
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. Mark Persky, our Section Liaisons, Drs. Paolo Campisi, Michael Benninger, Emily Boss, and Steven Wang, and our Program Committee. Some of our program highlights include Friday's panel on "What's the Latest and Greatest" and the popular "Point/Counterpoint" followed by the video sessions on "How I Do It". Friday panels will address "New Treatments for Eustachian Tube Disorders and Its Related Problems"; "Treatment of Aggressive Skin Carcinomas"; and "Everything You Wanted to Know About Surgery for OSA but Were too Bored to Ask". Saturday's panels include "Microlaryngoscopy, Difficult Exposures, Difficult Airways"; "Technical Pearls for Primary Functional Rhinoplasty"; "Rhinology—My Worst Case Ever"; and "Pediatric Potpourri: Updates and Innovations". Saturday's session is rounded out with the Resident Bowl. Come and cheer for your favorite team. You won't want to miss Dr. Susan Dorr Gould's invited lecture "Money, Medicine and Ethics", which you will find fascinating and thought provoking. Sunday's panels include "Controversies in Otolaryngology"; "If I Could Do It All Over Again - What I Have Learned from My Opportunities and Obstacles"; "Wake Up! Facing the New Challenges in Otolaryngology Practice"; and "Necessary Changes for 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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Meeting Overview

Thursday - January 9

- 3:00 pm - 7:00 pm Exhibitor Set Up - Americana 3 & 4
- 5:00 pm - 8:00 pm Poster Set Up - Americana 3 & 4
- 5:00 pm - 8:00 pm Speaker Ready Room - Poinciana 4
- 5:00 pm - 8:00 pm Registration - Rotunda East

Friday - January 10

- 7:00 am - 5:30 pm Speaker Ready Room - Poinciana 4
- 7:00 am - 6:00 pm Registration - Rotunda East
- 7:30 am - 8:00 am Continental Breakfast - Americana 3 & 4
- 7:30 am - 9:00 am Poster Set Up - Americana 3 & 4
- 7:30 am - 3:30 pm Exhibits open - Americana 3 & 4
- 7:30 am - 3:30 pm Spouse Hospitality - Americana 3 & 4
- 8:00 am - 12:45 pm SCIENTIFIC SESSIONS - Americana 1

Meeting Overview continued

Friday - January 10 (continued)

9:00 am - 5:45 pm Poster viewing - Americana 3 & 4
12:45 pm - 1:50 pm Lunch - Americana 3 & 4
12:45pm - 1:50 pm Laryngoscope Editors Meeting - Poinciana 1
1:50 pm - 6:00 pm SCIENTIFIC SESSIONS - Americana 1 & 2
6:00 pm - 7:00 pm Vice Presidents Welcome Reception - Americana Lawn

Saturday - January 11

7:00 am - 12:00 noon Speaker Ready Room - Poinciana 4
7:00 am - 12:30pm Registration - Rotunda East
7:00 am - 7:50 am Southern Section Business Meeting - Poinciana 3
7:00 am - 7:50 am Western Section Business Meeting - Poinciana 2
7:30 am - 8:00 am Continental Breakfast - Americana 3 & 4
7:30 am - 12:30 pm Exhibits open - Americana 3 & 4
7:30 am - 12:30 pm Poster viewing - Americana 3 & 4
7:30 am - 12:30 pm Spouse Hospitality - Americana 3 & 4
8:00 am - 12:30 pm SCIENTIFIC SESSIONS - Americana 1 & 2
12:45 pm - 2:45 pm Thesis Seminar (candidates and potential candidates) - Poinciana 2
12:45 pm - 2:15 pm RESIDENT BOWL - Americana 2
12:45 pm - 3:00 pm Physician/Scientist Meeting - Poinciana 3
6:30 pm Meet the Authors Poster Reception - Americana 3 & 4

Sunday - January 12

7:00 am - 12:00 noon Speaker Ready Room - Poinciana 4
7:00 am - 12:30 pm Registration - Rotunda East
7:00 am - 7:50 am Eastern Section Business Meeting - Poinciana 2
7:00 am - 7:50 am Middle Section Business Meeting - Poinciana 3
7:30 am - 8:00 am Continental Breakfast - Americana 3 & 4
7:30 am - 10:30 am Exhibits open - Americana 3 & 4
7:30 am - 10:30 am Poster viewing - Americana 3 & 4
7:30 am - 10:30 am Spouse Hospitality - Americana 3 & 4
8:00 am - 12:00 noon SCIENTIFIC SESSIONS - Americana 1 & 2
12:00 noon MEETING ADJOURNS

Combined Sections Meeting Loews Miami Beach Hotel Miami Beach, Florida January 10-12, 2014

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 2014 Combined Sections Meeting, participants will be able to:

- Treat vertigo with effective medical intervention.
- Define effectively treat sleep disorders secondary to airway obstruction and central apnea.
- Identify multiple methods of treating facial nerve paralysis.
- Medically treat refractory cases of chronic sinusitis without relying on surgery.
- Identify and realize ethical challenges related to changes in medical care.
- More fully comprehend the identification and proper treatment of aggressive skin carcinomas.
- Better evaluate those patients with thyroid carcinoma who may be best served by careful observation rather than treatment.
- Provide treatment for hearing compromised patients with a better appreciation of options available.
- Better evaluate patients who may benefit significantly by robotic surgery of the tongue.
- Better appreciate some of the existing controversies within otolaryngology.

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 American Laryngological Rhinological and Otological 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 13.75 *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
Division of Education

Exhibits

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 are in compliance with the Accreditation Council for Continuing Medical Education (ACCME) 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

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 Saturday, January 11th.

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Disclosure Information
Triological Society 2014 Combined Sections Meeting
January 10-12, 2014
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)
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Amir Allak, MD MBA	X	
Simon I. Angeli, MD	X	
Jose E. Barrera, MD FACS		Orbimed (fee, consultant)
David M. Barrs, MD	X	
Shethal Bearely, MD	X	
Michael S. Benninger, MD FACS	X	
Kofi D. Boahene, MD	X	
Emily F. Boss, MD	X	
Carol R. Bradford, MD FACS	X	
Joseph A. Brennan, MD FACS	X	
Dale H. Brown, MD	X	
Karen H. Calhoun, MD FACS	X	
Paolo Campisi, MD	X	
John M. Carter, MD	X	
Roy R. Casiano, MD FACS	X	
Benjamin P. Caughlin, MD	X	
Sujana S. Chandrasekhar, MD		Scientific Development & Research, Inc. Startup Biotech (development of medical applications for surfactant, board member, shareholder)
Michael Z. Chen, MD	X	
Dinesh K. Chhetri, MD*	X	
Alexander Guang-Yu Chiu, MD		Olympus Gyrus (consultant)
Rebecca L. Chota, BS	X	
John Jared Christophel, MD	X	
Daniel H. Coelho, MD		Med-EI (member, surgeons advisory board)
Marion E. Couch, MD PhD MBA FACS	X	
Mark S. Courey, MD	X	

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Charles W. Cummings, MD	X	
Deepa Danan, MD MBA	X	
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John M. DelGaudio, MD FACS	X	
Karen J. Doyle, MD PhD	X	
Victor M. Duarte, MD	X	
Pariket M. Dubal, BA	X	
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Susan D. Emmett, MD	X	
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Antoine Eskander, MD ScM(c)	X	
Edward H. Farrior, MD	X	
Jay K. Ferrell, MD	X	
Joel Franco, BS	X	
Dennis Onyeka Frank-Ito, PhD	X	
Marvin P. Fried, MD FACS	X	
C. Gaelyn Garrett, MD	X	
Douglas A. Girod, MD FACS	X	
Sharon H. Gnagi, MD	X	
Andrew N. Goldberg, MD MSCE FACS		Patent Pending 61/624, 105 (sinus diagnostics and therapeutics)
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Christine G. Gourin, MD FACS	X	
David J. Grindler, MD	X	
Patrick J. Gullane, MD FACS	X	
Joseph K. Han, MD		Medtronic (research grant); Merdarva (research grant)
Gady Har-El, MD FACS	X	
Bruce H. Haughey, MBChB FACS		Elsevier (royalties for text book editorship)
Richard E. Hayden, MD FACS	X	
Michael L. Hinni, MD FACS		Karl Storz (My employer has licensed a device to Karl Storz for possible manufacture. This device is NOT useful for the content of the presentation and will not be mentioned outside the initial disclosure.)
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Michael E. Hoffer, MD FACS	X	
Timothy E. Hullar, MD FACS		Advanced Bionics (honorarium for committee membership-medical advisory board)
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Kanwar Kelley, MD JD	X	
Ruwan Kiringoda, MD	X	
Glenn W. Knox, MD JD*	X	
Lindsey K. Koester, BA	X	
Stilianos E. Kountakis, MD PhD FACS		Acclarent (speaker); TEVA (speaker)
Paul Krakovitz, MD	X	
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Rachel L. Leonardis, BS	X	
Jonathan K. Lin, BS	X	
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Rahul K. Shah, MD FACS		HIPPOmsg (nothing received, own 30% of stock-co-founder healthcare communication company; shareholder)
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Triological Society Research Grant Programs

The Society continues to promote research into the causes of and treatments for otolaryngic diseases by providing financial support for the research efforts of young otolaryngologists-head and neck surgeons. **The Society has awarded more than \$3.6 million to otolaryngologists-head and neck surgeons in support of clinical and basic research.** These competitive research grant programs have included funding for resident research projects, research training grants, and career development grants.

The Society's research grant programs include Research Career Development Awards and Clinical Scientist Development Awards.

Research Career Development Awards are available to otolaryngologists who hold full-time, part-time and contributed service medical school faculty appointments, and who have made a commitment to focus on patient-oriented research. Awards provide support for research career development for up to \$40,000 of support over a one or two year period. The deadline for the Letters of Intent are in December of each year with applications due in January.

The 2013-2014 Research Career Development Awardees and their funded projects are:

- Alexander Tell Hillel, MD - *Role of Inflammation in the Development of Laryngotracheal Fibrosis*
- Amy Anne Donatelli Lassig, MD - *The Effect of Smoking on Wound Healing in Head and Neck Surgery*
- Amber Uyen Luong, MD PhD - *Dissecting Fungal Induced IL-33 Production in Respiratory Epithelial Cells*
- Andrew Alexander McCall, MD FACS - *Influences of Limb Afferents on Central Vestibular Processing*
- Albert H. Park, MD - *Congenital Cytomegalovirus Induced Hearing Loss in a Murine Model*

Clinical Scientist Development Awards: The Triological Society and the American College of Surgeons combined competitive grant program provides supplemental funding to otolaryngologists-head and neck surgeons who have received a new NIH Mentored Clinical Scientist Development Award (K08/K23) or have an existing award with a minimum of 3 years remaining in the funding period. This award is a means to facilitate the research career development of otolaryngologists with the expectation that the awardee will have sufficient pilot data to submit a competitive R01 proposal prior to the conclusion of the K award. This award provides financial support in the amount of \$80,000 per year for up to five years, or for the remainder of the term of existing grants, to supplement the K08/K23 award. The deadline for 2014-15 applications is May 10, 2014 and information is available at www.triological.org.

The 2013-2014 Triological/American College of Surgeons Clinical Scientist Development Awardees (TRIO/ACS) and their funded projects are:

- New Award--Devraj Basu, MD PhD - *Targeting Mesenchymal-like Cells in Oral Cancer to Overcome Cetuximab Resistance*
- Renewal--Michael E. Kupferman, MD - *Critical Role of TrkB for Invasion and Metastasis in Oral Cancer*
- Renewal--Frank R. Lin, MD PhD - *Hearing Loss and Aging*
- Renewal--Bruce Kuang-Huay Tan, MD - *Role of B-cell Mediated Inflammation in Chronic Rhinosinusitis with Nasal Polyps*

The 2012-2013 Triological Society Clinical Scientist Development Awardee and his funded project is:

- Renewal--Benjamin T. Crane, MD PhD - *Visual and Vestibular Percepts of Motion*

Guidelines and additional information is available at the Triological website - www.triological.org/researchgrants.htm

Guests of Honor

Marion E. Couch, MD PhD MBA FACS
Charles W. Cummings, MD
Richard E. Hayden, MD FACS
Robert H. Ossoff, DMD MD FACS

Citation Awardees

Linda Brodsky, MD FACS
Terry A. Day, MD
C. Gaelyn Garrett, MD
Patrick J. Gullane, MD FACS
Jonas T. Johnson, MD FACS
Robert M. Kellman, MD FACS
Edward S. Porubsky, MD
Clark A. Rosen, MD FACS
Ashok R. Shaha, MD FACS
Scott P. Stringer, MD FACS
Terance T. Tsue, MD FACS

Keynote Speaker

Susan Door Goold, MD MHSA MA

Patrick E. Brookhouser, MD Award of Excellence

H. Bryan Neel III, MD PhD FACS

Middle Section's George L. Adams, MD Young Faculty Award

Samir Suresh Khariwala, MD, Minneapolis, MN

Resident Research Awardees

Amir Allak, MD MBA
Deepa Danan, MD MBA
Sunshine M. Dwojak, MD MPH
Susan D. Emmett, MD
Antoine Eskander, MD ScM(c)
Chase M. Heaton, MD
Brandon L. Prendes, MD
Zafar A. Sayed, MD
Mausumi N. Syamal, MD
Nikolaus E. Wolter, MD

TRIOLOGICAL SOCIETY COMBINED SECTIONS MEETING PROGRAM JANUARY 10 - 12, 2014

FRIDAY, JANUARY 10, 2014

AMERICANA 1 & 2

- 7:55** **Welcome by Vice Presidents**
- 8:00 - 9:05** **Southern Section Guest Introductions - Christine G. Gourin, MD FACS*, Baltimore, MD**
Citation Awardees: Ashok R. Shaha, MD FACS*, New York, NY
Jonas T. Johnson, MD FACS*, Pittsburgh, PA
Edward S. Porubsky, MD, Augusta, GA
Guest of Honor: Marion E. Couch, MD PhD MBA FACS, Burlington, VT
The Importance of Diversity
- Western Section Guest Introductions - Mark S. Courey, MD*, San Francisco, CA**
Citation Awardees: Linda Brodsky, MD FACS*, Buffalo, NY
Clark A. Rosen, MD FACS*, Pittsburgh, PA
C. Gaelyn Garrett, MD*, Nashville, TN
Guest of Honor: Robert H. Ossoff, DMD MD FACS*, Nashville, TN
Perspectives in the Development of Laryngology as a Subspecialty
- Eastern Section Guest Introductions - Dale H. Brown, MD*, Toronto, ON**
Citation Awardees: Patrick J. Gullane, MD FACS*, Toronto, ON
Robert M. Kellman, MD FACS*, Syracuse, NY
Guest of Honor: Richard E. Hayden, MD FACS*, Phoenix, AZ
Battles Won Could Still Be Lost
- Middle Section Guest Introductions - Douglas A. Girod, MD FACS*, Kansas City, KS**
Citation Awardees: Terry A. Day, MD, Charleston, SC
Terance T. Tsue, MD FACS, Kansas City, KS
Scott P. Stringer, MD FACS, Jackson, MS
Guest of Honor: Charles W. Cummings, MD*, Baltimore, MD
The Role and Rewards of Mentoring
- Presentation of Middle Section's George Adams, MD Young Faculty Award
(by Douglas A. Girod, MD FACS*)**
Samir Suresh Khariwala, MD, Minneapolis, MN
- 9:05- 9:20** **Presidential Address**
Teaching the Teacher: An Essential Aspect of Our Educational Activities
Jonas T. Johnson, MD FACS*, Pittsburgh, PA
- 9:20** **Presentation of Second Annual Patrick E. Brookhouser, MD Award of Excellence
(by Jonas T. Johnson, MD FACS*)**
H. Bryan Neel III, MD PhD FACS*, Rochester, MN

*Denotes Fellow

Friday

9:25 **Triological Society Thesis - With Distinction Award**
Head and Neck Trauma in Iraq and Afghanistan: Different War, Different Surgery, Lessons Learned
Joseph A. Brennan, MD FACS*, Ft. Sam Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the trauma lessons learned in Iraq and Afghanistan.

Objectives: The hypothesis is that valuable head and neck trauma lessons applicable to civilian practice were learned in Iraq and Afghanistan. The objectives are to compare and contrast the head and neck trauma experience in Iraq and Afghanistan and to identify trauma lessons learned which are applicable to civilian practice. **Study Design:** A retrospective review of one head and neck surgeon's operative experience in Iraq and Afghanistan was performed using operative logs and medical records. **Methods:** The surgeon's daily operative log book with patient demographic data and operative reports was reviewed. Also, patient medical records were examined to identify the preoperative and postoperative course of care. **Results:** The head and neck trauma experiences in Iraq and Afghanistan were very different with a higher percentage of emergent or immediate cases performed in Iraq. In Iraq, only 10% of patients were pretreated at a facility with surgical capabilities (level II or level III echelons of care) while in Afghanistan 93% of patients were pretreated at such facilities. Acute neck explorations for penetrating neck trauma and emergent airway surgery were more common in Iraq, which most likely accounted for the increased perioperative mortality also seen in Iraq (5.3% in Iraq versus 1.3% in Afghanistan). Valuable lessons regarding soft tissue trauma repair, midface fracture repair, and mandible fracture repair were learned. **Conclusions:** The head and neck trauma experiences in Iraq and Afghanistan were very different and the future training for mass casualty trauma events should reflect these differences. Furthermore, valuable head and neck trauma lessons learned in both war zones are applicable to the civilian practice of trauma.

9:35 **Triological Society Thesis - Honorable Mention for Clinical Research Award**
Voice Disorders in the Workplace: Productivity in Spasmodic Dysphonia and the Impact of Botulinum Toxin
Tanya Kim Meyer, MD BS*, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the impact of voice disorders on work productivity measures.

Objectives: To study the impact of the disordered voice on standard work productivity measures and employment trends using spasmodic dysphonia (SD) as a model for a chronic treatable voice disorder. **Study Design:** Seventy-two currently employed established SD patients agreed to participate in a self-administered questionnaire study and provided highly detailed information on work related measures. Patients were asked to complete the work productivity and activity impairment (WPAI) instrument to determine work related measures for their best and worst voicing weeks over the duration since their previous BTX injection. **Methods:** Cross-sectional analysis using self-administered questionnaire. **Results:** Currently employed patients reported a mean 4.4% decrease in work missed (*absenteeism*), 28.1% decrease in work impairment (*presenteeism*), 29.4% decrease in work productivity, and 21.4% decrease in activity impairment ($p < .001$) in their best as compared to their worst voicing period over their last BTX injection cycle. *Presenteeism* accounted for the major component of the percent work productivity impairment calculation. Among patients that have worked during their diagnosis of SD, greater than 98% report that BTX injections helped them at work. **Conclusions:** Patients with SD reported that their vocal dysfunction caused a significant negative effect on work productivity and increase in activity impairment. There was a significant improvement in their voice related work parameters from their worst to best voicing periods over their last BTX injection cycle. Patients undergoing long term BTX treatment report a positive effect of this treatment in their workplace. Spasmodic dysphonia is a meaningful model in which to study the effects of voice disorders on work productivity and employment patterns.

9:45 **Q&A**

9:55 - 10:25 **Break with Exhibitors**

10:30 - Noon **WHAT'S THE LATEST AND THE GREATEST?**
Moderator: Christine G. Gourin, MD FACS*, Baltimore, MD
Guided Therapeutics in Head and Neck
Jonathan C. Irish MD MSc FRCSC FACS, Toronto, ON
Vertigo-Advances and Successes
Judith A. White MD PhD, Cleveland, OH
Advances in Sleep Apnea
Ryan J. Soose, MD, Pittsburgh, PA
Advances in the Treatment of Facial Nerve Paralysis
Kofi D. Boahene, MD, Baltimore, MD
Developments in the Medical Treatment of Sinusitis
Joseph K. Han, MD*, Norfolk, VA

Noon - 12:45 **KEYNOTE ADDRESS: MONEY, MEDICINE, AND ETHICS**
Susan Door Goold, MD MHSA MA, Ann Arbor, MI

12:45 - 1:50 *Lunch/Visit Exhibits and Posters*

1:50 - 3:30 **CONCURRENT SCIENTIFIC SESSIONS**

CONCURRENT SESSION I - OTOLOGY AMERICANA 1

Moderators: Karen J. Doyle, MD PhD*, Sacramento, CA
Debara Lyn Tucci, MD FACS, Durham, NC

1:50 **Generation of Intraoperative Otologic Autografts with 3D Subtractive CAD/CAM Printing**
Glenn W. Knox, MD JD*, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to explain how computer assisted manufacture can be utilized in the operating room to produce otologic autografts; discuss how this technology can save money; and discuss how complications may be reduced.

Objectives: A subtractive 3D CAD/CAM device can produce accurate bone and cartilage autografts on demand in the operating room. This process can save money by reducing operating room time, and reducing the need for expensive inventories of various shapes, sizes and types of prosthetic devices. Also, autologous materials are less likely to extrude or cause other complications such as infection. This also can reduce overall costs. **Study Design:** Prospective basic laboratory study utilizing subtractive CAD/CAM milling machine and cadaveric bovine bone material. **Methods:** A Roland MDX series milling machine (Roland DGA, Irvine, CA) was selected. This machine has been used commercially to produce orthopedic allograft materials. Conventional CAD/CAM software was utilized. Commercially available bovine byproducts were utilized to provide bone materials for testing. **Results:** Bovine cadaveric bone and cartilage utilization resulted in reliable production of prototype TORPs, PORPs, and cartilage auricular frameworks such as those utilized for microtia/anotia reconstruction providing proof of concept. **Conclusions:** Subtractive 3D CAD/CAM devices in the operating room can produce accurate bone autografts on demand in the operating room. This process can save money by reducing operative procedure times, reducing the need for expensive prosthetic devices, and reducing hospital inventory expense. Autologous materials also are less likely to extrude or cause other complications such as infection. This study utilized bovine materials to develop the proof-of-concept. Institutional review board approved trials with actual human otologic surgeries are warranted.

1:57 **WILLIAM W. MONTGOMERY, MD RESIDENT RESEARCH AWARD**
The Impact of Challenging Environmental Stimuli on Balance in Children with Bilateral Cochleovestibular Loss: Balancing in a Virtual World
Nikolaus E. Wolter, MD, Toronto, ON Canada; Karen A. Gordon, PhD CCC-A Reg CASLPO, Toronto, ON Canada;
Blake C. Papsin, MD MSc FRCS FACS FAAP*, Toronto, ON Canada; Sharon L. Cushing, MD MSc FRCS, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the impact of auditory and visual environmental cues in children with bilateral cochleovestibular loss.

Objectives: Children maintain their balance even in challenging sensory environments but it is not clear how the quality of these sensory inputs impacts balance. We aimed to determine whether children with bilateral cochleovestibular loss and bilateral cochlear implants (VL-CI) use auditory and visual cues differently from typically developing peers to maintain their balance. **Study Design:** Observational cross-sectional study. **Methods:** Balance was assessed in 18 children in the VL-CI group and 34 typically developing peers by performing the Bruininks-Oseretsky Test-2 (BOT-2) in the challenging environmental assessment lab virtual reality simulator under 4 sensory conditions of graded complexity. Randomized conditions combined 2 auditory (directional street sounds vs. directionless white noise) and 2 visual (dynamic street scenes vs. simple stationary street scene) stimuli designed to recreate a real world busy downtown street. **Results:** Balance was significantly worse in the children in the VL-CI group than the peer group in all sensory conditions as measured by BOT-2 score and time to fall ($p < 0.0001$). Balance ability (BOT-2 score) of the VL-CI group did not change significantly in the presence of directional street noise ($p = 0.791$) even when the corresponding visual scene was dynamic. **Conclusions:** Balance deficits in BCI users with VL-CI persist despite the addition of sensory rich auditory and visual cues. This suggests that these children were not accessing binaural cues for the purpose of improving their balance in this situation. Future work might address whether this is a function of limited binaural hearing or integration of auditory input to balance in these children.

- 2:04** **JAMES HARRILL, MD RESIDENT RESEARCH AWARD**
Bilateral Hearing Loss Is Associated with Decreased Nonverbal Intelligence in U.S. Children Ages 6 to 16 Years
Susan D. Emmett, MD, Baltimore, MD; Howard W. Francis, MD MBA, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the impact of bilateral and unilateral hearing loss on nonverbal intelligence in US children as well as the socioeconomic factors related to low nonverbal intelligence.

Objectives: To evaluate the association between hearing loss and nonverbal intelligence in U.S. children. **Study Design:** The Third National Health and Nutrition Examination Survey (NHANES III) is a cross-sectional survey conducted from 1988-1994 using a complex multistage sampling design to produce nationally representative demographic and examination data. **Methods:** A total of 4823 children ages 6-16 years completed audiometric evaluation and cognitive testing during NHANES III. Hearing loss was defined as low frequency pure tone average (PTA) >25 decibels (dB) (0.5, 1, 2 kHz) or high frequency PTA >25dB (3,4,6,8 kHz) and was designated as unilateral or bilateral. Nonverbal intelligence was measured using Wechsler Intelligence Scale for Children-Revised block design subtest standardized score. Low nonverbal intelligence was defined as subtest score <4, two standard deviations below the standardized mean of 10. **Results:** The mean nonverbal intelligence score differed between children with normal hearing (9.59) and children with bilateral (6.87;p=0.02) but not unilateral (9.12;p=0.42) hearing loss. Socioeconomic factors including female sex (p=0.04), non-Hispanic black and Mexican American race-ethnicity (p<0.001), and living below the poverty line (p<0.001) were associated with low nonverbal intelligence. After controlling for these factors, bilateral hearing loss was associated with a 6.95 times higher odds of low nonverbal intelligence compared to normal hearing children (OR 6.95;p=0.001). Unilateral hearing loss, however, was not associated with higher odds of low nonverbal intelligence (OR 0.68;p=0.32). **Conclusions:** Bilateral but not unilateral hearing loss is associated with decreased nonverbal intelligence in U.S. children. These results provide compelling evidence of the pervasive impact of hearing loss on childhood development and future opportunities.

- 2:11** **Landmarks for the Preservation of the Middle Temporal Artery during Mastoid Surgery: A Cadaveric Dissection Study**
Pedram P. Daraei, BS, Atlanta, GA; Douglas E. Mattox, MD*, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the relationship between the middle temporal artery and the external auditory canal, identify indications for use of the middle temporal artery flap, and discuss the importance of preserving the middle temporal artery.

Objectives: The middle temporal artery (MTA) flap is a vascularized periosteal flap that is highly useful for otologic reconstruction including the middle cranial fossa, mastoidectomy defect, and external auditory canal (EAC). The course of the artery is close to the EAC and easily injured during preliminary exposure and elevation of flaps. We describe the course of the middle temporal artery in relation to the EAC, superficial temporal artery, and temporomandibular joint to enhance preservation and use in otologic reconstruction. **Study Design:** Dissection of preserved, injected cadaveric temporal bones. **Methods:** Eight temporal bones were dissected in a planar manner to identify the MTA along the squamous temporal bone to origin on the superficial temporal artery. The superior border of the EAC was divided, horizontally, into thirds to create three points for measurement. Distances between the MTA and the bony portion of the EAC were then determined. **Results:** The MTA branched from the superficial temporal artery in all eight specimens. Mean horizontal diameter of the EAC was 9.98mm. Mean distances between the bony portion of the EAC and the MTA for the first, second, and third points along the horizontal diameter of the EAC were 1.57, 2.96, and 4.02mm, respectively. In at least one specimen, the artery dipped into the EAC. **Conclusions:** The middle temporal artery runs closest to the external auditory canal at the anterosuperior border. To preserve the middle temporal artery for use in reconstruction after otologic surgery, the surgeon should avoid dissection superior to the external auditory canal until the artery is positively identified.

- 2:18** **WALTER WORK, MD RESIDENT RESEARCH AWARD**
Recreating a "Stem Cell Niche" in the Inner Ear and Internal Auditory Canal with Nanofiber Based Peptide Amphiphile Gels
Zafar A. Sayed, MD, Chicago, IL; Augusta M. Fernando, PhD, Chicago, IL; Eric J. Berns, PhD, Chicago, IL; Samuel I. Stupp, PhD, Chicago, IL; Akihiro J. Matsuoka, MD PhD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the concept of the "stem cell niche" and appreciate the challenges inherent in inner ear stem cell transplantation.

Objectives: Despite recent encouraging progress, the potential clinical use of human pluripotent stem cell (hPSC) based therapies for regeneration of the inner ear is hindered by several critical hurdles—namely the long term survival of transplanted hPSCs and their effective neuronal differentiation. We hypothesized that using nanofiber based peptide amphiphile (IKVAV-PA) gels to recreate a "stem cell niche" at the time of transplantation of hPSCs into the inner ear may promote their viability and neuronal differentiation. Therefore, the purpose of this study was to develop an appropriate biochemical and biophysical "niche" for hPSCs with PA gels both in vitro and in cadaveric human temporal bones. **Study Design:** Translational research. **Methods:** In vitro live/dead cell viability assays and EdU proliferation assays were performed in PA gels with cultured hPSCs. Two human cadaveric temporal bones were used to test the fea-

sibility of using nanogels in a future clinical setting. The resultant vestibulocochlear nerve complex was harvested and sectioned for transmission electron microscopy. **Results:** Cell viability assays in IKVAV-PA gels demonstrated adequate cell viability on days 5 and 7, with increased apoptosis noted on day 21. Preliminary EdU cell proliferation assays on day 21 showed no proliferating cells, evidence supporting hPSC maturation into a neuronal phenotype. In a cadaveric temporal bone study, fluorescence corresponding to both IKVAV-PA gel and TRA 1-81 stained hPSCs was noted along the internal auditory canal following intracochlear injection. **Conclusions:** Recreating a “stem cell niche” by providing IKVAV-PA gels with the appropriate neurotrophins in the inner ear may promote cell survival and neuronal differentiation.

2:25 Analysis of Intraoperative Radiographic Confirmation of Electrode Placement during Cochlear Implantation
Sharon H. Gnagi, MD, Phoenix, AZ; Trenton M. Baker, BS, Phoenix, AZ; Taylor R. Pollei, MD, Phoenix, AZ;
David M. Barrs, MD*, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the advantages and disadvantages of intraoperative plain film radiographs in determining correct placement of cochlear implants.

Objectives: To investigate the clinical value of intraoperative plain radiographs in determining correct placement of cochlear implants. **Study Design:** Retrospective review. **Methods:** A surgical database was searched to identify all cochlear implant insertions over a ten year period by a single surgeon. Cases were then reviewed for etiology of hearing loss, history of prior implantation, surgical details, and intraoperative imaging. Pertinent cases of imaging affecting clinical management are then discussed. **Results:** 207 cochlear implantations performed in 187 patients were identified. There was no gender difference with 96 females and 111 males. Etiology of hearing loss, surgical variations, and implant type did not affect intraoperative imaging. Four cases were identified where variations in intraoperative imaging interpreted by the surgeon affected clinical management. In one patient, the intraoperative x-ray interpretation missed an incorrectly placed electrode. Postoperative CT scan confirmed implant electrode within the superior semicircular canal. In two patients, intraoperative x-ray results aided management by confirming surgical findings; however, no subsequent surgical or clinical alterations were made based on imaging. One patient had a noticeable decline postoperatively that correlated with altered positioning of the cochlear implant on intraoperative radiographs. Of the other 205 surgeries, no changes were made to the electrode placement based on the intraoperative radiographs. **Conclusions:** While intraoperative plain film imaging during cochlear implantation has been a standard practice, there is not a clear benefit to it being performed, and is an additional cost and radiation exposure to the patient. We recommend exclusion of intraoperative imaging in cochlear implantation.

2:32 The Role of a New Contralateral Routing of Signal (CROS) Microphone in Established Unilateral Cochlear Implant Recipients
Jafri B. Kuthubutheen, MBBS FRACS, Toronto, ON Canada; Aman Grewal, MD, Toronto, ON Canada; Kari Smilsky, MCIsc, Toronto, ON Canada; Vincent Y. Lin, MD FRCS, Toronto, ON Canada; Lendra Friesen, PhD, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the utility of contralateral routing of signal (CROS) in patients with a unilateral cochlear implant and not just in patients with single sided deafness; 2) explain the advantages and disadvantages of CROS; and 3) discuss the various methods of assessing binaural effects.

Objectives: To investigate whether incorporating a contralateral routing of signal (CROS) microphone in established unilateral cochlear implant (CI) users resulted in improved speech understanding in quiet and in noise. **Study Design:** Prospective case series. **Methods:** After a successful pilot study and institutional ethics approval, 10 post-lingually deafened adults with the same unilateral Advanced Bionics cochlear implant were recruited. Patients were established users. A custom made CROS microphone with direct feed into the CI via a cable behind the head was fitted via the implant mapping software. Pre CROS measurements of speech understanding were then compared to after 2 weeks of wear at home. The testing paradigms were AZBIO sentences in quiet at 0° and 270° azimuth, as well as presentation in noise with speech at 0° and noise at 0°, 90° and 270°. The APHAB (Abbreviated Profile of Hearing Aid Benefit), SSQ (Speech, Spatial and Qualities of Hearing Scale) were administered at both test sessions. Patients were asked to record their daily experience with the device and hours of use. **Results:** There was a statistically significant improvement in speech understanding scores when speech was presented in quiet towards the side of the CROS microphone. Performance deteriorated in all situations when noise was presented to the side of the CROS. However, the SSQ score was significantly better in patient with a CI-CROS microphone. Many patients reported a subjective hearing benefit in select situations and felt safer with improved environmental awareness. Several patients were willing to purchase the device should one be commercially available and some felt disadvantageous returning it. **Conclusions:** Based on these results, the use of a unilateral CI-CROS could provide a greater cost/benefit ratio than bilateral CIs, and may provide potential improvement for those patients who are not candidates for bilateral CIs. A CI-CROS may also be a temporary bridge for those on the waiting list for a second cochlear implant or in centers where bilateral cochlear implantation is not an option.

2:39 - 2:45 Q&A

2:45 - 3:35

NEW TREATMENTS FOR EUSTACHIAN TUBE DISORDERS AND ITS RELATED PROBLEMS

Moderator: Lorne S. Parnes, MD*, London, ON

Panelists:

Eustachian Tube Surgery to Treat Post Lateral Skull Base Surgery CSF Leaks

Simon I. Angeli, MD*, Miami, FL

Surgical Treatment for Patulous Eustachian Tubes

Brian W. Rotenberg, MD MPH, London, ON

Surfactants for Eustachian Tube Dysfunction

Sujana S. Chandrasekhar, MD*, New York, NY

Balloon Tuboplasty

Dennis S. Poe, MD PhD FACS*, Boston, MA

CONCURRENT SESSION II - HEAD & NECK AMERICANA 2

Moderators: Steven J. Wang, MD*, San Francisco, CA

Gady Har-El, MD FACS*, New York, NY

1:50

JOHN J. CONLEY, MD RESIDENT RESEARCH AWARD

Volume Outcome Relationships in the Surgical Management of Head and Neck Cancer in a Universal Health Care System

Antoine Eskander, MD ScM(c), Toronto, ON Canada; Jonathan C. Irish, MD MSc FACS FRCS, Toronto, ON Canada; David R. Urbach, MD MSc FACS FRCS, Toronto, ON Canada; David P. Goldstein, MD MSc FACS FRCS, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe common statistical errors in volume outcome studies; 2) better understand the relationship between hospital/surgeon resection volume and outcomes; and 3) understand what may explain for this relationship and why it is largely explained by one rather than both predictors.

Objectives: We aimed to assess whether surgeon and/or institution resection volume predicts long term survival in head and neck cancer in a publicly funded health care system. **Study Design:** Population based retrospective cohort study. **Methods:** Mucosal head and neck cancer patients who underwent a resection confirmed by both hospital level and physician level administrative data between 1993-2010 comprised our cohort (n=5720). Physician and hospital volumes were calculated based on number of cases performed in the year prior by the physician and at an institution performing each case respectively. A multi-level hierarchical Cox regression model was used to estimate the effect of each 25 increase in procedure volume on survival. **Results:** A crude model without patient or treatment characteristics demonstrated that both surgeon volume (hazard ratio (HR): 0.927 95% CI 0.879-0.978 p-value: 0.006) and hospital volume (HR: 0.980 95% CI 0.970-0.991 p-value: 0.0003) were associated with improved overall survival. After controlling for clustering and patient/treatment covariates, hospital volume (HR: 0.976 95% CI 0.955-0.997 p-value: 0.02) but not physician volume (HR: 1.042 95% CI 0.941-1.155 p-value: 0.43) remained a statistically significant predictor of overall survival. This translates into a 2.4% decrease in the HR for every twenty-five additional cases performed at an institution. **Conclusions:** Both high volume surgeons and hospitals are predictors of better overall survival in head and neck cancer patients. However, the effect is largely explained by hospital volume. This benefit at the institution level could potentially be explained by important processes of care that contribute to overall survival.

1:57

Factors Affecting Recurrent Benign Parotid Tumors

Michael Z. Chen, MD, Detroit, MI; Robert H. Mathog, MD*, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) identify risk factors which may be associated with recurrence of benign parotid tumor; and 2) apply this knowledge when choosing the procedure for initial resection of tumor.

Objectives: We investigate several variables related to tumor recurrence with emphasis on the type of procedure performed. **Study Design:** Retrospective chart review at four tertiary care institutions. **Methods:** One hundred forty-nine surgeries for benign parotid tumor were performed in 140 patients between 1999 and 2012. Patient demographics, tumor characteristics, type of procedure, and surgical experiences were analyzed. The main outcome measure was tumor recurrence. **Results:** Recurrence occurred in 17 of 149 (11.4%) benign parotid tumors following initial resection. Six cases of recurrence were excluded from subsequent analyses due to inadequate information. Median age at diagnosis was nearly 60 years. Eighty-three percent of tumors were located in the superficial lobe. Tumor types included pleomorphic adenoma (55%) and Warthin's tumor (36%). Median followup was 99 months vs. 18 months in the recurrence and non-recurrence groups, respectively. Mean time to recurrence was 60 months. Recurrence rates were significantly higher after limited dissection (24.2%) compared to superficial parotidectomy (3.9%) and total parotidectomy (0.0%). Capsular rupture and tumor spillage were not linked to tumor recurrence. The type of procedure did not affect rates of facial weakness or Frey syndrome. **Conclusions:** Our study suggests a correlation between limited surgery for benign parotid tumor and tumor recurrence. Complete superficial parotidectomy and total parotidectomy should be considered for any tumor within the superficial and/or deep lobe. Capsule rupture and tumor spillage may not be significant risk factors for recurrence. Morbidities such as facial nerve paralysis and Frey syndrome did not appear to be important factors in the choice of procedure.

2:04 FRANCIS E. LEJEUNE SR., MD RESIDENT RESEARCH AWARD
Transoral Robotic Surgery for Primary Treatment of Oropharyngeal Squamous Cell Carcinoma: A Cost Perspective
 Amir Allak, MD MBA, Charlottesville, VA; Weitao Wang, BS, Charlottesville, VA; Paul W. Read, MD PhD, Charlottesville, VA; Mark J. Jameson, MD PhD, Charlottesville, VA; David C. Shonka Jr., MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss and compare the costs of various modalities in the primary treatment of oropharyngeal squamous cell carcinoma.

Objectives: Transoral robotic surgery (TORS) is an effective alternative to radiation (RT) or chemoradiation (CRT) for primary management of oropharyngeal squamous cell carcinoma (OPSCC), but the relative costs of these approaches have not been established. **Study Design:** Retrospective cohort study. **Methods:** Records of patients undergoing primary TORS or primary RT/CRT for treatment of OPSCC were reviewed. Cost data were calculated from date of diagnosis to completion of treatment. **Results:** 67 patients were identified in the RT/CRT and 15 in the TORS group. Demographic data were similar. Staging showed lower T stage in the TORS group, but similar N and overall stages ($p = 0.02, 0.65,$ and 0.44 respectively). A stage matched group ($n=26$) was selected from the RT/CRT group with similar T, N, and overall stages. In the TORS group, adjuvant therapy included RT in 53% and CRT in 13%; in the stage matched RT/CRT group, RT was used in 23% and CRT in 76%. Average treatment duration was shorter among patients undergoing TORS when compared to the stage matched RT/CRT group (92 vs 125d; $p=0.015$). Average patient charges were \$131,000 for the TORS group and \$150,000 for the stage matched RT/CRT group ($p = 0.14$); direct cost was significantly lower in the TORS group (\$17,700 vs \$27,000; $p=0.001$). **Conclusions:** On average, direct costs are lower for patients with OPSCC undergoing TORS vs RT/CRT as the primary treatment modality. The observed shorter treatment duration for TORS would be expected to result in more rapid return to baseline quality of life and reduced opportunity cost.

2:11 Donor Site Morbidity and Functional Outcomes in the Elderly Patient after Osteocutaneous Free Flap Transfer
 Tyler S. Weaver, BS, Portland, OR; Jacob L. Wester, MD, Los Angeles, CA; John P. Gleysteen, MD, Portland, OR; Jessica J. Peck, MD, Portland, OR; Mark K. Wax, MD*, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss and compare the donor site morbidity and functional outcomes of elderly patients undergoing osteocutaneous free flap transfer compared to younger patients.

Objectives: Morbidity of free tissue transfer in the elderly is controversial. Recent studies have shown no significant difference in elderly fasciocutaneous free flap donor site morbidity. The purpose of this study is to assess donor site morbidity and functional outcomes in elderly patients receiving osteocutaneous free tissue transfer. **Study Design:** Retrospective chart review of patients 70 years and older undergoing osteocutaneous free flaps between 2000-2013. **Methods:** Fibular, radial forearm, and scapular flaps were reviewed. Younger patients randomly selected from the same time period served as controls. Data collected included donor site morbidity, flap complications, and functional outcomes. **Results:** 44 osteocutaneous free flaps were performed in elderly patients. Overall, there was no significant difference in donor site morbidity between older and younger patients ($p=0.50$) (tendon exposure, $p=1.00$; STSG loss, $p=0.36$; infections, $p=0.53$; dehiscence, $p=1.00$; seroma, $p=1.00$). Functional outcomes demonstrated no significant difference between older and younger patients being decannulated ($p=0.61$) or the time to decannulation ($p=0.24$). There was no difference in those who returned to baseline diet ($p=0.67$). All patients returned to baseline ambulatory status. Length of postoperative hospitalization ($p=0.78$) and ICU stay ($p=0.94$) were also equal. The only significant difference was that more elderly patients were discharged to skilled nursing facilities (40.9% vs 15.9%, $p<0.01$). **Conclusions:** Elderly patients undergoing free tissue transfer have similar flap and donor site outcomes, hospital stays, and functional outcomes compared to younger patients. They are, however, more likely to require skilled nursing facility care post-hospitalization.

2:18 Systemic Effects of Subcutaneous Heparin Use in Head and Neck Cancer Patients
 David J. Grindler, MD, St. Louis, MO; Sarah J. Blank, MD, St. Louis, MO; Janice Zerega, BSN RN, St. Louis, MO; Morey A. Blinder, MD, St. Louis, MO; Brian Nussenbaum, MD*, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to identify and discuss risk factors in head and neck cancer patients that could increase the likelihood of postoperative bleeding events related to the routine use of prophylactic subcutaneous heparin.

Objectives: The risk of systemic effects of pharmacologic DVT prophylaxis is amplified in patients with low body weight and low plasma protein concentration, two common characteristics of head and neck cancer patients. We present a case series of adverse events related to prophylactic subcutaneous heparin (SQH) use in head and neck cancer patients. **Study Design:** Single institution, retrospective case series. **Methods:** Patients with head and neck cancer who developed prolonged PTT from routine administration of SQH postoperatively were retrospectively identified over an 18 month period through a quality improvement database. **Results:** 6 patients with head and neck cancer postoperatively developed prolonged PTT levels on prophylactic SQH. All had BMI < 20 (kg/m²) and received 5000 units of SQH TID. Adverse events included 3 postoperative wound hematomas, an emergent reintubation due to airway obstruction, and a case of persistent gingival bleeding. 1 patient developed prolonged PTT after 1 dose of SQH, and after holding subsequent doses, developed a DVT requiring placement of an IVC filter. 17 patients with postoperative bleeding complications were identified from the QI database over the same time course; of these, 5 had prolonged PTTs from subcutaneous heparin use (29%). **Conclusions:**

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Head and neck cancer patients are a high risk group for perioperative DVTs. Yet, these patients are frequently malnourished and cachectic, and thus are at increased risk for systemic effects from standard doses of SQH. These systemic effects can lead to unintended bleeding complications. For this patient population, a protocol is needed for perioperative DVT chemoprophylaxis to minimize both DVTs and complications of prophylactic therapy.

2:25 **Prognostic Impact and Predictive Modeling of Tumor Extension for Oral Cavity and Oropharynx Cancer**
Erica R. Leavitt, BS, Boston, MA; Kevin S. Emerick, MD, Boston, MA (Presenter); Sebastian A. Jara, BS, Boston, MA; James S. Michaelson, PhD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the impact on survival attributable to different degrees of tumor extension for oral cavity and oropharynx cancer.

Objectives: 1) To quantify the prognostic impact of tumor extension for patients with oral cavity and oropharynx squamous cell carcinoma; and 2) incorporate this prognostic impact into a predictive model of cancer death. **Study Design:** Retrospective survival analysis using the Surveillance, Epidemiology, and End Results (SEER) cancer registry data of the National Cancer Institute. Extension information was extracted from the EOD-Extension and CS-Extension fields. **Methods:** Disease specific 10 year mortality rates were calculated for tumor extension variables: localized, extension to any adjacent structures, extension to adjacent structures that does not meet the criteria for T4, extension that meets the criteria for T4a, and extension that meets the criteria for T4b. Within the framework of the binary-biological model, quantitative measures of the contributions to lethality were calculated for the extension variables. **Results:** 10 year mortality rates were: 39% for localized tumors, 56% for tumors that extend into surrounding tissue, 49% for tumors with extension that did not meet the criteria for T4, 65% for those classified as T4a, and 69% for T4b. The respective g parameters for these groups are 0.87, 1.01, 1.39, and 1.55. This g parameter was successfully included in a predictive calculator for HN cancer outcome. **Conclusions:** Tumor invasion into adjacent structures that meet the criteria for T4a or T4b has a significant, negative prognostic impact, but invasion into adjacent regions that are not considered T4 has a negligible prognostic impact. Our findings lend support to the AJCC T staging system's current emphasis on the clinical severity of invasion into the adjacent structures that are considered T4a or T4b, but also suggest that a more stratified approach to staging is warranted.

2:32 **G. SLAUGHTER FITZ-HUGH, MD RESIDENT RESEARCH AWARD**
The Impact of Blood Transfusions on Outcomes in Head and Neck Cancer Patients Undergoing Free Tissue Transfer
Deepa Danan, MD MBA, Charlottesville, VA; Mark J. Jameson, MD PhD, Charlottesville, VA; Mark E. Smolkin, MS, Charlottesville, VA; Nikole E. Varhegyi, BS, Charlottesville, VA; Stephen R. Bakos, MD PhD, Charlottesville, VA; David C. Shonka, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the negative impact of blood transfusion on survival and wound healing in head and neck cancer patients undergoing free tissue transfer.

Objectives: Data regarding the impact of blood transfusions in head and neck cancer (HNC) patients is limited, particularly for patients undergoing free tissue transfer. The purpose of this study is to determine whether transfusions are associated with adverse outcomes in this population. **Study Design:** Retrospective cohort study. **Methods:** The records of all patients who underwent free flaps for reconstruction after HNC resection from 7/2007 through 2/2013 at a single institution were reviewed. Rates of overall survival (OS), recurrence free survival (RFS), and postoperative wound infection were determined. Statistical analyses included Cox proportional hazards models and Chi-square tests. **Results:** Of 167 patients, 90 received 0-2 units of blood and 77 received ≥ 3 . After controlling for age, preoperative hematocrit, cancer stage, and adverse pathologic features, transfusion of ≥ 3 units versus 0-2 was associated with poorer OS ($p=0.011$, $HR=1.97$), and poorer RFS ($p=0.055$, $HR=1.61$). The rates of wound infection in patients who received 0, 1, 2, or ≥ 3 units were 13.3%, 21.2%, 33.3%, and 31.2% respectively. There was a statistically significant difference in wound infection rates between those patients receiving 0-1 units versus ≥ 2 units ($p=0.04$). **Conclusions:** Patients who receive ≥ 3 units of blood after free tissue transfer for HNC were at nearly twice the risk of death after controlling for age, preoperative hematocrit, cancer stage, and adverse pathologic features. Increased transfusions are also associated with higher wound infection rates. The increased tendency to transfuse free flap patients in order to maintain a threshold hematocrit may have a detrimental impact on survival and wound infections and should be revisited.

2:39 - 2:45 **Q&A**

2:45 - 3:35 **TREATMENT OF AGGRESSIVE SKIN CARCINOMAS**
Moderator: Dale H. Brown, MD*, Toronto, ON
Panelists: Carol R. Bradford, MD FACS*, Ann Arbor, MI
Patrick J. Gullane, MD FACS*, Toronto, ON
Keyvan Nouri, MD, Miami, FL
Sandro J. Stoeckli, MD*, St. Gallen, Switzerland

3:35 - 4:00 **Break with Exhibitors/Poster Viewing**

4:00 - 5:40 CONCURRENT SCIENTIFIC SESSIONS - GENERAL AND SLEEP DISORDERS

CONCURRENT SESSION III - POINT/COUNTERPOINT, HOW I DO IT AMERICANA 1

4:00 - 5:00 THE GREAT DEBATE - POINT/COUNTERPOINT

Moderators: Mark S. Courey, MD*, San Francisco, CA
David M. Barrs, MD FACS*, Phoenix, AZ

Do Recurrent Thyroid Tumors Always Require Treatment?

Pro Ralph P. Tufano, MD MBA FACS*, Baltimore, MD

Con Ashok R. Shaha, MD FACS*, New York, NY

Q&A

Treatment of Unilateral Profound Sensorineural Hearing Loss: Cochlear Implant versus Hearing Aid or Bone Anchored Device

Hearing Aid/Bone Anchored Device

Jack J. Wazen, MD FACS*, Sarasota, FL

Unilateral Cochlear Implant

Daniel H. Coelho, MD, Richmond, VA

Q&A

5:00 - 5:40 HOW I DO IT, NOT WHEN AND WHY, JUST HOW—Video Session

Moderators: Brian Nussenbaum, MD FACS*, St. Louis, MO

David J. Terris, MD FACS*, Augusta, GA

Endoscopic Management of Pediatric Subglottic Stenosis

Michael J. Rutter, BHB MBChB FRACS, Cincinnati, OH

TORS for OSA Surgery

Erica Robb Thaler, MD FACS*, Philadelphia, PA

Minimally Invasive Parathyroidectomy

Brendan Stack, MD, Little Rock, AR

Cochlear Implantation

Timothy E. Hullar, MD FACS*, St. Louis, MO

Staple Assisted Endoscopic Management of Zenker's Diverticulum

to be named

CO2 Laser Assisted Endoscopic Management of Zenker's Diverticulum

Michael L. Hinni, MD FACS*, Phoenix, AZ

5:40 - 5:45 Q&A

CONCURRENT SESSION IV - GENERAL AND SLEEP DISORDERS AMERICANA 2

Moderators: Karen H. Calhoun, MD FACS*, Columbus, OH

Andrew H. Murr, MD FACS*, San Francisco, CA

4:00 Outcomes of Early versus Late Tracheostomy in the United States: 2008-2010

Jennifer A. Villwock, MD, Syracuse, NY; Kristin Jones, MD, Springfield, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the clinical and economic outcomes associated with the timing of tracheostomy in severely ill patients.

Objectives: Determine demographic and outcome differences in patients treated with early (< 10 days) versus late tracheostomy.

Study Design: Retrospective review of the 2008—2010 Nationwide Inpatient Sample for tracheostomy patients with extreme severity of illness, to match patients in both groups. As what constitutes early tracheostomy is debated, further subdivision of tracheostomy patients into 5 day intervals was performed (days 1-5, 6-10, etc). **Methods:** Descriptive statistics were obtained for hospital and patient demographics. Multivariate models were employed to analyze the effect of early versus late tracheostomy. Primary outcomes were morbidity and mortality, length of stay (LOS), and total charges. **Results:** Of 124,990 tracheostomy cases identified in the NIS database that met our inclusion criteria, 53,749 received early tracheostomy; 71,244 received late tracheostomy. Significant predictors ($p < .001$) of early tracheostomy included number of chronic conditions (OR: 1.048), admission to a Midwest hospital (OR: 1.400), and admission to a government, non-federal, hospital (OR 1.434). Significant predictors of late tracheostomy included admission to a small hospital (OR: 1.157), acute respiratory failure (OR: 1.595), and acute on chronic respiratory failure (OR: 1.374). LOS, hospital charges, and

mortality increased linearly with increasing time to tracheostomy ($p < .001$). Earlier tracheostomy was associated with a significantly increased rate of discharge to home ($p < .001$) and decreased rate of sepsis ($p < .001$); there was a trend towards significance for decreased risk of VAP ($p = .066$). **Conclusions:** Efficient and effective healthcare delivery is paramount in today's economic climate. Early tracheostomy is significantly associated with a decrease in mortality, LOS, and hospital charges. Further prospective studies are warranted as rapid identification of patients likely to need prolonged ventilator support and tracheostomy may prove to be a cost, and mortality, saving measure.

4:07 **A Novel Model for Assessing Adequacy in Ultrasound Guided Fine Needle Aspiration Training**
Joel Franco, BS, Indianapolis, IN; Michael S. Harris, MD, Indianapolis, IN; Mimi S. Kokoska, MD MHCM, Indianapolis, IN; William A. Berry, MD, Indianapolis, IN; Darrell D. Davidson, MD PhD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants will understand the value and importance of this novel ultrasound guided fine needle aspiration model.

Objectives: To develop an USFNA model that simulates thyroid nodules, lymph nodes, or small masses and allows for cytological confirmation and quantification of target acquisition. **Study Design:** Several types of vegetative products (simulating targets) that were readily purchased were trialed in combination within different types of meats. **Methods:** Consistent product availability, cost, quality of the ultrasound image and background, and cytological yield (number of starch granules per high power field) from the USFNA were assessed in determining which products in combination provided the best model for USFNA training. **Results:** A low cost model which consisted of a specific fresh meat and vegetable was determined to best simulate a pathologic lymph node or nodule on ultrasound, and to reliably provide confirmation of target entry and quantitative cytological yield by starch granule counts under high power microscopy. **Conclusions:** This novel simulation model for instruction in USFNA provides inexpensive and reliable confirmation of the adequacy of training in course participants or practitioners.

4:14 **Financial Incentive of Home Continuous Positive Airway Pressure Machine Use in the Inpatient Hospital Setting**
David F. Smith, MD PhD, Baltimore, MD; Charlene P. Spiceland, PhD CPA, Memphis, TN; Lauren C. Pringle, MD, Baltimore, MD; Kathryn Mattare, BS RRT, Baltimore, MD; Stacey L. Ishman, MD MPH, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the utilization of hospital owned versus home CPAP machines and explain the potential cost saving for patients requiring inpatient CPAP use. Participants should be able to compare the use of patient owned CPAP machines versus hospital owned CPAP machines during inpatient hospitalizations and how this may reflect an opportunity to provide cheaper care while maintaining high patient safety and quality care.

Objectives: Obstructive sleep apnea (OSA) is increasingly recognized as a significant factor in perioperative and inpatient health. Because of this, hospitalized OSA patients are encouraged to utilize CPAP therapy while inpatient. We investigated the cost difference of patient owned versus hospital owned CPAP machine use in admitted adult patients with OSA. **Study Design:** Prospective cohort study at a tertiary academic center. **Methods:** For 2 months, all new patient admissions >18 years prescribed CPAP while inpatient were included. Demographic information was collected and cost analysis was performed. **Results:** CPAP was required for 162 (1.2%) admissions. Mean patient age was 59 ± 13 years; the majority was white (56.8%) and male (64.2%). Average CPAP utilization was 5.3 ± 5.5 nights. The differential cost per day for patients using hospital owned CPAP was \$416.10 compared to patients using home CPAP machines. This differential cost includes direct costs of an extended initial visit, rental fee of \$27.50, and additional respiratory therapy evaluation time (average \$85-145 per day). The base initial visit was the same for all CPAP patients. Over the 2 month study period, the total cost difference in charges was \$195,912, which extrapolates to \$1,175,471 yearly. **Conclusions:** This is the first study to find that the utilization of home versus hospital owned CPAP machines resulted in a significant cost savings for patients requiring inpatient CPAP machine use. The use of patient owned CPAP machines during inpatient hospitalizations may reflect an opportunity to provide cheaper care while maintaining high patient safety and quality care although the actual economic impact to the hospital would vary based on the payer mix.

4:21 **A Comparison of Imaging Findings and Surgical Outcomes in Parotid Sialolithiasis**
Ruwan Kiringoda, MD, San Francisco, CA; David W. Eisele, MD*, Baltimore, MD; Jolie L. Chang, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better counsel patients on the positive and negative predictive value of CT scan in the evaluation of parotid stones, as well as guidance of successful management based on stone location.

Objectives: To examine preoperative imaging factors that predict successful management of obstructive salivary disorders in the parotid gland. **Study Design:** Retrospective review. **Methods:** Imaging studies, operative reports, and medical records were reviewed for 90 patients who underwent 108 parotid sialendoscopies between 2005 and 2013. Stone location was determined by CT scan: anterior (duct papilla to posterior masseter muscle border) versus posterior (posterior to masseter muscle, or within the parotid tail). Preoperative imaging findings were compared to intraoperative findings and management. **Results:** Ninety patients underwent parotid sialendoscopy. 52 patients (58%) had no CT scan evidence of sialolithiasis, 38 (42%) had evidence of obstruction. Of the 38 patients, 26 (68%) had at

least one sialolith visualized endoscopically. Two patients (5%) had a non-stone mass. For all stones visualized endoscopically, a corresponding calcification was identified on preoperative CT scan. No cases of radiolucent stones were seen. 82.4% of anterior stones were visualized endoscopically versus 52.5% of posterior stones. Anterior stones were more successfully retrieved using minimally invasive techniques than posterior stones (76.5% versus 27.3% respectively; $p = 0.01$). Average posterior stone diameter (4.6mm) was significantly smaller than anterior stone diameter (6.8mm; $p=0.01$). Anterior stones were preferentially addressed with basket retrieval or transoral sialodochotomy, and posterior stones with lithotripsy or a transfacial approach. **Conclusions:** There were no cases of radiolucent parotid stones (NPV of CT scan =100%). Stone location as determined by CT scan is important to guide management, with anterior stones retrieved with greater success than posterior stones.

4:28 A Learner Centered Educational Curriculum Improves Resident Performance on Otolaryngology Training Examination

Douglas D. Reh, MD, Baltimore, MD; Aadil Ahmed, MD, Baltimore, MD (Presenter); Ryan J. Li, MD, Baltimore, MD; Kulsoom Laeeq, MD, Baltimore, MD; Nasir I Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the beneficial effects of implementation of learner centered educational curriculum in otolaryngology residency training program.

Objectives: To examine the effects of a learner centered educational curriculum for our otolaryngology-head and neck surgery residents in improving their otolaryngology training examination (OTE) scores. We hypothesized that trainees who attend a learner centered program end up with improved performance on OTEs. **Study Design:** Prospective longitudinal study. **Methods:** In September 2008, a resident designed educational curriculum was implemented to better prepare residents for their OTE. These mandatory sessions led by faculty members comprised of an hour, every week in which residents were tested on their knowledge in high yield topics. Residents were expected to be prepared on pathophysiology, diagnosis, and treatment of the selected diseases. In 2011, residents were given responsibility to lead these sessions. OTE scores from 2002 to 2012 were analyzed to see any improvement after the implementation of this curriculum. **Results:** Linear regression analysis revealed significant improvement of OTE scores with subsequent interventions. During a three year period (2009-2011) after the first intervention, there was a significant increase ($p = 0.01$) of 0.69 in mean national and 0.78 in mean group stanine scoring. Similarly, after the second intervention in 2011, a further increment of 1.36 in mean national and 1.58 in mean group stanine scoring was seen ($p < 0.001$). **Conclusions:** Residents' OTE stanines improved significantly after the implementation of a learner centered educational curriculum. This finding suggests that trainees are able to perform better when involved in planning the educational curriculum.

4:35 Oropharyngeal Papillomas: Any Malignant Potential?

Aron Pollack, MD, New York, NY; Elana L. Opher, MD, New York, NY; Yosef P. Krespi, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate that oropharyngeal papillomas are benign entities with no malignant potential and represent a separate clinicopathologic disease process that occurs in HPV positive oropharyngeal squamous cell carcinoma (SCCA) and recurrent respiratory papillomatosis (RRP).

Objectives: The main objective was to demonstrate that oropharyngeal papillomas are benign entities with no malignant potential, representing a separate clinicopathologic disease process that occurs in HPV positive oropharyngeal squamous cell carcinoma (SCCA) and recurrent respiratory papillomatosis (RRP). **Study Design:** A prospective chart review of consecutive patients from 2009-2012 with oropharyngeal papillomas, without known oropharyngeal SCCA or RRP. **Methods:** For all enrolled patients, all papillomas were removed with either CO2 laser or electrocautery in an operating room or office setting; the mucosal base was burned after removal. Tissue was submitted for HPV typing using in situ hybridization techniques. All samples were tested for p16 immunohistochemical positivity, a surrogate marker for high risk HPV; those suspicious for dysplasia were tested with proliferation marker Ki-67. **Results:** Of a total 30 patients, 60% were male. Age ranged from 23-58 years. The majority of papillomas were found incidentally during office evaluation for chronic tonsillitis or sleep apnea, originating either within the palatine tonsil (upper pole), tonsillar pillar, free edge of the soft palate or distal uvula. Lesions were almost exclusively solitary; to date, there have been no recurrences. No evidence of high or low risk HPV infection was found within the excised samples. None of the lesions showed p16 positivity. **Conclusions:** Oropharyngeal papillomas show minimal or no relationship to HPV infection and remain benign entities with no malignant potential. They occur in predictable locations as isolated lesions and appear to be increasing in incidence. Complete surgical excision remains appropriate treatment with no risk for recurrence. This remains especially relevant, as HPV associated entities continue to gain increasing medical attention.

4:42 Improving Applicant Selection: Identifying Qualities of the Unsuccessful Otolaryngology Resident

Kanwar Kelley, MD JD, Irvine, CA; Karam Badran, BSc, Irvine, CA; Christian Conderman, MD, Irvine, CA; Hossein Mahboubi, MD, Irvine, CA; William Armstrong, MD*, Irvine, CA; Naveen Bhandarkar, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the prevalent qualities of unsuccessful otolaryngology residents.

Objectives: To identify the prevalence of unsuccessful otolaryngology residents and understand factors contributing to the training of these residents within US residency programs. **Study Design:** This is a multi-institutional anonymous digital survey. **Methods:** An anonymous survey was distributed to 160 current and former program directors in 2012. The factors associated with unsuccessful oto-

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laryngology residents along with those associated with the remediation of the problematic resident were investigated. An unsuccessful resident during training was identified as one who had been removed from or had quit the program for any reason. Remediation was defined as an individualized program instituted to correct documented weaknesses of a trainee. Respondents were able to select multiple qualities and forms of remediation for each resident observed. **Results:** The overall response rate was 25% (40 programs), of which 72%, or 29 programs, identified unsuccessful residents. Remediation was attempted for 71 total residents of which 44 were successfully remediated during their training. 36 residents were reported as unsuccessful, with 30 during training and 6 after graduation. This corresponds to 4% and 0.8% of residents graduating per year respectively. Remediation was attempted for 27 of the 30 unsuccessful residents during their training. The most common reason for being unsuccessful during and after residency was "change in specialty" (n=17) and unprofessional conduct (n=3), respectively. Poor performance on the in-training examination was the most common factor (n=22) amongst those who were successfully remediated. **Conclusions:** A large proportion of otolaryngology residency programs in this sample had at least one unsuccessful resident. Improved methods of applicant selection are necessary to optimize resident training.

4:55 - 5:45 **EVERYTHING YOU WANTED TO KNOW ABOUT SURGERY FOR OSA BUT WERE TOO BORED TO ASK**

Moderator: Kathleen L. Yaremchuk, MD*, Detroit, MI
Panelists: Jose E. Barrera, MD FACS*, San Antonio, TX
Stacey L. Ishman, MD, Cincinnati, OH
Edward M. Weaver, MD, Seattle, WA

5:45 **Q&A**

6:00 - 7:00 **VICE PRESIDENTS WELCOME RECEPTION - Americana Lawn**

SATURDAY, JANUARY 11, 2014

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

8:00 - NOON CONCURRENT SCIENTIFIC SESSIONS

CONCURRENT SESSIONS - LARYNGOLOGY and PLASTICS/RECONSTRUCTIVE SURGERY

CONCURRENT SESSION V - LARYNGOLOGY AMERICANA 1

Moderators: Michael M. Johns III, MD*, Atlanta, GA
Peak Woo, MD FACS*, New York, NY

8:00 Announcements by Vice Presidents

8:05 **The Utility of Office Based Biopsy of Laryngopharyngeal Lesions: Comparison with Surgical Evaluation**
Amanda L. Richards, MBBS FRACS, New York, NY; Jonathan E. Aviv, MD FACS*, New York, NY; Peak Woo, MD FACS*, New York, NY; Kenneth W. Altman, MD PhD FACS*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of office based biopsy and its correlation with histopathology from direct microlaryngoscopy.

Objectives: The office based biopsy for laryngopharyngeal lesions is increasingly common as a diagnostic adjunct for otolaryngologists. Clinicians and patients are guided regarding further management options based on the results of office biopsy, to include monitoring as well as the need for formal microlaryngoscopy. We evaluate the role and diagnostic value of these biopsies, and hypothesize that some disease processes may warrant more thorough surgical evaluation. **Study Design:** Retrospective chart analysis. **Methods:** A retrospective chart analysis was performed of all patients who underwent office biopsy with a CPT code of 31576 in a 3.5 year period from January 2010 to June 2013. Clinical diagnosis and histopathology results were analyzed for all specimens. **Results:** A total of 298 office biopsies were performed on 264 patients during the study period. 85 patients were identified as having an office biopsy followed by direct laryngoscopy and biopsy in the operating room. The most common lesions identified were vocal polyps, squamous papillomas, leukoplakia with dysplastic changes and carcinoma. While the congruency between office biopsy and operating room biopsy for histologically benign lesions was high, the accuracy of office biopsies for premalignant lesions was closer to 60%. **Conclusions:** Office biopsy can offer early direction and avoid operative intervention in some cases. However, surgical evaluation may be required for staging, full thickness biopsy of dysplastic lesions and leukoplakia, and therapeutic resection. Prioritization between accurate diagnosis, control of disease, and voice preservation is also discussed regarding medical decision making.

8:12 **Long Term Followup of Endoscopic Management of Adult Idiopathic Laryngotracheal Stenosis**
Sreeya Yalamanchali, MD, St. Louis, MO; Mark A. Varvares, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the outcomes of endoscopic management of adult idiopathic laryngotracheal stenosis and should be able to compare endoscopic management to laryngotracheal reconstruction.

Objectives: To analyze the outcomes of adult idiopathic laryngotracheal stenosis after endoscopic laryngeal or balloon dilation supplemented with CO2 laser incisions, Kenalog, or mitomycin C. **Study Design:** Retrospective chart review. **Methods:** Charts of 138 consecutive patients (age >18 years) diagnosed with laryngotracheal stenosis were reviewed. Patients with potential secondary causes of laryngotracheal stenosis such as prior airway trauma, prolonged intubation, tracheotomy, radiotherapy, airway surgery, and documented rheumatologic diseases were excluded. Only patients with the diagnosis of idiopathic laryngotracheal stenosis as based upon history and physical findings were included. Demographic and clinical data were reviewed from January 1999 to July 2013. **Results:** 18 patients with idiopathic laryngotracheal stenosis were identified. All were female (mean age at 1st surgery 46.9±10.7 years, mean BMI 30.0±7.2, mean follow up 5.2±4.9 years) and all presented with a degree of dyspnea on exertion, and/or shortness of breath (72.2%), stridor (42.8%), hoarseness (22.2%), or cough (22.2%). All patients were treated endoscopically with laryngeal dilation or balloon dilation and supplemented with CO2 laser incisions, Kenalog, or mitomycin C. The subglottis (79%) and cricotracheal junction were the most common areas of stenosis. The average time in between repeat procedures was 1.55±0.61 years. Recurrences were observed in 17% of patients at 6 months, 50% at 1 year, 60% at 2 years, and 85% at 5 years. None of the patients required open laryngotracheal reconstruction. **Conclusions:** Endoscopic management of patients

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with idiopathic laryngotracheal stenosis provides immediate symptomatic relief. Symptoms can be maintained by repeat endoscopic procedures which are safe and effective alternatives to laryngotracheal reconstruction.

8:19 Effects of Recurrent Laryngeal Nerve Asymmetry on Vibration, Aerodynamics, and Posture

Dinesh K. Chhetri, MD*, Los Angeles, CA; Elazar A. Sofer, MD, Los Angeles, CA; Juergen A. Neubauer, PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of laryngeal nerves in control of phonation and how recurrent laryngeal nerve paresis and paralysis affect laryngeal vibration, aerodynamics, and posture.

Objectives: Asymmetric vibratory phase of the vocal folds seen on office endoscopy is commonly attributed to tension asymmetry resulting from vocal fold paresis and paralysis. This study evaluated the effects of asymmetric recurrent laryngeal nerve stimulation on the vibratory phase, laryngeal posture, and acoustics. **Study Design:** Basic science study using an in vivo canine model of phonation. **Methods:** Bilateral recurrent laryngeal nerves (RLN) were symmetrically and asymmetrically stimulated over 8 graded levels of activation, representing 64 combinations of left/right RLN paresis and paralysis. The effect on vibratory phase was recorded using high speed photography. Phonatory posture parameters (glottal adduction and strain), aerodynamic parameters (subglottal pressure and airflow), and fundamental frequency of phonation were measured. These activation conditions were studied at four levels (levels 0-3) of bilaterally symmetric superior laryngeal nerve (SLN) stimulation. Phonatory assessments were made at phonation onset. **Results:** Asymmetric RLN stimulation led to asymmetric vibratory phase, with the mucosal wave on the more activated side leading in vibratory phase and excursion. RLN activation decreased glottal strain and fundamental frequency, and increased glottal adduction. SLN activation was antagonistic to RLN effects on these phonatory parameters. RLN activation increased phonation onset pressure and decreased airflow. Bilateral RLNs and SLNs were synergistic in their roles. **Conclusions:** Vocal fold vibratory asymmetry can be due to laryngeal paresis and paralysis from RLN abnormalities. This is most likely mediated from tension asymmetry.

8:26 Efficacy of Mitomycin C in Treatment of Laryngotracheal Stenosis—Is Repeat Treatment Beneficial?

Lara K. Reichert, MPH, Albany, NY; Alice S. Zhao, MD, Albany, NY; Lisa T. Galati, MD, Albany, NY; Stanley S. Shapshay, MD*, Albany, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential benefits and use of mitomycin C for laryngotracheal stenosis patients.

Objectives: To assess the safety and efficacy of mitomycin C (MMC) application as complimentary treatment of laryngotracheal stenosis (LTS). **Study Design:** Retrospective chart review. **Methods:** Patients were identified using ICD-9 codes for LTS, unspecified diseases of the larynx, and airway obstruction. Patients were divided into those who had received at least one dose of intraoperative MMC and those who had never received MMC. Several outcome measures were assessed. **Results:** Thirty patients were treated with MMC and 41 were not. Patients underwent similar numbers of procedures (2.3 MMC, 2.1 non-MMC, $p>0.05$). Average time between procedures was 360 (MMC) and 225 (non-MMC) days ($p>0.05$). Fewer MMC patients underwent procedures for respiratory distress than non-MMC patients (6.6% vs. 19.5%, $p>0.05$). The percent of patients undergoing repeat procedures was greater among MMC patients ($p=0.02$). No association was found between number of procedures and reflux, smoking history, or tracheostomy history in either group. A subset of patients had subglottic stenosis (SGS; 20=MMC, 14=non-MMC) and underwent an average of 2.5 (MMC) and 2.63 (non-MMC) procedures. SGS patients who underwent multiple procedures averaged 394 days between procedures for MMC patients ($n=12$) versus 178 days for non-MMC patients ($n=7$; $p=0.046$). Of the SGS subset, 14 MMC and 6 non-MMC patients were successfully treated and remained asymptomatic for an average of 11 months. **Conclusions:** MMC is a safe agent for the treatment of LTS and may decrease the number of emergent procedures necessary. For SGS patients, multiple treatments with MMC may ultimately result in less frequent need for operations.

8:33 Custom Implants for Medialization Laryngoplasty in Patients with Unilateral Vocal Fold Paralysis: A Model that Considers Tissue Compression

Michael S. Benninger, MD*, Cleveland, OH; Rebecca L. Chota, BS, Cleveland, OH (Presenter); Paul C. Bryson, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) evaluate CT scans of the larynx to design custom implants for medialization laryngoplasty; 2) anticipate tissue compression based on vocalis width which may be used to design implants; and 3) utilize CT scan and compression formula to design prosthesis for individual patients to maximize results and minimize OR time.

Objectives: Unilateral vocal fold paralysis can be treated with surgical medialization with a carved silastic or other implantable materials. One challenge to this approach is anticipating the dimensions of the implant required for adequate medialization. The purpose of this study was to develop a predictive model for implant design based on individual patient laryngeal anatomy. Compression of the vocalis muscle was evaluated in the analysis. **Study Design:** Retrospective chart review, prospective cadaver study. **Methods:** A retrospective chart review was performed on patients who had received silastic implant medialization laryngoplasty with favorable outcomes and who had preoperative CT scans performed. Patient age, sex, voice handicap index, maximum phonation time, and videostroboscopy were

collected from medical records and multiple predetermined laryngeal anatomic landmarks were taken from preoperative CT imaging. Laryngeal measurements were also taken from pre and postoperative CT scans of two fresh cadaveric specimens that underwent medialization laryngoplasty. Tissue compression was calculated and statistical analysis was performed. **Results:** There were 10 patients from the retrospective chart review and 2 cadavers included in this analysis. Of all laryngeal metrics, width of vocalis at maximal medialization was most strongly correlated to tissue compression ($R=0.738$). A linear regression was performed showing statistical significance ($y=0.52x - 1.475$, $R^2=0.545$, $P=0.006$, $F=11.98$). Individualized implants were designed based on CT and compression model. **Conclusions:** Tissue compression of the vocalis by silastic implant is linearly correlated with vocalis width at maximal medialization. A predictive formula was generated to anticipate tissue compression based on vocalis width and may be used to design implants for individual patients.

8:40 Office Based Vocal Fold Injection with the Laryngeal Introducer Technique
Matthew S. Clary, MD, Aurora, CO; Benjamin M. Milam, MD, Aurora, CO (Presenter); Mark S. Courey, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants will be able to perform awake laryngeal injections using the laryngeal introducer technique.

Objectives: There are numerous techniques for awake laryngeal injection, each with its limitations and technical challenges. We demonstrate a new modification to the thyrohyoid approach that stabilizes needle introduction and allows for consistent placement in a wide variety of larynges. **Study Design:** Retrospective review at a tertiary care institution. **Methods:** A retrospective review was performed of the charts for patients consecutively undergoing awake vocal fold injection augmentation in 2013 for unilateral vocal fold paralysis or vocal fold atrophy using the laryngeal introducer technique. We reviewed the consistency of needle placement, ease of technique, and patient tolerance. The technique utilizes a curved 1.5 inch 18 gauge needle as a laryngeal introducer through the thyroid notch. The laryngeal injection augmentation is then performed using a curved 3.5 inch 25 gauge spinal needle through the introducer. **Results:** 15 patients were identified who underwent awake vocal fold injection augmentation for unilateral vocal fold paralysis or vocal fold atrophy. 14 of 15 injections were successful with one injection aborted due to uncontrolled swallowing during the procedure. Resident physicians were able to perform the procedure with a high rate of success. Patient experience data demonstrated good tolerance with a preference for the awake procedure as compared to that performed under general anesthesia. **Conclusions:** The laryngeal introducer technique is a novel way of performing awake laryngeal injections. It provides a high rate of success, the ability to be consistently performed by inexperienced clinicians, and is well tolerated by patients.

8:47 Laryngeal Chondrosarcoma: A Population Based Analysis of Incidence and Survival
Pariket M. Dubal, BA, Newark, NJ; Peter F. Svider, MD, Detroit, MI; Amit A. Patel, MD, Newark, NJ; Vivek V. Kanumuri, BS, Newark, NJ; Soly Baredes, MD*, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss patient demographics, incidence, and survival for patients with laryngeal chondrosarcoma.

Objectives: Laryngeal chondrosarcoma (LC) is a rare entity, reportedly comprising less than 1% of all laryngeal tumors. Consequently, the incidence and survival for patients with this slow growing tumor are unknown. Our objective was to evaluate incidence, organized by patient demographics, as well as long term survival trends using a population based database. **Study Design:** Retrospective analysis of the United States National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) registry. **Methods:** The SEER database was searched for patients diagnosed with LC between 1973 and 2010. Data analyzed included patient demographics, incidence, and survival. **Results:** One hundred and twenty cases were identified, representing 1.9% of all laryngeal tumors. Median age at diagnosis was 62.5 years. Men and women constituted 71.2% and 28.8% of cases respectively. Whites comprised 95.8% of the cases. The 5 year and 10 year disease specific survival (DSS) for LC was 91.9% and 87.4%, compared to a 48.7% and 40.1% for patients with all other laryngeal tumors (p -values < 0.001). Relative survival (the ratio between observed survival rate and the expected age adjusted survival rate) was 95.4% at 1 year, 91.0% at 5 years, and 90.8% at 10 years. **Conclusions:** Laryngeal chondrosarcoma occurs infrequently, but has a strong predilection for white males. Prognosis for LC is significantly better than for other laryngeal malignancies.

8:54 - 9:00 Q&A

9:00 - 10:00 MICROLARYNGOSCOPY, DIFFICULT EXPOSURES, DIFFICULT AIRWAYS

Moderator: Michael S. Benninger, MD FACS*, Cleveland, OH

Panelists: C. Gaelyn Garrett, MD*, Nashville, TN
Michael M. Johns III, MD*, Atlanta, GA
Clark A. Rosen, MD FACS*, Pittsburgh, PA
C. Blake Simpson, MD*, San Antonio, TX

CONCURRENT SESSION VI - PLASTICS/RECONSTRUCTIVE SURGERY AMERICANA 2

Moderator: Brian J.F. Wong, MD PhD*, Irvine, CA

8:00 Announcements by Vice Presidents

8:05 **Computational Fluid Dynamics Analysis of an External Nasal Midvault Dilator**
Jennifer A. Villwock, MD, Syracuse, NY; Robert M. Kellman, MD*, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the importance and potential clinical relevance of computational fluid dynamics as a nasal airflow analytic tool. They will also be familiar with how an external nasal midvault dilator impacts the nasal airway.

Objectives: Nasal airway obstruction (NAO) is a common and challenging clinical entity. There is a paucity of objective data correlating anatomy with subjective measures of NAO. Computational fluid dynamics (CFD) has recently emerged as a powerful modality for evaluating the nasal airway. The objective of this study was to evaluate the impact of an external nasal midvault dilator (ENMD) on the nasal airway of cadaver specimens using CFD. **Study Design:** Fresh, unembalmed cadaveric heads underwent computational tomography scanning before and after application of the ENMD. **Methods:** Using a proprietary MATLAB program, the DICOM images were processed and imported into Mimics 15.01. 3 dimensional geometries were then imported into ICEM CFD and subsequently analyzed by ANSYS FLUENT 14. Parameters investigated included nasal symmetry and balance magnitude, airflow streamlines and velocity, resistance to airflow, and pressure. **Results:** The average improvement of pressure balance between the nasal cavities was 31.98%. Average decrease in airflow resistance with ENMD was 48.5%. When analyzing airflow streamlines, the asymmetry between nasal passages was corrected and the flow, in terms of velocity, was more uniform. Additionally, there was a more uniform pressure drop as air moves from the nasal vestibule to the nasopharynx and the sudden pressure drop seen pre-ENMD is eliminated. Application of the ENMD resulted in marked improvement of all parameters investigated. **Conclusions:** CFD is a powerful tool for analyzing the nasal airway. Our CFD analysis shows that ENMDs correct multiple factors that may contribute to NAO. The potential applications of CFD modeling are numerous. Further investigations on the impact of nasal manipulations, and clinical correlation, is needed.

8:12 **Nasal Surgery and the Laryngeal Mask Airway versus Endotracheal Tube Intubation: A 7 Year Single Institution Case Control Study**
Benjamin P. Caughlin, MD, Chicago, IL; Bharat B. Bhushan, PhD, Chicago, IL; John P. Maddolozzo, MD*, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the safety concerns and clinical applications of using the laryngeal mask airway versus endotracheal tube intubation for closed reduction nasal fracture and other endonasal procedures.

Objectives: Our hypothesis is that the risks of using LMA anesthesia and awakening the patient in the deep state outweigh the benefits. **Study Design:** A case control study in which all cases of closed reduction nasal fracture at a single institution by a single surgeon were examined. **Methods:** Those intubated with an endotracheal tube were compared to those that were anesthetized using a laryngeal mask airway (LMA). **Results:** Fifty patients that met the inclusion criteria. The average blood loss was 6.9 mL for the LMA group and 6.1 mL for the ETT group. The average postoperative VAS pain score was 0.47 for the LMA group and 0.56 for the ETT group. Two of the LMA group 2/16 (12.5%) had aspiration compared to 0/34 of the ETT group. A total of 24 patients had cough noted, 9/16 (56%) of the ETT group and 15/34 (44%) of the LMA group. Ten patients had stridor noted, 5/16 (31%) of ETT and 5/34 (15%) of the LMA group. Bleeding was noted in 28 patients postoperatively, 9/16 (56%) of ETT group and 19/34 (56%) of LMA group. The average hospital stay was 312.4m for ETT group and 252.6m for LMA group. The overall average operating room duration was 32.7m for the ETT group and 29.9m for the LMA group. The average length of time from cut to close was 9.2m for ETT group and 8.5m for the LMA group. The average nonoperative OR time was 22m for ETT group and 20.8 m for LMA group. **Conclusions:** We propose that there is more risk of aspiration with the use of LMA during closed reduction nasal fracture. In light of this data we propose that the triad of nasal surgery, laryngeal mask airway and deep extubation can lead to postoperative aspiration with respiratory compromise and the risks outweigh the benefits.

8:19 **In Depth Analysis of pH Dependent Mechanisms of Electromechanical Reshaping of Rabbit Nasal Septal Cartilage**
Edward C. Wu, MD, Los Angeles, CA; Ashley A. Hamamoto, BS, Irvine, CA; Cyrus T. Manuel, BS, Irvine, CA; Dmitriy E. Protsenko, PhD, Irvine, CA; Michael G. Hill, PhD, Los Angeles, 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 importance of local pH changes in electromechanical cartilage reshaping and how they relate to safe and effective clinical use.

Objectives: Electromechanical reshaping (EMR) involves reshaping cartilage tissue by mechanical deformation and delivering electric

current to the area around the bend axis, causing local stress relaxation and permanent shape change. The mechanism of EMR is currently unclear, though preliminary studies suggest that voltage and application time are directly related to the concentration and diffusion of acid base products within the treated tissue with little heat generation. The objectives of this study are to qualify local tissue pH changes following EMR and to demonstrate that local tissue pH changes are correlated with tissue damage and shape change. **Study Design:** Ex vivo animal study involving EMR of rabbit nasal septal cartilage and biochemical estimation of tissue pH changes. **Methods:** The magnitude and diffusion of acid base chemical products in control (0V, 2 minutes), shape change (4V, 4 minutes; 6V, 1, 2, 4 minutes; 8V, 1, 2 minutes), and tissue damage (8V, 4, 5 minutes; 10V, 4, 5 minutes) parameters following EMR are approximated by analyzing local pH changes after pH indicator application. **Results:** There is a direct relationship between total charge transfer and extent of acid base product diffusion ($p < 0.05$). A "pH transition zone" is seen surrounding the bend apex above 8V, 2 minutes. Colorimetric analysis suggests that small local pH changes (10^{-8} hydrogen ions) are at least partly implicated in clinically efficacious EMR. **Conclusions:** These results provide additional insight into the translational applications of EMR, particularly the relationship among pH changes, shape change, and tissue injury, and are integral in optimizing this promising technology for clinical use.

8:26 Evaluation of a Surgically Based Septal Deformity Scoring System (SDSS) Using Computed Tomography and Virtual Endoscopy

Jonathan K. Lin, BS, Irvine, CA; Veronika Volgger, MD, Irvine, CA; Kanwar S. Kelley, MD JD, Irvine, CA; Naveen D. Bhandarkar, MD, 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 use of this scoring system for documenting septal deformities, guiding surgery, and grading pre/postoperative outcomes.

Objectives: To create a comprehensive scoring system for documenting septal deformities and evaluate its inter-rater reliability. **Study Design:** Retrospective chart review study. **Methods:** The SDSS was generated using a modified Delphi approach incorporating expert opinions from 20 academic and clinical faculty at our institution. 11 features were identified and graded using Likert scales. Virtual endoscopy and multiplanar coregistered analysis (OsiriX software) was performed on 20 randomly selected facial CT images. Surgically relevant features included caudal deviations, C and S shaped dorsi, convexity/concavity of Little's area, fractures, spurs, valve narrowing, perpendicular plate-vomer junction deformity, and middle turbinate visualization. Scores from multiple raters examining the CT data set were compared using the kappa, interclass correlation, Cronbach's alpha, and overall agreement statistics to measure inter-rater reliability and agreement. **Results:** Moderate to good inter-rater reliability was found using the SDSS (Light's kappa = 0.41, 73.5% agreement) between three independent raters who each analyzed 20 CT studies using virtual endoscopy. Scores ranged from 0-2 for seven of the eight criteria with a score of 2 indicating severe deformation. 425 out of 456 ratings (93.2%) were within one point. Interclass correlation (ICC) and Cronbach's alpha (CA) were calculated. (ICC = 0.66, 95% CI: 0.55-0.74, CA = 0.66). **Conclusions:** The inter-rater reliability of this septal deformity scoring system was determined. The system is potentially valuable for surgical planning and provides a record that can be readily interpreted among different surgeons. Further, a validated scoring system can be critical for improved documentation regarding the severity of septal deviation in a given patient.

8:33 Concomitant Neck Lift Surgery with Robotic Facelift Thyroidectomy

Thomas H. Moulthrop, MD, New Orleans, LA; Salah Eldin H. Mohamed, MD, Staten Island, NY; Emad A. Kandil, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the safety and feasibility of robotic facelift thyroidectomy.

Objectives: New approaches for robotic assisted thyroidectomy were recently described. We have modified the established surgical approach for retroauricular robotic thyroidectomy adding a concomitant neck lift operation. We are reporting our initial experience to identify challenges and limitations of this new surgical approach. **Study Design:** Prospective study. **Methods:** This is a prospective study and was done under IRB approval for patients who underwent retroauricular robotic hemithyroidectomy at an academic North American institution. Clinical characteristics, total operative time, blood loss, surgical outcomes and length of hospital stay were evaluated. **Results:** Twelve female patients were included in this study. Mean age was 45 ± 4.43 years and mean body mass index was 28.6 ± 2.15 . Mean thyroid nodule size was 1.15 ± 0.26 cm. All cases were completed successfully via single retroauricular incision. There was no conversion to an open approach. Four out of 12 patients underwent additional neck lift surgery with a mean total operative time of 156 ± 15.88 . The eight cases who underwent retroauricular robotic assisted hemithyroidectomy without neck lift surgery have a mean total operative time of 145.4 ± 10.08 minutes. There were no cases of permanent vocal cord paralysis or permanent hypoparathyroidism. Mean blood loss was 22.4 ± 4.32 mL. Four patients left the hospital on the same day of surgery and rest were discharged after overnight stay. **Conclusions:** Single incision retroauricular robotic hemithyroidectomy can be a safe and feasible alternative to other remote access techniques. Neck lift surgery can be performed in a select group of patients. However, future studies are warranted to further evaluate the benefits and limitations of this novel approach.

8:40 What Are Your Patients Saying about You? Trends of Online Ratings for Otolaryngologists

Lindsay Beth Sobin, MD, Syracuse, NY; Parul Goyal, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should understand the presence and importance of the physician's online reputation.

Objectives: Many websites have allowed patients to complete rating scales and enter comments regarding their physicians. The goal of this study was to assess the distribution of ratings and comments for academic otolaryngology physicians practicing in the states encompassed by the Eastern Section of the Triological Society. **Study Design:** Case series. **Methods:** Faculty lists for academic programs in the northeastern United States were compiled. Each faculty's name was searched using the Google search engine to link to profiles on Healthgrades and Vitals. State, program, academic position, years in practice, subspecialty, rankings, and reviews were recorded. Ratings were compared using ANOVA. **Results:** 281 faculty from 25 programs were identified. 87% had a profile on one of the websites. Of those with profiles, 82% and 70% had patient reviews on Vitals and Healthgrades, respectively. The mean score was 4.4/5.0 on Healthgrades and 3.4/4.0 on Vitals. 72% of profiles contained comments and 27% were negative. 49% of physicians had at least one negative comment. Academic rank ($p = 0.0001$) and subspecialty ($p = 0.01$) impacted reviews on Healthgrades' academic program ($p = 0.005$) impacted reviews on vitals. State and years in practice did not influence reviews. **Conclusions:** The overwhelming majority of patients use online resources for healthcare information with greater than 100 million visits to physician rating websites per year. Physician perceptions of these sites tend to be negative. Most otolaryngologists had favorable ratings and comments. There were some differences based on academic rank and specialty. Awareness of the content and rating patterns may help physicians better manage their online reputation.

8:47 Squamous Cell Carcinoma of the Parotid Gland: A Population Based Analysis of 2,545 Cases

Michael J. Pfisterer, MD, Newark, NJ; Alejandro Vazquez, MD, Newark, NJ; Mohemmed N. Khan, MD, New York, NY; Soly Baredes, MD*, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the various demographic, clinicopathologic, and prognostic factors of parotid gland squamous cell carcinoma.

Objectives: Squamous cell carcinoma (SCC) of the parotid gland is an uncommon disease which generally affects older patients. In this study, we explore various aspects of this entity using a population based database. **Study Design:** Retrospective analysis. **Methods:** The Surveillance, Epidemiology, and End Results (SEER) registry was used to extract data on frequency, incidence and disease specific survival (DSS) from 1973-2009. Variables analyzed included age, gender, race, histologic grade, stage and treatment. Cox proportional hazards analysis was conducted. **Results:** 2,545 cases were identified. Parotid SCC was most common in males (79.8%), whites (92.9%), and patients aged ≥ 75 years (51.4%). Incidence increased slightly over the past three decades (annual percent change 1.90%, $P < 0.05$). Overall 5 year DSS was 54.4%. Statistically significant poor prognostic factors included: black race, age ≥ 75 years, tumor size >3 cm, and higher clinical stage at diagnosis. DSS was unaffected by the presence of neck metastases. Moreover, elective neck dissection (END) in patients staged N0 was associated with higher DSS (78.3% versus 51.1%, $p < 0.0001$). The omission of END in these patients was associated with a three fold greater hazard of death (hazard ratio 3.19, 95% confidence interval 2.01-5.19, $p < 0.0001$), regardless of whether or not radiation therapy was given. **Conclusions:** Parotid SCC is uncommon and data on which to base treatment decisions is limited. Our study profiles the demographic, clinicopathologic, incidence, and survival features of this entity. Perhaps most notably, our results support the practice of END of the N0 neck, an issue on which opinions have generally been divided.

8:54 - 9:00 Q&A

9:00 - 10:00 TECHNICAL PEARLS FOR PRIMARY FUNCTIONAL RHINOPLASTY

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

Finesse Management of the Inferior Turbinate

Alexander Guang-Yu Chiu, MD*, Tucson, AZ

Contemporary Septoplasty (not the SMR)

Scott J. Stephan, MD, Nashville, TN

Straightening the Twisted Dorsum

John Jared Christophel, MD, Charlottesville, VA

Correcting the Collapsed Dorsum

Edward H. Farrior, MD, Tampa, FL

Lateral Wall Collapse

Stephen S. Park, MD*, Charlottesville, VA

Q&A

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

CONCURRENT SESSIONS - RHINOLOGY and PEDIATRICS**CONCURRENT SESSION VII - RHINOLOGY
AMERICANA 1**

Moderators: Andrew N. Goldberg, MD MSCE FACS*, San Francisco, CA
Stilianos E. Kountakis, MD PhD FACS*, Augusta, GA

- 10:30** **Immunodeficiency Is Common in Patient's Refractory Chronic Rhinosinusitis**
Kara S. Davis, MD, Pittsburgh, PA; Shannon C. Fraser, MD, Pittsburgh, PA; Jorge I. Contreras, MD, Pittsburgh, PA;
Stella Lee, MD, Pittsburgh, PA; Berrylin J. Ferguson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, participants should understand the significance of appropriate immunologic evaluation in patients with RCRS.

Objectives: To assess the prevalence and clinical characteristics of undiagnosed immunodeficiency in patients with recurrent acute or refractory chronic rhinosinusitis (RCRS). **Study Design:** A retrospective review of prospectively collected data of immunologic and clinical findings in patients with RCRS referred to an academic rhinology clinic at a tertiary academic medical center. **Methods:** Patients with transplant, granulomatous disorders, cystic fibrosis, and previously diagnosed immunodeficiency were excluded; all other patients undergoing immunodeficiency testing were prospectively recorded and retrospectively reviewed for presence of t cell abnormalities, humoral immunodeficiencies, and associated clinical findings. **Results:** Immunodeficiency was present in 61 of 95 (64%) patients with RCRS. T cells were evaluated in 78 of 95 patients. In all patients with low CD4 (n=8) or low CD8 (n=8) there was an associated humoral immunodeficiency. 12 patients had an elevated CD4/CD8 ratio (11 with a humoral immunodeficiency). IgA deficiency was only seen in 1 patient. There were no differences in nasal polyps, eosinophilia, asthma, or elevated serum IgE in patients with or without immunodeficiency. IgG subclass deficiency was most frequent (48%), followed by deficiencies of more than one gamma globulin (32%), specific antibody deficiency (9.6%), and CVID (4.8%). 5 patients in our series were treated with IVIG. Patients treated with IVIG for CVID had resolution of RCRS. **Conclusions:** Immune dysfunction is common in patients with RCRS and should be pursued as part of management. In our patient population, a subset of these patients benefitted from immunoglobulin replacement therapy. These patients are immunocompromised and should be cultured and treated promptly.

- 10:37** **Predicting Post-Surgery Nasal Physiology with Computational Modeling**
Dennis Onyeka Frank-Ito, PhD, Durham, NC; Julia S. Kimbell, PhD, Chapel Hill, NC; Purushottam Laud, PhD,
Milwaukee, WI; Guilherme J.M. Garcia, PhD, Milwaukee, WI; John S. Rhee, MD*, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be aware of the potential utility of computational fluid dynamics (CFD) as a future presurgical planning tool.

Objectives: Failure rates for surgical treatment of nasal airway obstruction (NAO) ranging from 25-50% indicate that better diagnostic tools are needed to aid surgeons with surgical planning. This study evaluates whether computer models based on preoperative scans of NAO patients are predictive of postoperative nasal physiology as measured by CFD variables. **Study Design:** Comparison of computational simulations of nasal airflow after actual nasal surgery and retrospective virtual surgery. **Methods:** Three dimensional (3D) nasal models were reconstructed from computed tomographic scans of 10 NAO patients before and 5-8 months post-surgery. The preoperative models were modified digitally to represent the actual surgical procedures that each patient underwent. Computational meshes were generated from the 3D reconstructions and steady-state, laminar, inspiratory airflow was simulated in each mesh using the CFD software Fluent (ANSYS, Inc.) under physiologic, pressure driven conditions. CFD results (nasal resistance, unilateral airflow, and cross-sectional average pressure) of pre-, virtual and post-surgery models were compared. **Results:** Simulated nasal resistance and airflow were not statistically different at the 5% significance level in virtual surgery and post-surgery models on the predominately obstructed nasal cavity side. Furthermore, both virtual and post-surgery results were statistically different from pre-surgery results. Cross-sectional average pressure versus distance along the airway in the virtual surgery model closely tracked this variable in the post-surgery model for most individuals. **Conclusions:** This study suggests that computational models with modifications mimicking actual surgery and healing have the potential to predict postoperative CFD measured outcomes, despite variability due to translation of actual surgical steps to the computational models and unpredictable aspects of post-surgical healing.

- 10:44** **Do Endoscopic Findings Predict Symptoms of Sinusitis: The DIP Score and Sinonasal Symptoms**
Shethal Bearely, MD, San Francisco, CA; Steven D. Pletcher, MD, San Francisco, CA; Megan L. Durr, MD, San Francisco, CA; Andrew N. Goldberg, MD*, San Francisco, CA; Andrew H. Murr, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss current endoscopic scoring systems and compare it to a new endoscopic scoring system. They will then be able to explain the utility of this new grading system in predicting severity of symptoms in chronic sinusitis patients as measured by the SNOT20 score.

Objectives: To determine whether a novel endoscopic scoring system (the DIP score) can be used in chronic sinusitis patients to

predict severity of their symptoms as measured by the SNOT20 score. **Study Design:** Retrospective cohort study. **Methods:** Chronic sinusitis patients seen in an academic rhinology practice between 2010-2012 were examined. They were included if they had 2 or more nasal endoscopies and a completed SNOT20 form for those encounters. Encounters within 1 month postop were excluded. The nasal endoscopies were blinded and graded according to the novel DIP scoring method which assesses the amount of discharge, inflammation, and polyps/edema. **Results:** A linear mixed effects model was used to determine if the DIP score of the worse nasal cavity (MaxDIP) or the mean DIP score of the nasal cavities were predictive of SNOT20 scores. The MaxDIP score was positively correlated with the SNOT20 score ($r=0.037$, $p=.0015$). The MeanDIP score was also positively correlated with the SNOT20 score ($r=.040$, $p=.005$). **Conclusions:** The DIP score is a novel endoscopic scoring system that grades the amount of discharge, inflammation, and polyps/edema. It can be used to predict severity of symptoms as measured by the SNOT20 score in most chronic sinusitis patients.

10:51 **Effects of Smoking on Quality of Life following Sinus Surgery: The 10 Year Followup**
Lauren Crosby White, MD, Augusta, GA; Aasif A. Kazi, PharmD, Augusta, GA; David W. Jang, MD, Augusta, GA;
Stilianos E. Kountakis, MD PhD*, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss long term quality of life outcomes in smokers and nonsmokers with chronic rhinosinusitis.

Objectives: The purpose of this study is to investigate ten year postoperative quality of life outcomes in smokers and non-smokers with chronic rhinosinusitis. **Study Design:** Single institution prospective cohort study. **Methods:** 235 patients who were previously enrolled in a four year followup study were identified and contacted for telephone questionnaire. Rates of revision surgery, smoking status, and current SNOT-20 scores were obtained. Preoperative SNOT-20 scores were compared with those at 10 year followup. **Results:** 22.5% of patients enrolled in the initial 4 year study were contacted (53/235), including 43/185 non-smokers (23.2%) and 9/50 smokers (18%). The remainder of patients was lost to followup or declined participation. Demographic data including age, sex and race was analyzed and found to be similar between the two groups. Preoperative SNOT-20 scores were similar between non-smokers and smokers (28.9 versus 25.8, $p=0.89$). Long term SNOT-20 scores (ten years postoperatively) were also similar between non-smokers and smokers (31.5 vs. 28.2, $p=0.629$). **Conclusions:** Long term quality of life measures between smokers and non-smokers are similar following functional endoscopic sinus surgery ten years later. This study demonstrates that while smoking would appear to provoke additional insult to the sinonasal mucosa of patients who have undergone functional endoscopic sinus surgery, the smoker maintains a similar quality of life to a non-smoker even ten years postoperatively.

10:58 **Standardizing Allergy Practices through Development of a Central Resource Website in an Academic Otolaryngic Allergy Practice**
Benjamin L. Hodnett, MD PhD, Pittsburgh, PA; Berrylin J. Ferguson, MD*, Pittsburgh, PA; Stella Lee, MD,
Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to assess and incorporate departmental websites to standardize patient resources, data entry and access, and reporting and review of adverse events.

Objectives: A quality improvement assessment of our academic otolaryngic allergy practice was initiated. Five major areas for quality improvement were identified: standardization of training and assessment; elimination of mixing errors; review of current practices and modification of existing practices to adhere to standards; improve data entry, access, and relevance; reporting and review of adverse events. A new central resource website focusing on patient resources, data entry and access, sharing of information related to allergy practice standards and modifications, and reporting of adverse events was implemented. **Study Design:** Survey and website development. **Methods:** An initial survey was performed on six affiliated allergy practices. Action items were reviewed in various categories to identify areas for quality improvement. A website was developed in conjunction with our physician services division and beta tested with an attending physician, resident, and allergy technician. **Results:** Patient and allergy practice resources for both allergy technicians and physicians have been centralized on the website. Material for ongoing research projects, database entry, and reporting of adverse events have been incorporated. Database entry was also planned into the development of the website to allow for centralized reporting of adverse events. **Conclusions:** A systematic review of an academic otolaryngic practice was conducted to identify areas for quality improvement. A review of current practices and modification of existing practices to adhere to standards was incorporated into patient and allergy practice resources managed through a central website. These initiatives were designed to improve safety and quality care in the delivery of allergy treatment.

11:05 **Inferior Meatus Endoscopy with Directed Treatment for Epiphora: Long Term followup and Development of a Treatment Paradigm**
Pedram P. Daraei, BS, Atlanta, GA; John M. DelGaudio, MD*, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss a treatment paradigm for patients who present with epiphora and to explain the role of inferior meatus endoscopy with directed treatment in the management of nasolacrimal duct obstruction.

Objectives: Epiphora is a common symptom resulting from pathology anywhere along the nasolacrimal system. Inferior meatus (IM) surgery has been shown to have a 93% short term success rate in treating distal nasolacrimal duct obstruction. To date, no study has

addressed long term outcomes. We report on long term effectiveness of IM surgery for patients with epiphora and propose a management paradigm to improve outcomes. **Study Design:** Retrospective chart review with followup telephone survey to measure outcomes. **Methods:** Chart review of patients seen by the senior author for epiphora from July 2006 to April 2013. Patients who had undergone IM surgery were contacted by phone to assess for residual symptoms. **Results:** Eighteen patients were contacted for followup; fourteen patients responded, representing 18 nasolacrimal systems. One patient (2 sides) was excluded due to surgical specimen showing leukemic infiltrates. Mean time of followup was 5.4 years. Ten sides had distal nasolacrimal duct obstruction, and eight sides had proximal nasolacrimal duct obstruction. Of the nasolacrimal systems with distal obstruction, nine had long term subjective improvement of symptoms (90.0%). Of the nasolacrimal systems with proximal obstruction, three had long term subjective improvement of symptoms (37.5%). No patient had nasal complications. **Conclusions:** Directed inferior meatus endoscopic surgery resulted in long term improvement of epiphora in 90% of nasolacrimal systems when performed for distal nasolacrimal duct obstruction. The success rate in cases of proximal nasolacrimal duct obstruction was low (37.5%), making these patients better candidates for primary dacryocystorhinostomy. A treatment paradigm based on inferior meatus endoscopy and irrigation will be presented.

11:12 Inferior Turbinate Submucosal Resection: Does the Addition of Bone Removal Improve Outcomes?
Lindsey K. Koester, BA, Syracuse, NY; Parul Goyal, MD MBA, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the different types of turbinate surgical procedures; 2) understand validated scales used to assess nasal obstruction symptoms; 3) compare outcomes between different types of inferior turbinate surgical procedures.

Objectives: Inferior turbinate reduction is a very commonly performed procedure for nasal obstruction. A variety of turbinate procedures have been advocated, including different forms of submucosal soft tissue and bone resection. This study assessed outcomes using the Nasal Obstruction Symptom Evaluation (NOSE) scale in patients undergoing two forms of inferior turbinate submucosal resection: soft tissue resection alone versus a combination of bone and soft tissue resection. **Study Design:** Retrospective review. **Methods:** Using the NOSE scale, quantitative symptom analysis was conducted for patients who underwent inferior turbinate surgery. T-tests were used to compare pre and postoperative scores. Outcomes were also compared between patients undergoing the different types of turbinate procedures. **Results:** A total of 74 patients were included in the study. In group 1, 48 patients underwent submucosal resection of inferior turbinate bone and soft tissue. In group 2, 24 patients underwent submucosal soft tissue resection alone. At a mean followup period of 3 months, there was a very significant reduction in NOSE scores in each group (decrease of 47.7 for group 1, $p < .0001$ and 34.6 for group 2, $p < .0001$). The percent improvement in NOSE scores was used to compare the degree of improvement between the two groups and was found to be significant (65.2% for group 1 and 40.5% for group 2, $p = .02$). **Conclusions:** Submucosal inferior turbinate resection is very effective in improving symptoms of nasal obstruction. Bone and soft tissue resection together provide significantly greater symptom relief than does soft tissue resection alone.

11:19 Validation and Limitation of Image Guided Robotic Surgery for the Skull Base
Phillip B. Whiting, MD, Norfolk, VA; Christopher P. Benson, BS, Norfolk, VA; Barry Strasnick, MD, Norfolk, VA;
Joseph K. Han, MD*, Norfolk, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) demonstrate that an electromagnetic image guidance system (EM IGS) is compatible with a da Vinci robotic system within the skull base; 2) discuss factors that may affect the accuracy of an EM IGS while using the da Vinci robotic system along the skull base; and 3) discuss the accuracy of the EM IGS for specific surgical landmarks within the skull base using the da Vinci robotic system.

Objectives: Determine if image guidance system (IGS) can be used with robotic surgical system (RSS) to accurately localize surgical skull base landmarks. Also determine the limitations for IGS and RSS, as a combination, for the use in locating specific skull base landmarks. **Study Design:** Cadaver model. **Methods:** Cadaver heads were prepared with reference screws placed into skull base bony landmarks. Using a customized IGS probe attached to the robotic arm of the RSS, accessibility of the RSS and IGS to skull base reference points was evaluated. Accuracy, defined as the distance between the anatomic reference screw and corresponding radiographic landmark, was collected and recorded. For each accuracy point, the registration error of the IGS probe was collected as well. The registration error was determined by the IGS. The correlation of the accuracy and registration error was analyzed. **Results:** 48 reference points were collected from the 7 cadavers. The RSS and IGS could not access all of the anterior and lateral skull base landmarks. Mean difference between the anatomic landmarks to corresponding radiographic landmarks (defined as accuracy) was 2.71mm (SD 0.84). The mean registration error for the IGS probe was 2.78 (SD 0.92). There was a negative relationship between accuracy and the registration error, but it did not reach statistical difference. **Conclusions:** The skull base is difficult to access currently with the IGS and RSS. The accuracy of the IGS and RSS is reliable and can be performed. With further research, the accuracy of the IGS and RSS can be improved.

11:26 - 11:30 Q&A

11:30 - 12:30 RHINOLOGY—MY WORST CASE EVER

Moderator: Andrew P. Lane, MD*, Baltimore, MD

Panelists: Roy R. Casiano, MD FACS*, Miami, FL

John M. DelGaudio, MD FACS*, Atlanta, GA

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

Saturday

- 12:30 **Adjourn Sessions**
- 12:45 - 2:15 **RESIDENT BOWL - Americana 2**
Moderators: David M. Barrs, MD*, Phoenix, AZ
Michael E. Hoffer, MD FACS*, San Diego, CA
Albert L. Merati, MD FACS*, Seattle, WA
- 12:45 - 2:45 **TRIO Thesis Seminar - Poinciana 2**
- 12:45 - 3:00 **Physician/Scientist Meeting - Poinciana 3**
- 1:00 **Afternoon Recreation/Golf Outing**
- 6:30 **MEET THE AUTHORS POSTER RECEPTION - Americana 3 & 4**

CONCURRENT SESSION VIII - PEDIATRICS AMERICANA 2

Moderators: Paolo Campisi, MD*, Toronto, ON
Scott C. Manning, MD FACS*, Seattle, WA

- 10:30 **Initial Experience with Transoral Robotic Assisted Laryngeal Cleft Repair—A Focus on Functional Swallowing Outcomes in the Postoperative Period**
Rachel L. Leonardis, BS, Pittsburgh, PA; Umamaheswar Duvvuri, MD PhD, Pittsburgh, PA; Deepak Mehta, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the currently expanding role of robotic assistance in transoral surgical approach, specifically with respect to incorporation in laryngeal cleft repair. Participants will also be able to understand operative technique as the authors plan to present a segment of video footage from a surgical case if accepted for podium presentation.

Objectives: To assess operative and postoperative course following transoral robotic assisted laryngeal cleft repair in the pediatric population, with specific attention to postoperative swallowing function. **Study Design:** Retrospective chart review at a tertiary academic children's hospital. **Methods:** All patients underwent transoral robotic assisted laryngeal cleft repair from March 2011 to June 2013. Demographics, robotic docking time, operative time, and postoperative course and swallowing function were collected and analyzed. **Results:** Five children, 3 male and 2 female, underwent successful transoral robotic assisted laryngeal cleft repair for type I laryngeal cleft. Mean age at time of surgery was 21.6 months (SD 6.1 months, range 15-29 months). From case 1 to case 5, robotic docking time (18 to 10 min), robotic operative time (102 to 36 min), and total operating room time (173 to 105 min) decreased. There were no complications, with time until extubation (range 2-3 days), length of ICU stay (range 3-4 days) and total hospital stay (range 3-5 days) within acceptable range following laryngeal cleft repair. Modified barium swallow (2 patients) or fiberoptic endoscopic evaluation of swallowing (3 patients) was performed postoperatively, with all patients showing complete resolution of penetration and aspiration. In addition, all patients experienced subjective resolution of dysphagia and/or choking with feeds postoperatively. **Conclusions:** Transoral robotic assisted laryngeal cleft repair offers significant advantages over traditional endoscopic approach. In our experience, the procedure was well tolerated and associated with definitive surgical cure in all patients. The scope of robotic technology continually expands and should be considered a feasible tool at an institution based level.

- 10:37 **Effect of Haemophilus Influenzae on Staphylococcus Aureus Tympanostomy Tube Attachment and Biofilm Formation**
Lara S. Esin, BS, Gainesville, FL; Patrick J. Antonelli, MD*, Gainesville, FL; Carolyn P. Ojano-Dirain, PhD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants will learn that live H. influenzae may promote S. aureus attachment on tympanostomy tubes and high dose ciprofloxacin, as found in otological therapy, may reduce subsequent S. aureus attachment and biofilm formation.

Objectives: Tympanostomy tube (TT) biofilm formation may lead to sequelae. The aim of this study was to determine if the acute pathogen, haemophilus influenza (HI), promotes TT attachment and biofilm formation by the chronic pathogen, staphylococcus aureus (SA). **Study Design:** Controlled, in vitro. **Methods:** Fluoroplastic TTs were exposed to plasma then HI for 7 days. TTs were gas sterilized or exposed for 24 hours to 0 (untreated), 10, or 3000µg/ml ciprofloxacin (cipro). A third of the TTs from each treatment group underwent HI counts or scanning electron microscopy (SEM). Another third was used for a 2 hour SA attachment assay. The remainder, as well as TTs not exposed to HI, were cultured with SA for 2 days then treated with oxacillin to kill planktonic SA. SA counts and SEM were performed. **Results:** HI counts were lower on TTs treated with 3 mg/ml than TTs with 10 µg/ml cipro (p= 0.0001). SA attachment was higher TTs with untreated prior HI biofilm (p=0.0001) while gas sterilized TTs was not different (p=0.69) compared to TTs without prior

HI. SA attachment was lower on TTs with prior HI treated with 10 or 3000 µg/ml cipro ($p=0.006$ & $p=0.0001$) compared no prior HI. SA biofilm formation was similar across groups, with the exception of HI TTs treated with 3 mg/ml cipro, which had significantly less ($p=0.0001$). **Conclusions:** Live HI may promote SA attachment on TTs. Treatment of HI on TTs with cipro 3 mg/mL, as found in otological therapy, may reduce subsequent SA attachment and biofilm formation.

10:44 Healthcare Costs of Acute and Chronic Tonsillitis in the Pediatric Population

Victor M. Duarte, MD, Los Angeles, CA; Caitlin L. McGrath, BS, Los Angeles, CA; Nina L. Shapiro, MD*, Los Angeles, CA; Neil Bhattacharyya, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand and discuss the prevalence and healthcare costs associated with the diagnosis and treatment of acute and chronic tonsillitis (ACT) in children.

Objectives: To determine the prevalence and healthcare costs associated with the diagnosis and treatment of acute and chronic tonsillitis (ACT) in children. **Study Design:** Cross-sectional analysis of a national healthcare cost database. **Methods:** Pediatric patients (age < 18 years) were examined from the 2006, 2008, and 2010 Medical Expenditure Panel Surveys. From the linked medical conditions file, cases with a diagnosis of ACT were extracted. Ambulatory visit rates, prescription refills, and ambulatory healthcare costs were then compared between children with and without a diagnosis of ACT, with multivariate adjustment for age, sex, ethnicity, region, insurance coverage and comorbid conditions (e.g., asthma and otitis media). **Results:** A total of 74.3 million children (mean age 8.55 years, 51% male) were sampled (raw N=100,057). Of these, 804,229 children (1.1 + 0.1%) were diagnosed with ACT annually (mean age 7.24 years, 49.1% male). Children with ACT incurred an additional 2.3 office visits and 2.1 prescription fills (both $p < 0.001$) annually compared with those without ACT, adjusting for demographic variables and medical comorbidities, but did not have an increase in emergency department visits ($p=0.123$). ACT was associated with an incremental increase in total healthcare expense of \$1,685 per child, annually ($p < 0.001$). **Conclusions:** The diagnosis of ACT confers a significant incremental healthcare utilization and healthcare cost burden on children, parents and the healthcare system. With its prevalence in the United States, pediatric tonsillitis accounts for approximately \$1.355 billion in incremental healthcare expense and is a significant healthcare utilization concern.

10:51 The Efficacy of Balloon Dilation in the Treatment of Subglottic Stenosis

John M. Carter, MD, New Orleans, LA; Natalie Kim, MS, New Orleans, LA; Christina J. Yang, MD, Cincinnati, OH; Douglas M. Hildrew, MD, New Orleans, LA; J. Lindhe Guarisco, MD FACS, New Orleans, LA

Educational Objective: At the conclusion of the presentation, the participants should be able to understand the efficacy of endoscopic balloon dilation, describe the factors associated with surgical success and failure, and be able to discuss the different applications of the procedure.

Objectives: To examine the efficacy of endoscopic balloon dilation in the treatment of subglottic stenosis in a pediatric population. **Study Design:** Retrospective chart review. **Methods:** A retrospective analysis was performed from January 2005 to June 2013. Outcome measures: need for tracheostomy after dilation, need for salvage open airway surgery and tracheostomy status. **Results:** 63 dilations were performed on 28 patients. 86% had an acquired stenosis and 14% were congenital. The mean starting Cotton-Meyer score was 2.85. The average number of dilations was 2.25. 29% of patients required an airway stent and 71% were treated with mitomycin. 43% had a tracheostomy preoperatively, 7% required tracheostomy at or after the time of initial dilation and 14% of patients had previous open airway surgery. 64% of patients were successfully decannulated. 82.1% of patients were treated successfully. When comparing successful vs. failed treatment groups: only the comorbidity of lung disease ($p=0.006$) was significantly associated with failure. All patients with greater than 18 months followup were decannulated. Reasons for failure: persistent stenosis, persistent granulation tissue after stent removal, and inadequate followup time (1 month). When focusing on only the 25 patients that underwent primary dilation: 73% were successful. The presence of a tracheostomy prior to starting dilations ($p=0.005$) was associated with a greater chance of failure and use of mitomycin ($p=0.03$) was significantly associated with success. When examining adjuvant dilations (subsequent to an open airway procedure) all 4 cases were successful. 3/4 patients had a tracheostomy preoperatively and all were decannulated. **Conclusions:** Balloon dilation is effective as a primary and adjunct treatment for pediatric subglottic stenosis. When performed as a primary procedure the use of adjuvant mitomycin appears to be associated with a greater chance of success and preoperative tracheostomy is associated with an increased chance of failure.

10:58 Transoral Robotic Surgery and the Pediatric Airway

Jay K. Ferrell, MD, Houston, TX; Soham Roy, MD, Houston, TX; Sancak Yuksel, MD, Houston, TX; Ron J. Karni, MD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential applications and benefits of transoral robotic surgery in the management of pediatric airway disease.

Objectives: To report preliminary experience in the utilization of transoral robotic surgical (TORS) techniques in pediatric airway surgery. **Study Design:** Case series study. **Methods:** A retrospective review was performed of all pediatric patients who underwent transoral robotic airway procedures between August 2010 and December 2012 at a university based children's hospital. **Results:** Case 1 is 15 year old boy with posterior glottic stenosis for which robotic assisted laryngotracheal reconstruction with posterior cartilage graft placement was attempted but ultimately required conversion to an open technique. Case 2 is a 6 year old male with Down syndrome who

had robotic assisted endoscopic repair of a type II laryngeal cleft with subsequent resolution of his chronic aspiration and successful initiation of oral feeding. Case 3 is a 3 year old female who underwent robotic assisted left posterior cordectomy and subtotal arytenoidectomy for idiopathic bilateral vocal cord paralysis resulting in improved tolerance of a PMV. **Conclusions:** Transoral robotic assisted surgical procedures are becoming increasingly utilized in the field of head and neck surgery. TORS procedures are often less invasive and frequently show improved outcomes compared with traditional approaches. This study presents our experience utilizing TORS in the management of pediatric airway anomalies and represents one of the earliest series of robotic surgery of the pediatric airway in the literature. Although TORS has the potential to improve the management of pediatric airway pathology, larger, prospective studies are needed to better elucidate its feasibility and efficacy.

11:05 The Association between Secondhand Smoke and Sleep Disordered Breathing in Children: A Systematic Review

Sebastian M. Jara, BS, Baltimore, MD; James R. Benke, BS, Baltimore, MD; Sandra Y. Lin, MD*, Baltimore, MD; Stacey L. Ishman, MD MPH, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the association between secondhand smoke (SHS) and sleep disordered breathing (SDB) in children based on comprehensive findings from the literature.

Objectives: To systematically review existing literature on the association between secondhand smoke (SHS) and sleep disordered breathing (SDB) in children. **Study Design:** Systematic review. **Methods:** A literature search was performed encompassing all indexed years in PubMed, Embase, Cochrane CENTRAL, Web of Science, and Scopus. Inclusion criteria included English language papers containing original human data, with ≥ 7 subjects, and age < 18 years old. Data was systematically collected on study design, patient demographics, clinical characteristics/outcomes, and level of evidence. Two investigators independently reviewed all manuscripts. **Results:** The initial search yielded 72 abstracts; 18 articles were ultimately included with a total study population of 47,462 patients. Fifteen (83%) articles found a statistically significant association between SHS and SDB. All were case control studies. Quality of articles based on the Newcastle-Ottawa scale averaged 5.8/9 stars. SHS was characterized by serum cotinine testing in only 2 (11%) studies. SDB was quantified by polysomnography in only 4 (22%) of the studies and only one (6%) classified subjects using polysomnography exclusively. Habitual snoring was the most common form of SDB studied in 14/18 (78%) while obstructive sleep apnea was reported in the other 4 (22%). **Conclusions:** Although the majority of studies included in this review found a significant association between SHS and SDB, all of them were evidence level 3b, for an overall grade of B (Oxford Evidence Based Medicine Center). Further higher quality studies should be performed in the future to better evaluate the relationship between SHS and SDB in children.

11:12 Prevalence of Severe Obstructive Sleep Apnea in Pediatric Adenotonsillectomy Patients

Nancy Jiang, MD, New York, NY; Charise N. Muhammad, PA-C, New York, NY; Yan W. Ho, MD, New York, NY; Anthony G. Del Signore, MD, New York, NY; Andrew G. Sikora, MD PhD, New York, NY; Benjamin D. Malkin, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should recognize that the prevalence of severe obstructive sleep apnea is high in pediatric patients undergoing adenotonsillectomy, including those who do not meet criteria for preoperative polysomnography according to the current American Academy of Otolaryngology—Head and Neck Surgery clinical practice guideline.

Objectives: The purpose of this study is to determine the prevalence of severe obstructive sleep apnea (OSA) in a pediatric population who underwent surgery for sleep disordered breathing (SDB). **Study Design:** Retrospective chart review. **Methods:** The charts of patients age 2 to 18 years who underwent tonsillectomy or adenotonsillectomy over a four year period were reviewed. Indications for preoperative polysomnography (PSG), PSG results and perioperative complications were recorded. **Results:** Two hundred and thirty-five patients were included in the final analysis, of whom 160 had preoperative PSG performed. The overall prevalence of severe OSA was 38%. The prevalence in patients for whom preoperative PSG was recommended to have been performed or for which it should have been advocated according to the American Academy of Otolaryngology—Head and Neck Surgery (AAO-HNS) clinical practice guideline was 45% and 40%, respectively, while the prevalence in patients with no indication for preoperative PSG was 34%. There was no significant difference between groups ($p = 0.3941$). The overall complication rate was 11%, with the rate being significantly different ($p = 0.0022$) between patients who did not have preoperative PSG performed (0%) and those who did (16%). **Conclusions:** The prevalence of severe OSA in this pediatric population was high. Specifically, a significant percentage of children who would not have gotten preoperative PSG under the AAO-HNS recommendations had severe OSA and were consequently admitted for overnight observation. This suggests that preoperative PSG should be obtained for all pediatric patients with sleep disordered breathing.

11:19 Pediatric Airway Evaluation, Indications, and Clinical Findings

Beth N, McNulty, MD, Louisville, KY; Elizabeth D. Cash, PhD, Louisville, KY; Swapna K. Chandran, MD, Louisville, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to compare airway fluoroscopy, flexible laryngoscopy, direct laryngoscopy/rigid bronchoscopy as diagnostic tools for pediatric airway evaluation. Secondly, participants should be able to determine in which children a more invasive evaluation is warranted.

Objectives: To evaluate airway fluoroscopy (AF), flexible laryngoscopy (FL), direct laryngoscopy/rigid bronchoscopy (DLB) as diagnostic tools for pediatric airway evaluation. Secondly, to determine in which children DLB is warranted. **Study Design:** Prospective, observational study. **Methods:** Patients \leq six years of age undergoing an initial airway evaluation with AF, FL, and/or DLB at our hospital's division of pediatric otolaryngology were eligible for inclusion. Demographics, indications, past medical history, preoperative diagnosis, respiratory status, imaging, postoperative diagnosis, and subsequent intervention were recorded. Pearson's χ^2 test was used to compare the lesser invasive modalities (AF/FL) versus the gold standard, DLB. **Results:** 32 children were included, with a mean age of 1.1 years, and a male to female ratio of 2:1.2. The patients were divided into AF/FL N=14, and DLB N=18 groups. There was no statistical difference of dependent variables between the two groups, other than postop diagnosis being above or below the glottis ($p = .043$). Noisy breathing was the most common indication for airway evaluation. Patients in the DLB group were less likely to have imaging in their workup ($p = .552$) but were more likely to require intervention ($p = .357$), most commonly balloon dilation and tonsillectomy/adenoidectomy. Noisy breathing was the indication most likely to require intervention. **Conclusions:** AF/FL are simple, dynamic modalities for airway evaluation. A larger sample size is needed to validate our findings and support our hypothesis that AF/FL can be valuable in patients in whom a more invasive procedure is not warranted.

11:26 - 11:30 Q&A

11:30 - 12:30 PEDIATRIC POTPOURRI: UPDATES AND INNOVATIONS

Moderator: Emily F. Boss, MD*, Baltimore, MD

Endoscopic Nasal and Skull Base Approaches

Soham Roy, MD FACS, Houston, TX

Robotic Surgery in Pediatric Otolaryngology

Carlton J. Zdanski, MD FAAP FACS, Chapel Hill, NC

Pediatric Thyroid Disease

Paul Krakovitz, MD, Cleveland, OH

Pediatric Voice and Airway

Paolo Campisi, MD*, Toronto, ON

Vascular Anomalies

Kristina W. Rosbe, MD FACS

12:30 *Adjourn Sessions*

12:45 - 2:15 RESIDENT BOWL - Americana 2

Moderators: David M. Barrs, MD*, Phoenix, AZ

Michael E. Hoffer, MD FACS*, San Diego, CA

Albert L. Merati, MD FACS*, Seattle, WA

12:45 - 2:45 TRIO Thesis Seminar - Poinciana 2

12:45 - 3:00 Physician/Scientist Meeting - Poinciana 3

1:00 Afternoon Recreation/Golf Outing

6:30 MEET THE AUTHORS POSTER RECEPTION - Americana 3 & 4

SUNDAY, JANUARY 12, 2014

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

AMERICANA 1 & 2

8:00 Announcements by Vice Presidents

8:05 - 8:45 **CONTROVERSIES IN OTOLARYNGOLOGY**
Moderator: Douglas A. Girod, MD FACS*, Kansas City, KS
Central Neck Dissection for Thyroid Cancer - Is It Indicated?
Con Bruce H. Haughey, MBChB FACS*, St. Louis, MO
Pro David L. Steward, MD FACS*, Cincinnati, OH
Acoustic Neuroma Treatment - Surgery vs Radiation Therapy
Radiation Hinrich Staecker, MD PhD, Kansas City, KS
Surgery Fred F. Telischi, MD FACS*, Miami, FL

8:45 - 9:30 **IF I COULD DO IT ALL OVER AGAIN - WHAT I HAVE LEARNED FROM MY OPPORTUNITIES AND OBSTACLES**
Moderator: Marvin P. Fried, MD FACS*, Bronx, NY
Panelists: Jesus E. Medina, MD FACS*, Oklahoma City, OK
Clarence T. Sasaki, MD FACS*, New Haven, CT
Marshall Strome, MD*, Scottsdale, AZ
Randal S. Weber, MD FACS*, Houston, TX

9:30 - 10:30 **WAKE UP! FACING THE NEW CHALLENGES IN OTOLARYNGOLOGY PRACTICE**
Moderator: Sujana S. Chandrasekhar, MD*, New York, NY
Panelists:
Patient Satisfaction: Navigating the Maze Successfully
Rahul K. Shah, MD FACS*, Washington, DC
ICD-10 Conversion Made as Painless as Possible
Richard W. Waguespack, MD FACS*, Birmingham, AL
ACOs - How to Determine if They Are Right for You
Richard W. Waguespack, MD FACS*, Birmingham, AL
Making a Physician Extender Work for You
Wendy Stern, MD, North Dartmouth, MA
CME on Steroids: Maintenance of Certification
Sonya Malekzadeh, MD FACS, Washington, DC

10:30 *Break with Exhibitors/Poster Viewing*

10:45 - Noon **NECESSARY CHANGES: PROFESSIONALISM, PEER SUPPORT, AND POCKETBOOK**
Moderators: Jo Shapiro, MD, Boston, MA
Jesus E. Medina, MD FACS*, Oklahoma City, OK
Panelists:
Pocketbook/Payment Reform: Ethical Challenges with One Foot in Each Canoe
Michael G. Stewart, MD MPH FACS*, New York, NY
Professionalism: How Are We Holding Each Other and Ourselves Accountable?
Jo Shapiro, MD, Boston, MA
Peer Support: The Statistics on Physician Un-wellness (Burnout, Depression, Suicide) and What Are We Doing to Ameliorate?
Marion E. Couch, MD PhD MBA FACS, Burlington, VT

Noon Introduction of Vice Presidents-Elect by Section Vice Presidents
Adjourn

Allergy/Rhinology, Laryngology/Bronchoesophagology, Sleep Medicine

S1. Ecthyma Gangrenosum of the Sinonasal Tract Mimicking Acute Invasive Rhinosinusitis in an Immunocompromised Patient

Eric T. Carniol, MD, Newark, NJ; Alejandro Vazquez, MD, Newark, NJ; Sami J. Harawi, MD, Hackensack, NJ; Jean Anderson Eloy, MD, Newark, NJ; Brian E. Benson, MD, Hackensack, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the clinical, radiographic and histologic features of sinonasal ecthyma gangrenosum and understand its role in the differential diagnosis of necrotizing sinonasal infections of the immunocompromised host.

Objectives: Ecthyma gangrenosum is an uncommon cutaneous necrotizing infection classically associated with pseudomonas aeruginosa bacteremia. Only one case of sinonasal ecthyma gangrenosum has been reported to date. Here, we present a second case of sinonasal ecthyma gangrenosum with unique, previously unreported features. **Study Design:** Case report. **Methods:** Retrospective review of clinical case. **Results:** A 35 year old immunocompromised woman was evaluated for acute onset fever, left sided facial pain and swelling, without visual changes or facial dysesthesia. Three months earlier, she had undergone peripheral blood stem cell transplantation for the treatment of acute lymphoblastic leukemia; she had been receiving tacrolimus and prednisone since. High resolution computed tomography revealed opacification of the left maxillary and ethmoid sinuses, dehiscence of the posterior maxillary sinus wall, and widening of the maxillary sinus antrum; no intraorbital abnormalities were noted. Diagnostic nasal endoscopy revealed an eschar within the middle meatus, adjacent to an enlarged antrum. Biopsy showed no fungal elements. Due to concern for acute invasive fungal rhinosinusitis, the patient underwent sinonasal debridement via a combined endoscopic endonasal and endoscopic assisted Caldwell-Luc approach. Abundant necrotic tissue was encountered, necessitating a left inferior turbinectomy, extended maxillary antrostomy and anterior ethmoidectomy. Ischemic mucosa within the maxillary was debrided until bleeding margins were achieved. Histopathologic analysis again showed no fungal elements. Multi-drug resistant pseudomonas aeruginosa was isolated from tissue cultures. The patient showed significant clinical improvement following debridement and therapy with intravenous tobramycin and cefepime. **Conclusions:** A diagnosis of sinonasal ecthyma gangrenosum should be considered in an immunocompromised patient with an acute necrotizing rhinosinusitis in whom biopsies fail to show fungal elements.

S2. Calcium Hydroxylapatite Injection Laryngoplasty Outcomes in Irradiated and Non-irradiated Unilateral Vocal Fold Paralysis Patients

Joseph Chang, BS, San Francisco, CA; Katherine C. Yung, MD, San Francisco, CA (Presenter); Sarah L. Schneider, CCC-SLP, San Francisco, CA; Soha A. Al-jurf, CCC-SLP, San Francisco, CA; Mark S. Courey, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare calcium hydroxylapatite injection laryngoplasty outcomes in irradiated and non-irradiated unilateral vocal fold paralysis patients.

Objectives: To evaluate the effect of radiation therapy on the voice outcome and duration of effect of calcium hydroxylapatite (CaHA) injection laryngoplasty in UVFP patients. **Study Design:** Retrospective case series. **Methods:** UVFP patients treated with CaHA injection laryngoplasty at 'Institution X' were identified. Demographic information, history of irradiation to the larynx, and time to additional medialization procedures were obtained. Examinations at presentation and followup of irradiated patients and non-irradiated patients were analyzed for stroboscopic parameters and CAPE-V scores. **Results:** 4 non-irradiated and 5 irradiated patients underwent a total of 6 and 9 injection laryngoplasties, respectively. Time to additional procedures was longer in irradiated patients (p = 0.02). Prior to injection, non-irradiated patients had more severe glottic insufficiency (p=0.007, 0.002) than the irradiated patients. Post-injection, the irradiated patients demonstrated improvement in overall voice quality, breathiness, and loudness, while the non-irradiated patients demonstrated improved overall quality, breathiness, roughness, pitch, and loudness. Irradiated patients had no improvement in roughness, strain, or pitch with the injection medialization. **Conclusions:** CaHA injection laryngoplasty improved voice quality in both irradiated and non-irradiated patients. Non-irradiated patients experience greater vocal improvement following injection laryngoplasty compared to irradiated patients. Vocal cord stiffness due to radiation induced changes may be responsible for the lack of improvement in roughness, strain and pitch. Time to additional procedures was longer in irradiated patients and may be secondary to effects of prior radiation on graft resorption.

S3. Respiratory Epithelial Adenomatoid Hamartomas: Rare Benign Neoplasm Mimicking Nasal Polyposis

Adrienne L. Childers, MD, Richmond, VA; Eric N. Appelbaum, MD, Richmond, VA; Chow N. Woon, MD, Richmond, VA; Celeste N. Powers, MD PhD, Richmond, VA; Evan R. Reiter, MD FACS, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to review the epidemiology, evaluation, and treatment of respiratory epithelial adenomatoid hamartoma (REAH) of the nasal cavity, a benign neoplasm that may mimic nasal polyposis.

Objectives: To present a case and review the epidemiology, evaluation, and treatment of respiratory epithelial adenomatoid hamartoma (REAH) of the nasal cavity, a benign neoplasm that may mimic nasal polyposis. **Study Design:** Case report. **Methods:** Literature review. **Results:** A 69 year old female with history of adenocarcinoma of lung and cutaneous melanoma of right cheek

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presented for routine surveillance with complaint of persistent postnasal drip. She had remote history of two previous nasal polypectomies. Nasal endoscopy revealed smooth gray/white polypoid lesions in the upper nasal vaults bilaterally, while the middle meati were clear. Sinus CT showed soft tissue thickening of the nasal septum and anterior nasal cavity only. The patient underwent bilateral nasal endoscopy with polypectomy. Operative findings included bilateral non-obstructing polypoid masses arising medial to the middle turbinates within the superior nasal vault bilaterally. Final pathology revealed REAH. REAH is a benign entity that was first described in 1995 by Wenig and Heffner. This benign neoplasm results from abnormal proliferation of glandular tissue lined by pseudostratified ciliated respiratory epithelium. Etiology is unknown and presentation is often confused with chronic sinusitis. Curative treatment is surgical excision with low rate of recurrence. **Conclusions:** REAH is a rare entity often found incidentally on pathologic review of specimen. REAH is difficult to diagnose as symptoms are often indistinguishable from chronic sinusitis with nasal polyposis. These lesions can also be misinterpreted as other disease processes on pathology. Treatment of REAH is surgical excision, which is curative in most cases.

S4. The Endoscopic Suture Retriever as an Alternative Technique for Endolaryngeal Keel Placement in the Treatment of Anterior Glottic Webs

Amelia K. Clark, MD, Stanford, CA; Jennifer L. Bergeron, MD, Stanford, CA; Chih K. Sung, MD, Stanford, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the alternative methods for endo-extralaryngeal needle passing for laryngeal keel placement.

Objectives: Endoscopic placement of a laryngeal keel has traditionally required the use of a Lichtenberger endo-extralaryngeal needle passer which is not universally available in the operating room. We discuss a safe and technically simple alternative technique using an endoscopic suture retriever through a percutaneously placed angiocatheter. **Study Design:** Case report. **Methods:** An assistant passes two 14 gauge angiocatheters through the anterior neck under telescopic visualization of the larynx. The suture retriever is inserted through the distal angiocatheter and deployed open within the larynx. The 0 proline is threaded through the loop of the suture retriever, which then grasps the suture and is used to pull it out through the hollow angiocatheter and outside to the neck. **Results:** We have performed this procedure on two patients with excellent outcomes in both cases. **Conclusions:** Endoscopic keel placement is a widely used procedure for the treatment of anterior glottic webs and requires suture passage from within the larynx to the anterior neck in order to secure the keel into position. This is the first report of an endo-extralaryngeal suture retriever for placement of a laryngeal keel. This technique provides a safe, reliable, and efficient alternative to endo-extralaryngeal needle puncture and uses materials that are readily available in many practices.

S5. Fibrotic Unresectable Clival Spindle Cell Oncocytoma and Endoscopic Endonasal Surgical Management with Ultrasonic Bone Curette

Lauren W. Fedore, 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 rare disease spindle cell oncocytoma of adenohypophysis and utility of ultrasonic bone curette for its management.

Objectives: Spindle cell oncocytoma is an exceptionally rare disease that often requires multiple surgeries, usually with a transcranial approach. This tumor is known to be extremely fibrotic and difficult to resect with conventional instrumentation. Endoscopic techniques and novel ultrasonic bone curettes can be utilized to aid in a complete resection. **Study Design:** Retrospective analysis of a hospital chart. **Methods:** Case history of a patient with spindle cell oncocytoma of adenohypophysis. The novelty of this report is both the endoscopic management techniques and the ultrasonic curette, which are firsts for this rare and difficult tumor. **Results:** A 55 year old female, initially with bitemporal hemianopia, underwent two incomplete resections of a sellar and suprasellar spindle cell oncocytoma through translabial, transeptal approach and pterional craniotomy. After these two surgeries at an outside institution, serial MRIs demonstrated less than 5% of the tumor had been resected. The surgeon reported this tumor was so fibrotic it was unresectable. At our institution, the ultrasonic bone curette was employed to dissect out the fibrous tumor through endonasal endoscopic approach. An upper two-third transclival approach was performed and a gross total resection was achieved to the posterior fossa dura; a total resection was then confirmed by the postoperative MRI. Postoperatively, the patient was treated with 50.4 Gy radiotherapy. 30 months after surgery she remains free of tumor by MRI surveillance. The patient's endonasal exam shows a completely healed transclival defect and she is without sinonasal complaints. **Conclusions:** The direct nature of the endonasal approach and the newer ultrasonic bone curette can be utilized for resection of refractory spindle cell oncocytoma of adenohypophysis and clivus. This has ability to achieve a complete resection without the potential morbidity of a traditional craniotomy.

S6. Central Disease Is the Nidus of Recurrence in Patients with Samter's Triad

Michelle D. Fisher, MD, Augusta, GA; Jose G. Gurrola II, MD, Augusta, GA; David W. Jang, MD, Durham, NC; Stilianos E. Kountakis, MD PhD*, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate that disease in Samter's triad patients is more likely to recur centrally as compared to patients with polyps who are not aspirin sensitive.

Objectives: To demonstrate that disease is more likely to recur between the middle turbinate and septum after endoscopic sinus surgery in patients with Samter's triad (asthma, nasal polyps, aspirin sensitivity) when compared to patients with eosinophilic chronic rhinosi-

nusitis with nasal polyposis (eCRSwP) without aspirin sensitivity. **Study Design:** Analysis of prospectively collected data from a single institution. **Methods:** Twenty-nine patients with Samter's triad who underwent revision surgery were identified from a prospectively collected patient database from 2003-2013. Pre-revision surgery CT scans were compared to those of 30 consecutive patients with eCRSwP that underwent revision surgery who were not aspirin sensitive (control). The presence of recurrent disease between the middle turbinate and the septum on one or both sides of the nasal cavity was considered a positive finding. Statistical analysis was performed using the chi-squared test to examine the difference between the two groups. **Results:** Of the twenty-nine patients with Samter's triad, twenty-one (72%) had evidence of central recurrence of disease on CT whereas the control group showed recurrent central disease in two of the thirty scans reviewed (72% vs 6.7%, $p=0.0000002$). **Conclusions:** While lateral polyp recurrence occurs in both patient populations, the propensity for centralized recurrence is seen more often in the Samter's population. This could be due to a number of different factors. Contributing factors such as differences in central versus middle meatus mucosal inflammation and decreased efficacy of post-surgical central mucosa medication delivery warrant further exploration in this patient population.

S7. An Easy to Construct Training Simulator for Open and Endoscopic Laryngeal Surgery

Allen I. Foulad, MD, Irvine, CA; Peggy Y. Bui, BA, Irvine, CA; Brian J.F. Wong, MD PhD*, Irvine, CA; Seth H. Dailey, MD*, Madison, WI; Sunil P. Verma, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to construct and operate a low cost, user friendly laryngeal surgery training simulator.

Objectives: To describe a practical laryngeal surgery training simulator (LSTS) that is simple to construct, economical, and user friendly. The simulator apparatus is used in conjunction with a cadaveric larynx to practice open and endoscopic laryngeal surgeries. **Study Design:** Prototype design. **Methods:** The LSTS was designed using widely accessible parts such that it can be easily constructed using basic tools. The model was developed to minimize cost, while utilizing durable and hygienic materials. A cadaveric porcine larynx was used to demonstrate the feasibility of the simulator for both open and endoscopic surgery. **Results:** Using the design model, a medical student with no machine shop experience was able to construct the LSTS for under \$100. All required parts were accessible from online retail vendors, as well as from local hardware stores. The versatility of this simple to use device enables participants to practice a wide range of laryngeal surgeries, including thyroplasty, arytenoid adduction, laser surgery, neurotoxin injection, and vocal fold augmentation. **Conclusions:** The proposed LSTS is an inexpensive and easy to construct apparatus for practicing numerous types of laryngology procedures.

S8. Right Recurrent Laryngeal Nerve Mobilization for Primary Anastomosis following Segmental Resection

Edmund A. Pribitkin, MD*, Philadelphia, PA; Monica DiLorenzo, MD, Philadelphia, PA; David M. Cognetti, MD, Philadelphia, PA; Joseph Spiegel, MD*, Philadelphia, PA; Serge Jabbour, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to mobilize right recurrent laryngeal nerve to affect primary anastomosis following segmental resection.

Objectives: Describe technique of right recurrent laryngeal nerve mobilization and primary re-anastomosis. **Study Design:** Case report and review of literature. **Methods:** Following segmental resection of the right recurrent laryngeal nerve due to invasion by papillary thyroid cancer, the nerve is mobilized from underneath the right subclavian artery and tunneled under the artery to increase the length available for tension free anastomosis, which is then accomplished through standard microsurgical technique. **Results:** Successful restoration of tone and progressive partial restoration of vocal fold mobility on videostroboscopy is demonstrated at 3, 6, 12 and 18 months following surgery. **Conclusions:** Successful transposition of the right recurrent laryngeal nerve from its course around the subclavian artery to achieve primary anastomosis following segmental resection of the RLN can be accomplished with good voice outcomes. This technique avoids the need for a nerve interposition graft and provides an alternate method for reinnervation when the ipsilateral ansa cervicalis nerve is unavailable due to involvement by cancer or sacrifice during neck dissection.

S9. Snoring Relief following Septal and Turbinate Surgery

Behzad Salari, MD, Boston, MA; Javad S. Toutounchi, MD, Tabriz, Iran; Sepideh Ataeyeh, MD, Tabriz, Iran; Neghisa S. Toutounchi, MD, Tabriz, Iran; Sogol H. Biroon, DDS, Tabriz, Iran

Educational Objective: At the conclusion of this presentation, the participants should be able to know about the efficacy of three different nasal surgical procedures to relieve snoring.

Objectives: Nasal obstruction is commonly associated with snoring and daytime sleepiness. The present study aimed to evaluate the efficacy of three different nasal surgical procedures to relieve snoring. **Study Design:** Cohort study. **Methods:** Eighty-three consecutive patients were enrolled. Septoplasty was performed on 50 patients, septorhinoplasty on 21 patients and concurrent septoplasty and turbinate reduction on 12 patients. The patients were evaluated at baseline and 3 months after nasal surgery. **Results:** The mean age of the patients was 25.04 ± 7.31 years. Sixty-one patients were male and 22 were female. All the patients had septal deviations, 23 patients had septal dislocations, and 36 had turbinate hypertrophies. Overall, snoring of 48 patients relieved 3 months following nasal surgery. This included 31 (62%) patients with septoplasty, 11 (52%) patients with septorhinoplasty and all 12 (100%) patients with concurrent septoplasty and turbinate reduction. Concurrent septoplasty and turbinate reduction was superior to either septoplasty or septorhinoplasty to relieve snoring ($P=0.007$ and $P=0.004$, respectively). There was no statistically significant difference between septoplasty

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and septorhinoplasty (P=0.31) in relieving snoring. **Conclusions:** Compared to septoplasty or septorhinoplasty alone, concurrent septoplasty and turbinate reduction was the most effective procedure to relieve snoring in patients with nasal obstruction.

S10. Impact of Patient Related Factors on the Outcomes of Office Based Injection Laryngoplasty

Maya G. Sardesai, MD MEd, Seattle, WA; Albert L. Merati, MD*, Seattle, WA; Amanda Hu, MD, Philadelphia, PA; Hakan Birkent, MD, Ankara, Anatolia Turkey

Educational Objective: At the conclusion of this presentation, the participants should be able to describe how age, gender, and initial disease severity affected outcome in a prospective clinical study of percutaneous injection laryngoplasty.

Objectives: In-office percutaneous injection laryngoplasty (IL) is a common treatment for glottal insufficiency. The objective of this prospective study was to determine if voice outcomes from IL are affected by age, gender, or initial disease severity. **Study Design:** Prospective case series. **Methods:** Consecutive adult patients undergoing awake injection laryngoplasty were recruited. VHI-30, CAPE-V, and GRBAS were evaluated prior to and 2 months post-injection. **Results:** Thirty-five subjects were enrolled and 26 (15 male, 11 female; mean age 61.6±13.2 years) had complete data. No impact was seen between age or gender and outcomes from IL (p=0.16, p=0.76 respectively). Patients with poorer initial QOL scores tended to have more significant improvement (p=0.002), which may represent a ceiling effect. **Conclusions:** In this small prospective clinical study, age and gender did not affect outcome in IL. Patients with more severe deficits appeared to have greater improvement.

S11. Tracheobronchopathia Osteochondroplastica: A Case Report

John Caleb Simmons, MD, Houston, TX; Donald T. Donovan, MD*, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the pathology and physiology of this tracheal disease. They should be able to explain how this disease is best diagnosed.

Objectives: To examine findings in an index case of tracheobronchopathia osteochondroplastica causing cough and dyspnea on exertion. To review the literature regarding diagnosis, pathological etiology, and treatment of the condition. **Study Design:** At a tertiary referral center, this is a case report of one patient with clinical nonproductive cough and dyspnea on exertion. CT chest was performed as part of workup for possible TB, and multiple small nodules within the trachea were demonstrated, measuring 2-5mm. These were first diagnosed clinically as papilloma though pathologic diagnosis had never been obtained. Patient is a nonsmoker and had no sign of papilloma in the nasopharynx or hypopharynx. **Methods:** Preoperative imaging was reviewed. Direct laryngoscopy and bronchoscopy were then undertaken with biopsy of tracheal lesions. **Results:** In the distal portion of the upper third of the trachea to the distal third of the trachea, multiple submucosal thick, calcified appearing nodules were seen on the anterior and lateral tracheal walls. Mucosa was smooth. Biopsy was obtained with optical forceps. There was no disease demonstrated at carina or mainstem bronchi. Pathologic analysis demonstrated mucosa with mild polypoid change and disorganized cartilaginous tissue with degeneration, consistent with tracheobronchopathia osteochondroplastica. **Conclusions:** This case demonstrates interesting features of this rare tracheal process and is in agreement with previous studies showing a similar presentation and pattern of diagnosis. CT imaging findings and pathology findings as well as a review of the criteria for diagnosis are reviewed as well.

S12. Tension Pneumocephalus in a Patient with Obstructive Sleep Apnea and Morbid Obesity

Joshua Tokita, MD, Iowa City, IA; Rick F. Nelson, MD PhD, Iowa City, IA; Marlan R. Hansen, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) appreciate tension pneumocephalus as a complication of CPAP use following skull base surgery or trauma; 2) recognize pertinent history and physical exam findings in a patient presenting with pneumocephalus; and 3) discuss potential mechanisms for CPAP induced pneumocephalus.

Objectives: Tension pneumocephalus (TP) is a rare complication of chronic ear disease. TP has also rarely been reported in patients using CPAP following skull base surgery or trauma. Here we present a case of spontaneous TP associated with obesity, obstructive sleep apnea (OSA), and continuous positive airway pressure (CPAP) use. The objectives of this study are 1) to recognize the history and physical exam findings of a patient presenting with pneumocephalus; and 2) discuss potential mechanisms for CPAP induced pneumocephalus. **Study Design:** Retrospective chart review and literature search. **Methods:** Retrospective review of medical records of a patient with TP treated at a tertiary care hospital in 2012. The literature was reviewed using PubMed and relevant articles are discussed. **Results:** A 61 year old morbidly obese woman with a history of OSA, CPAP use, and chronic otorrhea presented with two weeks of worsening left sided headache, neck pain and photophobia. CT and MR examination revealed a large, 3.6cm x 2.4cm, intraparenchymal pneumocephalus in her left temporal lobe. CT also demonstrated a left tegmen tympani defect. The tegmen defect was repaired via a middle fossa craniotomy during which an encephalocele was removed from the mastoid and middle ear. Postoperative recovery was without complications. CT on postoperative day two showed reduction in the size of the pneumocephalus. CT on six week follow up demonstrated complete resolution of the pneumocephalus. **Conclusions:** Non-traumatic TP is rare and signs and symptoms can mimic those of meningitis. It is important to consider pneumocephalus in the differential in patients with meningismus and longstanding obesity and OSA.

S13. Modified Expansion Sphincter Pharyngoplasty for Treatment of Children with Obstructive Sleep Apnea
Seckin O. Ulualp, MD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the benefits of modified expansion sphincter pharyngoplasty in the treatment of children with obstructive sleep apnea.

Objectives: Lateral pharyngeal muscle wall collapse has been suggested in the pathogenesis of obstructive sleep apnea (OSA). A variety of procedures is used to prevent lateral pharyngeal wall collapse in adults with OSA. Aim of the present study was to describe a modified expansion sphincter pharyngoplasty (ESP) addressing lateral pharyngeal muscle wall collapse in the treatment of children with OSA. **Study Design:** Retrospective case series. **Methods:** The medical charts of children who underwent modified ESP for OSA were reviewed to obtain information on history and physical examination, past medical history, polysomnogram findings, drug induced sleep endoscopy findings and surgical management. Number of obstructive apnea, obstructive hypopnea, and obstructive apnea hypopnea index were evaluated before and after surgery. **Results:** Sixteen children (age range: 2 to 17 years, mean: 8.5+4.6) with OSA documented by polysomnogram were identified. Tonsil size was grade II in 7 children, grade III in 8 and grade IV in 1. Adenoid size was grade I in 4 children, grade II in 3, grade III in 8 and grade IV in one. Postoperative number of obstructive apnea (mean: 70.5+114.7) and obstructive hypopnea (112.6+70.3) events were less than the preoperative number of obstructive apnea (1.5+3.2) and obstructive hypopnea (15.2+23.4) events ($p<0.001$). Obstructive apnea hypopnea index after surgery (2.4+3.8) was less than obstructive apnea hypopnea index before surgery (51.1+36.8) ($p<0.001$). **Conclusions:** Modified expansion sphincter pharyngoplasty for children with OSA provided objective clinical improvement and might serve as an effective alternative to commonly employed surgical techniques in the treatment of pediatric OSA.

S14. Mucosal Sparing Septectomy for Endoscopic Endonasal Approach to the Craniocervical Junction
Alejandro Vazquez, MD, Newark, NJ; Eric T. Carniol, MD, Newark, NJ; Kiren P. Sahni, DO, Newark, NJ; Mohemmed N. Khan, MD, New York, NY; James K. Liu, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the steps in an endoscopic endonasal transclival/transodontoid approach to the craniocervical junction which spares the mucosa of the nasal septum.

Objectives: Recent technological advances and developments in surgical technique have made the craniocervical junction (CCJ) accessible through the transnasal surgical corridor. Endoscopic endonasal transclival and transodontoid approaches have been described in the literature; traditionally, both approaches entail a posterior bony and mucosal septectomy. Here, we present a new variation which preserves the mucosal integrity of the posterior nasal septum. **Study Design:** Case report. **Methods:** Retrospective review of clinical case with discussion of surgical technique. **Results:** A 61 year old woman with a history of rheumatoid arthritis presented with acute onset loss of consciousness and unresponsiveness. Four years earlier, she had undergone posterior spinal fusion for the treatment of a rheumatic pannus that was causing spinal cord compression at the CCJ. Neuroimaging demonstrated nonunion of the posterior hardware and a recurrent pannus compressing the brainstem and spinal cord at the CCJ. An endoscopic endonasal transclival/transodontoid decompression of the CCJ was performed with resection of the pannus. A mucosal sparing bony septectomy was performed by raising bilateral nasoseptal flaps which were tucked beneath their respective middle turbinates for protection. After the odontoidectomy, in the absence of an intraoperative CSF leak, the nasoseptal flaps were returned to their native positions and reapproximated with absorbable suture. **Conclusions:** This mucosal sparing variation on the traditional transclival and transodontoid approaches allows for the preservation of posterior mucosal nasoseptal integrity and salvages a reconstructive option for future usage. This is accomplished at no expense to visualization or surgical access.

Clinical Fundamentals, General, Facial Plastic & Reconstructive

S15. The Noble Laureates Who Contributed to Otolaryngology
P. Ryan M. Camilon, BA, Charleston, SC; Shaun A. Nguyen, MD MA CPI, Charleston, SC; Eric J. Lentsch, MD PhD, Charleston, SC; Ted A. Meyer, MD PhD, Charleston, SC; Paul R. Lambert, MD*, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the discoveries and advancements of Nobel laureates Emil Theodor Kocher, Robert Barany, and Georg von Bekesy and their effect on the field of otolaryngology.

Objectives: To highlight the contributions of Emil Theodor Kocher, Róbert Bárány, and Georg von Békésy to the field of otolaryngology. **Study Design:** Historical review. **Methods:** Literature search using the PubMed database supplemented by material obtained from various external sources. **Results:** As Professor of Surgery at the University of Bern, Kocher's research focused on the thyroid gland. He became the first to excise the thyroid for goiter in 1876. In 1909, Kocher received the Nobel Prize for his advancements in thyroid pathology, physiology and surgery. In addition, his implementation of antiseptic wound treatment significantly decreased operative mortality. Bárány was an Austro-Hungarian otologist who explored the functions of the vestibular apparatus. He is credited with multiple discoveries, most notably, the caloric reaction. Further work addressed vestibular posturing during equilibrium and the physiology of nystagmus. In 1914, he was awarded the Nobel Prize while a prisoner of war in Russia. Békésy, a Hungarian biophysicist, is credited with laying the foundation for cochlear mechanics. He sought to develop mechanical models that could reproduce the functions of the cochlea. In 1961, Bekesy was awarded the Nobel Prize in recognition of his research on the inner ear including his critical discovery

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of the cochlear traveling wave. **Conclusions:** The developments of Kocher, Bárány, and Békésy have greatly influenced our field. As not only discoveries in otology, but also those in general surgery and biophysics have had implications on otolaryngology, we are reminded of the truly, intellectually vast nature of this specialty.

S16. 4D CT Scan in Patients with Parathyroid Disease: A New Paradigm

C. Ron Cannon, MD*, Flowood, MS; Robert W. Wineman, MD, Jackson, MS; Ralph H. Didlake, MD, Jackson, MS; Ben W. Seale, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of 4D CT scan in patients with parathyroid disease in whom the sestamibi scan or ultrasound does not localize the tumor.

Objectives: Evaluate the efficacy of 4D CT scan in identifying the location of parathyroid adenoma in patients with non-diagnostic sestamibi scan or ultrasound exam. **Study Design:** Retrospective review of sestamibi scan, ultrasound, and 4D CT scan in patients with parathyroid adenoma. **Methods:** In patients in whom the initial sestamibi and/or ultrasound was negative the patients underwent 4D CT scanning to localize the site of pathology. A comparison of non-localizing sestamibi/ultrasound to 4D CT scan and pathologic findings in patients with parathyroid adenoma was made. Evaluation of efficacy of 4D CT scan was compared to traditional use of sestamibi scan and neck ultrasound. **Results:** In 12 patients with pathology proven adenoma the 4D CT scan was diagnostic in 10 patients, including 3 patients with bilateral adenomas. The sensitivity rate was 93%. **Conclusions:** In patients with negative or equivocal sestamibi/ultrasound imaging results the 4D CT scan is valuable in identifying the site of parathyroid adenoma. This modality is emerging as the primary screening modality in patients with parathyroid adenoma.

S17. Management of Anterior Table Obliteration and Sino-Cutaneous Fistulas after Failed Frontal Sinus Obliteration

Sergio S. Cervantes, MD, Phoenix, AZ; Matt Mors, BS, Phoenix, AZ; Richard E. Hayden, MD*, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss treatment options of failed frontal sinus obliterations and consider free flap reconstruction for frontal sinus obliteration and cosmetic reconstruction.

Objectives: The authors aim to discuss frontal sinus obliteration (FSO) and demonstrate a challenging case of FSO failure which resulted in complete erosion of the anterior table and subsequent sino-cutaneous fistulas. **Study Design:** Case report. **Methods:** We report and review the literature regarding a patient who failed FSO leading to the abovementioned complications. **Results:** A 61 year old male presented with a two year history of mucous drainage from two sino-cutaneous fistulas. Ten years previously the patient had undergone frontal sinus obliteration with hydroxyapatite. Radiologic imaging demonstrated the anterior table to be completely absent. The patient was taken for a revision frontal sinus obliteration. After removing the hydroxyapatite and sinus mucosa, the resulting defect was large because of the frontal table absence. We reconstructed the defect with an anterior-lateral thigh flap which resulted in excellent obliteration, adequate bulk, and nice cosmesis. **Conclusions:** Failure after FSO presents a challenging problem. Obliteration failure can occur deceptively late, thus related symptoms should prompt suspicion for failure. Although many cases can be managed endoscopically, sinuses obliterated with hydroxyapatite require an open approach to remove all of the infected material. Healthy vascularized tissue is an excellent material to obliterate the failed, infected sinus wound.

S18. When Things Go Wrong: Anesthesia Medication Errors in Otolaryngology Surgeries

Sujana Sree Devi Chandrasekhar, MD*, New York, NY; Emma E. Simon, New Haven, CT (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the clinical presentation of common medication swap errors by anesthesiologists during induction of surgery, discuss institutional remedies to minimize these errors, and explain how the practicing otolaryngologist can learn how to diagnose this error in a timely fashion.

Objectives: To describe a medication administration error during anesthesia induction for a routine otological surgery. Otolaryngology accounts for 450,000 inpatient and 4 million outpatient surgeries per year. The incidence of anesthesia medication errors is .85%, which translates to a potential 38,000 ENT cases per year. **Study Design:** Case report with extensive literature review. University hospital tertiary referral center. **Methods:** A healthy woman presented for external auditory canalplasty. During induction, she had tonic-clonic movements of her limbs and was nonresponsive for 2 minutes. The case was cancelled and she underwent an extensive seizure workup. It was eventually determined that she had been given succinylcholine instead of fentanyl. Color coded labeling of syringes may have prevented the error. Immediate distinction of symptoms between medication error and seizure disorder would have identified the problem in the OR and the procedure may have proceeded without incident. Instead, this patient did not have her surgery, but had a sizeable seizure workup. **Results:** Medication error during anesthesia is a problem. 85% of anesthesiologists surveyed report at least one medication error or "near miss". Syringe swaps (70.4%) and label misidentification (46.8%) were common. In a study of 2000 such events, fentanyl-succinylcholine swaps were the most common. **Conclusions:** To err is indeed human, but institution of easily used color coded labels may have prevented this problem. With a potential for 38,000 patients affected during ENT surgery annually, otolaryngologist familiarity with the presentation of awake succinylcholine administration is beneficial and in this case may have enabled surgery to proceed, saving the patient and family anxiety and potential expense.

S19. Sinonasal Malignancies: Site Specific Incidence and Survival in 12,582 Patients

Pariket M. Dubal, BA, Newark, NJ; Saurin Sanghvi, MD, Newark, NJ; Milap D. Raikundalia, BS, Newark, NJ; Soly Baredes, MD*, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to compare incidence, survival, and treatment options based on histology and anatomical site for malignancies throughout the sinonasal tract.

Objectives: Sinonasal malignancies vary in behavior according to histology and anatomical location. Incidence, survival, and optimal treatment for sinonasal tumors are thus uncertain in various cases. Our objective was to utilize a national population based registry to identify the most common sinonasal histopathologies by anatomical site, and subsequently analyze the data by incidence trends, survival rates, patient demographics and treatment modalities. **Study Design:** Retrospective analysis of the United States National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) registry. **Methods:** The SEER database was examined for patients diagnosed with sinonasal malignancies between 1973 and 2010. Data was stratified according to anatomical site, incidence, survival, histology, staging, and patient demographics. Therapy based outcomes were analyzed for cases from 1983 to 2010. **Results:** A total of 12,582 patients were identified, with an incidence of 0.84 per 100,000 people. Males comprised 58.5% of cases. Whites represented 81.5% of cases, while blacks comprised 8.7%. Squamous cell carcinoma was the most common histology (41.9%) across all sites of the sinonasal tract. The most common anatomical site of malignancy was the nasal cavity (45.5%) and the least common was the frontal sinus (1.2%). Furthermore, for single sites, 5 year disease specific survival (DSS) was highest for nasal cavity tumors (72.0%) and lowest for maxillary sinus malignancies (47.3%). Overlapping lesions had a 5 year DSS of 43.5%. The overall 5 year DSS for all sinonasal malignancies was 59.2%. **Conclusions:** Sinonasal malignancies are rare entities with poor overall prognosis. By anatomical site, prognosis is best for nasal cavity cancers and worst for overlapping lesions.

S20. Kimura Disease of the Parotid Gland Masquerading as a Venolymphatic Malformation

Daniel L. Faden, MD, San Francisco, CA; Annemieke VanZante, MD PhD, San Francisco, CA; Christine M. Glastonbury, MD, San Francisco, CA; Jolie Lien Chang, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation, imaging characteristics, differential diagnosis, workup and treatment options for Kimura disease.

Objectives: Kimura disease is an extremely rare, chronic inflammatory disorder, that most commonly presents as painless lymphadenopathy or masses in the head or neck. The disease occurs most frequently in young Asian males. The etiology is unknown. 20 percent of patients develop kidney disease. Current literature supports treatment of the primary lesion as a means to achieve remission of the nephritic disease. The rarity of the disease often leads to misdiagnosis. Imaging characteristics can be easily confused with more common lesions such as venolymphatic malformations. We describe the presentation and diagnosis of a case of Kimura disease in a patient with nephrotic syndrome, previously misdiagnosed and managed, as a venolymphatic malformation. **Study Design:** Case report. **Methods:** Physical exam findings, clinical photographs, pathology slides, radiographic imaging, and management of this unique entity are described. Additionally a review of the existing literature is provided. **Results:** A 32 year old male was referred to a multidisciplinary vascular anomalies clinic for management of a longstanding venolymphatic malformation. Due to selective imaging characteristics inconsistent with venolymphatic malformation, a biopsy of the lesion was recommended which revealed findings suggestive of Kimura Disease. Blood IgE testing confirmed the diagnosis. **Conclusions:** Kimura disease is an extremely rare chronic inflammatory disorder which occurs most commonly in the head and neck. Because of its rarity, the diagnosis is often missed; however, treatment may offer significant benefit to those who suffer from nephrotic disease. An understanding of the common presentation, physical exam and imaging characteristics are necessary to make a timely and accurate diagnosis.

S21. Management of Airway Compromise following Thyroid Cyst Hemorrhage after Thrombolytic Therapy

Sara C. Gallant, BA, New York, NY; Mark A. Fritz, MD, New York, NY (Presenter); Benjamin C. Paul, 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) describe the pathophysiology and presentation of thyroid cyst hemorrhage; and 2) navigate the management of a critical airway in the setting of acute thyroid cyst hemorrhage.

Objectives: Case report presentation with discussion of management of acute thyroid cyst hemorrhage resulting in airway compromise following thrombolytic therapy. **Study Design:** Case report and review of the literature. **Methods:** We present a case of a sixty-two year old female with an undiagnosed thyroid goiter who received tissue plasminogen activator (tPA) for an acute ischemic stroke and developed acute airway compromise. Unable to ventilate and unable to intubate, a surgical airway was called. An incision into the mass led to a massive release of colloid and blood, which decompressed the airway. The patient was then ventilated and intubated. Hemithyroidectomy to remove the mass was delayed for three days after this incident to normalize her coagulopathy after tPA administration. **Results:** The risk of hemorrhage after therapeutic administration of tPA is well known and cases of post-administration hemorrhage have been reported within many organ systems. This case is the first report of acute airway obstruction due to intrathyroidal hemorrhage after tPA administration. It underscores the need for extremely thorough physical exam prior to administering thrombolytic agents as well as vigilant monitoring of the patient's vital signs and clinical condition not only during but especially after administration. **Conclusions:** The management of the acute airway in the setting of a rapidly expanding neck after anticoagulation therapy should alarm the

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surgical airway team to the possibility of intrathyroidal or thyroid cyst hemorrhage. This rare presentation may complicate surgical entrance to the airway however opens a second avenue for surgical intervention through cyst decompression.

S22. Informed Consent When Prescribing Medication - A Randomized Controlled Trial

Jordan T. Glicksman, MD MPH, London, ON Canada; Brian W. Rotenberg, MD MPH, London, ON Canada; Irvine Sherman, LLB, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation the participants should be able to 1) discuss short term patient recall of medication risks that are described to them during the informed consent process; 2) better understand the issues regarding informed consent and patient recall, and how they are often at odds; and 3) appreciate the effectiveness of patient handouts used to improve the informed consent process for prescription medications.

Objectives: To determine patient recall of specific risks associated with medication prescription and whether or not handouts are an effective tool to augment the medication consent process. **Study Design:** Double blinded randomized controlled trial. **Methods:** Informed consent for prednisone prescription was studied comparing the effect of a verbal discussion (describing 10 specific adverse drug reactions) in conjunction with a handout going over the same, to that of discussion alone. Blinded assessments occurred by telephone interview 2-4 weeks following the intervention. Outcomes assessed were the number of risks of prednisone that patients could list and the number of risks they recalled having discussed with their physician. Other demographic details were also collected. **Results:** Twenty-five participants were randomly allocated to each group. Without prompting, the median number of risks spontaneously recalled by the handout group was not significantly different than the control group, and both groups had very low recall (2 vs. 1, $p=0.24$). When provided a list of potential side effects, it was observed that the handout group recalled a significantly higher median number of risks having been discussed with their physician compared to patients in the control group (8 vs. 5, $p=0.003$). The groups' demographics were otherwise identical. **Conclusions:** Patients in general did not remember discussing adverse prednisone risks with their physician even a short time after the discussion took place. While the patient handout resulted in improved recall of risks following the prescription of prednisone, its importance in the informed medication consent process remains an open question.

S23. Submandibular Venous Malformation Phleboliths Mimicking Submandibular Gland Sialoliths

Zhen Gooi, MBBS, Baltimore, MD; David E. Tunkel, MD*, Baltimore, MD; David W. Eisele, MD*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the importance of history, clinical examination and critical review of imaging studies to accurately distinguish salivary gland sialoliths from other clinical conditions that can mimic this disorder. Participants should acquire an appreciation of the salient presenting symptoms of salivary duct obstruction due to sialolithiasis and to demonstrate an understanding of known imaging features of arteriovenous malformations of the head and neck region.

Objectives: To demonstrate the importance of history and clinical examination as well as critical review of imaging studies to accurately distinguish salivary gland sialoliths from other clinical conditions that can mimic this disorder. **Study Design:** Case series and literature review. **Methods:** History and physical examination of two patients, in addition to review of imaging studies. **Results:** The first patient was a 14 year old girl who had presented to us with the diagnosis of submandibular gland sialolithiasis from an outside institution. She was initially evaluated for an asymptomatic right submandibular enlargement in 2009. Workup had included an ultrasound, CT and MRI, all of which had been interpreted as sialolithiasis of the right submandibular gland. History and physical examination, however, were inconsistent with submandibular duct obstruction. The imaging studies were interpreted as a venous malformation with numerous phleboliths adjacent to the submandibular gland. The second patient was a 8 year old girl who underwent an excisional biopsy for an asymptomatic left submandibular mass in 2009 which was interpreted by pathology as a fibrotic nodule consistent with sialolith. Subsequently the submandibular mass recurred. An MRI was performed that showed a venous malformation with phleboliths adjacent to the submandibular gland. **Conclusions:** The presence of calcified structures in the submandibular gland region should not necessarily imply the diagnosis of sialoliths. Rather, as demonstrated by these cases, other diagnoses including venous malformation with phleboliths should be considered on the basis of careful history and clinical examination and critical review of imaging studies.

S24. Comparison of Ultrasound Guided Fine Needle Aspiration (USFNA) Skills Acquisition Using Various Entry Approaches

Michael S. Harris, MD, Indianapolis, IN; Joel Franco, BS, Indianapolis, IN; William A. Berry, MD, Indianapolis, IN; Darrell D. Davidson, MD PhD, Indianapolis, IN; Bruce H. Matt, MD*, Indianapolis, IN; Mimi S. Kokoska, MD MHCM, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) appreciate the technical applications of two commonly used needle entry approaches in the performance of ultrasound guided fine needle aspiration (USFNA) biopsy in the workup of cervical lymphadenopathy; 2) employ the herein described novel USFNA model for training of novice USFNA practitioners.

Objectives: Determine which of two commonly employed USFNA approaches, the longitudinal or the transverse approach, 1) is more comfortable for users, 2) results in the shortest time-to-target per visual confirmation, and 3) results in the highest cytologically confirmed number of target hits and highest diagnostic yield. **Study Design:** A prospective trial was performed using a newly developed USFNA model, which allows for quantification of each successful needle aspirate. **Methods:** Main outcome measures: 1) validated participant comfort with technique questionnaire; 2) visual confirmation of target entry by US expert; 3) blinded cytologic confirmation of target

tissue in sample and quantification of diagnostic yield by counting the number of target cells per high power field. **Results:** The longitudinal approach proved significantly more comfortable for study participants according to questionnaire data ($p < .008$); per visual confirmation the bevel condition proved superior ($p < .031$); however, per cytologic confirmation data there was no difference among the different techniques examined ($p < .655$). **Conclusions:** It may be valuable for practitioner to become facile with all of these techniques rather than focusing on one; depending on the clinical application, both of the approaches studied here may have an advantage.

S25. Intractable Epistaxis Associated with Systemic Lupus Erythematosus: High Dose Intravenous Pulse Steroid Therapy

Douglas M. Hildrew, MD, New Orleans, LA; Emily A. Waselchuk, BS, New Orleans, LA; Ryan D. Winters, MD, New Orleans, LA; Michael S. Ellis, MD FACS, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the traditional treatment algorithm for the control of epistaxis; 2) appreciate that systemic lupus erythematosus potentiates intractable epistaxis through vasculitis; and 3) accept high dose intravenous pulse steroid therapy as a possible adjunct in the traditional treatment algorithm for patients with SLE.

Objectives: The objective of this case report is to describe a novel therapy for the treatment of intractable and refractory epistaxis in a subset of patients with poorly controlled systemic lupus erythematosus. Clinical presentation, employed treatments/interventions, and a discussion of the limited relevant literature are presented. **Study Design:** Case report and review of the literature. **Methods:** A patient's case was reviewed. A Medline search was performed using the terms: epistaxis AND steroid AND systemic lupus erythematosus. **Results:** This case report describes the hospital course of a patient with severe SLE and intractable epistaxis. We discuss classic management options for epistaxis and offer a novel treatment option for patients with SLE related vasculitides—goal directed medical therapy with high dose intravenous pulse steroid therapy. **Conclusions:** To our knowledge, this report is not only the first description of targeted treatment options for intractable epistaxis in patients with SLE, but serves to augment the traditional algorithm with the addition of a goal directed medical therapy—control of vasculitis through high dose intravenous pulse steroid therapy. We demonstrated that six milligrams of intravenous dexamethasone given every six hours can be highly effective in controlling epistaxis in patient with uncontrolled SLE. The presumed mechanism is through control of associated vasculitides.

S26. A Transnasal Injection Technique for the Patulous Eustachian Tube

Henry T. Hoffman, MD*, Iowa City, IA; Marlan R. Hansen, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss current and emerging management options for patients with symptoms consistent with patulous eustachian tube.

Objectives: Evaluate a transnasal endoscopic approach to induce partial eustachian tube obstruction. **Study Design:** Case report with video recording of injection technique following cadaver dissection and literature review. **Methods:** Literature review identified risk of stroke and death associated with carotid artery involvement through injections designed to narrow the eustachian tube in the management of autophony and aural fullness. Cadaver dissection coupled with testing of equipment led to treatment of a patient with carboxymethylcellulose injection deep in the anterior wall of the right e.t. by curving a 25 gauge sclerotherapy needle placed through the operative port of a flexible endoscope around the posterior septum from a left nostril approach. **Results:** Successful narrowing of the e.t was technically accomplished but provided only short term (one day) relief of symptoms. **Conclusions:** We identify a technique likely to be useful in management of the patulous e.t. still in need of indentifying appropriate injection materials.

S27. Otolaryngology in Medical Student Education: A Systematic Review of the Literature

Stacey Lynn Ishman, MD MPH, Baltimore, MD; C. Matthew Stewart, MD PhD, Baltimore, MD; Rosalyn W. Stewart, MD MHS, Baltimore, MD; James Stanley, BS, Baltimore, MD; Kevin D. Stierer, BS, Baltimore, MD; James R. Benke, BS, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the current state of published literature on medical student education in otolaryngology.

Objectives: Up to 25% of primary care complaints are otolaryngology related; however otolaryngology instruction is not routinely required in U.S. medical schools, potentially negatively impacting medical student career choices, knowledge and attitudes. This study systematically reviewed existing literature on the inclusion of otolaryngology in medical student education. **Study Design:** Systematic review. **Methods:** Our literature search encompassed all indexed years in PubMed, EMBASE, and ERIC. Inclusion criteria included English language, original human data, and a focus on medical student education. Data was collected on study design, teacher/target audience, educational topic, methods and venue. Two investigators independently reviewed all manuscripts. **Results:** The initial search yielded 352 abstracts. Sixty-six underwent full article evaluation and 28 remained in the final review. Ten (6%) each were from the US/United Kingdom, 3 (11%) from Malaysia, 2 (7%) from Canada, and 1 (4%) each from Spain, Croatia and the Netherlands. Study types included curriculum descriptions (8,29%), needs assessments (9,32%), educational methods (10,36%), skill assessments/simulation (8,29%) and problem based learning (2,7%). The majority represented a single institution (18,64%). The 3 US based needs assessments found otolaryngology complaints to be frequent and important. Despite this, otolaryngology was primarily taught in the preclinical curriculum and few programs had required clinical rotations. They also identified specific knowledge/skill deficits in hearing

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loss, adenotonsillectomy, ear/nasal foreign body removal and hearing test interpretation. **Conclusions:** There is limited literature on otolaryngology in medical student education. Much is from countries that integrate medical and college training, unlike the US, and most describe clinical training deficits in broadly relevant otolaryngology diagnosis, management, and skills.

S28. Palliative Care Laryngology—Tracheal Stenting as an End of Life Comfort Care Measure for Hospice Patients

Aasif A. Kazi, PharmD, Augusta, GA; Jeffrey W. Flowers, DMin, Augusta, GA; Paul M. Weinberger, MD, Augusta, GA

Educational Objective: At the end of this presentation, participants should have an improved understanding of the unique issues involved with hospice/end of life care as relates to laryngology and airway stenting in particular.

Objectives: To improve understanding of factors implicit to hospice and end of life care, which may not be intuitive to the otolaryngology and laryngology community. **Study Design:** Literature review and case report with prospective expert opinions from hospice care, patient advocate and airway surgeon's perspectives. **Methods:** A patient offered tracheal stenting for malignant airway obstruction is described. After identification of a significant knowledge gap, comprehensive review of the literature was performed using PubMed, Google Scholar, and review of manuscript references. Prospective consultation was sought from non-otolaryngology experts in the areas of hospice care and patient advocacy to identify pertinent issues. **Results:** There are over 1000 articles published from 1965 to 2013 on the topic of tracheal stents, and over 40,000 on hospice/end of life care. Only 3 manuscripts exploring the role of hospice care and airway stenting were identified. Experts identified significant issues for hospice care that are likely familiar to otolaryngologists dealing with morbid/mortal diseases such as head and neck cancer, but potentially less familiar to laryngologists. An example was that while it is well known that hospice care prohibits life prolonging treatment (such as curative surgery or treatments), quality of life surgery is solidly within the hospice paradigm. Patients with nonoperable tracheal obstruction from malignancy face a particularly unpleasant demise from suffocation. For those patients, stenting can restore airway patency but is not considered life prolonging. **Conclusions:** There are unique issues and resources available for end of life/hospice care. This is an underdeveloped area of otolaryngology that needs to be addressed.

S29. Ultra Low Cost 3D Modeling of the Face

Kanwar S. Kelley, MD JD, Irvine, CA; Eric Chiang, Yorba Linda, CA; Ryan J. Miller, Tustin, CA; Ryan Leary, BS, Long Beach, CA; Brian J.F. Wong, MD PhD*, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how to use open source software and any digital camera to perform high quality 3D facial photography and imaging.

Objectives: 1) Explain how to generate ultra low cost 3D models of the face with any digital camera and cloud based freeware; 2) demonstrate the accuracy and use of 3D photography and modeling in pre- and post-surgical patients; and 3) describe the value of this low cost technique in a facial plastic and reconstructive surgery practice. **Study Design:** Pre and post-surgical patients undergoing rhinoplasty were selected for 3D imaging and digital reconstruction. Pre- and post-surgical 3D images were compiled and compared to intraoperative measurements across a variety of datapoints to test the reliability and accuracy of our modeling systems. **Methods:** Using flat lighting around the patient's head 30 pictures were captured rotating 360 degrees on a zero degree axial plane. Further, 20 pictures were obtained orbiting 360 degrees around the patient at 20 degrees above and below the axial plane. These photos were then loaded into Autodesk 123D Catch and then processed and exported for 3D manipulation in programs such as 3ds Max or other freeware such as Blender. This approach was also replicated using X-box Kinect. **Results:** Pre- and post-surgical 3D images were compared. Fiducial accuracy was validated using caliper measurements. 3D modeling and manipulation provided reliable and accurate representations of facial contour, symmetry, and surgical changes. **Conclusions:** Ultra low cost imaging techniques and cloud based software represent a major advancement in surgical planning and outcomes followup. Future applications include translating 3D images into life size models using 3D printing.

S30. Submucosal Inferior Turbinoplasty: Evaluation of Functional Recovery and Complications

Anita Konka, MD MPH, Brooklyn, NY; Richard W. Westreich, MD, Brooklyn, NY; Tarashansky Konstantin, MD, Brooklyn, NY; Dina Finkel, BA, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) critically examine the hypothesis that the submucosal inferior turbinoplasty (SMIT) technique offers rapid functional recovery and is a safe procedure in patients with nasal obstruction; and 2) critically evaluate the rate of patient recovery and postoperative complications associated with this procedure and implications for clinical practice.

Objectives: Numerous techniques currently exist for the surgical treatment of inferior turbinate hypertrophy. In this historical cohort study we present a novel method for submucosal inferior turbinoplasty that addresses all structural components of the inferior turbinate. To evaluate the rate of patient recovery and safety of the procedure, we measure outcomes including duration of nasal packing, frequency of debridement, length and duration of nasal crusting, postoperative complications, and reoperation rate and demonstrate that this method of submucosal inferior turbinoplasty is a viable option during functional nasal surgery. **Study Design:** Historical cohort study. **Methods:** Chart review from a single surgeon's practice from 2005-2012. 112 patients were included in our analysis. Inclusion criteria were patients older than 15 years of age who underwent elective SMIT as a single procedure or in combination with concurrent nasal procedures (septoplasty, septorhinoplasty, FESS, adenoidectomy). Patients with less than 3 month followup were excluded. In our

analysis predictor variables were SMIT, age and gender. Outcome variables were measured as duration of nasal packings, number and timing of crust debridement (as a reflection of mucosal functional recovery), and complications (bleeding, synechiae, mucosal atrophy, scarring) and reoperation rate. **Results:** Surgical packing was removed POD #0 for 58% of patients, POD #1 for 39% of patients, and POD#2 for 3% of patients. 55% of patients underwent 1 postoperative debridement, 32% underwent 2 postoperative debridements, and 9% underwent 3 postoperative debridements. The average duration of nasal crusting was 13 days (SD 10 days). Complications were measured as follows: synechiae (1.2%), bleeding (3.7%), reoperation (1.2%), mucosal atrophy (0%) and scarring (0%). **Conclusions:** Inferior turbinectomy is the gold standard for addressing the role of turbinate hypertrophy in nasal obstruction. However, turbinectomy requires prolonged nasal packing and carries a risk of postoperative bleeding and prolonged nasal crusting. Alternative techniques of inferior turbinectomy, such as laser ablation, microdebridement, and radiofrequency ablation aim to provide short and long term improvements in patient recovery compared to turbinectomy. However, these procedures require special equipment and additional cost. The SMIT technique described here minimizes the need for postoperative packing and special equipment. Compared with historical data reported for alternative techniques, the SMIT measures favorably in terms of duration of nasal packing, frequency of debridements, length of nasal crusting, complication rates and reoperation rates.

S31. Long Range Optical Coherence Tomography as a Predictive Modeling Tool for Designing Structural Surgery of the Pediatric Facial Skeleton and Upper Airway

Frances B. Lazarow, MD, Irvine, CA; Gurpreet S. Ahuja, MD, Irvine, CA; Anthony E. Chin Loy, MD, Irvine, CA; Erica Su, BS, Irvine, CA; Zhongping C. Chen, 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 use of long range optical coherence tomography as a viable technology in the visualization and anatomic mapping of the pediatric upper airway, and its applications for tailoring surgery for airway obstruction.

Objectives: Upper airway (UA) obstruction affects up to 3% of children, with a 20% failure rate after adenotonsillectomy (AT). Failure is especially common in children with Down's syndrome and other craniofacial abnormalities. The decision to proceed to AT is based on clinical judgment, most often without quantitative anatomic criteria. Here long range optical coherence tomography (LR-OCT) was used to generate structural images of the UA in children. LR-OCT uses near infrared light to generate high resolution cross-sectional images of hollow organs. The long term goal is to obtain this anatomic information prior to surgery and better guide interventions such as AT, palatoplasty, and orthognathic procedures. **Study Design:** Non-randomized prospective clinical trial. **Methods:** 15 children undergoing surgery were imaged immediately before and after their procedures using a transnasally placed fiberoptic probe (helical scanning, 25 images/sec, 800 images/pass). 3D structural models were analyzed for sites of airway narrowing and collapse. **Results:** Pre and postoperative volumetric renderings clearly showed both stricture and post-surgical improvement in airway patency. Comparison of cross-sectional area and regional volume between anatomic subsites demonstrated statistically significant differences between pre and postoperative conditions. **Conclusions:** LR-OCT is an emerging technology that rapidly generates 3D structural images of the pediatric UA, which precisely identifies the narrowest segments of the airway. Additionally, these models can be used for computational fluid dynamics. This is the first step toward development of: 1) an office based system to image children during sleep and wakefulness; 2) a means to precisely identify loci of airway obstruction and tailor surgery to specific pathology; and 3) augment or replace polysomnography.

S32. Otolaryngic Manifestations of Acromegaly

Kevin A. Peng, 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 clinical features of acromegaly that are pertinent to the otolaryngologist.

Objectives: Acromegaly is an uncommon endocrinopathy resulting from excess growth hormone production, usually by a pituitary adenoma. The constellation of symptoms includes significant otolaryngic manifestations, and recognition may be critical in establishing the diagnosis. We present a series of patients with acromegaly, with particular attention to clinical features pertinent to the otolaryngologist. **Study Design:** Retrospective chart review. **Methods:** Twenty-five patients with a diagnosis of acromegaly from a pituitary adenoma who underwent surgery between 2008 and 2013 were identified. Demographic data and clinical manifestations of disease were analyzed. **Results:** Of the 25 patients, 8 (32%) suffered from obstructive sleep apnea (OSA), with an additional 5 (20%) reporting symptoms consistent with sleep disordered breathing. Fifteen patients (60%) had macroglossia. Two patients (8%) harbored an additional diagnosis of papillary thyroid carcinoma, while 3 others (12%) were diagnosed with benign thyroid nodules. One patient (4%) presented with a concurrent parathyroid adenoma, while another, diagnosed with MEN I, underwent parathyroidectomy for parathyroid hyperplasia. Other otolaryngic symptoms included hearing loss, tinnitus, and sinonasal issues. **Conclusions:** Acromegaly includes diverse manifestations which may be recognized and treated by the otolaryngologist. Various otolaryngic manifestations, including obstructive sleep apnea (OSA), thyroid and parathyroid hyperplasia and neoplasia, hearing disturbance, and sinonasal symptoms, are among the presenting symptoms. Routine screening of all acromegalics with thyroid ultrasound, audiologic testing, and sleep and sinonasal evaluations should be strongly considered. A multidisciplinary approach to diagnosis and management is crucial.

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S33. The Effect of Fibrin Glue on Wound Healing with Unilateral Neck Dissections

David A. Reiersen, MD, Shreveport, LA; Timothy S. Lian, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the use of fibrin glue in head and neck surgery and discuss an evidence based cost benefit analysis of its use in unilateral neck dissections.

Objectives: To demonstrate decreased postoperative drain output for patients who had intraoperative application of fibrin glue (FG) for unilateral neck dissections. **Study Design:** Retrospective chart review. **Methods:** Records were reviewed for 75 patients from a single institution with a focus of unilateral neck dissection. Bilateral neck dissections and laryngectomies were excluded from the study due to increased variability of the postoperative course. A total of 33 patients met the inclusion criteria, of these patients, 15 had application of fibrin glue and 18 did not (NFG=15, non-FG=18). T-test was used to compare mean drain output. **Results:** Mean drain output within first 24 hours was 110.1±36.8mL versus 63.2±66.7mL for the FG and non-FG groups with a p-value of 0.0166. The total drain output was not statistically significant based on use of fibrin glue, 106.4±78.7ml (FG) versus 104±79.1mL (non-FG), mean difference 1.6mL (p=0.953). Prior radiation was noted to be associated with decreased drain output; pre-radiated group (XRT) with 45.3±20.9mL compared to non-radiated group (non-XRT) with 100.5±61.1mL (p=0.0006) in first 24 hours. The total output for radiation was significant with 63.4±32.8ml (XRT) versus 116.4±82.6mL (non-XRT), mean difference 53.0mL (p=0.0141). **Conclusions:** Confirmed less drain output with fibrin glue within the first 24 hours, but no difference in total drain output. The use of fibrin glue did not decrease risk of complications and did not shorten the number of days with closed suction drains (or length of hospital stay) in the patients included in this study.

S34. An Integrated Approach to the Diagnosis and Management of Parotid Sialadenosis

Joshua Tokita, MD, Iowa City, IA; Robert A. Robinson, MD PhD, Iowa City, IA; Joel A. Miron, MD, Iowa City, IA; Henry T. Hoffman, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) incorporate sialadenosis into a diagnostic algorithm for evaluating salivary swelling; 2) discuss radiological and histological characteristics of sialadenosis; and 3) have a better understanding of treatment options.

Objectives: We present an illustrative case of idiopathic sialadenosis with painful swelling of the left parotid gland evaluated with CT, sialography, sialendoscopy and histology following parotidectomy. The objectives of this study are to 1) help incorporate sialadenosis into the diagnostic algorithm for evaluating salivary swelling; 2) discuss radiological and histological characteristics of sialadenosis; and 3) review treatment options. **Study Design:** Retrospective chart review and literature search. **Methods:** Chart review of a patient with sialadenosis of the parotid gland treated at a tertiary care hospital. **Results:** We evaluated a 54 year old male with a two year history of recurrent pain and swelling in his left parotid gland. He had a history of mumps and branchial cyst removal on the left side twenty years prior, but no history of diabetes, liver disease or alcohol use. ANA, RF, SSA and SSB antibodies were negative. CT revealed bilateral parotid enlargement with fatty infiltration and sialography revealed splaying and pruning of the distal branches of the parotid ducts; findings consistent with sialadenosis. Left parotid duct cannulation and infusion of 3ml of Kenalog 10 provided two weeks of relief. He then requested left parotidectomy which was performed two months later with accompanying sialendoscopy, which was unremarkable. Pathology demonstrated fatty infiltration and mild acinar hypertrophy consistent with sialadenosis. He remained asymptomatic at his four month followup. **Conclusions:** A systematic approach with knowledge of the radiological and histological characteristics of sialadenosis is critical to correctly identifying this entity while ruling out other causes of salivary swelling.

S35. A Case of Oropharyngeal Fistulae in Post-Transplant Lymphoproliferative Disorder

Courtney M. Tomblinson, MD, Phoenix, AZ; David G. Lott, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the clinical presentation of post-transplant lymphoproliferative disorder (PTLD) and appreciate populations at risk, cytopathologically distinguish PTLD from other etiologies of adenotonsillar hypertrophy, discuss management of patients with PTLD of the head and neck.

Objectives: To report a unique case of PTLD manifested as oropharyngeal ulcers and fistulae in an immunocompromised renal transplant patient who was EBV seronegative prior to surgery but whose donor was a known EBV seropositive. Literature review compares and contrasts this unique case with other presentations of PTLD in the head and neck in an immunocompromised host. **Study Design:** Case report and literature review. **Methods:** We report a unique manifestation of PTLD as severe oropharyngeal ulcers and fistulae in an immunocompromised renal transplant patient with EBV recipient-donor mismatch. Chart review and pathologic analysis were performed. Literature review compares and contrasts this unique case with other presentations of PTLD in the head and neck. **Results:** A 67 year old patient post-renal transplant from a related donor presented with a one month history of fatigue, night sweats, odynophagia, halitosis and weight loss. Direct visualization of the oropharynx revealed severe ulceration of the right tonsillar fossa and lateral pharyngeal wall with deep necrotic abscess that fistulized into the neck and right level II lymphadenopathy. Biopsy revealed an infiltrate of EBV+ B-cells, confirming a diagnosis of PTLD. Immunosuppression was reduced and treatment with rituximab was initiated. The patient's clinical condition improved and kidney function is normal despite the reduction in tacrolimus. **Conclusions:** PTLD occurs in 2-3% of adult transplant recipients, particularly those with EBV recipient-donor mismatch. Forty percent of PTLD manifests with head and neck symptoms, commonly in Waldeyer's ring. Treatment aims at lowering the immunosuppressive medication to allow for an adequate immunity, interferon-alpha, and antivirals. Surgical intervention is indicated in airway obstruction (tonsillectomy) or local control (incision and drainage of deep neck space infections unresponsive to intravenous antibiotics).

S36. Celecoxib vs Placebo in Tonsillectomy: A Randomized Double Blind Placebo Controlled Trial Comparing Analgesia

Douglas J. Van Daele, MD, Iowa City, IA; Douglas K. Trask, MD PhD, Cleveland, OH (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the benefits of perioperative use of celecoxib in tonsillectomy.

Objectives: Celecoxib is a cyclooxygenase 2 specific inhibitor used to treat pain secondary to osteoarthritis, rheumatoid arthritis, and acute pain. Studies in surgical models of acute pain have also demonstrated superior pain relief to placebo. The objective of this study was to test the efficacy and safety of celecoxib use for pain relief associated with tonsillectomy compared to placebo in the perioperative setting. **Study Design:** Randomized, double blind, placebo controlled trial. **Methods:** Patients eighteen and older planning to undergo tonsillectomy were recruited through the department of otolaryngology. Patients were randomized to 200 mg celecoxib versus placebo with a loading dose the night before surgery then twice per day for ten days postoperatively. Subjects were instructed to supplement the study drug with hydrocodone/acetaminophen liquid or acetaminophen for pain control as needed. Subjects completed a daily diary regarding their pain, nausea, vomiting, diet, and activity. Symptoms were rated on a Likert scale. **Results:** Eighteen patients enrolled. Two patients could not complete the diaries due to excruciating pain. Intraoperative blood loss was similar between groups, and no subjects had a peri or postoperative bleeding. Three patients in the placebo group returned to the emergency department for treatment. No patients required postoperative admission for complications. Subjects in the placebo group required statistically significantly ($p < 0.05$) higher doses of narcotic and acetaminophen to control pain. Pain and diet rating scores were slightly better in the celecoxib group compared to placebo. **Conclusions:** In this small cohort, celecoxib reduced postoperative narcotic and acetaminophen requirements with no complications compared to placebo.

S37. Pressure Washer as a Unique Cause of Pneumomediastinum

Douglas C. von Allmen, BS, Huntington, WV; Mark F. Sheridan, MD, Huntington, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the risks and treatment of this unique mechanism of injury.

Objectives: We present a case of pneumomediastinum with a unique method of injury and highlight the complicating circumstances and treatment. **Study Design:** Case report and literature review. **Methods:** The incidence of pneumomediastinum is estimated to be 1 in 14,000 and typically is more common in the pediatric population. Acquired pneumomediastinum is an unusual entity that rarely occurs as a result of trauma. Pressure washers are able to generate pressures of 1300-4000 psi and can create significant tissue injury, which is further complicated by the injection of foreign material into the wound. **Results:** A 9 year old male was brought to our facility after attempting to drink from a pressure washer. He presented with trismus, reduced mobility of the neck, sore throat, and crepitus of the neck and chest. Examination of the oropharynx identified a 2 cm abrasion in the right soft palate extending from near midline toward the superior tonsil. CT imaging displayed cervical emphysema and pneumomediastinum. The patient was started on clindamycin due to the concern for mediastinitis as a result of implantation of foreign material or oral flora due to the penetrating injury. Repeat CT scan at 48 hours revealed improvement and he was discharged on the 4th day. At followup he had returned to baseline. **Conclusions:** We present a unique cause of pneumomediastinum. All causes of pneumomediastinum may result in the injection of air, bacteria, and other foreign material. The use of antibiotics is controversial but should be considered in all cases due to the potential morbidity and mortality from this type of injury.

S38. Letters of Recommendation: Correlation with Interviewers' Perceptions and Preferences

VyVy N. Young, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the correlation between letters of recommendation and the interviewers' perception of the applicant; and 2) discuss reasons for preference for either narrative or standardized letters of recommendation.

Objectives: 1) Determine correlation between letters of recommendation (LOR) and interviewers' perceptions of residency applicants; and 2) assess interviewers' preferences regarding LOR. **Study Design:** Single institution, prospective questionnaire. **Methods:** During 2012 and 2013 interview cycles, before and after introduction of standardized LOR, fifteen interviewers were asked to rate the correlation of their impression of applicants with their impression from the LOR following each interview on a visual analog scale. Narrative LOR were assessed in 2012; narrative, standardized, and Dean's LOR were evaluated in 2013. Interviewers also answered a separate questionnaire regarding opinions about LOR. **Results:** Survey response rates averaged 34% each year. Analysis was performed of 356 total evaluations of narrative, 94 standardized, and 95 Dean's LOR. Respondents reported high correlation between their impressions of applicants based on LOR and their personal interactions, average 76/100 (narrative), 76/100 (standardized), and 72/100 (Dean's). Thirteen interviewers provided opinions regarding LOR; 46% preferred narrative LOR, 23% preferred standardized LOR, and 30% do not read LOR. Most common reasons for preferring narrative LOR included ability to read between the lines and get more information. Standardized LOR were preferred for speed. Lack of additional information and repetitiveness were reasons for not reading LOR. **Conclusions:** Standardized and narrative LOR seem to correlate equally with interviewers' impressions of residency applicants. Two-thirds of respondents who read LOR preferred narrative type; this may be related to greater familiarity. Given the amount of time

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devoted to LOR, it seems prudent to reconsider the value of each of these LOR types in the interview portion of the residency application process.

Head & Neck

S39. Carotid Artery Resection and Reconstruction in Advanced Stage Head and Neck Cancer: Postoperative Morbidity in the First 90 Days

Ashwin Ananth, BS, New Orleans, LA; Joshua M. Levy, MD MPH, New Orleans, LA (Presenter); Gregory Pippin, MD, New Orleans, LA; Taylor A. Smith, MD, New Orleans, LA; Akash G. Anand, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of carotid artery resection in the palliative management of advanced stage head and neck cancer.

Objectives: To evaluate clinical outcomes and postoperative morbidity associated with carotid artery resection and reconstruction for advanced stage head and neck cancer. **Study Design:** Retrospective chart review. **Methods:** Consecutive patients were evaluated at a single academic center with stage IVB head and neck cancer involving the carotid artery. These patients underwent composite resection of their cervical disease, with single stage vascular reconstruction and regional tissue advancement for wound closure. Patients were followed for three months following surgery with documentation of pain control, neurologic dysfunction and wound healing. **Results:** Two patients underwent carotid resection and reconstruction for advanced stage head and neck cancer. All procedures were single stage and there were no immediate or delayed signs of neurological dysfunction. There were no instances of graft failure or infection. Postoperative pain scores compared to preoperative pain scores showed noted improvements when using a visual analog scale. **Conclusions:** Carotid resection and reconstruction for advanced stage head and neck cancer is a safe procedure with minimal postoperative morbidity related to neurological impairment and graft failure. Furthermore, noted improvement in postoperative pain was measured, suggesting benefits in quality of life.

S40. Autologous Plasma Adhesives and Forearm Wound Healing in Radial Forearm Free Flap Donor Sites

Douglas J. Angel, MD, London, ON Canada; Kevin Fung, MD, London, ON Canada; John Yoo, MD, London, ON Canada; Philip C. Doyle, PhD, London, ON Canada; Damian Micomonaco, MD, Sault Ste Marie, ON Canada; Anthony C. Nichols, MD, London, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the mechanism by which autologous plasma adhesives have an effect on wound healing; 2) understand the potential beneficial effects of platelet rich plasma on wound healing; and 3) have an understanding to the potential benefits of using platelet rich plasma in this subset of patients.

Objectives: To evaluate the effect of platelet rich plasma (PRP) on forearm wound healing in patients undergoing radial forearm free flap (RFFF) reconstruction for head and neck cancers defects. **Study Design:** Prospective, blinded, randomized control trial. **Methods:** Patients undergoing RFFF were randomly assigned to one of two groups, determined by a sealed envelope opened intraoperatively. Group A received PRP on the surgical bed of the RFFF donor site, while group B received saline. High resolution photographs were taken at 3, 6, and 12 months postoperatively using a standardized method. Blinded observers then evaluated each photograph, and rated each scar using the Western Scar Camouflage scale. This scale has been previously validated with linear scars and has shown good validity and reliability. All photographs were presented in random order to observers who then rated each photo independently. **Results:** Eleven patients received PRP to their forearm and fifteen patients received saline to their forearm. Based on data obtained, no differences between PRP and saline groups were identified at 3 or 6 months; however, scaled scores were reduced by approximately 30% in the PRP group at 12 months, which is indicative of a less obvious or more camouflaged scar. **Conclusions:** The 30% reduction in scaled scores is indicative of a less obvious scar, and thus PRP may have a positive effect on wound healing in this subset of patients.

S41. Transoral Robotic Surgery in Non-Squamous Cell Carcinomas Involving the Oropharynx

Swathi Appachi, BS, Cleveland, OH; Joseph Scharpf, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to explain and discuss the use and benefits of transoral robotic surgery for non-squamous cell carcinoma of the oropharynx seen in a small case series.

Objectives: Transoral robotic surgery (TORS) is a technique used for cancer resection. It has been studied in squamous cell carcinoma (SCC), but this series reports outcomes for resections of non-SCC involving the oropharynx. **Study Design:** This is a case series of four patients diagnosed with non-SCC who underwent TORS from April 2011 to January 2013 at a quaternary care center. **Methods:** Four patients underwent TORS with the da Vinci surgical system. Charts were reviewed retrospectively for age, gender, cancer type, tumor site, surgical margins, pTNM stage, complications, return of swallowing, adjuvant therapy, and recurrence. **Results:** Tumors resected included low grade mammary analog secretory carcinoma, intermediate grade laryngeal chondrosarcoma with extensive oropharyngeal extension, and high and intermediate grade mucoepidermoid carcinomas. Tumor sites included the soft palate (n=1), base of tongue (n=3), and epiglottis (n=1). Surgical margins in all cases were negative. No major intraoperative complications were observed. One patient underwent reoperation on POD10 for delayed bleeding. All patients had restoration of swallowing by POD2. Two patients received adjuvant radiotherapy, and one patient underwent chemoradiotherapy with cisplatin based on pathological findings. No patients

have had cancer recurrence with mean followup of 16 months. **Conclusions:** Although a small series, TORS appears to provide an innovative treatment option for non-SCC of the oropharynx, where primary surgical treatment is the best initial option. It affords complete resection of the primary tumor with functional restoration. This surgical method should be studied further to establish its role as a treatment modality and compared to open techniques in non-SCC of the oropharynx.

S42. Outpatient Thyroid Surgery in a Low Surgical Volume Hospital
 Marco A. Ayala, MD, North Chicago, IL; Myron W. Yencha, MD, North Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the safety and outcome of outpatient thyroid surgery in a small low surgical volume hospital.

Objectives: 1) To determine the safety and outcome of outpatient thyroid surgery in a small low surgical volume hospital; and 2) to determine the clinical and social factors that may prohibit outpatient thyroid surgery. **Study Design:** Retrospective analysis of all thyroid surgery performed by authors at a small surgical volume hospital from August 2006 to August 2013. **Methods:** One hundred and thirty-seven patients underwent thyroid surgery during the study period. Electronic medical records were reviewed for all patients. Data collection included demographic information, type of thyroid surgery, length of hospital stay, laboratory/pathology results, comorbidities and complications. **Results:** Of the 137 patients who underwent thyroid surgery, 97 (70.8%) were discharged on the day of surgery. Thirty-five patients (25.5%) were admitted for 23 hour observation and 5 patients (3.5%) required admission for longer than 24 hours. Total thyroidectomy surgery was performed in 51 patients (37.2%) and 86 patients (62.8%) underwent a hemithyroidectomy. Complications included 5 temporary recurrent laryngeal nerve (RLN) injuries (3.6% /2.7% of total RLN at risk), 1 permanent recurrent laryngeal nerve injury (0.7%/0.53% of total RLN at risk), and 7 cases of temporary hypocalcemia (5.1%). There were no cases requiring emergent return to the operating room or hospital. **Conclusions:** Outpatient thyroid surgery can be performed safely in a low surgical volume center. Reasons for a longer stay include clinical as well as social factors.

S43. Retropharyngeal Lymph Node Involvement in Human Papilloma Virus Associated Oropharyngeal Squamous Cell Carcinoma
 Michael C. Baxter, MSc, Baltimore, MD; Jason Y. Chan, MBBS, Baltimore, MD; Patrick K. Ha, MD, Baltimore, MD; Nishant Agrawal, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the frequency of retropharyngeal lymph nodes in patients with human papilloma virus related oropharyngeal squamous cell carcinoma and the impact of the presence of retropharyngeal lymph nodes on patient outcomes.

Objectives: The purpose of this study was to retrospectively review patients with human papilloma virus (HPV) associated oropharyngeal squamous cell carcinoma (OPSCC) for the presence of retropharyngeal lymph nodes (RPLN) before and after treatment and determine the utility of RPLN in predicting outcomes. **Study Design:** Retrospective review. **Methods:** We identified two hundred thirty patients from 2008 to 2011 with a diagnosis of HPV related OPSCC treated primarily with chemoradiation and looked for the presence of RPLN on contrast enhanced positron emission tomography/computed tomography (PET/CT) both pre- and post-treatment. **Results:** Of the 230 patients, 148 had both pre- and post-treatment imaging available for review. Five patients (3.4%) had RPLN pre-treatment and two (1.4%) were found to have RPLN post-treatment and none were positive for RPLN before and after treatment. Among patients positive for RPLN pre-treatment with an average followup of 2 years, four (80%) were found to have no evidence of disease and one (20%) was alive with disease. Both patients positive for RPLN post-treatment were found ultimately to have no evidence of disease on serial imaging and there was no association between RPLN status and patient outcome. **Conclusions:** This is a unique investigation utilizing PET/CT to classify RPLN status in HPV related OPSCC. RPLN were a relatively uncommon finding in our HPV associated OPSCC cohort compared to the quoted positivity of 10-21% in all OPSCC and that a combination of PET/CT is useful in identifying RPLN. Prospective investigation will be needed to determine the precise impact of RPLN on HPV related OPSCC treatment and outcomes.

S44. Outcomes of Total Laryngectomy: A Single Institution Experience, 2001-2012
 Eleni M. Benson, MD, Baltimore, MD; Richard M. Hirata, MD, Baltimore, MD; Carol B. Thompson, MS MBA, Baltimore, MD; John R. Saunders, MD, Baltimore, MD; Ray G. Blanco, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss risk factors for pharyngocutaneous fistula and esophageal stricture after total laryngectomy.

Objectives: To determine the incidence of and risk factors for pharyngocutaneous fistula (PCF) and esophageal stricture and to describe survival in patients undergoing total laryngectomy (TL). **Study Design:** Retrospective cohort study. **Methods:** The records of 59 patients who underwent primary or salvage TL at our institution from 2001-2012 were reviewed. Data collected included patient characteristics, comorbidities, treatment with radiotherapy and/or chemotherapy, tumor site and stage, preoperative tracheostomy, surgical closure technique, and concurrent neck dissection. These risk factors were analyzed for association with PCF and stricture formation. Time until oral diet, length of hospital stay, and survival were also analyzed. **Results:** 28 patients (47%) developed PCF and 29 patients (47%) developed stricture requiring dilation. 2 year overall survival (OS) was 60%. Using multivariable analysis, pectoralis major (PM) myocutaneous flap incorporated into the suture line increased odds of PCF (odds ratio 7.0 [95% confidence interval 1.0-48], p=0.05);

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when limited to salvage patients, PM incorporated into the suture line and PM only reinforcement of primary closure both increased the odds of PCF compared to primary closure with suture (14.5 [1.4-149], $p=0.03$; and 22.1 [1.1-431], $p=0.04$). PCF was associated with increased time to initiation of oral diet and length of hospital stay ($p=0.05$; $p=0.002$). Preoperative chemotherapy was significantly associated with increased odds of stricture in univariate analysis (3.0 [1.0-9.6], $p=0.05$). **Conclusions:** PCF and stricture are common complications of TL. Our data suggest that surgical technique is important in determining the risk of PCF, and that preoperative chemotherapy may be a risk factor for stricture.

S45. Staged Thyroidectomy for Large Substernal Goiters: Improving Outcomes and Hospital Utilization

John M. Carter, MD, New Orleans, LA; Mohammad A. Murcy, MD, New Orleans, LA; Sarah Lookabaugh, MD, New Orleans, LA; Zaid Al-qurayshi, MD, New Orleans, LA; Emad Kandil, MD, New Orleans, LA; Paul L. Friedlander, MD, Usa, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of a two stage thyroidectomy as a viable and cost effective option in the management of large substernal goiters.

Objectives: To compare two stage versus single stage total thyroidectomy for the treatment of large substernal goiters. **Study Design:** Retrospective chart review. **Methods:** A retrospective review of patients who underwent thyroidectomy for large substernal goiters between 2008-2013. We used an intention to treat analysis and patient groups were divided into single versus two stage approach. **Results:** A total of 158 operations were performed on 135 patients. There were no significant differences in age, race or gender between the two stage and single stage patients. Average operative time was significantly less in the two stage group (2.23 hours vs. 3.03 hours; $p = 0.003$). Intraoperative recurrent laryngeal nerve monitoring lead to staging of three cases (1.9%). The overall rate of perioperative complications decreased 2.4 fold in the two stage group (OR = 2.4; 95% CI [1.1, 5.2] $p = 0.021$). Patients who underwent a staged approach had a trend for less thyroid related perioperative morbidity (24 (26%) vs. (18) 43%; $p = 0.07$) and average hospital stay (2.7 d vs. 1.5 d; $p = 0.14$). In addition, single staged patients were 5.1 times more likely to be admitted to the ICU than patients who underwent two stage operations (OR = 5.1; 95% CI [1.75, 15.08]; $p = 0.004$). Total hospital costs tended to be higher in the single staged group (\$6503.3 vs. \$ 2742.6; $p = 0.09$). **Conclusions:** Staged thyroidectomy is a safe, feasible and cost effective alternative to one stage total thyroidectomy in the management of large substernal thyroid goiters.

S46. How Long Have I Had My Head and Neck Cancer? Estimating the Age of Oral Cavity and Laryngeal Squamous Cell Carcinoma at Diagnosis Using Collins' Law

Garret W. Choby, MD, Pittsburgh, PA; James K. Byrd, MD, Pittsburgh, PA; William G. Albergotti, MD, Pittsburgh, PA; Jonas T. Johnson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the application of Collins' law to squamous cell carcinomas of the oral cavity and larynx.

Objectives: Patients and family members often ask their surgeon how long their head and neck cancer has been present. Our study approximates the age of oral cavity and laryngeal tumors at the time of diagnosis by examining time to local recurrence in patients treated with surgery alone, utilizing the concept of Collins' law. **Study Design:** Retrospective review of patients at a single, tertiary university hospital system. **Methods:** A retrospective review of all patients treated for head and neck cancer from 1997—2013 at a single institution was performed. Patients were selected who underwent treatment for oral cavity or laryngeal squamous cell carcinoma with surgery. Patients who received radiation or chemotherapy were excluded. Time to recurrence was noted for patients who had local recurrence within 5 years. Collins' law was then applied to estimate the time elapsed from tumorigenesis to diagnosis. **Results:** For oral cavity squamous cell carcinoma, a total of 90 local recurrences were noted. The average time to local recurrence was 16.5 ± 14.1 months with a range of 1 to 54 months. For laryngeal squamous cell carcinoma, a total of 39 recurrences were noted. The average time to local recurrence was 12.0 ± 11.1 months with a range of 2 to 41 months. **Conclusions:** Applying the concept of Collins' law to estimate age of tumors at diagnosis using time to local recurrence, the mean age of oral cavity squamous cell carcinomas at diagnosis is 16.5 months. The mean age of laryngeal squamous cell carcinomas at diagnosis is 12 months.

S47. Intraoperative Ultrasound Use during Transoral Robotic Surgery

Daniel R. Clayburgh, MD PhD, Pittsburgh, PA; James K. Byrd, MD, Pittsburgh, PA; Jennifer R. Bonfili, RN, Pittsburgh, PA; Umamaheswar Duvvuri, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the potential applications of intraoperative ultrasound during transoral robotic surgery.

Objectives: Intraoperative and postoperative hemorrhage is a major complication of transoral robotic surgery (TORS). Intraoperative identification and ligation of potential bleeding vessels is critical to avoid hemorrhage; however, use of the robot eliminates tactile feedback to the surgeon. Intraoperative use of ultrasound may improve visualization of blood vessels and tumor margins, thereby aiding resection and reducing blood loss. **Study Design:** Case series. **Methods:** Patients underwent transoral robotic surgery for resection of oropharyngeal lesions. During surgery, an ultrasound probe was periodically applied to the surgical site to assess for nearby vasculature and tumor borders. Ultrasound findings were recorded and compared to patient anatomy during tumor resection. **Results:** The ultrasound probe was utilized in four consecutive patients undergoing TORS. Use of the ultrasound probe intraoperatively allowed for early identification of blood vessels within the surgical field, before they could be seen with the robot. Careful dissection could then be

performed to identify and ligate the blood vessel if necessary to avoid hemorrhage. Tumor boundaries could also frequently be visualized with the ultrasound, thereby ensuring that adequate margins were resected around the tumor. **Conclusions:** Intraoperative ultrasound during TORS is a useful adjunct to standard TORS resection of oropharyngeal lesions. This may improve visualization of nearby blood vessels and tumor margins, thus potentially reducing the incidence of intraoperative and postoperative bleeding and improving surgical margins. Further study of this tool will better define its application during TORS.

S48. Metastatic Adenocarcinoma of the Lung Mimicking Papillary Thyroid Carcinoma

Anthony G. Del Signore, MD, New York, NY; Hailun Wang, MD, New York, NY; Andrew Kleinberger, MD, New York, NY; Jeffrey Cheng, 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 recognize that lung adenocarcinoma occasionally metastasizes to the thyroid gland and can present a diagnostic dilemma for the treating physician.

Objectives: To report cases of metastatic adenocarcinoma of the lung mimicking papillary thyroid carcinoma and the potential for lung adenocarcinoma with papillary features and papillary thyroid carcinoma to be confused based on fine needle aspiration (FNA) biopsy alone. **Study Design:** Retrospective case series. **Methods:** Two patients who had lung adenocarcinoma with metastases to the thyroid gland that were initially diagnosed as papillary thyroid carcinoma were identified. Their charts were reviewed, including the history, physical findings, imaging studies and pathology. **Results:** We present two cases of patients who presented with synchronous thyroid and lung masses. The initial workup in both cases—including FNA biopsy—was suspicious for papillary thyroid carcinoma; however, further tissue studies confirmed lung adenocarcinoma as the primary tumor. The confounding clinical features and pathologic considerations, including the importance of immunohistochemical markers, are discussed. **Conclusions:** Lung adenocarcinoma metastatic to the thyroid gland can be confused with papillary thyroid carcinoma. Although rare, it should be in the differential diagnosis for patients with synchronous thyroid and lung masses. Given the challenges in making a correct diagnosis based on FNA biopsy alone, consideration should be made to obtain a tissue biopsy with immunohistochemical analysis to make a definitive diagnosis.

S49. RICHARD J. BELLUCCI, MD RESIDENT RESEARCH AWARD

Incremental Health Care Expenditures for Head and Neck Cancer in the United States

Sunshine M. Dwojak, MD MPH, Boston, MA; Neil Bhattacharyya, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the annual cost of head and neck cancer per person to individuals without cancer and individuals with other common cancers.

Objectives: Determine the incremental costs associated with head and neck cancer (HNCA) and compare the costs with other common cancers. **Study Design:** Cross-sectional analysis of healthcare expenditure database. **Methods:** All cases of HNCA were extracted from the Medical Expenditure Panel Surveys for 2006, 2008, and 2010. The incremental expenditures associated with HNCA were determined by comparing the healthcare expenditures of individuals with HNCA to the population without cancer, controlling for age, sex, education, insurance status, marital status, geographic region, and Charlson Comorbidity Index. Healthcare expenditures for HNCA were then compared to individuals with lung cancer and colon cancer to determine relative healthcare expenditures. **Results:** An estimated 264,713 patients (annualized) with HNCA were identified. The mean annual healthcare expenditures per individual for HNCA were \$23,408 ± 3,397 versus \$3,860 ± 52 for those without cancer. The mean adjusted incremental cost associated with HNCA was \$15,852 ± 3,297 per individual (p<0.001). Within this incremental cost, there was an increased incremental outpatient services cost of \$3495 ± 1044 (p=0.001) and an increased incremental hospital inpatient cost of \$6783 ± 2894 (p=0.020) associated with HNCA. The annual health care expenditures per individual fell in between those for lung cancer (\$25,267 ± \$2,375, p=0.607) and colon cancer (\$16,975 ± \$1,291, p=0.055). **Conclusions:** Despite its lower relative incidence, HNCA is associated with a significant incremental increase in annual health care expenditures per individual, which is comparable to or higher than other common cancers. In aggregate, the estimated annual costs associated with HNCA are \$4.20 billion.

S50. Defining the Success, Utility and Versatility of Supraclavicular Flap Reconstruction following Total Laryngectomy

Kevin S. Emerick, MD, Boston, MA; Marc W. Herr, MD, Boston, MA; Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the different total laryngectomy related defects that can be successfully reconstructed with the supraclavicular flap.

Objectives: 1) To report on the successful usage of the supraclavicular flap for reconstruction following total laryngectomy; and 2) to highlight the utility and versatility of the supraclavicular flap for reconstruction after total laryngectomy. **Study Design:** Retrospective review of a single institution experience. **Methods:** A single institution database was reviewed to identify patients undergoing total laryngectomy and supraclavicular flap reconstruction. The following key datapoints were collected: reconstruction site, extent of surgery, history of radiation, and complications. **Results:** 41 supraclavicular flaps were in the database to date and 13 of these were used following total laryngectomy. Nine were used for pharyngeal reconstruction, 3 for cutaneous defects related to previous tracheotomy, and 1 as a pharyngeal interposition graft. 10 of these cases were performed in the salvage setting after previous radiation. Four cases had significant oropharyngeal resection requiring reconstruction. There were no complete flap losses. 3 patients developed pharyngocutaneous fistula (1 had rapidly recurrent disease). One patient required one additional surgical procedure to address a complication. 3 had minor incisional dehiscence. All minor complications resolved with basic wound care. No significant donor site morbidity was identified.

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tified. **Conclusions:** The supraclavicular flap can be successfully used for multiple purposes following total laryngectomy. This has been successfully used for reconstruction of limited pharyngeal defects, extensive pharyngeal resection, and skin reconstruction following previous tracheotomy. This flap can be successfully used following previous radiation and with limited morbidity.

S51. Mandibular Metrics, Perceived Disability and Quality of Life Associated with Trismus

Kevin Fung, MD, London, ON Canada; Goran Jeremic, MD, London, ON Canada; Steven R. Cox, MS, London, ON Canada; Philip C. Doyle, PhD, London, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the utility of quantitative measures of mandibular capacity and discuss these data relative to perceived disability and quality of life in individuals who experience trismus secondary to treatment for head and neck cancer.

Objectives: While radiotherapy (RT) is a highly effective therapeutic intervention for many head and neck cancers (HNC), side effects can be disability in the areas of oral functioning and speech, and quality of life (QOL). This study sought to longitudinally assess the impact and disability of trismus secondary to RT or chemoradiotherapy (CRT). **Study Design:** Prospective, cohort study. **Methods:** Twenty-five adult participants treated with either RT or CRT were assessed for degree of masticator dysfunction by incorporating four different measurements of mouth opening into the Helkimo Masticatory Dysfunction Index (HMDI); maximal vertical distance, maximal protrusion distance, and maximal lateral distances—bilaterally. Additionally, measures using the Therabite Range of Motion Scales (TROMS) were acquired, as well as measures using the Mandibular Function Impairment Questionnaire (MFIQ), to assess the impact of trismus on QOL and activities of daily living. **Results:** Trismus was identified in more than 80% of participants using the HMDI. Further, moderate to severe levels of trismus were observed in approximately 40% of participants, with approximately one-half of that group demonstrating severe trismus and substantial perceived disability. Moreover, trismus was quantitatively measurable in 90%+ of patients using the HMDI and TROMS procedures. **Conclusions:** While the identification of trismus is not unexpected in this group of participants, the ability to quantitatively define the degree of limitation over time post-treatment provides a valuable means of indexing broader outcomes. Trismus is prevalent in those treated for HNC with RT, and especially with CRT. Additionally, our finding of considerable self-perceived disability in relation to trismus provides valuable information that can serve to establish proactive rehabilitation procedures that may reduce the extent and severity of trismus.

S52. Improved Outcomes for Oral Cavity Squamous Cell Carcinoma Patients Receiving Adjuvant Radiation Therapy at an Academic Center: A Matched Pair Analysis

Jonathan R. George, MD MPH, San Francisco, CA; Sue S. Yom, MD PhD, San Francisco, CA; Steven J. Wang, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand differences in combined modality treatment outcomes for patients with oral cavity carcinoma who underwent postoperative radiation therapy at an academic center versus nonacademic radiation treatment centers.

Objectives: Our objective was to evaluate for outcomes differences for patients with oral cavity squamous cell carcinoma (OCSCC) who underwent primary surgical resection at an academic center (AC) followed by postoperative radiation therapy either at the AC or at a nonacademic radiation treatment center (non-AC). **Study Design:** Matched pair analysis of a retrospective cohort study. **Methods:** A retrospective cohort of 53 patients with previously untreated OCSCC who underwent surgery followed by adjuvant therapy at an AC from 2002 to 2012 were matched to 53 OCSCC patients surgically treated at the AC but received adjuvant radiation at a non-AC. Matched pairs shared similar TNM stage, age, and gender. We analyzed data for within-pairs differences in clinicopathologic variables, radiation treatment metrics, and survival outcomes. The main outcome measures were overall survival, disease specific survival, and locoregional control rates. **Results:** There were no significant between-groups differences in demographic and clinicopathologic variables except for smoking status (never smokers 43.3% for AC vs. 20.8% for non-AC; $p=0.037$). Non-AC OCSCC patients received a significantly lower total radiation dose ($p=0.0004$), lower radiation fractional dose ($p=0.0002$), and higher frequency of treatment delays or breaks than their AC matched pair counterparts. AC treatment was associated with improved overall survival ($p=0.006$), disease specific survival ($p=0.019$), and locoregional control ($p=0.016$). AC treatment was an independent predictor of overall survival on multivariate analysis ($p=0.019$), after adjustment for clinicopathologic differences between groups. **Conclusions:** Improved survival for combined modality treatment of OCSCC at the AC was noted on multivariate analysis. Differences in key radiation treatment metrics could explain survival differences noted in this study.

S53. WITHDRAWN--Tophaceous Gout of the Zygoma: Report of a Case and Review of Literature

Victoria B. Givens, New Orleans, LA; Celeste C. Gary, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to include gouty crystalline disease in the differential diagnosis of a facial lesion and understand the predisposing risk factors of gout for early diagnosis and treatment.

Objectives: Gout is a metabolic abnormality associated with inflammatory tophaceous deposition and debilitating arthropathy. Incidence of tophaceous gout of the zygoma is novel as literature lacks an existing account. We report a landmark case of tophaceous gout of the zygoma. **Study Design:** Case report and review of literature. **Methods:** A 78 year old male presented with an asymptomatic facial lesion of the left zygoma. Neurological workup was within normal limits. **Results:** Imaging studies demonstrated an expansile osseous

lesion of the zygomatic region. Pathology found crystalline material suggestive of gout. No further medical or surgical management was pursued by the patient. **Conclusions:** Knowledge of predisposing gouty risk factors and expansion of the differential diagnosis of a facial lesion to include tophaceous gout is necessary as early diagnosis and treatment often have a profound effect.

S54. Temporal Trends in Head and Neck Cancer Surgery Reconstruction

Zhen Gooi, MBBS, 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 demonstrate a broad understanding of the changing patterns in flap reconstruction for head and neck cancer. Participants should identify changes in patient population and surgical volume associated with flap reconstruction over the past decade. Participants should be able to demonstrate an understanding of factors associated with high volume surgical care and discuss the impact of high volume care on short term outcomes following flap reconstruction.

Objectives: Reconstructive surgery has become an indispensable part of the head and neck cancer (HNCA) surgeon's armamentarium in an era of increasing use of nonoperative treatment, with surgery increasingly being performed for salvage. We sought to characterize contemporary patterns of HNCA reconstructive surgery and identify variables associated with surgical care and short term outcomes.

Study Design: Retrospective cross-sectional study. **Methods:** Discharge data from the Nationwide Inpatient Sample for 133,850 patients who underwent a major ablative procedure for a malignant oral cavity, laryngeal, hypopharyngeal or oropharyngeal neoplasm in 1993-2010 was analyzed using cross-tabulations and multivariate regression modeling. **Results:** Reconstructive cases increased from 11% of cases in 1993-2000 to 16% of cases in 2001-2010. Compared to 1993-2000, flap reconstruction in 2001-2010 was significantly associated with prior radiation (OR 2.6, P=0.004), advanced comorbidity (OR 1.6, P=0.006), laryngeal cancer (OR 0.7, P=0.008), oropharyngeal cancer (OR 0.5, P<0.001), high-volume hospitals (OR 3.9, P=0.007) and high-volume surgeons (OR 2.0, P=0.028). High-volume surgeons were significantly more likely to perform reconstruction in patients with prior radiation (OR 1.8, P=0.024) and undergoing laryngectomy (OR 2.2, P=0.003). There was no association between high volume surgeon or hospital care and postoperative complications; however, high volume surgical care was associated with lower in-hospital mortality (OR 0.3, P=0.048). After controlling for all other variables, a statistically significant negative correlation was observed between surgery by a high volume surgeon, length of hospitalization and hospital related costs. **Conclusions:** These data reflect changing trends in HNCA reconstructive surgery, with meaningful differences in the type of surgical care provided by high volume surgeons.

S55. Oropharyngeal Squamous Cell Carcinoma among Veterans in the Era of HPV: Prognostic Indicators and Outcomes

John S. Hamblin, BS, Houston, TX; Vlad C. Sandulache, MD PhD, Houston, TX; Heath D. Skinner, MD PhD, Houston, TX; Jose P. Zevallos, MD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss prognostic factors, treatment, and outcomes among veterans with oropharyngeal squamous cell carcinoma.

Objectives: To evaluate prognostic factors, treatment, and outcomes among veterans with oropharyngeal squamous cell carcinoma (OPSCC). **Study Design:** Retrospective chart review. **Methods:** Patient and tumor characteristics, compliance with NCCN guidelines, and outcomes were collected for OPSCC patients treated between 2000 and 2012 at a tertiary care Veterans Affairs Medical Center (VA). **Results:** One hundred ten patients were identified. Mean age at diagnosis was 62 years and all were male. Eighty-nine percent of patients were smokers and 90% drank alcohol regularly. Primary tumor sites included base of tongue (45%), tonsil (15%), soft palate (25%), and lateral pharyngeal wall (12%). Fourteen percent of patients had T1, 30% T2, 24% T3, and 30% T4 tumors. Sixty percent of patients presented with advanced nodal disease (>N2A) and 3.6% with distant metastases. Primary treatment consisted of concurrent chemoradiation (55%), radiotherapy alone (27%), induction chemotherapy and concurrent chemoradiation (3%), and surgery (11%). Twenty-two percent of patients received palliative care or refused treatment. Gastrostomy and tracheostomy tubes were required in 25% and 13% of patients, respectively. Overall NCCN compliance was 95%. Disease free survival at 2 years was 48% and overall survival was 55%. **Conclusions:** Despite the emphasis on HPV positive OPSCC and treatment de-escalation in the general population, the VA population continues to have a high percentage of patients with tobacco and alcohol related OPSCC. A renewed focus on improving outcomes for OPSCC associated with traditional carcinogens is needed. Prospective studies should be aimed at developing novel multimodality approaches, including a reassessment of surgery as a possible primary treatment modality.

S56. SHIRLEY BARON RESIDENT RESEARCH AWARD

TP53 and CDKN2a Mutations in Non-Smoker Oral Tongue Squamous Cell Carcinoma

Chase M. Heaton, MD, San Francisco, CA; Megan L. Durr, MD, San Francisco, CA; Annemieke Van Zante, MD, San Francisco, CA; Osamu Tetsu, MD PhD, San Francisco, CA; Steven J. Wang, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of TP53 and CDKN2a somatic mutations in oral tongue squamous cell carcinoma from non-smokers.

Objectives: HPV-negative oral tongue squamous cell carcinoma in non-smokers represents a new and growing class of head and neck squamous cell carcinoma. The incidence and clinical significance of TP53 (encoding the p53 protein) and CDKN2a (encoding the

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p16INK4a protein) somatic mutations in non-smoking patients with HPV-negative tumors has not been studied. **Study Design:** Case series and laboratory analysis of archived tissue specimens. **Methods:** Paraffin embedded tumors from non-smokers with oral tongue squamous cell carcinoma were used in the study. p53 and p16 protein expression was determined with antibody based immunohistochemical (IHC) staining kits. Tumor sample DNA was isolated and amplified by PCR with the primer sets to detect CDKN2a exon 2 and TP53 exons 5-8. Direct sequencing and mutation analysis was then performed. Fisher's exact and Mann Whitney statistical tests were used to determine the clinical significance of the observed mutations. **Results:** Fifty-one samples were studied. TP53 mutations were seen in 10 patients (20%). There was no correlation between p53 IHC and TP53 mutations. Patients with TP53 mutations had statistically significant earlier recurrence ($p=0.024$), higher TNM stage (0.049), and more aggressive tumor differentiation (0.025) than those patients without mutations. CDKN2a mutations were seen in 4 patients (8%). There was no correlation between p16 IHC and CDKN2a mutations. Patients with CDKN2a mutations had statistically significant earlier recurrence ($p=0.019$) than those patients without mutations. **Conclusions:** TP53 and CDKN2a somatic mutations may contribute to carcinogenesis in non-smoker oral tongue squamous cell carcinoma and are associated with worse clinicopathologic characteristics.

S57. Use of Periodic Magnetic Resonance Imaging for Locoregional Surveillance of Salivary Gland Carcinoma

Shirin M. Hemmat, BA, San Francisco, CA; William R. Ryan, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of periodic surveillance imaging in patients with curative treatment for salivary gland carcinoma that are clinically without evidence of disease.

Objectives: To assess the utility and accuracy of periodic head and neck magnetic resonance imaging (HN-MRI) for the detection of locoregional recurrence in patients with salivary gland carcinoma (SGC). **Study Design:** Retrospective chart review. **Methods:** We analyzed 1) patients with SGC who underwent surgery at our institution from 2001-2011 with or without postoperative radiation; 2) had a negative post-treatment HN-MRI within 6 months after treatment; 3) then underwent one or more periodic HN-MRIs at least 6 months after treatment with no concurrent suspicious symptoms or exam findings; and 4) had at least 6 months of subsequent followup. Accuracy metrics were then determined. **Results:** 41 patients (with carcinoma of the parotid gland: 34 (83%), submandibular gland: 6 (15%), and sublingual gland: 1 (2%)) underwent 96 periodic HN-MRIs from 6 to 24 months after primary site excision in 41 (100%), neck dissection in 18 (44%), and postoperative radiation in 29 (71%). None of the periodic HN-MRI scans had a true positive finding. Six out of the 41 (15%) patients had a false positive finding. Patients who had a false positive finding underwent an increased number of subsequent periodic HN-MRI scans compared to patients who had negative findings on their periodic HN-MRI ($p=0.0065$). Periodic HN-MRI scans had a negative predictive value of 100%. **Conclusions:** The use of periodic HN-MRI for detection of locoregional recurrence of SGC appears to have a low utility when used in patients who do not have concurrent suspicious symptoms or exam findings.

S58. Long Term Outcomes of Revision Central Neck Dissection for Differentiated Thyroid Carcinoma

Matthew S. Hensler, MD, Cincinnati, OH; Mercedes Falciglia, MD, Cincinnati, OH; David L. Steward, MD*, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the risks and benefits of revision central neck dissection for recurrent thyroid carcinoma.

Objectives: Review long term outcomes of revision central neck dissection. **Study Design:** Single institution retrospective chart review. **Methods:** An IRB approved electronic database search using CPT code 60502 was used to identify patients undergoing revision central neck dissection for recurrent/persistent disease from February 2005 through June 2012. Primary outcomes included complications and recurrence. Patients with papillary and follicular (including insular and Hurthle) carcinomas were included. **Results:** 42 eligible patients were identified for inclusion with a mean followup of 4.6 years. Demographic analysis revealed a mean age of 52 years (range 14-88), and predominately female (83%), papillary (86%), without distant metastasis (87%), and unilateral dissection (69%). Recurrent laryngeal nerve injury was detected in 11.9%, however in all cases the nerve was involved with tumor ($p<0.0001$). Transient hypoparathyroidism, defined by PACU PTH < 15 pg/ml, occurred in 15%. Clinical recurrence requiring subsequent additional neck surgery was 13.6%. Low serum thyroglobulin (<1) was achieved in 59% of patients. **Conclusions:** The results of long term followup of patients undergoing revision central neck dissection for differentiated thyroid carcinoma showed the majority obtained undetectable or low serum thyroglobulin levels, but 14% of patients developed clinical recurrence in the neck requiring subsequent surgery. Rates of hypoparathyroidism were low, but recurrent laryngeal nerve injury was relatively higher than for initial surgery, with intraoperative recognition of nerve involvement by tumor the primary determinant. This can be difficult to determine preoperatively, and appropriate patient counseling prior to the procedure is important.

S59. Assessment of Shoulder Function following Head and Neck Reconstruction with the Supraclavicular Artery Flap

Marc W. Herr, MD, Boston, MA; Andrea A. Bonanno, PT DPT GCS CLT, Boston, MA; Lisa A. Montalbano, PT DPT, Boston, MA; Daniel G. Deschler, MD, Boston, MA; Kevin S. Emerick, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss various applications of the supraclavicular flap for head and neck reconstruction and understand the functional impacts associated with its use.

Objectives: The supraclavicular artery (SCA) flap is a pedicled fasciocutaneous flap that is thin, pliable, has an excellent color and texture match to the head and neck, and can be harvested in a short period of time. Such advantageous characteristics have led to a dramatic increase in both interest and utilization of the flap. Donor site complications are infrequent and typically self-limiting. There

have been no documented cases of prolonged or permanent functional morbidity of the shoulder; however, formal studies remain limited. The goal of this study was to formally assess the effects of SCA flap harvest on postoperative and long term shoulder strength and flexibility. **Study Design:** Prospective cohort study. **Methods:** Data was gathered prospectively during routine patient followup and surveillance. Functional outcomes were assessed using data gathered from two patient surveys and objective measurements of strength and flexibility performed by physical therapists. **Results:** Fifteen patients were evaluated from January to July, 2013. Analysis of data from the Constant Shoulder Score and Penn Shoulder Score surveys revealed good to excellent subjective function and minimal pain in fourteen patients. One patient reported moderate pain eight weeks postop. Fourteen patients demonstrated no significant difference in strength and mobility between the donor and non-donor shoulders. A single patient demonstrated mild impairment of lateral elevation and external rotation in the donor shoulder. **Conclusions:** The supraclavicular artery flap is a versatile reconstructive option for a multitude of head and neck defects and demonstrates no significant long term morbidity with regard to shoulder function.

S60. Pneumoparotitis

Laura K. House, BA, Jackson, MS; Tara L. Rosenberg, MD, Little Rock, AR; Andrea F. Lewis, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the etiology, clinical presentation, appropriate diagnostic tests, and treatment of pneumoparotitis with subcutaneous emphysema.

Objectives: To review a case of pneumoparotitis and compare it with other reported cases in the literature. **Study Design:** Case report and literature review. **Methods:** The case of a 34 year old inmate with bipolar disorder presenting with recurrent subcutaneous emphysema of the head and neck is reviewed. The patient's pertinent history, clinical findings and imaging studies are examined. **Results:** The patient had a recurrent history of subcutaneous emphysema involving the head and neck. He was afebrile, in no distress, and without dysphagia. Stensen's duct demonstrated purulent discharge bilaterally. Physical examination revealed palpable crepitans of the head and neck, greater on the left. He was unable to open his left eye. He refused direct laryngoscopy and esophagoscopy. Fiberoptic laryngoscopy and barium esophagram were normal. Computed tomography of the neck demonstrated significant left pneumoparotitis and subcutaneous emphysema involving the orbit and subcutaneous areas from the scalp to the clavicles, including deep fascial spaces. **Conclusions:** Pneumoparotitis is most frequently observed in pediatric and psychiatric populations. It has been reported in wind instrumentalists, divers, and balloon blowers of the adult population. Pneumoparotitis is usually caused by repeated retrograde movement of air via Stensen's duct into the parotid gland. This is an unusual presentation of pneumoparotitis and malingering. This patient had incentive to recreate his subcutaneous emphysema, as this allowed him to leave prison and receive narcotics.

S61. Mandibular Osteotomy for Expanded Transoral Robotic Surgery (MOTORS): A Novel Technique

Alfred Marc C. Iloreta, MD, New York, NY; Brett A. Miles, MD DDS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the advantage of technique of mandibular osteotomy in the setting of TORS.

Objectives: Transoral robotic surgery (TORS) has revolutionized the surgical treatment of malignant lesions of the oropharyngeal region. Recent studies have shown that this approach is a very safe procedure and can provide favorable clinical and functional outcomes with respect to traditional approaches. Many patients that present with lesions amenable to TORS resection may not be candidates due to anatomical access issues. Anatomic features such as a retrognathic mandible, macroglossia, trismus, dentition, and small oral aperture limit the ability to perform TORS with current technology. We propose a modified TORS approach in which transoral mandibular osteotomies are performed that can greatly improve exposure to oropharyngeal subsites and expand access to the larynx in selected patients. **Study Design:** Anatomic study of 5 experimental procedures was performed on 5 cadavers. **Methods:** Five cadavers were obtained for the investigation. Measurements including retractor opening, lateral cephalography, acoustic pharyngometry and high resolution photographs were taken prior to mandibular osteotomies and then repeated following the osteotomies. **Results:** An increase in retractor opening, transoral exposure, oral cavity was observed in all specimens. **Conclusions:** Mandibular osteotomies increase exposure to oral cavity and oropharyngeal lesions in the setting of transoral robotic surgery.

S62. Recidivism Rates of Patients with Advanced Head and Neck Squamous Cell Carcinoma Enrolled in Chemotherapy and Irradiation Treatment as a Function of Geography, Anxiety and Depression, and Substance Abuse

Ziad A. Katrib, MD, Louisville, KY; Ryan B. Nesemier, BS, Louisville, KY; Elizabeth L. Cash, PhD, Louisville, KY; Liz Wilson, BSN, Louisville, KY; Jeffrey M. Bumpous, MD*, Louisville, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effect of geography, psycho-social variables, and substance abuse on head and neck cancer patient's treatment completion rates.

Objectives: The multidisciplinary head and neck cancer clinic has been enrolling and treating patients for nearly 11 years. This clinic enrolls patients from many different geographic and socioeconomic backgrounds. No previous studies have analyzed the relationship between geography, anxiety and depression, and substance abuse with completion rates of the assigned treatments. To evaluate the completion rates of the assigned treatments between the different geographic, psychological, and behavioral variables present in this patient population. **Study Design:** Retrospective chart review at a tertiary care cancer center. **Methods:** We analyzed 476 patients that were assigned either chemotherapy and/or irradiation, but not operative intervention, between 2009 and 2012. Patients were between the ages of 40 and 80, and had a pathological diagnosis of squamous cell carcinoma of the head and neck. **Results:** Of the 476

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patients reviewed, 452 patients completed treatment. Although not statically significant, patients who lived within 10 miles of the cancer center appeared to have lower completion rates than patients who lived 11-25 miles from the center. Completion rates were not affected by anxiety, depression, and substance abuse. **Conclusions:** Despite varying socioeconomic and psychological risk factors, patients enrolled in the multidisciplinary head and neck cancer clinic have very high treatment completion rates.

S63. Polymorphous Low Grade Adenocarcinoma: A Review of the Literature

Adam J. Kimple, MD PhD, Chapel Hill, NC; Grace G. Kim, MD, Chapel Hill, NC; Rupali N. Shah, MD, Chapel Hill, NC; Chris M. Welch, MD PhD, Chapel Hill, NC; Adam M. Zanation, MD*, Chapel Hill, NC; William W. Shockley, MD*, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the overall incidence of polymorphous low grade adenocarcinoma among salivary gland tumors, sites of presentation, potential for metastasis and recurrence rates.

Objectives: Information on polymorphous low grade adenocarcinoma (PLGA) consists primarily of case reports and institutional series with varying recurrence rates. We conduct a systematic review to assess the overall incidence of PLGA among oral salivary gland tumors and determine recurrence rates. **Study Design:** A literature based systematic review. **Methods:** PubMed and Medline databases were queried using the search terms polymorphous low-grade adenocarcinoma from January 1984 to January 2012. Two hundred and fifty-eight case reports, case series and large series were identified. These articles were abstracted and analyzed. **Results:** In a total of 8423 pooled intraoral salivary tumors the incidence of PLGA 1.2%. Our literature review identified 54 case reports, 8 case series, and 17 large series totaling 456 cases of PLGA. The overall recurrence rate was 19.1%. Half of the recurrences occurred by 36 months; however, recurrences were reported up to 24 years after initial resection. The most common site of presentation was the palate. **Conclusions:** PLGA arises from minor salivary glands and is characteristically slow growing and indolent. While these tumors may be histologically low grade, our review casts doubt on the concept that these tumors routinely behave in a low grade fashion. Recurrence rates approach 20%. Lymph node metastasis as well as distant metastasis are rare but can occur.

S64. A Description of the Anatomy Glossopharyngeal Nerve as Encountered in Transoral Surgery

Summit B. Kundaria, MD, Pittsburgh, PA; Chengyuan Wang, MD, Beijing, China; Umamaheswar Duvvuri, MD PhD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the course of the glossopharyngeal nerve when encountered transorally.

Objectives: To describe the anatomy of the glossopharyngeal nerve as encountered during transoral surgery. **Study Design:** Anatomic study of eight fresh cadaveric heads, injected with latex dye. **Methods:** Fresh cadaveric heads were prepared by injecting silicone into the arteries and veins. Transcervical dissections of the parapharyngeal space were carried out using an operating microscope and microsurgical instruments, and the glossopharyngeal nerves were identified. The heads were placed in the surgical position with a mouth gag, and a transoral lateral oropharyngectomy was carried out. Detailed measurements of the lengths and branches of the nerves were made. **Results:** The glossopharyngeal nerve was divided into three segments: the upper segment superior to the stylopharyngeus muscle (SPM), the middle segment posterior to the SPM, and the inferior segment from the SPM to its termination in the base of tongue. The lengths of the upper, middle, and lower segments are 9.1 ± 1.2 mm, 7.0 ± 1.5 mm, and 16.5 ± 2.2 mm, respectively. The total length is 32.6 ± 3.1 mm. The average number of branches in the upper, middle, and lower segments is 3, 4, and 3, respectively. There were no significant differences in these values between specimens or between left and right sides. **Conclusions:** We provide data that allows for reliable identification and preservation of CN IX. This may have implications for postoperative pain, dysgeusia, and dysphagia after oropharyngectomy. As transoral oropharyngectomy is practiced with increasing frequency, a better understanding of the neurovascular anatomy may help reduce the morbidity of surgery.

S65. p16 Status and Neck Nodal Disease in Oropharyngeal Squamous Cell Cancer

Heather E. Lee, MD, Louisville, KY; Kevin L. Potts, MD, Louisville, KY; Jeffrey M. Bumpous, MD*, Louisville, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that despite high incidence of cervical lymph node metastasis with oropharyngeal cancers, there was no association found between p16 status and clinically and radiologically positive cervical lymph nodes.

Objectives: To investigate the relationship of p16 status and cervical lymph node metastasis for oropharyngeal squamous cell carcinomas (OPSCC). In particular, does p16 status influence clinical and radiological N positive status and stage. Secondly when p16 status and pack-year history of tobacco use are considered do differences in neck nodal status emerge. **Study Design:** Retrospective analysis. **Methods:** In total, 104 patients diagnosed with OPSCC between 2010 and 2012 were included in the study. Demographic data, smoking history, p16 and HPV status, and presence and location of clinically and radiologically positive nodes, and pathologic features including lymphovascular invasion (LVI), perineural invasion (PNI) and extracapsular spread (ECS) were reviewed retrospectively. **Results:** Of the 104 patients, 8% were p16-, 72.1% were p16+, 59.6% were HPV-, 10.6% HPV+. Comparison between p16 status and clinically or radiologically positive lymph nodes failed to show statistical significance ($p=0.797$ and $p=0.984$, respectively). p16 compared with pathologic features did not reveal statistical significance (LVI $p=0.309$; PNI $p=0.545$; ECS $p=0.555$). After stratification

of the p16+ group for smoking history (≤ 10 versus >10 pack-year), significant differences emerged for clinically positive nodes ($p=.003$). Survival analysis revealed a significant difference between all 3 groups (Wilcoxon=11.465; $p=.003$) with p16- patients experienced the poorest survival when compared to p16+ patients ($p's<.046$). **Conclusions:** There was no significant association between p16 status and clinically or radiologically identified neck nodal disease for OPSCC. P16 positive and negative oropharyngeal cancers were equally likely to have clinical and radiologically positive nodes.

S66. Etiology of Long Term Dysphagia in Total Laryngectomy Patients: The Impact of a Postoperative Fistula
David H. Ludlow, MD, Shreveport, LA; Timothy S. Lian, MD FACS, Shreveport, LA; Cherie Ann O. Nathan, MD FACS*, Shreveport, LA; Vikas Mehta, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify fistula as a concerning factor for dysphagia in total laryngectomy patients.

Objectives: With the increasing emphasis on functional outcomes in head and neck cancer, the study of dysphagia has been largely limited to patients undergoing organ preservation and endoscopic surgical techniques. Despite the impossibility of aspiration, complete disruption of the pharyngeal musculature after total laryngectomy leads to a high incidence of postoperative dysphagia. The etiology of long term dysphagia in post-laryngectomy patients has yet to be elucidated, including its association with surgical techniques and complications. Our objective was to investigate predictive factors for long term dysphagia in total laryngectomy patients. **Study Design:** Retrospective study. **Methods:** A retrospective study was performed of 73 total laryngectomy patients at our institution between 2003 and 2010. Information regarding dysphagia and pharyngocutaneous fistula was present in 57 patients. Additional factors assessed were age, race, TNM staging, nutritional status, anemia, primary treatment modality, and type of pharyngeal closure. **Results:** The overall dysphagia rate in this study was 47.4%. Of those reporting dysphagia after completion of treatment, 59% had a history of a postoperative fistula. Chi squared analysis revealed a strong association ($p<0.0001$) between long term dysphagia and fistula. **Conclusions:** While some degree of swallowing difficulty in laryngectomy patients may be implicit to the procedure, patients who developed a pharyngocutaneous fistula demonstrated higher rates of dysphagia. With recent emphasis on organ preservation techniques, many undergo laryngectomy after having received chemotherapy and radiation. Chemoradiation results in poor tissue quality and predisposes to fistula formation. With the close relationship between dysphagia and fistula, achieving good closure of the neopharynx is essential and may require extensive reconstructive techniques.

S67. Occult Merkel Cell Carcinoma of the External Auditory Canal Presenting as Diffuse Cervical Lymph Node Metastases
Brian A. Moore, MD, New Orleans, LA; Alison G. Kartush, BA, New Orleans, LA (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the variety of presentations for Merkel cell carcinoma; 2) discuss the clinical evaluation of a patient presenting with anterior and posterior triangle adenopathy, with a focus on potential cutaneous sources; and 3) explain the clinical and pathologic features of Merkel cell carcinoma.

Objectives: Merkel cell carcinoma (MCC) is a rare and aggressive neuroendocrine neoplasm of the skin, most commonly found on the head and neck. MCC has a high propensity for lymphatic spread; 50% of all cases have metastases upon diagnosis. Misdiagnosis of MCC is very common due to its similarities in clinical and pathologic appearance to both benign and malignant neoplasms. Therefore, it is important to have a high index of suspicion for MCC to secure an accurate and timely diagnosis. While most cases of MCC involve sun exposed tissues, MCC of the external auditory canal is exceedingly rare. We highlight the case of a 50 year old man who presented with diffuse anterior and posterior cervical triangle lymphadenopathy as the initial finding of a concealed primary lesion. **Study Design:** Retrospective case report. **Methods:** Review of clinical, radiographic, and pathologic data. **Results:** Identification of the occult primary tumor ensured an accurate diagnosis, facilitating multidisciplinary treatment. **Conclusions:** Merkel cell carcinoma should be included in the differential diagnosis of small blue cell tumors in the head and neck. Patients presenting with anterior and posterior triangle adenopathy should be evaluated for a cutaneous primary, with particular focus on the ear and temporal scalp.

S68. Incidence and Predictors of Contralateral Occult Lymph Node Metastasis in Advanced Medial Wall Pyriform Sinus Squamous Cell Carcinoma Presenting with a Clinically N0 Contralateral Neck
Wataru Nishijima, MD, Ageo, Saitama Japan; Joshua Tokita, MD, Iowa City, IA (Presenter); Nobuhiro Tokita, MD, Kawagoe, Saitama Japan; Seiji Kishimoto, MD, Tokyo, Japan; Masahisa Saikawa, MD, Kashiwa, Saitama Japan

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) appreciate the frequency of occult nodal metastasis in T3 and T4 medial wall pyriform sinus squamous cell carcinoma presenting with a clinically N0 contralateral neck; 2) understand factors that correlate with the frequency of contralateral nodal metastasis; 3) consider bilateral neck dissection in treatment of patients presenting with T3/T4, N+ medial wall pyriform sinus SCC regardless of nodal status of the contralateral neck.

Objectives: The objective of this study was to determine the incidence and predictors of contralateral occult lymph node metastasis in clinically N0 contralateral necks in patients presenting with T3/T4, ipsilateral N+ medial wall pyriform sinus SCC. **Study Design:** Retrospective chart review and literature search. **Methods:** We reviewed the medical records of 33 patients with medial wall pyriform sinus SCC and vocal fold fixation (T3 or T4 stage) and at least one clinically detectable ipsilateral lymph node. Each patient underwent laryngopharyngectomy with bilateral neck dissection followed by reconstruction using a free jejunal autograft. Surgical treatment was con-

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ducted with curative intent. In each case, the T and N stage were noted as well as the number of positive nodes found in each sample. **Results:** Clinically detected nodes were histologically confirmed. Occult nodes were found in 25 of 33 patients (75%) and occult metastasis to the contralateral neck nodes was detected in 23 of 33 patients (70%). Neither T nor N stage correlated with the presence of contralateral metastasis. Contralateral nodes were found in 12 (63%) of T3 and 11 (77%) T4 stage patients ($p=0.57$) and in 13 (65%) of N1 and 11 (77%) N2a stage patients ($p=0.63$). T stage did correlate with the total number of contralateral occult nodes. Median number of occult nodes for T3 and T4 was 1.20 and 2.29 respectively ($p=0.039$). N stage did not correlate with a higher incidence of positive nodes. Median number of occult nodes for N1 and N2a was 2.0 occult nodes and 4.0 nodes respectively. **Conclusions:** Contralateral lymph node metastasis in clinically N+ ipsilateral and N0 contralateral necks occurred more frequently than expected. We advocate bilateral neck dissection in all patients presenting with T3/T4, N+ medial wall pyriform sinus SCC regardless of nodal status of the contralateral neck.

S69. VICE PRESIDENT'S RESIDENT RESEARCH AWARD
Prevalence and Relationship between Oral and Anal Human Papillomavirus Infections in Men with HPV Related Anogenital Dysplasia
Brandon L. Prendes, MD, San Francisco, CA; Eli R. Groppo, MD, Sacramento, CA; Joel M. Palefsky, MD, San Francisco, CA; David W. Eisele, MD*, Baltimore, MD; Steven J. Wang, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the prevalence of oral HPV infection in men at high risk for oropharyngeal HPV colonization and identify risk factors associated with oral HPV infection.

Objectives: Human papillomavirus (HPV) is an etiologic agent for anogenital and oropharyngeal carcinoma, however, little is known about the relationship between oral and anogenital HPV infections. We sought to determine the prevalence of oral HPV infection in men with HPV related anogenital dysplasia and to identify risk factors for oral and concordant oral-anal HPV infection. **Study Design:** Cross-sectional cohort study. **Methods:** Oral rinse and anal brushing samples were collected from 66 men who have sex with men (MSM) and had a history of HPV related anal dysplasia. Samples were analyzed for HPV DNA and were type specified by in situ hybridization to an HPV DNA probe array. Each patient completed a survey querying demographic history, sexual behaviors, and substance use. **Results:** Overall oral HPV prevalence was 30.3%. Prevalence of oral HPV infection with high risk subtypes was 10.6%, with HPV 16 amongst the most prevalent high risk subtypes (3.0 %). Concurrent oral-anal HPV infection was found in 26% of patients and was significantly associated with: age at first sexual encounter, number of male penile-anal sex partners, number of male oral-penile sex partners, and number of male oral-anal sex partners ($p < 0.05$). On multivariate analysis, HIV positivity and number of male oral-penile sex partners were associated with oral HPV infection ($p < 0.05$). **Conclusions:** Prevalence of oral HPV infection in this cohort of MSM with HPV related anal dysplasia is high. Increased risk of oral HPV infection was associated with HIV positivity and oral sex practices.

S70. Asymptomatic HPV Associated Oropharyngeal Squamous Cell Carcinoma—An Emerging Incidentaloma
Jordan P. Sand, MD, St. Louis, MO; Brian Nussenbaum, MD*, St. Louis, MO; Bruce H. Haughey, MD ChB*, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss an emerging trend of asymptomatic HPV associated oropharyngeal squamous cell carcinoma being diagnosed incidentally while undergoing evaluation for other completely different disease processes.

Objectives: Identify and describe an emerging trend of purely incidentally identified asymptomatic HPV associated oropharyngeal squamous cell carcinoma (OPSCCa). **Study Design:** Case series. **Methods:** Patient identification was based on clinical experience at a tertiary care academic medical center from July 2011 to July 2013. Patients were selected if they were diagnosed with an asymptomatic HPV related OPSCCa while undergoing evaluation for a completely different clinical problem. Institutional review board approval was obtained. Clinical records were reviewed and a literature search for head and neck incidentalomas utilizing PubMed was performed. **Results:** Five patients were identified with asymptomatic HPV associated OPSCCa found during workup for other nonrelated medical problems. Four of these patients were found to have early T-stage disease and underwent surgical treatment as a single modality. One patient had advanced stage disease and subsequently underwent chemoradiation. At a mean followup of 11.6 months, four of the patients remained disease free and the fifth patient is currently undergoing chemoradiotherapy. **Conclusions:** With the epidemic increase of HPV associated OPSCCa and lack of screening technologies for early disease, purely incidentally diagnosed HPV associated OPSCCa is likely to increase in incidence. Early experience suggests that these patients have an excellent prognosis, potentially with unimodality therapy. Ultimately, clinical acumen and judgment are necessary components when evaluating a patient as an astute observation may lead to a diagnosis of an asymptomatic OPSCCa with a favorable outcome after treatment.

S71. Surgical Treatment of Myositis Ossificans Traumatica of the Neck: A Case Report
Abraham M. Sheffield, MD PhD, Iowa City, IA; James V. Nepola, MD, Iowa City, IA; Henry T. Hoffman, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the pathophysiology of myositis ossificans traumatica, its diagnosis, surgical treatment and risk of recurrence as applied to a case of unusual localization within the neck.

Objectives: We report on surgical excision for treatment of a unique case of myositis ossificans traumatica (MOT) of the neck that developed secondary to trauma sustained in a snowmobile accident. **Study Design:** Illustrative case report and literature review. **Meth-**

ods: A 40 year old woman was referred to our clinic for evaluation of left neck pain and firm mass 3 months after a snowmobile accident resulted in left humerus fracture and neck trauma. Further evaluation, including CT imaging, suggested MOT. Approximately one year after the original trauma, pain persisted and surgery was performed to remove the heterotopic bone. **Results:** Intraoperatively, we identified the trapezius branch of the spinal accessory nerve and dissected down to the mass, which was then successfully excised by the orthopedic team. Histopathologic examination of the specimen confirmed the diagnosis of myositis ossificans. The risk of recurrence (>10%) and the potential role for postoperative irradiation to reduce this risk was discussed with the patient. Radiation therapy was not pursued given the relative youth of patient. Patient reported relief of pain for 11 months followed by return of mild discomfort, a concern for possible recurrence. **Conclusions:** Myositis ossificans traumatica is a disorder of heterotopic bone formation occurring in response to soft tissue trauma. It is generally a benign, self-limiting disease, however surgical intervention is warranted in some instances. This report describes the surgical treatment of a case of MOT that is unique given its location in an accessory muscle of the left neck.

S72. Epstein-Barr Positive Mucocutaneous Ulcer: A Rare Lesion Presenting as a Large Lower Lip Mass
 Shalin M. Soni, BS, Orlando, FL; Ronald W. Mercer, BA, Orlando, FL (Presenter); Kavita M. Pattani, MD, Orlando, FL;
 James M. Magill, MD, Orlando, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the risk factors, clinical presentation, clinical course and histopathology of Epstein-Barr positive mucocutaneous ulcers.

Objectives: To review a case of Epstein-Barr virus positive mucocutaneous ulcer involving the lower lip. **Study Design:** Case report. **Methods:** Retrospective chart review and a review of the literature. **Results:** We present a unique case of EBV positive mucocutaneous ulcers presenting in an 89 year old man. The patient presented with multiple scalp lesions and a large lower lip lesion which had been rapidly enlarging over the course of several months, causing dysphagia and a 10 pound weight loss. Prior tissue biopsy of the lesions were suspicious for squamous cell carcinoma, so the patient underwent resection of the scalp lesions and of the lip mass with radial forearm flap reconstruction in addition to a selective neck dissection of levels I-IV. Final pathology revealed cells which were morphologically similar to Hodgkin s Reed Sternberg cells and were reactive with CD45, MUM-1, CD138, PAX-5, CD79a, EBV-ISH, and Ki67, indicating a diagnosis of EBV positive mucocutaneous ulcer. All margins and lymph nodes were found to be negative. **Conclusions:** Epstein-Barr virus (EBV) positive mucocutaneous ulcer is a form of EBV associated lymphoproliferative disorder associated with drug induced and age related immunosenescence. It should be considered in the differential diagnosis of elderly patients and patients with drug induced immune suppression who present with an ulcerative lesion.

S73. Can Presenting Symptoms Predict Primary Tumor Site in HPV Positive OPSCC Patients?
 Amit J. Sood, BA, Charleston, SC; Wesley R. McIlwain, BS, Charleston, SC; Shawn M. Stevens, MD, Charleston, SC;
 Shaun A. Nguyen, MD, Charleston, SC; Terry A. Day, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss specific presenting symptoms that may predict primary tumor site in HPV positive oropharyngeal squamous cell carcinoma patients.

Objectives: 1) To determine if presenting symptoms are predictors of primary tumor site in HPV positive OPSCC patients; and 2) to determine if complaints of neck mass is a predictor of primary tumor site in HPV positive OPSCC patients. **Study Design:** Retrospective medical record review. **Methods:** We performed a retrospective review of all untreated OPSCC patients with known HPV status evaluated by one physician in a tertiary care cancer center from 2008 to 2013. Initial patient reported symptoms and primary tumor site (tonsillar complex, base of tongue, soft palate, and posterior oropharynx) were extracted from our electronic medical record through provider encounter notes. **Results:** Of 430 patient charts identified with OPSCC, 88 patients met inclusion criteria with 81% (n=71) HPV positive and 19% (n=17) HPV negative. In the HPV positive patients, reporting a visible mass (r=0.429, p=0.001) correlated with tonsillar complex, whereas weight loss (r=0.239, p=0.04) and change in voice (r=0.360, p=0.002) correlated with base of tongue. Reporting of globus sensation (r=0.233, p= 0.05) and trismus (r=0.252, p=0.03) correlated with soft palate. Although reliably indicating nodal disease, reporting of a neck mass revealed no statistical difference between primary sites. **Conclusions:** This study provides preliminary evidence that certain presenting symptoms may predict primary tumor site location in HPV positive oropharyngeal squamous cell carcinoma patients. This information may aid in detection of HPV positive oropharyngeal cancers when the primary site has not been determined and supports the need for comprehensive head and neck examination of certain oropharyngeal locations based upon patient presenting symptoms.

S74. Survival Benefit of Surgical Therapy in Elderly Head and Neck Cancer Patients
 William Alvo Stokes, BS, Charleston, SC; Marion Boyd Gillespie, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the benefit of surgical treatment versus no surgical treatment for head and neck squamous cell carcinoma in elderly patients.

Objectives: To determine the therapeutic benefit of surgery for elderly head and neck cancer (HNC) patients. **Study Design:** Retrospective case controlled study. **Methods:** Post-op overall survival (OS) for patients undergoing HNC surgery from 2004-2009 was calculated from the SEER database and combined with a local cohort from a tertiary care cancer center treated between 2000-2011. The local tumor registry calculated 1 and 3 month OS after surgery, as well as the institutions average time to surgery which correlated with SEER's overall survival at 3 month post diagnosis. **Results:** We found no statistical difference between the <75 and 75+ patient groups'

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1 and 3 month post-op OS in the in the local cohort. The average lag time to treatment was 1.55 months (95% CI=1.44-1.66). In the SEER database, there was a statistically significant decrease in 3 month survival for the 75+ patients versus patients with ages between 1-74 years that received surgery [93.1% (95% CI=92.71-93.49%) versus 80.3% (95% CI=79.12%-81.48%); $p<.001$]. However, another SEER analysis found a significant increase in 2 and 5 year OS for 75+ patients who underwent surgery compared to those who did not (2 year OS, no surgery=26.6% (95% CI=29.15-24.05%) versus surgery=40.3% (95% CI= 36.18-44.42%); 5 year OS, no surgery=13.1% (95% CI=10.36-15.84%) versus surgery=22.3% (95% CI=17.40-27.20%)($p<.001$ after controlling for stage). **Conclusions:** Despite an increase in immediate postoperative mortality, surgery offers overall benefit to elderly HNC patients. Given the survival benefit, surgery should remain an important part of the treatment paradigm in older HNC patients.

S75. JOSEPH OGURA, MD RESIDENT RESEARCH AWARD

Comparative Finite Element Analysis for Defect Reconstruction with Local Flaps

Mausumi N. Syamal, MD, Detroit, MI; Tamer A. Ghanem, MD, Detroit, MI; Scott T. Lovald, PhD, Menlo Park, CA; Jorge A. Ochoa, PhD, Menlo Park, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to see the utility of comparative 2D finite element analysis (FEA) to select the optimum local flap for facial defect reconstruction.

Objectives: To utilize comparative 2D finite element analysis (FEA) to select the optimum local flap for facial defect reconstruction.

Study Design: Computer simulation study based on prior validated 2D, nonlinear hyperelastic human skin/face models. **Methods:** 2D finite element models of 6 discrete surgical flaps (advancement short and long, rotational, rhomboid, Webster hybrid(s), and Dufourmentel) were parameterized for reconstruction of a 2 x 2cm facial defect. Flap edges were first displaced to seal the defect and the resultant defect edges were coupled to simulate stitching and relaxed to allow the skin to displace to its steady state. ANSYS 12.1 was used to compute the stress/strain and reaction force results. **Results:** FEA analysis allows the surgeon to model a surgical defect and plan the optimum closure by providing valuable stress/strain information as well as anticipate potential problems such as dog earing and coning. For our defect, a Webster hybrid flap was the best option analyzed taking into consideration neighboring structures (eye, ear, scalp), skin tension lines and extent of undermining and cutting required. **Conclusions:** The utility of finite element models for analyzing and planning presurgical endeavors have been documented in the field of otolaryngology as well as head and neck reconstruction. However, to the best of our knowledge, no such studies have been documented for comparative surgical planning. Our study serves not only to fill this void but to also show its utility in flap planning, suture placement, avoidance of complications and predicting eventual viability.

S76. Nasopharyngeal Carcinoma Mimicking Juvenile Nasopharyngeal Angiofibroma

Bobby A. Tajudeen, 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 differentiate pediatric nasopharyngeal carcinoma (NPC) and juvenile nasopharyngeal angiofibroma (JNA) by radiographic and clinical means.

Objectives: To differentiate radiographic and clinical features of pediatric NPC and JNA. **Study Design:** Case report and review of the literature. **Methods:** Two patients were identified with nasopharyngeal masses diagnosed as JNA who on final histopathology was found to have NPC. The records of these patients were reviewed and their case histories are presented, with a review of the literature. **Results:** Two male patients, aged 13 and 16 years, presented with unilateral epistaxis, and clinical exam showing a polypoid/reddish mass in the nasopharynx. Preoperative MRI showed a hypervascular mass centered in the nasopharynx. Both patients underwent embolization for presumed JNA. Feeding vessels were found from the ascending pharyngeal and internal maxillary artery as well as the internal carotid artery. Endoscopic resection was performed in both instances and final pathology returned as NPC. Upon review of the imaging, one patient had no evidence of involvement of the pterygopalatine fossa, and while the other patient had involvement of the pterygopalatine fossa, there was also an enlarged level IIa lymph node with central hypodensity suggestive of metastasis. **Conclusions:** NPC and JNA can be easily confused and their angiographic appearances can be indistinguishable. JNA presents with pathognomonic enlargement of the sphenopalatine foramen. Care should be taken in diagnosing young, male patients with JNA when atypical findings are noted in preoperative imaging such as absence of involvement of the pterygopalatine fossa and the presence of abnormal lymph nodes. However, biopsy of a unilateral nasal mass in a teenage male still should be performed in the operating room.

S77. Analysis of Single Ipsilateral Cervical Nodes in Advanced Cancer of the Pyriform Sinus

Joshua Tokita, MD, Iowa City, IA; Wataru Nishijima, MD, Ageo, Saitama Japan; Nobuhiro Tokita, MD, Kawagoe, Saitama Japan; Seiji Kishimoto, MD, Tokyo, Japan; Masahisa Saikawa, MD, Kashiwa, Saitama Japan

Educational Objective: At the conclusion of this presentation, the participants should be able to: 1) discuss the frequency of occult metastases in lymph nodes in patients with advanced stage (stage III/IV); 2) appreciate the clinical and surgical implications of a single clinically detected lymph node; 3) understand the importance of meticulous surgical dissection and resection of lymph bearing tissue in the vicinity of clinically palpable nodes; and 4) appreciate inherent difficulties in designing prospective clinical studies while minimizing bias.

Objectives: 1) Determine the frequency of occult metastases in lymph nodes in patients with advanced stage (stage III/IV) and a single clinically detected lymph node; and 2) emphasize the importance of meticulous surgical dissection and resection of lymph bearing tissue

in the vicinity of clinically palpable nodes. **Study Design:** This prospective case series studied 30 consecutive cases of stage III/stage IV hypopharyngeal squamous cell carcinoma (HPSCC) with vocal fold fixation who presented with a single clinically detected ipsilateral lymph node. **Methods:** All patients underwent evaluation and surgical resection of the tumor at a single comprehensive cancer institution. Tumors resected from seven of the 30 patients were subjected to serial examination of every 5 μ m section (group A). Tumors from the remaining 23 patients (group B) were subjected to routine examination consisting of an evaluation of a 5 μ m section every 150 μ m. **Results:** Group A revealed a median number of three occult metastatic nodes per neck (range 2-6, mean 2.71, 95% CI [1.2, 4.2]). Group B showed one positive occult node (range 0-4, mean 1.35, 95% CI [0.9, 1.8]). Median number of total positive nodes in group A was 4 (range 2-6, mean 3.7, 95% CI [2.1, 5.2]). Median number of total positive nodes in group B was 2 (range 1-5, mean 2.3, 95% CI [1.8, 2.8]). There was an increase in the number positive nodes detected in group A versus group B ($p=0.018$). All small positive nodes were found within a few millimeters of the clinically detected ipsilateral node. **Conclusions:** Multiple micrometastases are almost certain to exist in patients with advanced stage HPSCC who present with a single ipsilateral node. We advocate aggressive surgical treatment emphasizing meticulous dissection to include resection of lymph bearing tissue in the vicinity of a clinically palpable node.

S78. Bilateral Carotid Body Tumors in the Setting of Chronic Hypoxia from a Rare Congenital Heart Defect

Ashley E. Wenaas, MD, Houston, TX; Alexander H. Gelbard, MD, Nashville, TN; Robert B. Parke, MD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the etiology of disordered oxygen sensing underlying paraganglioma formation. Participants should also be able to compare the phenotypic similarities between inheritable mutations in oxygen sensation that lead to paraganglioma formation with states of chronic hypoxia that induce cellular hyperplasia.

Objectives: To reinforce the etiology of disordered oxygen sensing that leads to paraganglioma formation in the carotid body through the presentation of a patient exposed to chronic hypoxia due to a congenital heart defect. The presentation of carotid body tumors in this setting has not previously been discussed. **Study Design:** Case report and literature review. **Methods:** Literature review reveals hereditary carotid body tumors arise in the absence of any hypoxic stimulus. Analysis of affected families has previously revealed germ line mutations in the SDHD gene, which encodes a mitochondrial respiratory chain protein (cybS) implicated in oxygen sensing. Interestingly, chronic exposure to hypoxia also induces cellular hyperplasia and anaplasia in the carotid body. We describe a patient that presented with no family history of paraganglioma, but with bilateral carotid body tumors and a rare congenital heart defect that led to a state of chronic hypoxia. **Results:** Our patient is a 38 year old woman with incidentally found bilateral carotid body tumors and a rare congenital heart pathology including an unrepaired tetralogy of Fallot defect, pulmonary artery atresia, a ventricular septal defect, and collateral arteries branching off the aorta that supplied both lungs. Her baseline SpO₂ was 83%. She was diagnosed with non-hormone producing, bilateral carotid body paragangliomas that developed in response to her state of chronic hypoxia. **Conclusions:** Although this case represents the extreme presentation of a rare tumor, the phenotypic similarity between hereditary carotid body tumors and the normal carotid body exposed to chronic hypoxia reinforces the etiology of disordered oxygen sensing underlying paraganglioma formation.

S79. Diagnostic Value of MRI in the Evaluation of Pleomorphic Adenoma and Other Parotid Gland Tumors

Soroush Zaghi, MD, Los Angeles, CA; Leenoy Hendizadeh, BS, Los Angeles, CA; Tony Hung, MD, Los Angeles, CA; Elliot Abemayor, MD PhD*, Los Angeles, CA; Ali Sepahdari, MD, Los Angeles, CA

Educational Objective: At the conclusion of the presentation, the participants should be able to identify MRI findings characteristic of pleomorphic adenoma of the parotid gland and discuss the diagnostic utility of MRI in the preoperative evaluation of parotid gland tumors.

Objectives: To validate an MRI algorithm characteristic of pleomorphic adenoma and assess the utility of MRI vs. fine needle aspiration in the diagnostic evaluation of parotid gland tumors. **Study Design:** Cross-sectional analysis. **Methods:** PowerPath database was searched for all parotidectomy specimens from 2001-2012 with a final diagnosis of pleomorphic adenoma, Warthin's tumor, mucoepidermoid carcinoma, acinic cell carcinoma, or carcinoma expleomorphic adenoma. The radiology system was cross referenced to identify cases for which preoperative MRIs were available for analysis. MRI images were graded for 5 criteria by a neuroradiologist blinded to the clinical history and pathologic diagnosis. The accuracy of preoperative fine needle aspiration cytology (FNAC) was assessed by comparison to final pathology. **Results:** A total of 66 parotidectomy cases were identified (pleomorphic adenoma n=42, Warthin's tumor n=8, mucoepidermoid carcinoma n=9, acinic cell carcinoma n=5, carcinoma expleomorphic adenoma n=2). MRI imaging characteristics that are high probability for pleomorphic adenoma include: bright T2-signal, sharp margins, heterogeneous nodular enhancement, lobulated contours, T2-dark rim. If all 5 radiologic criteria are fulfilled, MRI has a specificity of 91.6% and sensitivity of 40.4% for pleomorphic adenoma. FNAC had 92.8% specificity and 76.2% sensitivity for pleomorphic adenoma and provided no additional diagnostic utility for tumors that met the high probability MRI criteria. **Conclusions:** A high probability MRI is more than 90% specific for pleomorphic adenoma. This may allow the surgeon to reliably avoid FNAC and proceed directly to resection in the subset of patients with MRI imaging that is highly suggestive of pleomorphic adenoma.

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S80. Expression of Poor Prognostic Biomarkers in Cutaneous Squamous Cell Carcinoma of the Parotid

Terence M. Zimmermann, MPH, Birmingham, AL; Larissa Sweeny, MD, Birmingham, AL; Major B. Burch, MS, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to compare and discuss the differing prognostic biomarkers in terms of levels of expression and implications for prognosis in cutaneous squamous cell carcinomas of the parotid.

Objectives: Extracellular matrix metalloproteinase inducer (EMMPRIN) and epidermal growth factor receptor (EGFR) are upregulated in cutaneous squamous cell carcinoma (cSCC), and increased expression is associated with poor outcomes. Our objective was to evaluate biomarker expression indicative of poor prognosis. **Study Design:** Patients who underwent a parotidectomy for cSCC at a tertiary care center between 2003 and 2012 were included (n = 218). Of these, 28 archived tumor samples were chosen for further molecular analysis. **Methods:** These 28 patients were separated into three cohorts: positive cervical lymph nodes (n=7), positive parotid and cervical lymph nodes (n=12), and neither cervical nor parotid lymph nodes positive (n=9). The expression of EMMPRIN, BMP-6, S100A9, and EGFR was examined by three blinded observers using immunohistochemistry techniques. **Results:** The positive parotid cohort demonstrated high EGFR reactivity (2+-3+) (100%, n=12) compared to the positive cervical cohort (71%, n=5) and the lymph node negative cohort (67%, n=6). Few patients across all cohorts demonstrated high BMP-6 reactivity (29%, n=8). The positive parotid cohort demonstrated high S100A9 reactivity (75%, n=9), as did the lymph node negative cohort (89%, n=8). All cohorts demonstrated high EMMPRIN reactivity (86-92%, n=23). However, expression of EGFR, S100A9, BMP-6, and EMMPRIN did not differ significantly between the three cohorts. Increased EGFR expression did significantly correlate with increased levels of both EMMPRIN and S100A9 across all cohorts (p=0.53 and p=0.06, respectively). Furthermore, high EGFR reactivity was associated with decreased overall survival from the time of parotidectomy (24.7 months) compared to low EGFR reactivity (56.6 months) across all cohorts (p=0.02). **Conclusions:** Increased EGFR expression in cSCC of the parotid was associated with poorer outcomes, and correlated positively with both EMMPRIN and S100A9, suggesting a potential therapeutic target.

Otology/Neurotology

S81. A Newborn with Three Cochlear Turns: Case Report and Literature Review

Ashwin Ananth, BS, New Orleans, LA; John M. Carter, MD, New Orleans, LA; Douglas M. Hildrew, MD, New Orleans, LA; Jesse A. Guittard, MBA, New Orleans, LA; Kimsey Rodriguez, MD, New Orleans, LA; Timothy B. Molony, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize the finding of increased number of cochlear turns on imaging studies; 2) discuss existing knowledge of variation in cochlear anatomy; and 3) explain the possible significance of number of cochlear turns to diagnosis and treatment of sensorineural hearing loss.

Objectives: The objective of this case report is to describe a newborn patient presenting after abnormal newborn hearing screening who was found to have cochleae with three turns bilaterally. Audiologic findings, radiographic images and a discussion of the limited relevant literature is presented, along with possible implications of this rare abnormality. **Study Design:** Case report and review of the literature. **Methods:** A patient's case was reviewed. A MEDLINE search was performed using the terms: cochlea AND turns AND 3. **Results:** The patient's history is presented. Cochleae with three complete turns are described based on computed tomography imaging findings. **Conclusions:** Many otolaryngologists are unaware of human cochleae with more than 2.5 turns. The finding of 3 complete cochlear turns is important to recognize and may have implications in cochlear function. The implications for cochlear implantation and device function are unclear.

S82. Size of Semicircular Canal Dehiscence as a Predictor of Clinical Findings

Dane M. Barrett, MD, Charlottesville, VA; Stephen S. Schoeff, MD, Charlottesville, VA; Brian D. Nicholas, MD, Syracuse, NY; Bradley W. Kesser, MD*, Charlottesville, VA; George T. Hashisaki, MD*, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the relationship between semicircular canal dehiscence and objective findings and discuss the need for increased use of objective measurements in the selection of surgical patients.

Objectives: To determine an association between the length and location of superior semicircular canal dehiscence with objective audiometric data and patient symptomatology. **Study Design:** Retrospective study correlating patient clinical data with length and location of superior semicircular canal dehiscence on non-contrasted temporal bone CTs. **Methods:** Neuroradiologists measured length and location of the canal dehiscence. Pearson correlation coefficients were calculated to identify correlations between length and location of the dehiscence and patient symptoms and audiometric data, including speech reception threshold (SRT), pure tone average (PTA), bone PTA (bPTA), and air bone gap (ABG). **Results:** 39 patients over 13 years met criteria for inclusion. The association between dehiscent canal length and ABG was statistically significant (0.610, p<0.001), although there was not a significant relationship between location of dehiscence and ABG (p=0.093). Neither length of dehiscence nor location was significantly correlated with SRT, PTA, and bPTA. Patient symptomatology did not correlate significantly with length or location of canal dehiscence. **Conclusions:** The longer the dehiscence of the superior semicircular canal, the wider the ABG. Length of dehiscence did not correlate with other audiometric findings.

Location of the dehiscence did not correlate with audiometric data, and patient symptomatology did not correlate with length or location of dehiscence. Future directions include correlation of dehiscence length with VEMP data and symptom severity scores via a prospective patient survey.

S83. Changes in the Jugular Bulb Associated with Sacrifice of the Internal Jugular Vein

Christopher D. Brook, MD, Boston, MA; Karen Buch, MD, Boston, MA; Dominick Gadaleta, BS, Boston, MA; Scharukh Jalisi, MD*, Boston, MA; Osamu Sakai, MD PhD, Boston, MA; Avner Aliphias, MD, Boston, MA

Educational Objective: After presentation of this topic viewers should be able to explain changes in the jugular bulb after sacrifice of the ipsilateral jugular vein.

Objectives: To determine whether sacrifice of the internal jugular vein causes subsequent changes in the jugular bulb. **Study Design:** Retrospective chart and radiology review of patients undergoing unilateral neck dissection at a single institution over 6 years. **Methods:** Patients were selected by CPT code for neck dissection, and included in the study if they had undergone unilateral neck dissection and had pre and postoperative CT scans through the temporal bone. Pre and postoperative radiologic films were then reviewed and the jugular bulb was measured in the axial plane at its widest diameter. Cross-sectional area of the jugular bulb was calculated, and comparison was made between pre and postoperative films in patients having undergone unilateral neck dissection with or without ligation of the internal jugular vein. **Results:** The preoperative size of the jugular bulb on the right measured a mean of 65 mm², and 51.5 mm² on the left. Postoperatively they were 63.7 and 51.5 mm² respectively. After unilateral neck dissection the contralateral jugular bulb increased in size by 1.65 mm² with sacrifice of the ipsilateral IJV and only 0.67mm² if the vein was not sacrificed (p=0.847). The ipsilateral jugular bulb decreased in size by a mean of 10.6mm² if there was sacrifice of the ipsilateral IJV, compared to a decrease of only 0.42mm² if there was not (p=0.025). **Conclusions:** Changes in size of the jugular bulb can occur with surgical manipulation of the jugular vein. This study demonstrates decrease in size of the jugular bulb with ipsilateral IJV sacrifice.

S84. Preoperative Systemic Antimicrobial Prophylaxis for Cochlear Infection

Brittany C. Dobson, MD, Gainesville, FL; Patrick J. Antonelli, MD*, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants will learn whether preoperative antimicrobial prophylaxis is effective at reducing surgical site infections with primary cochlear implant surgery.

Objectives: Antimicrobial agents are commonly administered perioperatively in an attempt to minimize the risk of surgical site infection (SSI) with cochlear implant (CI) placement. Data supporting this practice is limited and conflicting. The aim of this study was to assess the impact of systemic, preoperative antimicrobial prophylaxis (AP) on a single surgeon's CI rate of SSIs. **Study Design:** Retrospective case series. **Methods:** Records of all patients undergoing primary CI placement over an 18 year period were reviewed. SSIs were minor if controlled with oral antibiotics and local wound care. SSIs were major if treated with parenteral antimicrobials or device removal. **Results:** Of 518 primary CIs, 435 received AP and 83 did not. 54 minor and 14 major SSIs were identified. Minor SSIs occurred in 7.2% without AP and 11.0% with AP. Major SSIs occurred in 2.4% without AP and 3.0% with AP. None of these differences was significant (p > 0.05). **Conclusions:** SSIs are relatively uncommon with primary CI surgery, and this rate is not reduced through the use of systemic AP. As AP is associated with additional costs and possible side effects, further investigation through a prospective trial seems warranted.

S85. Enhancing Cochlear Implant Convenience with no Shaving and Early Activation

Justin S. Golub, MD, Cincinnati, OH; Ravi N. Samy, MD, Cincinnati, OH; Lisa Houston, AuD, Cincinnati, OH; Andrew Dimitrijevic, PhD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the ability to safely perform cochlear implantation without any shaving and with activation at 1-2 weeks postoperatively.

Objectives: Preoperative hair shaving and delay of activation until a month or more postoperatively may deter patients from undergoing cochlear implantation. The objective of this study is to determine if cochlear implantation can be safely performed with no shaving and with activation at 1-2 weeks postoperatively. **Study Design:** Retrospective case series. **Methods:** Nine patients underwent cochlear implantation using a no shave technique and a postauricular incision contained completely within the shadow of the auricle. Postoperatively, subjects underwent device activation at a mean of 9.6 days (range 5-14 days). **Results:** No wound infections were noted. In all patients, the device was successfully activated in 2 weeks or fewer postoperatively. Subjectively, patients were pleased with the lack of shaving and the ability to use their device within two weeks. **Conclusions:** Cochlear implantation with no shaving and a completely concealed incision can be performed with a low risk of postoperative wound infection. In addition, early activation of the device at 1.5 weeks postoperatively is feasible. Both components enhance patient experience and satisfaction.

S86. Idiopathic Intracranial Hypertension Presenting as Cerebrospinal Fluid Otorrhea

Brittany E. Howard, MD, Phoenix, AZ; Alpen B. Patel, MD, Phoenix, AZ; David M. Barrs, MD*, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize spontaneous cerebrospinal fluid (CSF) otorrhea as a possible presenting symptom of idiopathic intracranial hypertension; and 2) identify patients

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presenting with CSF otorrhea who warrant further evaluation for idiopathic intracranial hypertension and potential medical management.

Objectives: 1) Recognize spontaneous cerebrospinal fluid (CSF) otorrhea as a possible presentation of idiopathic intracranial hypertension; and 2) identify patients with CSF otorrhea who warrant further evaluation for idiopathic intracranial hypertension and potential medical management. **Study Design:** Case report and systematic review of the literature. **Methods:** Case report of intracranial hypertension presenting as unilateral hearing loss and CSF otorrhea with associated review of the literature. **Results:** A 27 year old obese female presented to a tertiary neurotology clinic with unilateral right sided hearing loss and pulsatile tinnitus. Associated symptoms included debilitating headaches and blurred vision. On exam she had a thin, clear fluid filling the right middle ear associated with a 25 dB conductive hearing loss. CT scan showed right sided focal dehiscence of the tegmen tympani and opacification of the middle ear and mastoid. Further testing revealed bilateral papilledema with lumbar puncture opening pressure of 570 mmH₂O (normal 60-200 mmH₂O). Idiopathic intracranial hypertension was diagnosed and medical management with a loop diuretic and carbonic anhydrase inhibitor was initiated. Within 3 months of medical management she had symptom improvement and full resolution of CSF otorrhea. Review of the literature found 67-80% of patients presenting with CSF otorrhea may have idiopathic intracranial hypertension. Prior reports focus on surgical intervention, but medical management of patients with CSF otorrhea has not been previously well described. **Conclusions:** Idiopathic intracranial hypertension can be associated with spontaneous CSF otorrhea. Further evaluation of these patients is warranted, and in a select subgroup a trial of medical therapy prior to surgical intervention may be reasonable.

S87. Modified Approach to Jugular Foramen Tumors with Canal Wall Reconstruction

Danielle S. Hoyne, MD, Iowa City, IA; Sarah E. Mowry, MD, Augusta, GA; Marlan R. Hansen, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) review the presentation and evaluation of head and neck paraganglioma; 2) discuss the standard management of glomus jugulare tumors; 3) identify potential advantages of modifying these standard approaches with canal wall reconstruction (CWR).

Objectives: To report our experience with the use of CWR technique in the resection of jugular foramen tumors. Compared to the more traditional approaches, which involve closure of the external ear canal (EAC) and result in maximal conductive hearing loss, en bloc removal and later reconstruction of the EAC allows for maintained middle ear structures without compromising exposure. **Study Design:** Case series and literature review. **Methods:** This is a case series of 2 patients with glomus jugulare tumors. One patient had bilateral tumors and a modified infratemporal approach with CWR was used on each side. This approach involves: en bloc removal of the inferior/posterior canal wall, anterior translocation of the facial nerve from the 2nd genu; tumor extirpation, reconstruction of the canal wall with preservation of the EAC, tympanic membrane, and ossicular chain. In our second case example, a mastoid approach with CWR was preformed. **Results:** This modified approach provided excellent exposure in all 3 ears with long term preservation of the ear canal and middle ear structures in each case. **Conclusions:** Modification of the infratemporal and mastoid approaches with reconstruction of the EAC has the potential to preserve hearing without compromising surgical exposure of extensive jugular foramen tumors.

S88. Conservative Management of Vestibular Schwannoma: Predictors of Growth and Hearing Loss

Daniel Jethanamest, MD, Miami, FL; Hongzaho Ji, BS, Miami, FL; Andrew M. Rivera, MD, Miami, FL; Venkatarthikeyan Chokkalingam, MD, Miami, FL; Fred F. Telischi, MEE MD*, Miami, FL; Simon I. Angeli, MD*, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants will be able to describe rates of hearing loss, tumor growth and changes in management, as well as clinical predictors of these outcomes for patients undergoing observation as initial management for vestibular schwannoma.

Objectives: To describe the outcomes of serial observation for vestibular schwannoma (VS) and identify clinical factors at presentation that predict growth or hearing loss. **Study Design:** Retrospective case control. **Methods:** A retrospective review was conducted of patients seen at a tertiary care medical center between 2002 and 2013 with an ICD-9 diagnosis code of 225.1. Patients electing serial observation as initial management, with at least two documented imaging results were included. Exclusion criteria comprised bilateral VS, diagnosis of neurofibromatosis type 2, and neoplasms other than VS. Decline in serviceable hearing, tumor growth and any change in management strategy were recorded. Survival analysis to assess median time to outcomes and multiple logistic regression analyses were performed. **Results:** A total of 976 patients were identified and 94 met inclusion criteria. While undergoing serial observation, 22.3% of patients underwent a change in management strategy to microsurgical excision or stereotactic radiosurgery. Hearing outcomes are reported with scattergrams consistent with the AAO-HNS Hearing Committee standards. No significant clinical factors were identified to predict changes in hearing. Approximately two-thirds of patients electing observation as initial management continue to do so at five years. Imbalance at presentation was found to be associated with an increased adjusted odds ratio (OR 2.96, p=0.04) for tumor growth. **Conclusions:** Serial observation of VS is a viable treatment strategy for selected patients with two-thirds of patients electing to continue this management option after five years. Imbalance as a presenting symptom is associated with subsequent tumor growth.

S89. The Draining Open Mastoid Cavity: Causes and Solutions

Seth T. Kay, MD, Maywood, IL; John P. Leonetti, MD*, Maywood, IL; Sam J. Marzo, MD*, Maywood, IL; Matthew L. Kircher, MD, Maywood, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand why some ears continue to drain following canal walldown (CWD) mastoid surgery and techniques that can be employed to provide a safe and dry mastoid cavity.

Objectives: 1) To identify the causes for persistent otorrhea following CWD mastoidectomy; and 2) to provide surgical techniques to successfully revise the wet open mastoid cavity. **Study Design:** This was retrospective chart review.

Methods: The medical records of all patients who underwent revision CWD mastoidectomy at our tertiary care, academic medical center between 2002 and 2012 were reviewed. Perioperative assessment of the open cavity was reviewed from clinical and operative notes made by the treating surgeon. **Results:** Two hundred thirty-six patients underwent revision CWD mastoidectomy in the 10 year period reviewed. The most common causes for presenting otorrhea were inflamed middle ear or mastoid mucosa, inadequate meatoplasty, and a high facial ridge. Enlargement of the meatus, cavity saucerization with lowering the facial ridge and exoneration of all mucosal disease with concomitant cavity resurfacing and/or tympanoplasty provided a dry, open cavity in 217 of 236 patients (92%). **Conclusions:** A dry open cavity can be achieved following CWD mastoidectomy by removing all diseased mucosa, resurfacing the exposed bone, adequately lowering the facial ridge, and providing an appropriately sized meatoplasty.

S90. Tinnitus in a Non-Hearing Ear: Prevalence and Efficacy of BAHA Use for Treatment

Andleeb Khan, MD, Pittsburgh, PA; Andrew E. Bluher, BA, Baltimore, MD (Presenter); David J. Eisenman, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the prevalence of tinnitus in patients with single sided deafness and the efficacy of bone conduction devices for treatment.

Objectives: 1) Establish the prevalence of tinnitus in patients with unilateral, unaidable sensorineural hearing loss (SNHL); and 2) assess the impact of BAHA implantation on tinnitus. **Study Design:** Prospective observational study of consecutive patients with unilateral, unaidable SNHL who were candidates for BAHA implantation. The prevalence of tinnitus in this population was assessed using validated surveys. Patients receiving a BAHA implant underwent reassessment postoperatively. **Methods:** Tinnitus was quantified with two validated questionnaires, the Tinnitus Handicap Inventory (THI) and the Tinnitus Severity Index (TSI). All subjects received the questionnaires at their initial evaluation. BAHA patients completed them a second time at least 3 months post-activation. Pre- and post-activation results were compared using a two tailed, paired T-test. **Results:** 9 out of 17 patients with unilateral SNHL reported having tinnitus, defined as a score >16 on the THI (prevalence 52%). The pre-BAHA mean THI score was 31.8 ± 21.8 , as compared with a post-BAHA mean score of 14.6 ± 11.1 ($p = 0.097$). The pre-BAHA mean TSI score was 29.3 ± 13.0 , as compared with a post-BAHA mean score of 26.6 ± 8.17 ($p = 0.65$). **Conclusions:** Prevalence of tinnitus is higher in patients with unilateral SNHL (52%) than in the general population as reflected in the literature (3-30%). There may be a reduction in tinnitus severity in patients who have received osseointegrated bone conduction devices. Auditory stimulation via bone conduction could potentially be a mode of treatment for tinnitus in selected patients.

S91. The Effects of Floating Mass Transducer Position of Vibroplasty Hearing Outcomes

Jafri B. Kuthubutheen, MBBS FRACS, Perth, Australia; Roberta Marino, BSc DipAud, Perth, Australia; Dayse V. Tavora, PhD Aud, Perth, Australia; Peter Lampacher, Innsbruck, Austria; Gunesh P. Rajan, MD FMH FRACS, Perth, Australia

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) demonstrate an understanding of the applications on hearing outcomes; 2) compare the different placements of the floating mass transducer (FMT); and 3) discuss the outcomes of how different positions of FMT placement can affect outcomes.

Objectives: Vibroplasty has offered a new modality of hearing rehabilitation in patients with mixed hearing loss or total conductive block. The positioning of the floating mass transducer (FMT) in vibroplasty surgery has a critical effect on hearing outputs. The objective of this study is to determine if different placements of the floating mass transducer of the Vibrant Soundbridge affects hearing outputs and coupling efficiency. **Study Design:** Ongoing prospective study. **Methods:** 16 patients who received the Vibrant Soundbridge were assessed. Patients had chronic suppurative otitis media, failed otosclerosis surgery, external auditory canal atresia or eczema. All patients had a standard audiological test battery including routine audiometric testing, Soundfield testing, both aided and unaided, performed pre and postoperatively at 1, 3, 6 and 12 months. Direct drive transfer function analysis was performed to assess coupling efficiency. Quality of life measure questionnaires were used to assess quality of life. Patients were divided into those who had round window vibroplasty, stapes vibroplasty and incus vibroplasty. **Results:** Patients with a soft tissue coupler between the FMT and the RW had significantly reduced coupling efficiency. Patients who had direct RW contact had significantly improved coupling efficiency. Patients who had a stapes or incus vibroplasty had the greatest coupling efficiency. **Conclusions:** It has been previously thought that a soft tissue coupler provides the greatest coupling between the FMT and the RW but we have shown that different vibroplasty modalities have different coupling efficiencies.

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S92. Hearing Preservation Cochlear Implantation and the Role of Cochlear Duct Lengths on Outcomes

Jafri B. Kuthubutheen, MBBS FRACS, Toronto, ON Canada; Aman Grewal, MD, Toronto, ON Canada; Vincent Lin, MD FRCS, Toronto, ON Canada; Sean Symons, MD FRCS, Toronto, ON Canada; Joseph Chen, MD FRCS*, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) explain how to measure the cochlear duct length; 2) discuss how cochlear duct lengths vary between individuals; and 3) discuss how cochlear duct lengths can determine how long a cochlear implant electrode can be inserted.

Objectives: To determine if the cochlear duct length is involved in determining hearing outcomes after hearing preservation surgery. **Study Design:** Retrospective cohort. **Methods:** 40 adult patients who received a Med-El Flex 31 electrode and 20 patients who received a Med-El Flex 28 electrode with a minimum of 6 months followup were assessed. Preoperative high resolution temporal bone CT scans were reformatted in the plane of the cochlear basal turn. The basal diameter of the cochlear (A value) was then measured and the cochlear duct length calculated based upon a formula (3.65A - 3.63) previously proposed. The calculated measures of duct length were then compared to direct manual CT scan measurements of the mid scalar and outer wall lengths of the cochlear duct. The outcome measures were depth of insertion (based upon postoperative imaging and intraoperative findings), auditory thresholds and speech discrimination scores. **Results:** Preliminary results indicate that longer cochlear duct lengths are associated with a greater depth of insertion and more electrodes within the cochlea. Calculated and direct CT scan measurements of cochlear duct length were positively correlated in our series but with a correction factor. This factor was different for the shorter and longer electrodes. The relationship between cochlear duct lengths and hearing preservation and speech outcomes will be presented. **Conclusions:** The variability in cochlear duct lengths has an implication on electrode choice and appears to affect depth of insertion and potentially hearing outcomes. The future of cochlear implantation may be customized electrode length choice based upon each patient's own individual cochlear metrics determined radiologically.

S93. Asymmetric Hearing Loss Is Common and Benign in Patients 95 Years and Older

Matthew J. Leskowitz, BA BS, New York, NY; Francesco F. Caruana, New York, NY; Jaclyn B. Spitzer, PhD, New York, NY; Anil K. Lalwani, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the key audiologic findings in the advanced elderly population of individuals older than 95 years of age.

Objectives: The objective of our study was to investigate age specific auditory function in the patient population 95 years and older. **Study Design:** Retrospective chart review. **Methods:** Medical records of 51 patients older than 95 years (82% female, 18% male) who underwent audiologic testing at a tertiary medical center were reviewed. The following information was collected: age at time of most recent audiogram and prior audiograms, bilateral air conduction thresholds (250-8000 Hz), and speech recognition results. **Results:** None of the subjects had hearing in the normal range. For the poorer hearing ear, average low frequency, high frequency, and overall pure tone averages (PTA) for the population were 67.9, 82.1, and 74.9dB HL, respectively. Mean word recognition score (WRS) was 57.6% and deteriorated with increasing PTA ($p=.0002$). Asymmetry, defined by a 10dB difference at 2 frequencies, was present in 39.2% of the sample, and WRS asymmetry, defined as a difference of 12% in WRS between ears, was present in 33.0% of the sample. Retrocochlear evaluation did not identify pathology in any of the cases tested. In the poorer hearing ear, average decline in PTA per year was 2.9dB. **Conclusions:** In individuals >95 years of age, hearing loss was universal, moderately severe to profound in magnitude and associated with substantial loss of speech recognition. Contrary to expectation, hearing loss progressed at a rate typical of younger cohorts. In this oldest old population, asymmetry of loss and WRS was common and is not indicative of retrocochlear pathology.

S94. Lipochoristoma of the Internal Auditory Canal

George A. Scangas, MD, Boston, MA; Aaron H. Remenschneider, MD, Boston, MA; Felipe Santos, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, participants will understand the presentation, clinical course, and radiographic features of a rare benign tumor, lipochoristoma of the internal auditory canal.

Objectives: Lipochoristomas comprise 0.1% of all cerebellopontine angle tumors and may be misdiagnosed as vestibular schwannomas. We describe a lipochoristoma of the internal auditory canal and present the salient features of the evaluation, diagnosis and management. **Study Design:** Retrospective case review. **Methods:** Retrospective case review. **Results:** A 51 year old woman presented with left sided severe hearing loss and tinnitus, mild episodic vertigo, and facial paresthesias that have been progressive over one year. An MRI demonstrated a small (5mm x 4mm) T1 hyperintense lobulated lesion in the distal internal auditory canal. With fat suppressed images, there was no enhancement of the lesion. A diagnosis of IAC lipochoristoma was made. Conservative management was recommended and on 17 month followup there has been no interval growth. The patient remains symptomatically stable with improved equilibrium but persistent left sided hearing loss. **Conclusions:** Differential diagnosis of an enhancing internal auditory canal lesion includes acoustic neuroma, meningioma, epidermoid and arachnoid cysts, lipochoristoma and metastatic tumors. Fat suppressed MRI sequences aid in definitive diagnosis of lipochoristomas. Because lipochoristomas may have a tendency for more indolent growth and intimate involvement of the auditory nerve, conservative management with interval imaging is recommended. Surgical treatment is reserved for growing lesions or those with disabling vestibular symptoms.

- S95. Management of a Zone II Penetration Injury through the Jugular Foramen: Case Report and Literature Review**
Nathan M. Schularick, MD, Iowa City, IA; Sarah E. Mowry, MD, Iowa City, IA; David M. Hasan, MD, Iowa City, IA; Nader S. Dahdaleh, MD, Iowa City, IA; Marlan R. Hansen, MD*, Iowa City, IA

Educational Objective: At the conclusion of this presentation, participants should be able to correctly classify penetrating injuries to the neck (zone I/II/III), describe management of a penetrating injury to the neck and skull base through the jugular foramen, and appreciate the benefits of a combined treatment approach between otolaryngology and neurosurgery teams.

Objectives: This case report will illustrate successful endovascular and surgical management of a penetrating metal rebar injury involving the neck, skull base, and temporal lobe. Proximal and distal hemostatic control of the jugular bulb are also discussed. **Study Design:** Illustrative case report and literature review. **Methods:** A 22 year old male suffered a penetrating neck injury after falling on a piece of steel rebar. Physical exam and CT imaging revealed the rebar entered zone II of the neck, extended through the left jugular foramen into the cranial vault. **Results:** Angiography revealed possible damage to the jugular bulb, directing further evaluation of the jugular vein and sigmoid sinus via mastoidectomy and skull base approach. A temporoparietal frontal craniectomy allowed for direct control of the superior limit of the rebar, which was then successfully removed. At one year followup cranial nerve function is intact but the patient does suffer periodic seizures. **Conclusions:** Penetrating zone II neck trauma extending through the jugular foramen can be successfully managed with a combined endovascular, mastoidectomy, skull base, and craniectomy approach.

- S96. Isolated Cochlear Otosclerosis Demonstrated on CT Imaging with no Oval Window Involvement and Sensorineural Hearing Loss Alone**
John Caleb Simmons, MD, Houston, TX; Nikhila Raol, MD, Houston, TX; Robert A. Williamson, MD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate findings and staging systems of otosclerosis. They should be able to explain the pathophysiology of otosclerosis and compare the findings of oval window involvement and cochlear involvement.

Objectives: To examine findings in an index case of bilateral cochlear otosclerosis causing only sensorineural hearing loss in one ear and mixed hearing loss in the other, and to review the literature regarding CT imaging findings and staging in otosclerosis. **Study Design:** At a tertiary referral center, this is a case report of one patient with clinical, audiometric and imaging signs consistent bilateral otosclerosis, but with a mixed hearing loss in one ear and purely sensorineural loss in the other. On computed tomography of temporal bones, extensive cochlear otospongiosis was noted bilaterally. On the left, the classic double ring sign was noted with extensive cochlear otosclerosis, however no lesion was demonstrated near the oval window, suggesting an absence of stapes fixation. On the right, extensive radiolucent otospongiosis was noted involving the cochlea and oval window niche, both anteriorly and posteriorly. **Methods:** Preoperative imaging was reviewed and middle ear exploration and stapedotomy were undertaken on the right. **Results:** By audiometry and imaging, stapes was not fixed on the left despite extensive cochlear otosclerosis. On middle ear exploration, stapes fixation was demonstrated on the right side. **Conclusions:** This case demonstrates interesting features of cochlear otosclerosis without oval window or stapes fixation, and is in agreement with previous studies reporting that conductive hearing loss and stapes fixation is more likely to be found with involvement by otosclerosis of the oval window on computed tomography. CT imaging findings in otosclerosis and CT based staging systems reported in the literature are also summarized.

- S97. Temporal and Spectral Contributions to Musical Instrument Identification among Cochlear Implant Users**
Timothy R. Stoddard, MD MS, Milwaukee, WI; Tanner M. Fullmer, BS, Milwaukee, WI; Alison M. Crane, BS, Milwaukee, WI; David R. Friedland, MD PhD*, Milwaukee, WI; Christina L. Runge, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, participants should recognize that cochlear implant (CI) users can attain excellent speech recognition with contemporary devices but struggle with music perception and appraisal. Participants will be able to explain how CI users perform poorly at instrument identification, but identify differences in timbre, or tone color, as well as normal hearing subjects by relying on temporal rather than spectral acoustic cues.

Objectives: To identify how cochlear implant users utilize acoustic cues for music perception. **Study Design:** Prospective cohorts of normal hearing (n=12) and cochlear implant (n=25) subjects. **Methods:** Subjects were presented with acoustic samples of musical notes played by trumpet, clarinet, alto-saxophone, flute, and violin. Notes were modified to remove components of the temporal envelope such as the attack and decay. Spectral cues were controlled by normalizing instrument samples to the same pitch. Tests of instrument identification and instrument discrimination were performed with native and modified temporal and spectral stimuli. Tests were performed with notes spaced by 0.5 seconds or with no interval space. **Results:** CI users scored significantly lower than NH listeners on instrument identification across all conditions. Performance worsened for both NH and CI users when either the attack or decay was removed from the stimulus. CI users could discriminate between stimuli as accurately as NH subjects when the stimuli were spaced apart. When stimuli were concatenated, timbre discrimination improved for NH listeners but not for CI users. **Conclusions:** CI users have difficulty identifying musical instruments but can discern differences between them as well as NH subjects. This suggests that CI listeners perceive temporal envelope differences but are not interpreting them appropriately. In the absence of envelope cues, NH listeners, in contrast to CI users, rely on harmonic fine structure to detect timbre differences. Auditory training and accentuation of fine structure are potential strategies to improve timbre discrimination among CI users.

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S98. Juvenile Xanthogranuloma of the Temporal Bone in a Young Adult

Alex D. Sweeney, MD, Houston, TX; William M. Guy, MD, Houston, TX (Presenter); Marc E. Nader, MD, Houston, TX; Jeffrey T. Vrabec, MD*, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the diagnosis and management of juvenile xanthogranuloma and understand how the management of juvenile xanthogranuloma can change based on its location and the associated symptoms.

Objectives: We present a rare case of juvenile xanthogranuloma (JXG) of the temporal bone to illustrate how the management of this disease process can be influenced by its location and the associated symptoms. **Study Design:** Case report of a juvenile xanthogranuloma of the temporal bone. **Methods:** We present a patient with a juvenile xanthogranuloma of the temporal bone evaluated by the otolaryngology - head and neck surgery service of an academic, tertiary care hospital in 2012 and 2013. The literature was also reviewed for similar cases through a directed PubMed search. **Results:** A 20 year old patient presented to clinic with complaints of progressive hearing loss and vertigo over six months. A previous diagnosis of JXG had been given based on an open biopsy performed at an outside institution. Physical exam revealed a fleshy tumor obliterating the left ear canal. Imaging revealed extensive bony destruction in the left, lateral skull base with extension into the inner ear and posterior fossa. Immunohistochemical analysis confirmed the diagnosis of JXG. **Conclusions:** While JXG has been previously described in the temporal bone, this case represents the first reported presentation in an adult patient. Generally, JXG is a self-limited disease. However, temporal bone tumors can result in significant symptoms necessitating surgical management.

S99. Success of Lateral Graft Technique for Closure of Tympanic Membrane Perforations

Shan Tang, MD, New York, NY; Kevin D. Brown, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participant should be able to contrast the lateral graft tympanoplasty technique to an underlay technique, understand the high success rate of the lateral technique in diverse presentations, and discuss situations in which lateral graft may be preferable.

Objectives: To determine if the success of lateral graft tympanoplasty was affected by either age of patient, size of perforation at time of surgery, or previous underlay tympanoplasty. **Study Design:** Case series with chart review. **Methods:** A retrospective review was performed of all patients who underwent lateral graft tympanoplasty by the senior author between March 2010 and December 2012. Patient demographics, baseline clinical data, postoperative findings, and audiologic data were collected. The primary outcome was successful closure of perforation, and the secondary outcome was change in air bone gap (ABG). The study was powered to detect a 25% difference in success between groups. **Results:** Twenty-seven patients were included in the study, with a mean followup period of 11 months (range 1 to 34 months). Successful closure of tympanic membrane perforation occurred in 93% of all patients. Closure was observed in 13 of 15 (87%) patients with perforations 50% or smaller. All patients (12 of 12) with perforations 60% or larger were closed ($p=0.49$, Fisher's exact test). For revision cases, 8 of 9 (89%) were closed compared to 17 of 18 (94%) in primary tympanoplasty ($p=1$). Adults and children were equally likely to be closed by lateral graft tympanoplasty (10 of 11 children vs. 15 of 16 adults) ($p=1$). The mean preoperative to postoperative ABG improved from 25 +/- 12 dB to 15 +/- 9 dB ($p=0.001$, paired t-test). **Conclusions:** Lateral graft tympanoplasty has a high rate of success for the closure of tympanic membrane perforations with a significant improvement in ABG. There were no significant difference in success rates comparing small vs large perforations, primary vs revision tympanoplasty, or children vs adults suggesting that lateral graft tympanoplasty is an excellent technique for the more difficult situations of large perforations and revision surgery.

Pediatrics

S100. Juvenile Ossifying Fibroma: Successful Endoscopic Gross Total Resection of a Rare Sinonasal Tumor in an Adolescent Male

Kaelan Black, MD, Tampa, FL; Iman Naseri, MD FACS, Jacksonville, FL; Philipp Aldana, MD, Jacksonville, FL; Jeff Goldstein, MD, Jacksonville, FL; Gary Josephson, MD*, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) report a rare case of juvenile ossifying fibroma in a child with extension to the orbit and anterior cranial fossa; 2) describe a method of removing the tumor completely through an endonasal endoscopic approach with little morbidity and no recurrence to date; 3) discuss a review of the literature of juvenile ossifying fibromas and their treatment.

Objectives: To report a rare case of juvenile ossifying fibroma in a child with extension into the orbit and anterior cranial fossa successfully removed by an endonasal endoscopic approach. **Study Design:** Case report with literature review. **Methods:** PubMed search and case report. **Results:** The endonasal endoscopic approach was successful in obtaining a gross total resection of this large tumor that extended lateral into the orbit and superiorly into the anterior cranial fossa across the midline. Endoscopic office evaluation and followup CT scan is consistent with no evidence of recurrent disease at more than six months. **Conclusions:** Juvenile ossifying fibroma is a rare tumor of the sinonasal cavity and even more unusual in the pediatric age group. Large tumors involving the orbit and cranial fossa have traditionally been resected using an open transnasal/ transcranial approach, with an open transcranial and endonasal endoscopic approach for smaller tumors. We describe a case in which visualization with straight and angled telescopes and endoscopic

instrumentation allowed high confidence resulting in a gross total resection of this very large tumor. We believe this approach by an experienced endoscopic can offer equal success in treatment outcome with lower morbidity and quicker recovery than the traditional approaches for this tumor.

S101. Management of Head and Neck Lipoblastoma

Stephanie A. Culver, MD, New York, NY; Benjamin C. Paul, 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 describe the pathophysiology and surgical management of a rare white fat tumor known as lipoblastoma.

Objectives: 1) Describe the pathophysiology of lipoblastoma; and 2) describe the surgical management of lipoblastoma in the head and neck. **Study Design:** Case report with literature review. **Methods:** A seven month old male presented with a 6x4x4 cm³ rapidly expanding mass in the right peri-parotid soft tissue anterior to the tragus. Fine needle aspirate confirmed lipoblastoma. The patient had surgical excision with extirpation of all visible disease. Within one month of surgical excision, a rapidly expanding mass was now noted posterior to the tragus and adjacent to the mastoid. Repeat MRI confirmed a 1.7 x 2.4 cm mass, which was excised en bloc. There has been no recurrence to date. **Results:** Lipoblastoma is a rare benign neoplasm arising from embryonic white fat that presents predominantly in infancy. Tumors occur most commonly in the trunk and extremities and are much less common in the head and neck, with fewer than 50 reported cases. They have a propensity for rapid growth and early involvement of important neurovascular structures, particularly in the region of the head and neck. Diagnosis may be suggested by immature lipoblasts in a myxoid background on fine needle aspiration. Surgical excision is considered curative, though persistence/recurrence rates are reported as high as 50%. **Conclusions:** Complete excision of lipoblastoma in the head and neck is notoriously challenging, and preoperative counseling should stress the possibility of persistence. This case represents a peri-parotid lipoblastoma with persistence in a yet to be described location, posterior to the tragus, necessitating a second excision. Postoperative management should include close screening with short interval office visits, and an argument could be made for planned postoperative MRI.

S102. Atypical Lemierre's Syndrome

Walid I. Dagher, MD, Boston, MA; Andrew R. Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the signs and symptoms of typical and atypical Lemierre's syndrome as prompt initiation of treatment reduces the complications associated with this disease.

Objectives: 1) To describe classic Lemierre's syndrome, its characteristic presentation, clinical, radiological, and bacteriological findings, and report an atypical etiology of Lemierre's syndrome in our patient with facial vein thrombosis; and 2) to increase physician awareness of this disorder, as a high degree of clinical suspicion is essential for accurate and timely diagnosis as well as for prompt initiation of treatment. **Study Design:** Case presentation. **Methods:** The clinical presentation, physical examination, imaging features, surgical findings, bacteriological profile and pathology slides were reviewed in the case of a pediatric patient with an etiologic variant of Lemierre's syndrome. The literature on Lemierre's syndrome was reviewed as was that of its typical findings. Permission was obtained from the patient to publish the findings. **Results:** A previously healthy 16 year old female presents with a 5 day history of worsening sore throat and fever along with neck swelling. Examination revealed a subcutaneous tender cord-like structure consistent with thrombophlebitis. CT scan of the neck with contrast showed thrombosis of the left facial vein with patent jugular veins. CT of the chest identified multiple septic pulmonary emboli. Neck exploration revealed frank purulent drainage and thrombus formation within the lumen of the facial vein. Cultures were consistent with Fusobacterium species. Review of the literature identified only a few such reported cases. **Conclusions:** Although classic Lemierre's syndrome is well described in the literature, it has been termed the forgotten disease because it is frequently overlooked and underreported. We report an atypical etiology of Lemierre's syndrome due to facial vein thrombosis.

S103. The Bifid Nose

Walid I. Dagher, MD, Boston, MA; Andrew R. Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain normal midfacial embryologic development and discuss an esthetically acceptable, single staged repair of the bifid nose anomaly.

Objectives: 1) To review the normal midfacial embryologic development, and review the bifid nose anomaly as part of the midline facial cleft spectrum; and 2) to review an esthetically acceptable, single staged nasal reconstruction, via extensive resection of the skin, cartilaginous, and bony nasal framework in our 6 months old female patient with a bifid nose. **Study Design:** Case report. **Methods:** The clinical presentation, physical examination, imaging features, surgical findings, and technique for repair were reviewed in the case of a pediatric patient with bifid nose. The literature on normal midfacial embryologic development was reviewed as was that of the spectrum of midfacial malformations with emphasis on the bifid nose. Permission was obtained from the patient's parents to publish the findings. **Results:** We describe a newborn female who was noted to have a widened nasal bridge by prenatal ultrasonography, and a bifid nose at birth. Examination revealed a wide nasal bridge, duplication of the nasal tip, columella, philtral columns and a submucosal cleft. No other genetic malformations were identified. CT scan of facial bones showed bilateral piriform aperture stenosis, three central incisors and duplication of the nasal septum. MRI revealed no intracranial anomalies. Via an external approach, skin, bone, and cartilaginous resection resulted in an esthetically acceptable nasal contour. Review of the literature identified only a few such reported cases. **Conclusions:** The bifid nose poses challenges to the reconstructive surgeon. Successful outcomes depend on a thorough understanding

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of normal midface embryology, the bifid nasal anatomy, proper patient evaluation, and precise surgical technique.

S104. A Systematic Review over the Past 15 Years of the Management of the Internal Fistula of a Branchial Pouch Anomaly and Case Description of a Novel Technique

Gary D. Josephson, MD*, Jacksonville, FL; Kaelan D. Black, MD, Tampa, FL (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize that pyriform sinus fistulas can be successfully treated by closing the internal fistula alone with little morbidity through a systematic review of the literature; and 2) learn a new technical option using CO2 laser with oversewing to treat the internal pyriform sinus fistula.

Objectives: To report a systematic review and outcomes of treating only the internal opening of a pyriform sinus fistula as well as present a novel technique using CO2 laser with mucosal oversewing. **Study Design:** Systematic review and case report. **Methods:** PubMed search and systematic review. **Results:** A PubMed search identified seven papers addressing treating the internal fistula of the pyriform sinus. Fifty-eight cases including ours were available for review. Ages ranged from 4.5 months to 49 years. Twenty-eight cases were male, 20 were female and gender not reported in ten. All cases were left sided. Eighteen were closed using electrocautery, 18 with chemocautery (trichloroacetic acid or silver nitrate), 17 were treated with excision of the mass, and one was closed using CO2 laser and oversewing. Thirty-seven patients had laryngoscopic treatment of the sinus opening alone. There were 7 recurrences (19%). 81% of these patients had successful treatment. **Conclusions:** Branchial cleft anomalies with a pyriform sinus fistula often present as a mass and recurrent neck infections. This systematic review reveals that treating the internal pyriform sinus opening can be successful treatment. This procedure has low morbidity, short operative time and high success. We advocate this approach first with a combined open/laryngoscopic approach for failed cases. We feel our technique of laser ablation followed by oversewing increases the likelihood of successful closure. We believe this to be the first systematic review of this topic and our case to be the first described using the CO2 laser to ablate the fistula with oversewing.

S105. Evaluation of Pseudomonas Aeruginosa Adherence on Adenoid Tissue

Jennifer Kuo, BS, Gainesville, FL; Barbara K. Snowden, BS, Memphis, TN; Patrick J. Antonelli, MD*, Gainesville, FL; Carolyn P. Ojano-Dirain, PhD, Gainesville, FL; Rodrigo C. Silva, MD, Gainesville, FL; William O. Collins, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants will learn the impact of acute upper respiratory tract infections on the development of chronic upper respiratory tract infections.

Objectives: Chronic upper respiratory infections (URIs) have been postulated to develop as a result of recurrent acute URIs. The objective of this study was to determine if pseudomonas aeruginosa (PA), a pathogen common in chronic URIs, is more likely to adhere to adenoids from patients diagnosed with recurrent acute otitis media (RAOM), chronic otitis media with effusion (COME), or obstructive sleep apnea (OSA). **Study Design:** Controlled, ex vivo. **Methods:** Adenoids were obtained from children undergoing adenoidectomy for RAOM (n=8), COME (n=4), or OSA (n=12). PA tagged with green fluorescent protein (GFP) was used for a 2 hour attachment assay. The quantity of PA-GFP attached to the adenoid specimens was analyzed by Western blotting and flow cytometry. **Results:** Levels of GFP were not different in adenoids from the three diagnostic groups (p=0.56). Similarly, the number of PAO1-GFP bacterial cells assessed by flow cytometry was not different between groups (p=0.18). **Conclusions:** RAOM and COME are not commonly associated with increased adherence of PA to adenoid tissue. Other factors must play a larger role in the transition from acute to chronic URIs.

S106. Implications of Duplicated Internal Auditory Canal on Cochlear Implantation Candidacy

Jonathan B. Overvest, MD PhD, San Francisco, CA; Anna K. Meyer, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the indications and implications of cochlear implantation in rare cases of internal auditory canal duplication, where cochlear nerve status is uncertain.

Objectives: To describe a patient with bilateral duplicated internal auditory canals (IACs) and their impact on cochlear implantation candidacy. **Study Design:** Retrospective case review. **Methods:** Retrospective review of electronic medical record, including MRI and CT imaging. **Results:** An 11 year old boy presented for cochlear implantation evaluation with a history of progressive bilateral asymmetric hearing loss. At presentation, right hearing was consistent with a profound sensorineural loss (SNHL), but with responses in the aided condition. Left hearing was normal low frequency sloping to profound SNHL with 48% word recognition. Computed tomography and magnetic resonance imaging revealed a right duplicated IAC, with two nerve structures in the superior canal, an empty inferior canal, and an absent cochlear canal. The left IAC was reduced in caliber with a partial superior bony partition, two nerve structures, and a narrow cochlear canal. The cochleae were normal bilaterally. Given his significant left residual hearing and confirmed right cochlear nerve responses despite an absent cochlear canal, the patient was offered right cochlear implantation. **Conclusions:** Patients with IAC duplications are rare and their candidacy for cochlear implantation may be difficult to determine when the status of the cochlear nerve is uncertain.

S107. Subperiosteal Orbital Abscess in Infants Secondary to Acute Sinusitis: A Case Report and a Systematic Review of the Literature over the Past 50 Years

Saurabh Sharma, MD, Tampa, FL; Gary D. Josephson, MD MBA*, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to gain a better understanding of etiology, presentation, evaluation and treatment of subperiosteal abscess in children <1 year of age.

Objectives: To report a systematic literature review over the past 50 years of the diagnosis, management, and outcomes of subperiosteal orbital abscess (SPOA) in infants including our case managed successfully with endoscopic drainage and intravenous antibiotics.

Study Design: A systematic review of the literature for all cases of SPOA from acute sinusitis in infants (defined as <1 year of age) over the past 50 years including our case report. **Methods:** PubMed search was performed to collect all the case reports in English language with SPOA in infants. **Results:** 10 cases of SPOA in infants were identified, our case report describing the 11th. Age ranged from 10 to 60 days. There were 6 females and 5 males. The right eye was affected in 5 cases, the left in 5 and both in one case. Staph aureus was the most common organism isolated in nine of eleven cases. Seven cases had an open surgical drainage. Two cases had endoscopic drainage including ours. One case drained by reported spontaneous rupture. One case in which the abscess was not drained expired. **Conclusions:** Orbital complications due to ethmoiditis are very rare in infants. Drainage in this age group appears to be paramount as the only case without drainage expired. The endoscopic approach for drainage with total ethmoidectomy to clear the nidus of infection is safe and effective in this age group. We believe this to be the first report dedicated to the evaluation, treatment, and outcomes of SPOA in this age group.

S108. Venous Malformation of the Inferior Turbinate: A Case Report

Daniel A. Strigenz, MD, Columbus, OH; Stan W. McClurg, MD, Chapel Hill, NC; Michael A. Arnold, MD PhD, Columbus, OH; Jonathan M. Grischkan, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize vascular malformations as a potential etiology of airway obstruction in pediatric patients who present with symptoms of airway obstruction, demonstrate an understanding of the natural history of vascular anomalies of the head and neck, and explain the diagnostic workup and management of pediatric vascular anomalies.

Objectives: Attendees will recognize vascular malformations as a potential etiology of airway obstruction in pediatric patients presenting with symptoms of airway obstruction. **Study Design:** Case report of an 18 year old female with a history of cleft palate who presented with longstanding nasal obstruction and tonsillar hypertrophy who was found to have a large venous malformation arising from her inferior turbinate. **Methods:** The patient's hospital records were reviewed. A review of the literature on vascular malformations of the head and neck was conducted. **Results:** Vascular anomalies in the head and neck are relatively common among pediatric patients, but anomalies of the nasal cavity are quite rare. When present, they may present with nasal obstruction, epistaxis, snoring, or sleep apnea. In this report, the patient presented with a long history of nasal obstruction and tonsillar hypertrophy. The diagnosis of vascular malformation evaded practitioners until the discovery of an obstructive 2.0 x 1.6 cm lesion originating from the left inferior turbinate during tonsillectomy and adenoidectomy. The mass was surgically excised, and pathology confirmed a diagnosis of venous malformation. This is the only documented case in the literature of a venous malformation arising from within the inferior turbinate. The unusual location of this mass coupled with her symptoms typical of adenotonsillar hypertrophy led to difficulty with initial diagnosis. **Conclusions:** Although the nasal cavity is a rare site for the origination of vascular malformations, the clinician must consider intranasal pathology when a patient presents with symptoms of airway obstruction, even if more common etiologies such as adenotonsillar hypertrophy are also present.

S109. Bone at Sinodural Angle: Potential Site for Bone Anchored Hearing Device for Children Younger than 5 Years

Celsha C. Ukatu, BS, Atlanta, GA; Norman Wendell Todd, MD MPH*, Atlanta, GA (Presenter); Nilesh K. Desai, MD, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss that bone thickness at the sinodural angle is sufficient for many children suffering from aural atresia to have bone anchored hearing devices implanted younger than the present FDA approved age of 5 years.

Objectives: To describe in children younger than the present FDA approved 5 years of age, the thickest part of the temporal bone available for placement of a bone anchored hearing device. Children with unilateral hearing loss have deficits in at least language comprehension and oral expression. The early provision of hearing to the atretic ear may minimize the potential for auditory deprivation.

Study Design: Point prevalence descriptive study. **Methods:** With IRB approval, from the radiology records of a large children's hospital, for the years 2002-2012, thirty-eight patients less than age 6 years with congenital aural atresia had temporal CTs useable for this study. Bone thickness perpendicular to the surface of the bone was measured in the topmost axial CT slice that included any adjacent petrous ridge (i.e., at the sinodural angle). **Results:** The mean bone thicknesses at the sinodural angles of the atretic ears were 5.1, 5.8, 4.5, 5.6, 5.0, and 4.8 mm for the <1, 1, 2, 3, 4, and 5 year olds, respectively; of the non-atretic ears 4.2, 5.2, 4.7, 4.4, 4.2, and 4.7 mm. **Conclusions:** Based on this small case series, bone thickness at the sinodural angle is sufficient for many children suffering from aural atresia to have bone anchored hearing devices implanted younger than the present FDA approved age of 5 years.

Posters

S110. A Rare Cause of Tonsillitis

Stanley U. Voigt, MD, Boston, MA; Mark A. Vecchiotti, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate some of the symptoms associated with trichotillomania. A rare case of this disorder leading to bilateral tonsilloliths will be discussed.

Objectives: A rare case of trichotillomania leading to bilateral tonsilloliths will be discussed along with imaging and management options.

Study Design: Case report. **Methods:** We present a unique case of a 10 year old male with trichotillomania who presented to our pediatric otolaryngology clinic upon referral from his primary care physician for noted hair within his tonsils. **Results:** Trichotillomania is an impulse control disorder that involves strong urges to pull out one's own hair and in some cases eat it. The patient had been pulling out his hair for 2 years and ingesting the hair with development of bilateral tonsilloliths. These hairs were partially removed in the clinic setting and the patient required eventual operative management in the form of bilateral tonsillectomy. A review of trichotillomania as well as our management of this unique condition is discussed. **Conclusions:** Trichotillomania in a child with tonsil hypertrophy can present as a cause of tonsillitis. A knowledge of the underlying disorder may influence eventual management in this unique scenario.

S111. Balloon Laryngoplasty as a Treatment for Pediatric Laryngeal Stenosis: Case Series and Systematic Review

Jennifer L. Wentzel, MS, Charleston, SC; Sidrah M. Ahmad, MD, Philadelphia, PA; Christopher M. Discolo, MD MSCR, Charleston, SC; Marion B. Gillespie, MD MSc, Charleston, SC; David R. White, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the history and technique of balloon laryngoplasty and discuss the utility of the procedure in treating pediatric laryngeal, primarily subglottic, stenosis.

Objectives: The aim of this study is to systematically review available literature on the outcomes of children treated with balloon laryngoplasty (BLP) as a primary or adjuvant treatment for subglottic or laryngeal stenosis, as well as briefly report on a new series of 60 children treated at our institution from 2007-2013. **Study Design:** Review of published case series and retrospective chart review.

Methods: A literature search was performed in PubMed and Medline to identify trials that reported clinical outcomes of BLP in human patients under the age of 18 with subglottic or laryngeal stenosis. Single case reports and series studying the dilation of tracheal or bronchial stenosis alone were excluded. Hospital billing codes were to identify appropriate patients for retrospective chart review. A successful outcome for chart review was determined to be decannulation of previous tracheostomy or avoidance of open laryngotracheoplasty or tracheostomy. **Results:** Seven studies published between 1991 and 2012 met inclusion criteria and reported outcomes with success defined through improvement of symptoms, decrease in Myer-Cotton level of stenosis, decannulation, or avoidance of reconstructive procedures. Including 60 children from our institution, 202 patients between 1 day and 22 years of age (average 35 months) underwent 457 dilations with an average of 2.26 dilations per patient (2.25 in our population). The overall success rate was 64% (84% in our population). No complications were reported with subglottic or laryngeal dilations. **Conclusions:** BLP is a highly effective, low risk alternative or adjunct to traditional reconstructive procedures in children with subglottic or laryngeal stenosis.

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