects connected with the preservation of hearing function and facial nerve function and on factors regarding the quality of life after surgery. The study group consisted of 59 patients (60 cases of tumor) operated via EMFA in our ENT department in the years 1998-2008. **Methods:** The study was performed using the unified study protocol, which consisted of: patient's medical history; ENT examination; results of pre- and postoperative audiological examination, intraoperative, and postoperative data. **Results:** Among patients in T1 and T2 stadium hearing preservation was achieved in 67.4% and 37.5% respectively. There was statistically significant correlation observed between better treatment results and absence of tumor adhesion to the surrounding tissue (92.8% versus 52.8%). The authors observed tendency to the better postoperative audiological results when patients had intraoperative hearing monitoring (53% versus 50%) and when the primary location of tumor were facial nerve (100%) or superior vestibular nerve (50%). Preservation of facial nerve function (stage I-II in House Brackmann scale) was stated in 81.4% for patients with T1 tumor and in 66.66% for T2 tumors. **Conclusions:** Tumor morphology (absence of adhesion) has statistically significant influence on hearing preservation and facial nerve function preservation. Other factors are: intraoperative monitoring, low stadium of sickness (T1), age (under 31 year for VII nerve function) and location of tumor (facial nerve or superior vestibular nerve in case of hearing function). Facial nerve dysfunction and hearing loss undermine psychological quality of life. In patients' opinion the facial nerve dysfunction has however, more influence on quality of life than deafness, though this does not correlate with degree of facial nerve dysfunction in House-Brackmann scale.

S157. Efficacy of Hammock Tympanoplasty in the Treatment of Anterior Perforations

Robert Peng, MS, New York, NY; Anil K. Lalwani, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to perform and know the effectiveness of hammock tympanoplasty in the treatment of anterior tympanic membrane (TM) perforation.

Objectives: Surgical repair of large anterior TM perforations continue to be a challenge for the otologic surgeon. Lateral graft tym-

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panoplasty, the recommended treatment, is technically difficult and is plagued with blunting of the anterior sulcus and lateralization of the TM, both of which can lead to CHL. In this study, we introduce and evaluate the efficacy of hammock tympanoplasty in the treatment of anterior perforation. **Study Design:** Retrospective case series. **Methods:** The hammock tympanoplasty, a medial graft tympanoplasty, utilizes a large anterior and posteriorly based tympanomeatal flap and the placement of a hammock graft extending from the anterior to the posterior external auditory canal. In this retrospective study, the medical, surgical, audiological, and radiological records of 25 patients treated with hammock tympanoplasty were reviewed. **Results:** The average age of the patients was 40.6±20 years. The perforation involved the right ear in 17 and at least two quadrants of the TM in 24 of 25 patients. The TM perforation was successfully closed in 24 of 25 patients with improvement of the air conduction threshold in 22 of 25 patients. None of the patients experienced SNHL or lateralization of TM. There was one patient with blunting of anterior sulcus and another patient who experienced delayed facial paresis 9 days following surgery that subsequently resolved. **Conclusions:** The hammock tympanoplasty is technically easier, highly effective in restoring the integrity of the TM, and shows improvement in postoperative hearing.

S158. Incidence and Clinical Significance of Superior Semicircular Canal Dehiscence

Rafael Antonio Portela, MD, Hershey, PA; Jenny Liu, BS, Hershey, PA; Sangam Kanekar, MD, Hershey, PA; Soha Ghossaini, MD, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the incidence of superior semicircular canal dehiscence in the general population. In addition, participants should be able to compare certain otologic symptoms present amongst patients with and those without superior semicircular canal dehiscence.

Objectives: Superior semicircular canal dehiscence (SSCD) is a newly described entity which may be under-diagnosed in the general population. It is classically associated with sound or pressure induced vertigo. The true incidence of SSCD is currently unknown. The purpose of this study is to determine the incidence of SSCD at our institution. In addition, we sought to compare certain otologic symptoms present amongst patients with and without SSCD. **Study Design:** This retrospective chart review was approved by our institutional review board. **Methods:** All temporal bone computer tomography (CT) scans performed from October 2009 to June 2010 were analyzed by a neuroradiologist for the presence of SSCD. Patients with a history of cholesteatoma, mastoidectomy, malignancy, or temporal bone trauma were excluded. Specific otologic symptoms associated with SSCD were collected and used for comparison. **Results:** A total of 160 CT scans were performed during the above time frame. 69 patients met our inclusion criteria for a total of 138 temporal bones analyzed. A total of 7 temporal bones were found to have SSCD, two were bilateral and three were unilateral. 80% of patients with SSCD presented with tinnitus. 60% presented with mixed hearing loss. Only one patient presented with the classic signs/symptoms of SSCD syndrome. **Conclusions:** The incidence of SSCD amongst our patient population was found to be 5%. The majority of patients with SSCD presented with tinnitus and mixed hearing loss. Although uncommon, a high index of suspicion is necessary to diagnose SSCD in patients with common otologic complaints of unknown origin.

S159. The Incus-Stapes Angle

Ansley M. Roche, MD, Atlanta, GA; N. Wendell Todd, MD MPH*, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) know that assessing the incus-stapes angle is difficult; 2) that the angle has clinical and scientific importance; and, 3) that better tools are needed to assess the angle.

Objectives: To quantitatively study the incus-stapes angle. Specifically, to elucidate intraobserver agreement, bilateral symmetry, and the potential correlation of incus-stapes angle with the extent of mastoid pneumatization. **Study Design:** Postmortem material analysis. **Methods:** Of 41 adult crania without clinical otitis, the five with the largest mastoids, and the five with the smallest mastoids, were assessed by high resolution computed tomography, both direct axial and direct coronal. On the coronal image best depicting the long process of the incus, the angle to the mid of the oval window was measured. **Results:** Intraobserver agreement for determining incus-stapes angle was only fair-moderate (Spearman $r=.45$ for all 20 angles, $P<.05$). Bilateral symmetry of incus-stapes angles was suggested, Spearman $r = .45$. However, we found no relationship of I-S angle with mastoid size. **Conclusions:** The incus-stapes angle is clinically and scientifically important, but is difficult to measure with computed tomography. Bilateral symmetry of incus-stapes angles was suggested statistically, but no association with mastoid size was found.

S160. Vestibular Evoked Myogenic Potentials across a Spectrum of Dizzy Diagnoses

William R. Schmitt, MD, Rochester, MN; Neil T. Shepard, PhD, Rochester, MN; Matthew L. Carlson, MD, Rochester, MN; Jeffrey P. Staab, MD, Rochester, MN; Scott D. Eggers, MD, Rochester, MN; Brian A. Neff, MD*, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize vestibular evoked myogenic potentials in selected neurotologic, neurologic, and psychiatric conditions presenting to a multidisciplinary dizziness clinic.

Objectives: Cervical vestibular evoked myogenic potentials (cVEMPs) produced by air conducted sound are thought to interrogate the sacculocolic reflex. The diagnostic role for VEMPs is under investigation, as abnormalities are found in many conditions. We present cVEMP data for patients with Ménière's disease (MD), vestibular migraine (VM), unrelated headache (HA), chronic subjective dizziness (CSD), and anxiety spectrum disorders (ASDs). **Study Design:** Retrospective chart review. **Methods:** Consensus diagnoses for study conditions were rendered by a multidisciplinary team including experts from neurotology, neurology, audiology, and

psychiatry. Patients with comorbid disorders were excluded to decipher effects attributable to individual diseases. Individuals >70 years and those with conductive hearing loss were excluded due to confounding effects. cVEMP testing was performed using 500 Hz air conducted tone burst stimuli. **Results:** We compared 25 patients with MD, 28 with VM, 32 with HA, 11 with CSD, and 6 with ASDs. The rate of absent cVEMP responses was 56%, 18%, 24%, 45%, and 66% respectively, with MD and ASDs yielding statistically significant differences when compared with VM ($p=0.005$ and 0.031). Patients with migraine unrelated to their dizziness had a similar rate of absent VEMP response to their VM and non-migraineur HA counterparts (25 versus 24 and 22%, respectively).

Conclusions: Abnormal cVEMP responses are common among patients reporting dizziness, including individuals with traditional neurotologic diagnoses and those with presumed functional disorders. These data suggest that patients who were previously considered to have normal labyrinthine function may have either otolithic abnormalities or central nervous system modulation of the sacculocolic reflex.

S161. Selection of ABR vs MRI for Workup of CPA Tumors in Patients with Asymmetric Sensorineural Hearing Loss: Creation of a Diagnostic Algorithm

Glenn Todd Schneider, MD MS, Rochester, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the clinical features of patients best suited for ABR testing, MRI scan, or clinical observation based on the experiences of our otologists over a two year period. As well they will better understand the implications of test choice on followup.

Objectives: Testing patients with asymmetric sensorineural hearing loss for CPA tumors presents the otolaryngologist with a choice between MRI or ABR. This decision requires consideration of both the sensitivity/specificity of the tests as well as the financial implications on our patients and the healthcare system. Previous studies have focused on the cost effectiveness of these screening tools but neither has proven to be ideal. We hypothesized that testing choice would be correlated to insurance status and severity of disease and would dramatically affect followup. **Study Design:** We performed a retrospective review of the selection criteria and outcomes of the patients screened with these tests in order to create a diagnostic algorithm. **Methods:** To test these hypotheses we reviewed the charts of 637 patients seen for asymmetric sensorineural hearing loss seen in our department's tertiary otology practice. Of the 315 patients included in the study three groups were identified: MRI ($n=112$), ABR ($n=92$), and clinical observation ($n=111$).

Results: Demographics were not significantly different between groups. When compared to the ABR and observation groups, patients screened with MRI scan had significantly lower speech discrimination*, worse speech discrimination scores between ears*, higher pure tone averages in the affected ear*, more severe clinical symptoms*, and better percent followup*. Insurance coverage of the patients in this study was not significantly correlated with choice of testing. $*(p<0.01)$. **Conclusions:** From this study we were able to create clinical criteria to better help us choose the appropriate testing for patients with asymmetric sensorineural hearing loss.

S162. An Assessment of Symptom Characteristics and Hearing Loss Etiologies in Individuals with Hearing Loss in the Health Professionals Followup Study and the Nurses Health Study

Josef Shargorodsky, MD MPH, Boston, MA; Sharon G. Curhan, MD ScM, Boston, MA; Roland Eavey, MD SM*, Nashville, TN; Gary C. Curhan, MD ScD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the symptom characteristics and prevalence of different hearing loss etiologies in individuals with known hearing loss.

Objectives: Hearing loss is a common sensory disorder but individuals with hearing loss vary greatly in symptom severity, progression and etiology. **Study Design:** Retrospective evaluation of participants in the Health Professionals Followup Study and the Nurses Health Study cohorts. **Methods:** A total of 3,657 men and 4,371 women with a reported professional hearing loss diagnosis responded to questions regarding age of onset, progression, and characteristics of their hearing loss. The prevalence of different hearing loss etiologies was calculated in those participants who were given a specific diagnosis for their hearing loss. **Results:** The mean age of hearing loss onset was 53 years in men and 62 years in women, while the most common age range for hearing loss onset was 60-69 in both cohorts. The majority of cases were bilateral (84.6% men, 73.6% women), had a gradual onset over years (84.7% men, 71.5% women) and worsened gradually (88.7% men, 84.2% women), although in both cohorts the younger the age of onset, the more likely individuals were to have sudden onset hearing loss. Only 46% of men and 20% of women with a hearing loss diagnosis were given a specific etiology for their hearing loss, with noise induced being the most common in men (43.5%), and age related/presbycusis being most common in women (36.4%). **Conclusions:** This study quantifies the symptom characteristics as well as the prevalence of different hearing loss etiologies in individuals with hearing loss, and shows that the nature of hearing loss varies based on age and sex.

S163. Prospective Evaluation of the Subperiosteal Technique for Receiver-Stimulator Fixation in Cochlear Implant Surgery

Emily Z. Stucken, MD, New York, NY; Samuel H. Selesnick, MD*, New York, NY; Michelle K. Kraskin, PhD, New York, NY; Hannah E. Shonfield, AuD, New York, NY; Joseph J. Montano, PhD, New York, NY; Kevin D. Brown, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility and safety of the subtemporalis pocket technique of receiver-stimulator fixation in cochlear implant surgery.

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Objectives: Recent refinements in cochlear implant surgery now permit placement of a receiver-stimulator in a subperiosteal pocket in the standard implant position without direct bony fixation. Two major concerns have been raised with this technique; migration of the receiver-stimulator and damage to a non-recessed electrode lead. We wished to determine the incidence of these potential complications by prospectively evaluating a cohort of patients receiving cochlear implants at our institution using the subperiosteal technique. **Study Design:** Prospective cohort. **Methods:** All patients undergoing cochlear implantation by a subperiosteal technique were included. The type of implant, patient age, months of followup, evidence of migration of the receiver-stimulator, and evidence of soft or hard implant failures were recorded. **Results:** The total number of ears implanted utilizing this technique was 26 (13 adult ears, 13 pediatric ears). There were 17 Cochlear Nucleus 5 devices placed, 3 Cochlear Freedom devices and 6 MedEl Sonata devices. Average patient age was 22 months for children and 63 years for adults (10-51 months, 21-85 years). Average followup length was 9 months (range 1-28 months). There were no episodes of either hard or soft failures. **Conclusions:** The subperiosteal technique is a safe and effective method for restraining the receiver-stimulator. No episodes of migration were seen and there were no episodes of hard or soft failures.

S164. Cost Analysis of Imaging Efficacy on Patients Presenting to the Emergency Department with Dizziness

Mausumi N. Syamal, MD, Detroit, MI; Syed F. Ahsan, MD, Detroit, MI; Kathleen Yaremchuk, MD*, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the potential for cost savings by simply implementing stricter guidelines for ordering in-emergency room CT scans for patients presenting with vertigo or dizziness.

Objectives: To determine the cost effectiveness of imaging in evaluating patients with dizziness in the emergency department. **Study Design:** Retrospective chart review. **Methods:** Charts of patients presenting to metropolitan emergency departments (EDs) with dizziness and vertigo between January 2008 and January 2011 were reviewed. Patient demographics, signs/symptoms and imaging studies were assessed for correlations and stepwise logistic regressions. **Results:** 1681 patients that presented to the EDs, 810 (48%) received a CT brain/head scan. \$988,200 was spent on CT brain imaging where only 0.74% yielded clinically significant pathology requiring intervention. Logistic regression analysis reveals that older patients and those of lower income were more likely to receive a CT scan. **Conclusions:** Many physicians, including otolaryngologists, use imaging as a first line modality to quickly rule out more serious causes. However, a look at CT scans ordered on patients with dizziness and vertigo in the emergency room yields a low predictive value for significant pathology. This reveals a great potential for cost savings by simply implementing stricter guidelines for ordering in-ED CTs for these patients. It is our hope that our investigation into our own practices will shed light on avenues to run leaner practices within our institution as well as serve as a model for other health care systems.

S165. Management of Complications of Acute Otomastoiditis in Solid Organ Transplant Patients

Ryan D. Winters, MD, New Orleans, LA; Rizwan Aslam, DO MS, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the microbiology, clinical course, and treatment of complications of acute otomastoiditis in patients immunosuppressed due to solid organ transplant.

Objectives: There are over 183,000 patients living with a functioning solid organ transplant in the United States, and almost no data exist discussing complications of acute otomastoiditis in this vulnerable population. Early recognition and treatment of acute otomastoiditis is essential in patients whose immune system is not normal, as progression can lead to sepsis, meningitis, brain abscess, Bezold's abscess, sigmoid sinus thrombosis, or other potentially fatal sequelae. **Study Design:** Case report with extensive literature review. **Methods:** The presentation, clinical course, and treatment of a renal transplant patient with otogenic meningitis and sigmoid sinus thrombosis is discussed. Extensive literature review is presented, revealing the paucity of data on management of complicated acute otomastoiditis in such patients. **Results:** A 63 year old man presented 3 years after cadaveric renal transplant with otorrhea and altered mental status. His acute otitis media progressed to meningitis with sigmoid sinus thrombosis and sepsis, and management included IV and otic antibiotics, tympanostomy tube placement, and cortical mastoidectomy. The patient made a full recovery without residual neurologic deficit. **Conclusions:** Extrapolating data from patients immunosuppressed for other reasons, patients immunosuppressed after solid organ transplant should receive prompt recognition and aggressive treatment of acute otomastoiditis is essential to prevent or address potentially devastating intracranial or systemic complications.

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S166. Congenital Nasolacrimal Duct Cyst: An Argument for a Genetic Basis

Henry P. Barham, MD, Aurora, CO; Justin M. Wudel, MD, Denver, CO; Robert W. Enzenauer, MD MPH, Denver, CO; Kenny H. Chan, MD*, Denver, CO

Educational Objective: At the conclusion of this presentation, the participants should be able to diagnose, explain the embryogenesis, and discuss the genetic basis of congenital nasal lacrimal duct cysts.

Objectives: Embryogenesis of a congenital nasolacrimal duct (NLD) cyst is attributed to the failure of the Hasner membrane of the NLD system to cannulate. Prenatal diagnosis of congenital NLD cysts supports the argument for a developmental error, with a post-natal prevalence of 6%. The role of a genetic basis for this malformation has never been ascribed. We present a set of monozygotic

twins with bilateral congenital NLD cysts as an argument for a genetic basis of this entity. **Study Design:** We present two cases of bilateral congenital NLD cysts occurring in a set of monozygotic twins. **Methods:** Case series and literature review. **Results:** Patients were delivered at 37 weeks via cesarean section. The pregnancy was complicated by pre-term labor at 33 weeks requiring administration of terbutaline and betamethasone. At presentation, twin A had bilateral eye discharge, erythema and swelling medial to the medial canthi as well as nasal obstruction. Computed tomography (CT) showed classic bilateral cystic masses in the inferior meatus. The diagnosis of bilateral infected congenital dacryocystoceles was made. Twin B initially presented with only bilateral eye discharge and CT showed a dilated NLD system. Twin B subsequently developed early signs of bilateral dacryocystoceles the following day. The patients underwent lacrimal probing and endoscopic marsupialization of the dacryocystoceles. Biopsies were consistent with dacryocystocele. **Conclusions:** Dacryocystocele is a common presentation of unresolved neonatal NLD obstruction. This case series in a set of identical twins is an argument for a genetic basis for the formation of this lesion.

S167. Case Report: A Complication of Acetic Acid Sclerotherapy for Lymphatic Malformations

Jennifer Bergeron, MD, Los Angeles, CA; Sameer Ahmed, MD, Los Angeles, CA; Ashley Balaker, MD, Los Angeles, CA; Elliot Abemayor, MD PhD*, Los Angeles, CA; Maie St. John, MD PhD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the complications of sclerotherapy and to better educate their patients/families in advising for sclerotherapy.

Objectives: The head and neck is the most common location for macrocystic lymphatic malformations. Because surgical resection will often result in neurovascular injury, sclerotherapy is recommended as treatment for these malformations. Acetic acid is one of many possible sclerosing agents. It works rapidly but can have serious side effects. Here we report a case of life threatening complications that developed soon after acetic acid sclerotherapy. **Study Design:** A case report from a patient treated at a university affiliated county hospital. **Methods:** NB is a 13 year old girl with a history of a right neck stage 3 lymphatic malformation who underwent ultrasound guided sclerotherapy with 40% acetic acid solution. **Results:** Two weeks following sclerotherapy the patient presented with hemoptysis and was found have a large floor of mouth and oropharyngeal defect extending into the right neck. The patient developed acute hemorrhage requiring emergent intubation followed by tracheostomy and right neck exploration with ligation of a ruptured internal jugular vein. Within three days she was taken back to the operating room twice for control of hemorrhage from other vessels. She eventually required a radial forearm free flap and is recovering in the pediatric ICU. **Conclusions:** In this case, acetic acid likely extravasated and caused diffuse tissue necrosis. A startling aspect of this case is that even after several washouts, the patient continued to develop complication after complication. In the literature, sclerotherapy for lymphatic malformations has been shown to produce excellent results; however such procedures can lead to life threatening sequelae which must be clearly discussed with patients and their families.

S168. Patient Satisfaction in Pediatric Otolaryngology

Emily F. Boss, MD MPH, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to describe patient satisfaction scores in ambulatory pediatric otolaryngology and evaluate differences by age.

Objectives: Patient experience scores are emerging as a key measure of healthcare quality. The objectives of this report are to describe patient satisfaction scores in ambulatory pediatric otolaryngology and evaluate differences by age. **Study Design:** Patient level analysis of Press Ganey Medical Practice® surveys completed by U.S. otolaryngology patients or caregivers (for children) in 2010. **Methods:** Surveys were grouped by child (<18) or adult age. Children were evaluated in 3 subgroups (0-5, 6-12, and 13-17). The survey contains 29 Likert rated items which comprise 6 service domains of access, visit, nursing, provider, personal issues, and assessment. The item likelihood-to-recommend was measured to indicate patient loyalty. Mean scores were compared by Kruskal-Wallis rank test for nonparametric data. Multivariate logistic regression adjusting for demographics was performed to evaluate association of age with receipt of highest-scores (dichotomous) in each domain. **Results:** Of 44,010 surveys analyzed, 5,996 (13.6%) were pediatric. The majority of children were <6 years (n=3141, 52.4%). Mean scores were lower for children overall (88.4 children vs. 90.2 adults, p<0.0001), in domains of access, visit, nursing, issues, and assessment, and for likelihood-to-recommend (p<0.001, all comparisons). Scores were equal for care provider (p=0.426). Children were less likely to give highest-scores overall (OR 0.81; 95% CI 0.76-0.86; p<0.001) and in all domains except for provider (p=0.944). Children ages 12-17 were more likely to give highest-scores compared to younger children (overall: OR 1.22; 95% CI 1.10-1.42; p=0.009). **Conclusions:** Compared to adults, satisfaction is lower in all service domains except care provider for children seen in outpatient otolaryngology. Satisfaction is lowest among younger children. Otolaryngologists should consider the unique needs of the child and family to improve overall patient experience.

S169. Diagnostic Pitfalls in Pilomatrixoma

Eugenia G. Chu, MD, Washington, DC; Maunik Patel, BS, Washington, DC; Earl H. Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able discuss the major diagnostic challenges in pilomatrixoma.

Objectives: To discuss common challenges in diagnosing pilomatrixoma in the head and neck in children. **Study Design:**

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Pilomatrixoma is an uncommon benign skin tumor that originates in the dermis or subcutaneous tissue. The disease is diagnosed clinically however the accuracy rate of preoperative diagnosis is low. We present 3 pediatric cases that presented with skin lesions in the head and neck. Preoperative diagnosis included brachial cleft cyst, parotid tumor, and epidermal cyst. Definite diagnosis of pilomatrixoma was made on histopathology in all 3 cases. We conducted a literature review to discuss common factors associated with misdiagnosis and the modalities used. **Methods:** N/A. **Results:** Literature review shows common misdiagnoses are commonly found in lesions with atypical locations, absence of calcifications, and with variable cystic lesions. Misdiagnoses are also found on FNA cytology and radiologic imaging. CT and MRI imaging are most useful for masses near the parotid to delineate extension of tumor. **Conclusions:** Pilomatrixoma should be included in the differential when encountering head and neck mass in the pediatric population. Increased awareness of the clinical presentation of the disease will help increase preoperative diagnostic accuracy.

S170. Cervical Necrotizing Fasciitis in Children under Two Years of Age

Victor K. Chung, MD, Boston, MA; Yi Hsuan Wu, MD, Boston, MA; H. Cody Meissner, MD, Boston, MA; Andrew R. Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current management strategies for the diagnosis and treatment of cervical necrotizing fasciitis in this young age group.

Objectives: To report on two cases of cervical necrotizing fasciitis in toddlers and to discuss the current management strategies for the diagnosis and treatment of this life threatening infection in this age group. **Study Design:** Case series and literature review. **Methods:** The prior literature as it pertains to necrotizing fasciitis in infants and toddlers is reviewed. **Results:** We present two cases of life threatening, necrotizing infections of the head and neck region that progressed to bacteremia and sepsis in two toddlers. Potential contributing factors leading up to the presentation of these infections are reviewed as is the medical and surgical management strategies employed in controlling the disease. The literature is reviewed as it pertains to prior reports and treatment strategies for managing necrotizing fasciitis in this age group. **Conclusions:** Cervical necrotizing fasciitis is a rare infectious process in young children. Immunocompromised children may be at higher risk for developing fulminant infections. Optimal management requires an early diagnosis and a combination of medical and surgical interventions. An aggressive surgical approach may be required to adequately clear the infection.

S171. Isolated Amyloidosis of the Nasopharynx

Clarice S. Clemmens, MD, Philadelphia, PA; Ken Kazahaya, MD MBA, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the presentation of amyloidosis of the nasopharynx, diagnose head and neck amyloidosis, and evaluate and manage amyloidosis of the head and neck.

Objectives: A review of the literature reveals only two previously reported cases of nasopharyngeal amyloidosis. We will present a pediatric patient with isolated nasopharyngeal amyloidosis. **Study Design:** This is a case report and literature review discussing a rare finding of isolated nasopharyngeal amyloidosis in a pediatric patient. We describe the presenting signs and symptoms of head and neck amyloidosis and will discuss the evaluation and treatment options for this disorder. **Methods:** We describe a fifteen year old male who was found to have amyloidosis of the nasopharynx which was subsequently resected. **Results:** We describe the treatment and followup of our patient, discuss the diagnosis and treatment of amyloidosis of the nasopharynx in a pediatric patient, and the management of recurrence and systemic disease. **Conclusions:** Isolated nasopharyngeal involvement with amyloidosis is an exceedingly rare entity. In this case report we describe diagnosis and management of amyloidosis in a pediatric patient.

S172. Fluid Characteristics in Pediatric Otitis Media with Effusion

Kelley M. Dodson, MD, Richmond, VA; Randall S. Cohen, MD, Tucson, AZ; Bruce K. Rubin, MD MEng MBA, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the fluid characteristics in pediatric otitis media with effusion and discuss differences in children undergoing an initial myringotomy tube procedure versus those undergoing repeated procedures.

Objectives: Persistent otitis media with effusion is caused by poor clearance of middle ear fluid usually following an episode of acute otitis media. This fluid is thought to be viscous and poorly transportable by cilia. Because a subset of children require multiple myringotomy and tube placements for recurrent disease, we hypothesized that children requiring repeated procedures would have effusion fluid that was more viscous and less transportable than those having their first procedure. **Study Design:** Prospective clinical study in a tertiary care center. **Methods:** Middle ear secretions were collected at the time of myringotomy and tube insertion in 36 children accrued sequentially. Twenty-six of these children were having their first procedure and 10 had previously undergone myringotomy and tube placement. The secretions were evaluated for in vitro mucociliary transportability and dynamic rheology in a magnetic micro-rheometer. **Results:** Children with the need for repeated procedures had effusions with significantly lower mucociliary transportability, and overall higher mean measures of surface mechanical impedance or frictional adhesion, but these did not reach statistical significance. **Conclusions:** Persistent or recurrent otitis media with effusion is associated with poorly transportable middle ear fluid which may have higher frictional adhesion.

S173. Airway Hemangiomas in PHACE Syndrome

Megan L. Durr, MD, San Francisco, CA; Kevin C. Huoh, MD, San Francisco, CA; Anna K. Meyer, MD, San Francisco, CA; Ilona J. Frieden, MD, San Francisco, CA; Kristina W. Rosbe, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the clinical presentation and airway characteristics of children with airway hemangiomas and concomitant PHACE syndrome.

Objectives: To describe the clinical presentation and airway characteristics of infants with airway hemangiomas and concomitant PHACE syndrome. **Study Design:** Clinical case series. **Methods:** This series includes five patients with facial hemangiomas diagnosed with PHACE syndrome and concomitant airway hemangioma. We will discuss the clinical presentation, airway findings, treatment measures, and outcomes. **Results:** Five patients diagnosed with PHACE syndrome and airway hemangiomas are included. All patients underwent direct laryngoscopy and bronchoscopy by a pediatric otolaryngologist at an average age of 66 days (range 22-106 days). All patients had facial hemangiomas; four (80%) had hemangioma in S2 distribution and three (60%) in S1 and S3 distributions. Two patients (40%) were Hispanic and the remaining 60% were Caucasian. Four patients (80%) were female and one was male. Four (80%) patients were symptomatic with stridor or barking cough prior to airway evaluation. All patients had subglottic hemangioma. Three (60%) had partial subglottic hemangioma, and two (40%) had circumferential subglottic hemangioma with an average of 65% obstruction. Three patients (60%) had additional hemangioma within the airway located on the epiglottis, vocal folds, and tracheal wall. Four (80%) were treated with propranolol, another four (80%) were treated with systemic steroids, and one patient (20%) received vincristine. One patient required laser ablation of subglottic hemangioma and eventually tracheotomy.

Conclusions: Airway hemangiomas are a common complication of PHACE syndrome and can be life threatening. Our series demonstrates that airway hemangiomas are most commonly located within the subglottis but may also be located within the glottis, supraglottis and trachea. We recommend having a low threshold for airway evaluation in children with PHACE syndrome.

S174. Outcomes of Surgical Closure in the Treatment of Dysphagia and Aspiration in Children with a Congenitally Widened Interarytenoid Space

Edward T. El Rassi, BS, Oklahoma City, OK; Erika N. Lee, MS, Oklahoma City, OK; G. Paul Digoy, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the distinction made between a widened interarytenoid space and a laryngeal cleft, discuss the immediate and long term health implications of a widened interarytenoid space, and demonstrate the effectiveness of surgical closure as a viable treatment option.

Objectives: Presented is an entity referred to as a widened interarytenoid space. This may represent what some refer to as a type I laryngeal cleft, however, the presence of interarytenoid muscle leads us to use alternate terminology. This paper discusses a three year experience in the surgical management of children with a widened interarytenoid space by endoscopic repair. **Study Design:** This IRB approved retrospective case series focuses on ten consecutive pediatric patients referred to our institution for dysphagia, aspiration, and/or recurrent pneumonia determined to have a widened interarytenoid space that underwent endoscopic surgical repair by the senior author. **Methods:** A systematic chart review was undertaken to gather patient data. Patients were also contacted by phone for further evaluation to determine long term effectiveness and caretaker satisfaction. **Results:** Six of the ten patients who underwent surgical repair did so successfully and without complications. Four patients suffered from partial wound dehiscence and recurrence of symptoms. A second attempt at closure was successfully done in two of these patients. All patients who had a successful closure have been symptom free on followup, ranging from 7 to 32 months (median 18.5 months, mean 18.75 months).

Conclusions: A widened interarytenoid space is a clinical entity that we believe to be separate from a laryngeal cleft. From our experience, these children may have the ability to improve greatly with surgical intervention and we encourage that surgical closure be incorporated in the therapeutic discussion with caretakers.

S175. Prevention of Pressure Ulcers after Pediatric Tracheotomies Using a Mepilex Dressing

Connie Y. Kuo, MD, Nashville, TN; Steven L. Goudy, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the effectiveness of Mepilex Ag foam dressings in reducing the incidence of postoperative tracheostomy wound breakdowns.

Objectives: Breakdown of the peristomal tracheostomy site in pediatric patients is a common occurrence due to pressure necrosis from the tracheostomy ties and neck plate. The aim is to determine the effectiveness of Mepilex foam dressings in reducing post-tracheostomy wound complications. **Study Design:** Retrospective case series. **Methods:** Data from 147 pediatric tracheostomies performed between June 2005 and June 2011 were analyzed for postoperative wound breakdown and pressure ulcer formation. Each chart was reviewed for ulcer or wound development immediately following the first tracheostomy change. Starting February 2010 the application of Mepilex Ag, a silver impregnated foam dressing, around the tracheostomy tube and under the tracheostomy ties became standard practice. Stoma and neck skin complications were documented. The rates of wound breakdown before and after the introduction of Mepilex Ag were compared. Age, indication for tracheostomy and type of tracheostomy tube were similar in both groups. **Results:** Patients undergoing tracheostomies before February 2010 did not receive Mepilex Ag at the conclusion of the procedure (n=106), while patients receiving tracheostomies starting February 2010 and onward did (n=41). In cohort without Mepilex Ag application, 10 of 106 (9.5%) patients developed associated pressure ulcers after first tracheostomy change. When Mepilex Ag was used to pad the tracheostomy site, no postoperative pressure ulcers occurred (0%). Reviewing associated medical conditions, sever-

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ity of illness and post-tracheostomy ventilation settings had no effect on ulcer formation. No complications were associated with the use of Mepilex Ag after tracheostomy. **Conclusions:** The use of Mepilex Ag in pediatric tracheostomy prevents the development of postoperative peristomal pressure ulcers.

S176. Airway Management for Intubation in Newborns with Pierre Robin Sequence

Alexander P. Marston, BA, Minneapolis, MN; Timothy A. Lander, MD, Minneapolis, MN; Robert J. Tibesar, MD, Minneapolis, MN; James D. Sidman, MD*, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the described intubation and anesthetic methods for airway management in Pierre Robin Sequence newborns and discuss the anatomic features that lead to the difficulty of these airway cases.

Objectives: To review airway management in Pierre Robin Sequence (PRS) newborns for general anesthesia and to determine if endotracheal intubation is safe in this population. **Study Design:** Case series and retrospective chart review at a tertiary children's hospital. **Methods:** PRS newborns who underwent endotracheal intubation or other airway intervention before 3 months of age between January 2000 and July 2011 were identified from a pediatric otolaryngology practice database. Indications for airway intervention, anesthetic management, method of intubation and comorbid conditions were collected. **Results:** Thirty-three PRS newborns were identified. Twenty had isolated PRS and 13 had PRS related to a coexisting syndrome. Thirteen of 35 (37%) endotracheal intubations performed in PRS newborns prior to mandibular distraction osteogenesis were accomplished with direct laryngoscopy. The remaining 22 of 35 (63%) who failed intubation with direct laryngoscopy were intubated over a flexible fiberoptic bronchoscope. No significant difference was observed between the isolated and syndromic PRS newborns with regard to technique utilized for intubation. No patient required rescue laryngeal mask airway or emergent tracheotomy and no case resulted in death. **Conclusions:** This series demonstrates that endotracheal intubation is safe and effective in PRS newborns. In patients who failed intubation with direct laryngoscopy, intubation over a flexible fiberoptic bronchoscope provided a reliable alternative method. Although airway management in PRS newborns poses a significant challenge, experienced otolaryngologists and anesthesiologists can successfully manage these difficult airway cases.

S177. Osseous Choristoma

James C. Spencer, MD, Jackson, MS; J. Mark Reed, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the incidence, causes, clinical considerations and histological features of the rare osseous choristoma.

Objectives: To review a case study of osseous choristoma and discuss its incidence, causes, clinical considerations and histological features noted in published literature. **Study Design:** Case study and review of the literature. **Methods:** The case of an eleven year old male who presented with a left posterior tongue nodule is reviewed. Clinical history, intraoperative photographs, radiology, and pathology are presented, and literature of previously reported cases of lingual osseous choristoma is examined to allow for comparison and discussion of this rare diagnosis. **Results:** The patient initially presented with an asymptomatic 1 cm pedunculate nodule on the posterior tongue. Thyroid scans showed no evidence of a lingual thyroid. Intraoperative findings included a hard, pedunculated nodule, easily removed with electrocautery. Pathology revealed mature bone with overlying reactive squamous mucosa consistent with osseous choristoma. Postoperatively, the patient experienced no complications. **Conclusions:** Osseous choristoma of the oral cavity is a rare entity which appears to be congenital, usually adjacent to the foramen cecum at the posterior tongue. The exact pathophysiology is unknown but is likely due to aberrant differentiation of primordial tissues in a branchial arch remnant. Preoperative workup should include thyroid studies to exclude lingual thyroid, however, routine CT scans may not be necessary. Osseous choristomas can usually be excised easily via transoral approach and there are no reported cases of recurrence of such lesions at the base of tongue.

S178. Factors Contributing to Cost in Partial versus Total Tonsillectomy

Emily Z. Stucken, MD, New York, NY; Eli Grunstein, MD, New York, NY; Joseph Haddad Jr., MD*, New York, NY; Erik H. Waldman, MD, New York, NY; Vikash K. Modi, MD, New York, NY; Robert F. Ward, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify preoperative, perioperative, and postoperative factors that lead to differences in cost and resource utilization between patients undergoing partial and total tonsillectomies.

Objectives: We will examine differences between total tonsillectomy and partial intracapsular tonsillectomy techniques that may lead to differences in global cost and resource utilization between these two procedures. Preoperative, perioperative, and postoperative management and outcome factors will be examined. **Study Design:** Retrospective review at two university based tertiary care hospitals from January 2007-June 2010. **Methods:** Pediatric patients with obstructive symptoms were divided into those undergoing total tonsillectomy and those undergoing partial intracapsular tonsillectomy. The records of 289 patients who underwent total tonsillectomy and 289 patients who underwent partial intracapsular tonsillectomy were reviewed. **Results:** The average age of patients undergoing total and partial tonsillectomies was 4.99 years and 5.0 years, respectively. Significant differences for patients undergoing total versus partial tonsillectomies were as follows: operative time (29.5 minutes vs. 24.2 minutes, $p < 0.0001$), PACU time (176 minutes vs.

91 minutes $p < 0.0001$), percent admitted postoperatively (21.5% vs. 1.7%, $p < 0.0001$), number requiring PICU stay (3.5% vs. 0.3%, $p < 0.05$), number of readmissions after discharge (3.5% vs. 0.3%, $p < 0.05$), and number of postoperative ED visits separate from those requiring readmission (4.8% vs. 0%, $p = 0.0001$). Factors that were not found to be significantly different included number of patients with postoperative hemorrhage and number requiring second operations for tonsillar regrowth. **Conclusions:** Previous studies have shown equivalent effectiveness between these two procedures; our study suggests decreased cost and resource utilization with partial tonsillectomy through reduced operative and PACU times and number of postoperative admissions and ED visits. As in all retrospective reviews, the findings are potentially confounded by unmeasured variables, including patient and demographic factors.

S179. Juvenile Xanthogranuloma of the Airway

Alex D. Sweeney, MD, Houston, TX; Tang Ho, MD, Houston, TX; Ellen M. Friedman, MD*, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the pathophysiology of juvenile xanthogranuloma, discuss the options available for pediatric patients who present with juvenile xanthogranuloma of the airway and compare management techniques.

Objectives: Juvenile xanthogranuloma (JXG) is an uncommon disease in which the initial growth of lesions is generally followed by involution. However, if growth occurs in the airway, lesions can be life threatening. This study explores the pathophysiology and contemporary management of this disease process. **Study Design:** Retrospective review of institutional experience and previously reported cases. **Methods:** One patient was identified from the experience at an academic children's hospital between 2005 and 2011. A PubMed search revealed ten patients with airway JXG between 1974 and 2011. **Results:** The reports of eleven total patients with JXG of the airway were analyzed. Lesions most commonly occurred in the larynx and trachea ($n = 5$, 45.5%). In this group of five patients, tracheotomy was performed in two (40%). In the three patients (60%) who did not undergo tracheotomy, endoscopic surgical debulking was performed. Other airway lesions were located in the oral cavity, oropharynx and nasal cavity. In these cases, surgical debulking or a formal excisional biopsy was performed. In all cases where surgical excision or debulking was attempted, the average reported disease free followup was 23.8 months (median = 22 months) though three lesions recurred (27.3%) at an average of 9.7 postoperative months. In cases where a tracheostomy was initially created, decannulation occurred at an average of 19.5 postoperative months. **Conclusions:** JXG of the airway represents a rare disease process in an uncommon location. Based on our experience and a review of the literature, initial surgical debulking and excision may obviate the need for a tracheostomy.

S180. Midline Cervical Clefts: A Rare Anatomic Anomaly

Christopher G. Tang, MD, Oakland, CA; Dennis C. Kuo, MS, Detroit, MI; Joshua A. Gottschall, MD, Orlando, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to properly evaluate and treat patients with midline cervical clefts as well as determine appropriate surgical management.

Objectives: Midline cervical clefts (MCC) are rare congenital abnormalities thought to occur from abnormal fusion of the branchial arches at the midline. The classic description of repairing midline cervical clefts includes removal of the cutaneous dehiscence, fistula, and subcutaneous fibrous banding followed by various closure types. Closure types range from multiple z-plasties for larger defects to primary closure for mild soft tissue deficiencies. We present a 4 case series of midline cervical cleft repairs. **Study Design:** Review of an ongoing case series of midline cervical clefts repaired by the previous chief of pediatric otolaryngology at our institution. **Methods:** Chart review (as above). **Results:** Three of the four cases received opposing z-plasties of the platysma in hopes of improving definition of the cervicomenal angle as primary closure in the vertical or horizontal plane could result in unacceptable scarring or contracture. The fourth case had a mild soft tissue deficiency and was closed primarily. She is currently being followed to determine if her cervicomenal profile is as well defined as the other three patients in our series. **Conclusions:** The efficacy of the platysma z-plasty is debatable. In our case series, the overall lateral cervicomenal profile was improved in all three patients who received the z-plasty. Scarring in the horizontal plane of the z-plasty is excellent, though hypertrophic scarring is more common at the oblique closures and varies between individuals. Although no consensus exists regarding optimal surgical management of MCC, opposing z-plasties of the subcutaneous tissue and the platysma appear to improve the cervicomenal contour of our patients, and should be considered when planning surgical reconstruction.

S181. WALTER WORK, MD RESIDENT RESEARCH AWARD (3rd Place Middle Section) Changing Microbiology of Pediatric Neck Abscesses

Paul C. Walker, MD, Iowa City, IA; Deborah S.F. Kacmarynski, MD, Iowa City, IA; Lucy H. Karnell, PhD, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the changing microbiology of pediatric neck abscesses and their associated antibacterial resistance patterns.

Objectives: To examine the changing microbiology of pediatric neck abscesses over a 10 year period with particular interest in methicillin resistant staphylococcus aureus (MRSA) infections and their associated antibacterial resistance patterns. To determine the level of resistance to clindamycin, a frequently used antibiotic for staphylococcus aureus. **Study Design:** Retrospective chart review at a tertiary academic medical center. **Methods:** Of 122 consecutive pediatric patients, ages 0 to 18 years of age, managed between

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January 2000 and June 2010 with incision and drainage of a proven neck abscess, 74 patients with 76 abscesses were identified. **Results:** Positive identification of a microorganism was found in 65 (85%) of the 76 abscesses, 43% with staphylococcus aureus (SA), 12% with community acquired MRSA (CA-MRSA), and 31% with methicillin sensitive staphylococcus aureus (MSSA). There was a significant increase in the incidence of MRSA during the study period, with only 1 case of MRSA diagnosed in the first half of the study (from 2000-2004) compared with 7 in the second half (from 2005-2010) ($p=0.023$). Of the remaining abscesses, 27% were streptococcus pyogenes and the remaining 30% were mixed oral flora and other microorganisms. **Conclusions:** These findings demonstrated a statistically significant rise in the proportion of community acquired MRSA neck infections in pediatric patients. Resistance to clindamycin is highest among MSSA isolates. Clindamycin resistant S. aureus and MRSA are established pathogens in neck infections. In communities with similar microbiology patterns, empiric treatment with combination therapy of trimethoprim/sulfamethoxazole and a beta lactam should be initiated until culture results are available.