

**TRIOLOGICAL SOCIETY COMBINED SECTIONS MEETING
PROGRAM**

**JANUARY 27 - 29, 2011
SCOTTSDALE, ARIZONA**

THURSDAY, JANUARY 27, 2011

KIERLAND 1 & 2

- 8:00 WELCOME BY VICE PRESIDENTS**
David W. Eisele, MD*, San Francisco, CA *Western Section*
Kenneth M. Grundfast, MD*, Boston, MA *Eastern Section*
William W. Shockley, MD*, Chapel Hill, NC *Southern Section*
D. Bradley Welling, MD PhD*, Columbus, OH *Middle Section*
- 8:05 W**estern Section Guest Introductions by David W. Eisele, MD*
Guest of Honor:
Robert A. Schindler, MD*, San Francisco, CA
Citation Awardees:
Michael R. Holtel, MD, San Diego, CA
Andrew H. Murr, MD*, San Francisco, CA
Lisa A. Orloff, MD, San Francisco, CA
Joseph C. Sniezek, MD*, Tripler Army Med. Center, HI
- 8:15 E**astern Section Guest Introductions by Kenneth M. Grundfast, MD*
Guest of Honor:
Loring W. Pratt, MD*, Fairfield, ME
Citation Awardees:
Charles D. Bluestone, MD*, Pittsburgh, PA
Gregory A. Grillone, MD, Boston, MA
Paul A. Levine, MD*, Charlottesville, VA
M. Stuart Strong, MD*, Bedford, MA
Charles W. Vaughan, MD*, Hingham, MA
- 8:25 S**outhern Section Guest Introductions by William W. Shockley, MD*
Guest of Honor:
Harold C. Pillsbury, MD*, Chapel Hill, NC
Citation Awardees:
G. Richard Holt, MD*, San Antonio, TX
Stephen S. Park, MD*, Charlottesville, VA
Fred J. Stucker, MD*, Shreveport, LA
Mark C. Weissler, MD*, Chapel Hill, NC
- 8:35 M**iddle Section Guest Introductions by D. Bradley Welling, MD PhD*
Guest of Honor:
David E. Schuller, MD*, Columbus, OH
Citation Awardees:
Long-Sheng Chang, PhD, Columbus, OH
Paul R. Lambert, MD*, Charleston, SC
William H. Saunders, MD*, Columbus, OH
Gregory J. Wiet, MD, Columbus, OH

Introduction of Annual Middle Section Award

The George L. Adams, MD Young Faculty Award
Timothy E. Hullar, MD FACS, St. Louis, MO

8:50 **I**ntroduction of and Address by Triological Society President
Gerald S. Berke, MD*, Los Angeles, CA

Triological Society Honorable Mention Theses - 2010

9:05 **H**onorable Mention Award for Triological Society Thesis
Manual Control of the Upper Esophageal Sphincter
Peter C. Belafsky, MD*, Davis, CA

Educational Objective: At the conclusion of the presentation, the participants should be able to discuss how manual control the upper esophageal sphincter may be a possible treatment for profound oropharyngeal dysphagia.

Objectives: Oropharyngeal dysphagia (OPD) is common and costly. In order to improve quality of life for patients and costs to society, better treatments than currently available are needed. The author hypothesized that manual control of the upper esophageal sphincter (UES) is possible by pulling the larynx directly forward with anterior traction on the cricoid cartilage. The purpose of this investigation was to evaluate the effectiveness of manual control of the UES as a possible therapy for OPD. **Study Design:** Retrospective chart review, medical device development, prospective cadaver trial, prospective animal experiment, and initial human experience. **Methods:** Charts were reviewed of all persons with OPD who had a traction suture placed by the author around the anterior rim of the cricoid cartilage. The opening of the UES was assessed with and without traction on the suture. The ability of the cricoid suture to improve UES opening was evaluated under fluoroscopy. The swallow expansion device (SED) was designed to manually control the UES. The ability of the SED to manually open the UES was evaluated. The SED was implanted in 10 cadavers, and 5,000 pulls of the device were performed on each specimen to evaluate for gross damage to the cricoid cartilage. The ability of the SED to open the UES was evaluated under direct laryngoscopy. The safety and efficacy of the SED was evaluated in an ovine model of OPD. The SED was implanted in eight sheep. Five thousand pulls of the device were performed on each animal weekly for 8 weeks. At the end of the study, damage to the cricoid cartilage was evaluated histologically, and the ability of the SED to open the UES and eliminate aspiration was assessed fluoroscopically. The SED was placed in 1 human with dysphagia. Preliminary experience will be discussed. **Results:** Six patients with OPD who had a suture placed around the anterior aspect of the cricoid cartilage were identified. Anterior traction on the suture improved UES opening by 0.36 cm (60.19 cm) ($P < .01$). A titanium coated ferrous implant that secures to the cricoid cartilage was fabricated (SED). An external magnetic device that affixes to the implant across intact skin was developed. Anterior traction of the SED opened the UES in cadavers a mean of 1.16 cm (60.22 cm) ($P < .001$). Anterior traction on the SED opened the UES in sheep a mean of 1.27 cm (60.36) ($P < .001$). Aspiration was eliminated in 100% of the animals. The implant became infected and had to be removed in one (12.5%) animal. Remodeling of the cricoid cartilage was evident, but there was no histologic evidence of cartilage damage. **Conclusions:** Manual control of the upper esophageal sphincter is possible. Simple anterior traction on the suture placed around the cricoid cartilage improved UES opening by 0.36 cm (60.19) in a cohort of dysphagic patients. The swallow expansion device opened the UES of cadavers and living sheep to superphysiologic proportions ($P < .001$). There was no histologic evidence of cricoid damage from prolonged use of the implant. Preliminary human experience will be discussed.

9:15 **H**onorable Mention Award for Triological Society Thesis
Facial Determinants of Female Gender and Feminizing Forehead Cranioplasty
Jeffrey H. Spiegel, MD*, Boston, MA

Educational Objective: At the conclusion of my presentation, participants should be able to 1) discuss the areas of the face most significant for determining gender; and 2) understand the role of cranioplasty in gender confirming facial surgery.

Objectives: 1) Determine the area of the face most significant in identifying female gender; 2) determine if individuals with gender confirming surgery of the face are identified as male or female; 3) review the efficacy and safety of a series of feminizing forehead cranioplasties. **Study Design:** 1) Prospective evaluation of computer simulated changes and postoperative patient images; 2) retrospective review of medical records. **Methods:** 1) Photographs of men were digitally altered to adjust a) the forehead, b) the nose/lip, c) the jaw. Each change a, b, or c is done in isolation in both frontal and profile views. Subjects were shown the three profile and the three frontal photographs and asked to rate which of each set is the most feminine. 2) Photographs of male-to-female (MTF) transgender patients who may have had forehead, midface, or jaw surgery were shown to subjects. Subjects were asked the gender of the person in each picture. 3) Medical records and operative reports of 168 patients who underwent feminizing forehead cranioplasty were evaluated for surgical technique, and complications. **Results:** For experiment 1, in frontal views of all subjects the forehead modification was selected as the most feminine while in no cases was the forehead modification selected as least feminine by a majority of respondents. For the profile view, again the forehead modification was selected as most feminine by respondents for the majority of subjects, but surprisingly, the strength of the association between frontal modification and femininity, while strongly statistically significant, was more evi-

dent in the frontal view. For experiment 2, among transgendered faces shown to viewers, 82% of postoperative forehead modifications were judged as women, 87% of postoperative midface modifications were judged as women, and 85% of postoperative lower faces were judged as women. For section 3, the review of safety and technique in 168 feminizing forehead cranioplasties, there were three basic surgical techniques utilized with only 3 complications for an overall complication rate of 1.8%. **Conclusions:** Feminization of the forehead through cranioplasty is safe and has a significant impact in determining the gender of the patient. The strong association between femininity and attractiveness can now be more specifically attributed to the upper third of the face and the interplay of the glabellar prominence of the forehead, along with the eyebrow shape and position, and hairline shape and position. These results have strong implications for a paradigm shift in the method of facial analysis used to select aesthetic procedures and illuminate the processes by which femininity and attractiveness are interpreted in faces.

First Place Resident Research Awards

9:25 **Shirley Baron Resident Research Award (Western Section)** **Etiologic Factors in Sialolithiasis**

Kevin C. Huoh, MD, San Francisco, CA; David W. Eisele, MD*, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the pathophysiology of sialolithiasis and some potential risk factors for disease.

Objectives: The purpose of this study was to investigate the patient factors in a population of patients with sialolithiasis from the United States. **Study Design:** Retrospective, cohort study. **Methods:** Charts for all patients diagnosed with sialolithiasis between January 2001 and February 2010 were retrospectively reviewed. Demographic factors, smoking history, comorbid conditions, and medication history were recorded. Statistical analyses were then performed on the collected data. Population prevalences of smoking, diuretic usage, cholelithiasis, and nephrolithiasis were obtained through literature review. **Results:** A total of 153 patients with sialolithiasis were identified. Of these patients, 125 (82%) had submandibular sialolithiasis and 28 (18%) had parotid sialolithiasis. Positive smoking histories were present in 67 individuals (44%). The observed prevalence of smoking in our state was 13.3% in 2008. Smoking history did not correlate with the size of the primary sialolith. Diuretic usage in the cohort was observed at a rate of 20%, higher than reported population rates of diuretic use of 8.7%. The prevalences of cholelithiasis and nephrolithiasis were not different from observed population rates. **Conclusions:** Sialolithiasis is a rare condition caused by decreased salivary secretory activity, salivary stasis, and inflammation of salivary ductal epithelium. While association between smoking and sialolithiasis has been proposed previously, this study demonstrates a substantial correlation between smoking and salivary stone disease. We also present data to support an association between diuretic therapies and salivary stone formation. Further research is needed to elucidate relative risks of smoking and stone formation.

9:33 **Lawrence R. Boies, MD Resident Research Award (Middle Section)** **Effects of Simultaneous Speech and Sign on Infants' Attention to Spoken Language**

Jonathan Y. Ting, MD, Indianapolis, IN; Tonya R. Bergeson, PhD, Indianapolis, IN; Richard T. Miyamoto, MD*, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential effects of competition from simultaneous sign language on infants' attention to spoken language.

Objectives: To examine the hypothesis that infants receiving a degraded auditory signal have more difficulty segmenting words from fluent speech if familiarized with the words presented in both speech and sign compared to familiarization with the words presented in speech only. **Study Design:** Experiment utilizing an infant controlled visual preference procedure. **Methods:** Twenty 8.5 month old normal hearing infants completed testing. Infants were familiarized with repetitions of words in either the speech + sign (n=10) or the speech only (n=10) condition. Infants were then presented with four six-sentence passages using an infant controlled visual preference procedure. Every sentence in two of the passages contained the words presented in the familiarization phase, whereas none of the sentences in the other two passages contained familiar words. **Results:** Infants exposed to the speech + sign condition looked at familiar word passages for 15.3 seconds and at non-familiar words for 15.6 seconds, $t(9)=-.130$, $p=.45$. Infants exposed to the speech only condition looked at familiar word passages for 20.9 seconds and to non-familiar word passages for 15.9 seconds. This difference was statistically significant, $t(9) = 2.076$, $p = .03$. **Conclusions:** Infants' ability to segment words from degraded speech is negatively affected when these words are initially presented in simultaneous speech and sign. The current study suggests that a decreased ability to segment words from fluent speech may contribute towards the poorer performance of pediatric cochlear implant recipients in total communication settings on a wide range of spoken language outcome measures.

9:41 **Lloyd Storrs, MD Resident Research Award (Southern Section)** **The Role of TNF-Alpha in Inflammatory Olfactory Loss**

Babar Sultan, MD, Baltimore, MD; Lindsay A. May, BS, Baltimore, MD; Andrew P. Lane, MD*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) demonstrate existing knowledge regarding inflammatory olfactory loss; 2) explain the use of a TNF-alpha transgenic mouse model as a model for inflammatory olfactory loss; and 3) compare the effects of steroids on TNF-alpha mediated inflammatory steroid loss.

Objectives: Insights into the cellular and molecular effects of inflammation on the olfactory system have been provided by a transgenic mouse model. Here, the specific role of the CRS associated cytokine, TNF-alpha, is explored using this model. **Study Design:** Basic science. **Methods:** 3 transgenic mice were induced to express TNF-alpha in the olfactory epithelium for 6 weeks. In 3 other mice, 1 mg/kg prednisolone was administered daily concurrently to inhibit downstream inflammatory responses. The olfactory epithelium (OE) was analyzed by histology and electro-olfactogram (EOG) recordings. **Results:** Treatment with prednisolone successfully prevented inflammatory infiltration over significant regions of the OE. In areas where subepithelial inflammation was present, a corresponding loss of olfactory neurons was observed. In contrast, areas without inflammatory changes had normal olfactory neuron layers, despite chronic local expression of TNF-alpha. Prednisolone partially reversed the complete loss of olfaction in the mouse model, preserving odorant responses that were significantly diminished compared to controls, but not absent. **Conclusions:** The addition of prednisolone to the transgenic model of olfactory inflammation isolates the direct effects of induced TNF-alpha expression on the OE. The finding that prednisolone treatment prevents neuronal loss in some regions of the OE suggests that TNF-alpha does not directly cause neuronal apoptosis, and rather that subepithelial inflammation or other downstream mediators may be responsible. At the same time, EOG results imply that TNF-alpha directly causes physiologic dysfunction of olfactory neurons, independent of the inflammatory state. An understanding of the role of TNF-alpha and other inflammatory cytokines may suggest novel therapeutic strategies for CRS associated olfactory loss.

9:49 **William W. Montgomery, MD Resident Research Award (Eastern Section)**
Dexamethasone and Postoperative Bleeding after Tonsillectomy and Adenotonsillectomy in Children: A Meta-Analysis of Prospective Studies
 Josef Shargorodsky, MD MPH, Boston, MA; Christopher J. Hartnick, MD MS*, Boston, MA; Gi Soo Lee, MD MEd, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relation between perioperative dexamethasone administration and postoperative bleeding outcomes.

Objectives: Tonsillectomy and adenotonsillectomy are common pediatric surgical procedures. Although perioperative administration of dexamethasone is common, recent data indicate a possible association between dexamethasone and increased risk of postoperative hemorrhage. This study assesses the association between perioperative dexamethasone administration and postoperative bleeding risk in children undergoing tonsillectomy or adenotonsillectomy. **Study Design:** Meta-analysis using Medline and Embase, including all placebo controlled prospective studies with perioperative dexamethasone as the intervention and postoperative bleeding as the outcome, in children age \leq 18 years undergoing tonsillectomy or adenotonsillectomy. **Methods:** The association between any dexamethasone dose and bleeding outcomes was quantified. Dexamethasone dose analyses were performed using meta-regression and stratified dose analysis models. Individuals were pooled using the random effects model, and Mantel Haentzel odds ratios (OR) were used to assess the associations. All p-values were two sided. **Results:** 12 studies with 1,180 total participants were included in the meta-analysis. There was no significant association between dexamethasone at any dose and odds of bleeding, compared to placebo (OR=1.07, 95% CI 0.58-1.98; p=0.82). The meta-regression also did not demonstrate a significant association between increasing dexamethasone dose and bleeding (regression slope=-1.47, p=0.10). Stratifying by dose ranges, studies comparing dexamethasone doses in 0.4-0.6mg/kg range to placebo showed significantly increased odds of bleeding (OR=3.14, 95% CI 1.14-8.65; p=0.03). Higher or lower doses were not associated with a difference in bleeding. **Conclusions:** There was no overall association between dexamethasone administration and postoperative bleeding in children undergoing tonsillectomy or adenotonsillectomy. However, this study cannot exclude the possibility of an association between specific dexamethasone doses and increased odds of bleeding. The results underscore the need for more dedicated prospective studies of this very common intervention.

9:57 **Q&A**

◆ 10:03 - 10:35 Break with Exhibitors/Poster Viewing ◆

PANEL

10:35 - 12:00 **What's the Latest & Greatest in . . .**
Moderator: Marlan R. Hansen, MD*, Iowa City, IA
 10:35 **MOC**
 Robert H. Miller, MD MBA*, Houston, TX
 10:50 **Duty Hours and RRC/ACGME**
 Bradley F. Marple, MD, Dallas, TX
 11:05 **Update on Manpower Work Hours**
 Harold C. Pillsbury, MD*, Chapel Hill, NC
 11:20 **Otology**
 D. Bradley Welling, MD PhD*, Columbus, OH
 11:28 **Head & Neck**

- David E. Eibling, MD*, Pittsburgh, PA
- 11:36 **Plastics**
Brian J.F. Wong, MD PhD*, Irvine, CA
- 11:44 **Laryngology**
Mark S. Courey, MD*, San Francisco, CA
- 11:52 **Rhinology**
Ralph B. Metson, MD*, Boston, MA

◆ 12:00 - 1:15 Lunch in Exhibit Hall/Poster Viewing ◆

1:15 - 2:10 Concurrent Sessions

Thursday - Concurrent Session I
General & Resident Research Awards
KIERLAND 1 & 2

Moderators:

Kenneth M. Grundfast, MD*, Vice President, Eastern Section
William W. Shockley, MD*, Vice President, Southern Section

1:15 **John J. Conley, MD Resident Research Award (Eastern Section)**
Congenital Choristomas of the Oral Cavity in Children

Raymond L. Chai, MD, Pittsburgh, PA; John A. Ozolek, MD, Pittsburgh, PA; Barton F. Branstetter, MD, Pittsburgh, PA; Deepak K. Mehta, MD, Pittsburgh, PA; Jeffrey P. Simons, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe proposed theories on pathogenesis of congenital choristomas of the oral cavity in the pediatric population, identify typical radiologic and pathologic characteristics of these lesions, and compare different surgical techniques for their removal.

Objectives: To review our institutional experience with oral cavity choristomas in children. **Study Design:** Retrospective case series and medical record review. **Methods:** Medical records including clinic notes, operative reports, radiologic studies, and pathology reports were reviewed. All imaging studies and pathology material were reviewed by a head and neck radiologist and pediatric pathologist respectively. **Results:** 16 patients (11 males and 5 females) with congenital oral cavity choristomas were identified. Mean age at diagnosis was 1.8 months. Location of the lesions included tongue (n=9) and floor of mouth (n=7). Preoperative imaging included MRI (n=6), CT (n=5), plain radiograph (n=1), and no imaging (n=4). The most frequent radiologic appearance was that of a well defined cystic mass, indistinguishable from more common entities such as dermoid cyst and lymphatic malformation. Symptoms were present in 5/16 patients and included difficulty feeding, swelling with URI, and partial airway obstruction. Complete surgical excision was performed in 15/16 patients; mean age at the time of surgery was 12.7 months. One patient underwent marsupialization. No complications were noted perioperatively. No recurrences of choristoma were seen. On histological examination, the predominant component was cystic with cyst linings of respiratory epithelium (n=5), gastric (foveolar) epithelium (n=1), or both (n=10). **Conclusions:** This study supports surgical excision as an effective intervention for children with oral cavity choristomas. Because the etiology of these cysts is unknown and diagnostic terminology is widely variable, we propose a more descriptive diagnosis based on the histology (i.e., lingual cyst with respiratory epithelium or lingual cyst with gastric epithelium).

1:23 **John E. Bordley, MD Resident Research Award (Southern Section)**
STT3A, C1orf24, TFF3: Putative Markers for Characterization of Follicular Thyroid Neoplasms from Fine Needle Aspirates

Mihir R. Patel, MD, Chapel Hill, NC; Michael E. Stadler, MD, Chapel Hill, NC; Allison M. Deal, MS, Chapel Hill, NC; Hungsuk S. Kim, PhD, Chapel Hill, NC; Carol G. Shores, MD PhD, 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 advantages of rt-PCR over immunohistochemistry for evaluating fine needle aspiration biopsies of follicular thyroid neoplasms.

Objectives: 1) Characterize gene expression using fine needle aspirates (FNA) from follicular neoplasms to distinguish follicular adenomas (FA) from follicular carcinomas (FTC), and follicular variant of papillary carcinomas (FVPTC); and 2) utilize FNA material to distinguish benign versus malignant follicular neoplasms. **Study Design:** Retrospective expression analysis of diagnosed follicular neo-

plasms (Level of Evidence 2b). Prospective cohort of FNA from the operating room after thyroid lobectomy (Level of Evidence 1b). **Methods:** Gene expression analysis of normal thyroid tissue (n = 63) and follicular neoplasms as diagnosed on preoperative FNA: FA (n = 16), FTC (n = 13), FVPTC (n = 24), and papillary thyroid carcinomas (n = 10) was performed taking RNA from core biopsied formalin fixed, paraffin embedded tissues and quantified using rt-PCR. FNA was performed on thyroid nodules (n = 17) in the operating room. Samples were placed in RNA preservative and analyzed using markers from the retrospective series with rt-PCR prior to obtaining final pathology. **Results:** Quantitative gene analysis detects differential TFF3 expression in FA versus FTC, FVPTC, PTC (p = 0.02). RT-PCR of FNA samples identified malignant nodules to overexpress STT3A compared to those with benign disease (p=0.046). The combination of STT3A overexpression/ Clorf24 underexpression identified malignant disease (p=0.03) on FNA samples. **Conclusions:** Gene expression data suggests that there is a difference in expression between STT3A, Clorf24 and TFF3 in follicular adenomas versus carcinomas that may be detected from an FNA sample. Findings must be validated from preoperative FNAs in larger numbers.

1:31 **Lester A. Brown, MD Resident Research Award (Southern Section)**

Disruption of Ephrine B/EphB Interaction Results in Abnormal Cochlear Innervation Patterns

Constance Q. Zhou, MD, Dallas, TX; James Lee, MD PhD, Pasadena, CA; Dongmei Shao, MD, Dallas, TX; Mark J. Henkemeyer, PhD, Dallas, TX; Kenneth H. Lee, MD PhD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to identify that the interaction of ephrine B with EphB is a well characterized mechanism for axon guidance, understand that these proteins are expressed in cochlear tissue, and disruption of this interaction leads to functional consequences both in vitro and in vivo.

Objectives: Determine the expression patterns of B ephrines and Ephs in the cochlea and identify functional consequences of disruption of ephrine B/Eph B interactions in both cultured spiral ganglion neurons and in the cochlea of live animals. **Study Design:** The expression patterns of various B ephrines and Ephs were determined in mice with Lac-Z mutated mice. Mice with null function of individual B ephrine and Eph proteins and those with multiple knockouts were studied for cochlear innervation patterns. **Methods:** Mice with B ephrines and Ephs disrupted with the β -galactosidase gene were sacrificed at P6, and their cochleae isolated and processed for Lac-Z staining to determine expression of these proteins in cochlear tissue. Spiral ganglion cells from wild type as well as ephrine B1 knockout mice were isolated and co-cultured with Eph B2 expressing Cos1 cells and neurite lengths were determined. Fluorescent lipophilic dyes were used to label spiral ganglion cell nerve fibers to determine cochlear innervation patterns in wild type and knockout mice. **Results:** Eph B1, B2, and ephrine B2 but not B3 was expressed in the cochlea. Eph B2 inhibited outgrowth of spiral ganglion cell axons from wild type mice but not from ephrine B1 knockout mice in culture. Knockout mice with null function of ephrine B1 alone or Eph B1, Eph B2, Eph B3 in combination demonstrated abnormal innervation patterns in the organ of Corti. **Conclusions:** Disruption of B ephrines and Ephs results in functional consequences in spiral ganglion cells, suggesting that these proteins play a role in establishing normal innervation patterns in the cochlea.

1:39 **Q&A**

1:45 **GUEST SPEAKER**

Clinical Cancer Research in Otolaryngology: Head and Neck Surgery

David E. Schuller, MD*, Columbus, OH

◆ 2:10 Adjourn Concurrent Sessions ◆

2:15 - 5:50 Scientific Session
Kierland 1 & 2

Thursday - Concurrent Session II
Head & Neck
KIERLAND 3

Moderator: David E. Eibling, MD*, Pittsburgh, PA

1:15 **Treatment Outcome in the Residually Positive Neck after Definitive Chemotherapy and Irradiation**

Laura M. Dooley, MD, Louisville, KY; Jeffrey M. Bumpous, MD*, Louisville, KY; Liz D. Wilson, BSN RNC CCRP OCN, Louisville, KY; Zachary J. Cappello, BS, Louisville, KY; Kevin L. Potts, MD FACS, Louisville, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of neck dissection in the clinically positive neck after definitive chemotherapy and irradiation for upper aerodigestive squamous carcinoma.

Objectives: Determine the prevalence of viable malignancy in patients undergoing neck dissection for palpable residual neck disease following concomitant chemo/xrt for upper aerodigestive squamous carcinoma. To determine the survival in groups with a neck complete response to those who had residual disease requiring neck dissection. **Study Design:** Retrospective chart review. **Methods:** Retrospective chart review of 230 patients who underwent definitive chemo/xrt for primary SCCa of the head and neck from 2005-2009 in one institution. **Results:** 39 (17%) patients underwent ND for residual palpable neck mass within 6 months post-treatment. 49% (19/39) were pathologically positive for malignancy and 51% (20/39) were negative. The probability of a +ND based on original Nstage was not statistically significant ($p=0.368$). Primary site did not yield significant probability of having +ND, except in the oral cavity ($p=0.02$). Patients had similar overall 5 year survival among those that had a complete response in the neck (66%), neck dissection for residual disease (71%), or the patients remaining NED or recurring after 6 months (71%). Lower initial Nstage demonstrated improved survival in all outcome groups. Tonsil SCCa patients who underwent ND had improved survival compared to those with initial complete response (87.5% vs 75.8%, $p=9.61 \times 10^{-8}$), both of which had increased survival compared to the NED group which included late neck recurrence (65%). **Conclusions:** This study supports the use of ND in the post-chemo/xrt clinically positive neck regardless of primary site or initial Nstage. ND in this setting conveys survival equal to patients with complete response in the neck after chemo/xrt.

1:23 **C**omparison of Outcomes for Head and Neck Squamous Cell Carcinoma Patients with N3 Neck Disease Treated Primarily with Chemoradiation versus Surgical Resection

Jessica K. Smyth, MD, Chapel Hill, NC; Benjamin Y. Huang, MD, Chapel Hill, NC; Allison M. Deal, MS, Chapel Hill, NC; Carol G. Shores, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the available treatment options for advanced stage head and neck squamous cell carcinoma. Additionally, the participants should be able to compare outcomes for those patients' treatment with primary chemoradiation therapy versus primary surgical resection followed by chemoradiation for those patients with N3 (>6cm) neck disease.

Objectives: Although treatment paradigms have shifted to recommend primary chemoradiation (CRT) therapy in many patients with advanced head and neck squamous cell carcinoma (HNSCC), few studies have included any significant number of patients with N3 (>6 cm) neck disease. The aim of our study was to determine if primary CRT has equivalent outcomes regarding overall and disease free survival when compared to primary surgical resection followed by adjuvant CRT in patients with N3 neck disease. **Study Design:** Nonrandomized single institution retrospective cohort study. **Methods:** A retrospective analysis of 105 patients treated for HNSCC with N3 neck disease between 1989 and 2009 was performed. **Results:** Of the 105 patients identified, 74 were treated with primary CRT, 24 underwent primary surgical resection with adjuvant CRT, 2 were treated with radiation therapy alone, and 5 refused treatment or pursued palliative treatment. With a mean followup of 2.2 years, the patients who received primary surgery had better overall survival than those who had primary CRT (5 yr OS: 68% (95% CI: (45%, 84%)) vs 32% (19%, 45%) $p=0.047$). Of the patients treated with primary CRT, there was no difference in overall or disease free survival in those patients who underwent a post-CRT neck dissection ($n=28$), either planned or performed for persistent disease, than those who did not ($n=46$, $p=0.96$). **Conclusions:** Despite the trend toward treatment with primary CRT, patients with advanced stage HNSCC have better overall survival with primary surgical treatment. Additionally, a neck dissection following primary CRT may not improve survival.

1:31 **H**ead and Neck Rhabdomyosarcoma: Analysis of 558 Cases from the Surveillance, Epidemiology and End Results Database

Justin H. Turner, MD PhD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to summarize the trends in incidence and survival for patients with head and neck rhabdomyosarcoma.

Objectives: Rhabdomyosarcoma (RMS) is a highly malignant tumor of striated muscle most commonly diagnosed in young children and adolescents. These tumors commonly present in the head and neck, particularly the orbit and paranasal sinuses. In the current study, trends in RMS incidence and survival were evaluated using a national cancer database. **Study Design:** Retrospective review of a national cancer database. **Methods:** Incidence and survival trends were examined for head and neck RMS diagnosed between 1973 and 2007 using the Surveillance, Epidemiology, and End Results Program. Frequencies, age adjusted incidence rates, and relative survival curves were calculated for various RMS subtypes and primary sites. **Results:** Between 1973 and 2007 the incidence of RMS of the head and neck increased significantly with an annual percentage change of 1.16%. Incidence was equivalent for males and females. Relative 5 year survival was statistically unchanged during the study period at $62.8\% \pm 2.3\%$. Improved survival was noted for tumors of embryonal histology and for tumors of the orbit, while tumors of the parameningeal tissues had the poorest survival. When evaluated by stage, the majority of orbital tumors (60.6%) presented with localized disease while a majority of parameningeal tumors presented with either regional (53.2%) or distant (28.1%) spread. Relative survival was found to be largely dependent on extent of disease rather than primary site. **Conclusions:** Despite reported advances in overall and disease free survival for patients with RMS, population based analysis shows no substantial improvement during the last 30+ years. The incidence of head and neck RMS has increased for unclear reasons. The prognosis of these patients is largely dependent on extent of disease at diagnosis.

1:39 **T**elemedicine—An Efficient and Cost Effective Approach in Parathyroid Surgery

Andrew C. Urquhart, MD, Marshfield, WI; Nina M. Antoniotti, RN MBA PhD, Marshfield, WI; Richard L. Berg,

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the benefits of telemedicine in the postoperative management of parathyroid patients.

Objectives: To demonstrate the effectiveness and cost benefit of performing telemedicine for the postoperative visit in patients undergoing parathyroidectomy for primary hyperparathyroidism. **Study Design:** Retrospective noncontrolled study of a cohort of 39 patients undergoing postoperative care after parathyroidectomy through telehealth at a number of sites at various distances from the primary surgical facility. **Methods:** From October 2006—January 2010, 149 patients underwent parathyroidectomy for primary hyperparathyroidism at a single tertiary medical center by a single surgeon. Age, sex, distance from the patient's home to the surgical center, distance from the patient's home to the telehealth site, effective completion of the telehealth visit and postoperative complications were recorded. **Results:** A total of 149 patients underwent parathyroidectomy, of which 39 had their postoperative visit through telehealth (26%). There were 26 females (67%) and 13 males. Mean age was 64 years. Average roundtrip distance saved was 119 miles (71.7%). This translated into an average \$357.00 saving per patient with further immeasurable benefits to the patient and health care system. All visits were effectively carried out and completed with a nurse at the telehealth site and the surgeon at the surgical center site. There were no postoperative surgical complications noted with the visit. **Conclusions:** Telehealth is a cost effective and efficient way to see patients undergoing parathyroidectomy with significant convenience and financial benefits for the patient and health care system.

1:47 **R**igid Esophagoscopy in an Academic Training Program: Complications and Contributions

Ashli K. O'Rourke, MD, Charlottesville, VA; Scott R. Owen, BS, Charlottesville, VA; James F.E. Reibel, MD, Charlottesville, VA; Paul A. Levine, MD*, Charlottesville, VA; Mark J. Jameson, MD PhD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the common complications associated with rigid esophagoscopy and compare the benefits of utilizing rigid versus flexible esophagoscopy in certain clinical situations.

Objectives: To assess the safety and efficacy of rigid esophagoscopy for staging head and neck cancer patients. **Study Design:** Retrospective case series in a tertiary care center. **Methods:** All patients undergoing rigid esophagoscopy for head and neck cancer staging from July 2004 through March 2010 were included. The main outcome measures of complication rate and esophageal pathologic findings were assessed by review of operative notes and postoperative documentation. **Results:** 446 patients (345 males and 101 females) with a mean age of 60 years (range 16 to 88 years) were included. 462 rigid esophagoscopies were performed with 7 complications (1.5%) including 1 esophageal perforation (0.2%), 3 dental injuries (0.6%), 2 anesthesia complications (0.4%), and 1 temporomandibular joint dislocation (0.2%). Esophageal findings were normal in 402 studies (87.0%). No synchronous primary esophageal carcinomas were found. Nonmalignant pathology was found in 32 cases (6.9%). Esophagoscopy was aborted in 30 patients due to resistance (4), osteophytes (11), inability to position the neck (4), pharyngeal tumor (2), body habitus (1), or unknown reasons (8). **Conclusions:** Rigid esophagoscopy for cancer staging can be performed safely in an academic training program. However, the utility of this procedure for cancer staging is low and some complications occur. Given the accuracy and minimal risk of current high resolution imaging techniques and of awake, in-office flexible transnasal esophagoscopy, consideration should be given to more selective use of rigid esophagoscopy.

1:55 **A**ntibiotic Prophylaxis in Uncontaminated Neck Dissection

Li-Xing Man, MSc MD MPA, Pittsburgh, PA; Daniel M. Beswick, BSc, Pittsburgh, PA (Presenter); Jonas T. Johnson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current literature on the indications for prophylactic antibiotics for uncontaminated neck dissection.

Objectives: To describe our institution's experience with antibiotic prophylaxis in uncontaminated neck dissection and to identify risk factors associated with postoperative wound infection. **Study Design:** Retrospective chart review. **Methods:** Between April 2006 and June 2010, 211 patients underwent 240 uncontaminated neck dissections at a single tertiary care center. Patient factors, operative details, and postoperative complications were recorded. Patients were separated into three groups: No prophylactic antibiotics, intraoperative antibiotics only, and intra- and postoperative antibiotics. **Results:** Wound infections occurred after 9 of the 240 procedures (3.8%). All of the wound infections occurred in patients receiving intraoperative antibiotics only (4 of 136) or intra- and postoperative antibiotics (5 of 68) ($P = 0.13$). The development of a wound infection was not associated with age, gender, tobacco and alcohol history, history of prior head and neck surgery, and history of prior radiation or chemotherapy. Wound infection was associated with closure with a pedicled flap (adjusted OR 5.92, 95% CI 1.04 - 33.61, $P = 0.05$), operative time (adjusted OR 1.31, 95% CI 1.03 - 1.66, $P = 0.03$, for each additional hour of surgery), radical neck dissection (adjusted OR 20.99, 95% CI 2.37 - 186.01, $P < 0.01$), and extended neck dissection (adjusted OR 13.79, 95% CI 1.73 - 109.77, $P = 0.01$). Other common postoperative complications included seroma (3.8%), chyle leak (2.9%), wound or flap dehiscence (2.1%), and hemorrhage (1.7%). **Conclusions:** Our data did not support the use of antibiotic prophylaxis in routine uncontaminated neck dissection. Prophylactic antibiotics, however, may be indicated for more extensive lymphadenectomy procedures.

2:03 **Q&A**

◆ 2:08 Adjourn Concurrent Sessions ◆

2:15 - 5:50 Scientific Session
Kierland 1 & 2

POINT/COUNTERPOINT

- 2:15 - 3:00 Moderator: David J. Terris, MD*, Augusta, GA**
Open versus Endoscopic Management of Skull Base Lesions
Paul A. Levine, MD*, Charlottesville, VA
Ricardo Carrau, MD*, Santa Monica, CA
Balloon versus Traditional Sinus Management
Bradley F. Marple, MD, Dallas, TX
Peter J. Catalano, MD, Boston, MA
Stereotactic Radiation versus Surgical Resection for Vestibular Schwannomas
Rick A. Friedman, MD*, Los Angeles, CA
P. Ashley Wackym, MD*, Portland, OR

◆ 3:00 - 3:30 Break with Exhibitors/Poster Viewing ◆

PANEL

- 3:30 - 5:30 How I Do It (video enhanced)**
Moderator: G. Richard Holt, MD*, San Antonio, TX
3:30 **Tricks for Finding the Parathyroid**
Bruce H. Haughey, MD, St. Louis, MO
3:36 **Robotic Surgery for Head & Neck Cancer**
F. Christopher Holsinger, MD, Houston, TX
3:42 **Placement of Batten Grafts in Functional Rhinoplasty**
Dean M. Toriumi, MD*, Chicago, IL
3:48 **Reduction of Nasal Fractures**
Wm. Russell Ries, MD*, Nashville, TN
3:54 **Managing the Severely Twisted Caudal Septum with Explantation**
Edmund A. Pribitkin, MD*, Philadelphia, PA
4:00 **Nasal Reconstruction with the Forehead Flap**
Stephen S. Park, MD*, Charlottesville, VA
4:06 - 4:16 Questions & Comments from Audience
4:16 **Percutaneous Injection Laryngoplasty**
Dinesh K. Chhetri, MD*, Los Angeles, CA
4:22 **Diagnosing Laryngopharyngeal Reflux**
Jacob Pieter Noordzij, MD*, Boston, MA
4:28 **Lateral Port Revision after Pharyngeal Flap**
J. Paul Willging, MD*, Cincinnati, OH
4:34 **Endoscopic Laser Radial Incision and Balloon Dilation of Subglottic Stenosis**
C. Gaelyn Garrett, MD*, Nashville, TN
4:40 **Pearls for Atresia Repair**
Bradley W. Kesser, MD*, Charlottesville, VA
4:46 **Plugging the Superior Semicircular Canal**
C. Matthew Stewart, MD PhD, Baltimore, MD
4:52 - 5:02 Questions & Comments from Audience
5:02 **Managing the Diseased Frontal Outflow Tract**
Andrew N. Goldberg, MD*, San Francisco, CA
5:08 **Endoscopic Repair of CSF Leaks**
Stilianos E. Kountakis, MD PhD*, Augusta, GA
5:16 **Endoscopic Resection of Nasal Tumors**
Adam M. Zanation, MD, Chapel Hill, NC
5:22 **Managing the Large Tongue**

Eric J. Kezirian, MD, San Francisco, CA
5:28 **Identifying the Anatomic Etiology of OSA**
B. Tucker Woodson, MD*, Milwaukee, WI
5:34 **Nuances with the Stroboscopic Exam**
Mark S. Courey, MD*, San Francisco, CA
5:40 - 5:50 **Questions & Comments from Audience**

6:00 - 7:30 Vice President's Welcome Reception

FRIDAY, JANUARY 28, 2011

Concurrent Session I

Rhinology/Plastics

KIERLAND 1 & 2

8:00 **Announcements by Vice Presidents**

PANEL

8:05 - 9:10 **The Nasal Valve and Functional Rhinoplasty**
Moderator: William W. Shockley, MD*, Chapel Hill, NC
Panelists: Wm. Russell Ries, MD*, Nashville, TN
Jeffrey H. Spiegel, MD*, Boston, MA
Dean M. Toriumi, MD*, Chicago, IL
Stephen S. Park, MD*, Charlottesville, VA

Moderator: Karen H. Calhoun, MD*, Columbus, OH

9:15 **Nasal Tip Projection and Facial Attractiveness**

Zlatko Devcic, BS, Irvine, CA; Benjamin A. Rayikanti, San Francisco, CA; Jesse P. Hevia, San Francisco, CA;
Natalie A. Popenko, Irvine, CA; Koohyar Karimi, BS, Laguna Hills, 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 the six landmark ratios for measuring nasal tip projection, as proposed by Goode, Simons, Baum, Powell, and Crumley, correlate with facial attractiveness and contribute to overall facial aesthetics. They should be able to discuss the uses and limitations of these ratios in the management of facial attractiveness, and compare their utility.

Objectives: Six nasal tip projection (NTP) ratios from Goode, Simons, Baum, Powell, and Crumley guide clinical and academic practice on quantifying NTP, but have not been empirically correlated with facial attractiveness. The study objectives are to determine: 1) if there is a correlation between these ratios and facial attractiveness; and 2) if the most attractive faces fit the ideal NTP ratios. **Study Design:** Computer based basic research study. **Methods:** 300 digital portraits of women (ages 18-25) were randomly paired and morphed to create 300 synthetic lateral facial images rated by 78 raters in the community. NTP ratios were measured in each portrait. **Results:** Our database generated a broad range of NTP. Although the Goode ratio had the strongest correlation with facial attractiveness, none of the ratios had strong correlations. For the Baum, Powell, and Simons ratios facial attractiveness increased as NTP deviated one, two, three, or more standard deviation from the ideal, while facial attractiveness decreased as NTP deviated from the Goode and Crumley ideal ratios. **Conclusions:** To our knowledge, this is the first study to empirically correlate the six landmark ratios for quantifying NTP with facial attractiveness. While we did not find a strong correlation with any of the six ratios, the ideal ratios proposed by Goode and Crumley improved facial aesthetics the most. Although the ideal ratios are useful in establishing surgical guidelines in rhinoplasty, they should only partly contribute to the management of achieving an aesthetic face on the whole, as they may not be robust enough to correlate with overall facial attractiveness.

9:23 **Electromechanical Reshaping of Costal Cartilage Grafts: A New Surgical Treatment Modality**

Cyrus T. Manuel, BS, Irvine, CA; Allen Foulad, BS, Irvine, CA; Dima E. Protsenko, PhD, Irvine, CA; Brian J.F. Wong, MD PhD*, Irvine, CA

Educational Objective: At the conclusion of the presentation, the participants should be able to understand the concept of electromechanical reshaping and recognize the potential clinical applications of this minimally invasive procedure in reconstructive surgery.

Objectives: Needle electrode based electromechanical reshaping (EMR) is a novel, ultra low cost nascent surgical technology to reshape cartilage with low morbidity. EMR uses direct current (DC) to induce mechanical relaxation in cartilage that is first deformed into a required geometry, which in turn leads to permanent shape change. The objective of this study was to determine the effect of EMR voltage and time on the shape change of costal cartilage grafts. **Study Design:** NA. **Methods:** Central segments of fresh porcine costal cartilages (n=100) were sectioned (24 x 8 x 0.7 mm) with a custom cutting device and allocated into groups that underwent reshaping using different voltage (3-7 V) and application times (1-4 min). During EMR, the cartilage specimens were bent to form a 90° angle and then exposed to DC using platinum needles. After EMR and removal of the jig, the resulting bend angle was photographed and measured using digital micrometry. **Results:** There is a threshold for voltage and time above which the retention of bend angle is statistically significant in treated specimens compared to the control (p<0.05). Above the threshold of 3V, shape retention initially increased

with application time for all voltages tested and was then observed to reach a plateau. Shape retention was noted to be greatest at 6V (e.g. 71° bend angle at 4min) without any rise in temperature. **Conclusions:** EMR provides a novel method to bend and shape costal cartilage grafts for use in facial plastic surgery. A low voltage can reshape cartilage grafts within several minutes; however, ideal retention of shape change will require further optimization of parameters and/or electrode placement. This study shows feasibility of EMR and brings this minimally invasive procedure closer to clinical implementation.

9:31 **M**andible Fractures: Does the Timing of Repair Affect Outcomes?

Daniel A. Barker, MD, Charlottesville, VA; Kenneth K. Oo, MD, Singapore; Amir Allak, MD, Charlottesville, VA; Stephen S. Park, MD*, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current literature regarding timing to repair of the mandible. They should also be able to discuss this data as it pertains to surgical planning and informed consent.

Objectives: Timing of repair will prove to be a significant factor with regard to the rate of complications after repair of mandible fractures. **Study Design:** Retrospective chart review of the previous five years (January 2005—January 2010). **Methods:** All patients undergoing mandible fracture fixation performed in the study period and having complete records were analyzed (n=83). Patients were stratified first by time to fixation and evaluated. Subjects were then separated by presence or absence of complications: infection, malunion and nonunion. Logistical regression was then performed. **Results:** Out of 83 patients there were 5 patients with 6 complications including malunion (N=4) and infection (N=2). There were no cases of nonunion. Time to surgery did not affect complication rate. **Conclusions:** Considering that complications from repair of mandible fractures are rare, it is difficult to achieve numbers proving that timing does not affect outcomes. In this study we found no relationship between complications and time to repair.

9:39 **A**nterior Lateral Thigh Free Tissue Transfer: An Assessment of Donor Site Morbidity in 100 Patients

Tammara L. Watts, MD PhD, Galveston, TX; Mark K. Wax, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the donor site morbidity associated with harvest of the anterior lateral thigh free flap and discuss risks and benefits of selecting the anterior lateral thigh free flap for reconstruction of head and neck defects.

Objectives: To determine the perioperative and postoperative complications associated with harvest of the anterior lateral thigh free flap. **Study Design:** Retrospective chart review was performed from 9/2003-7/2010. 100 patients meet inclusion criteria. **Methods:** This is a retrospective review from a single surgeon experience with harvest of the anterior lateral thigh free flap. Outcomes measured included: intraoperative morbidity and postoperative morbidity donor site morbidity. Motor function and neurologic deficits were measured subjectively and compared to the unaffected side. Donor site wound healing was also determined and complications related to hematoma, seroma formation, and poor healing characterized. **Results:** Intraoperative complications associated with flap harvest occurred in 4/100 patients (4%). Postoperative donor site morbidity was 8/100 (8%) and included transient numbness 2/100, transient weakness 1/100, permanent weakness 1/100, seroma 3/100 and 1/100 wound dehiscence. **Conclusions:** As the popularity of the ALT flap increases, assessing donor site morbidity is important. To date, this is the largest study specifically addressing ALT donor site morbidity. With an overall morbidity of 12%, this free flap donor site has an acceptable morbidity for head and neck reconstruction.

9:47 **S**uccessful Reconstruction of Scalp and Skull Defects: Lessons Learned from a Large Series

David C. Shonka, MD, Charlottesville, VA; Andrea E. Potash, MD, Iowa City, IA; Mark J. Jameson, MD PhD, Charlottesville, VA; Gerry F. Funk, MD, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the management of a variety of scalp and skull defects.

Objectives: To provide a framework for the management of scalp and skull defects. **Study Design:** Retrospective chart review. **Methods:** Patients who underwent primary reconstruction of scalp and/or skull defects with free flaps, rotational skin flaps, rotational fascial flaps, skin grafts, and implants at two tertiary care hospitals were evaluated. Defects of the lateral temporal bone and skull base, and defects repaired by primary closure were excluded. **Results:** Sixty-two primary reconstructions were performed on 55 consecutive patients. Treatment of skin cancers and intracranial tumors necessitated 30 (48%) and 22 (35%) of the reconstructions, respectively. Defects included partial thickness soft tissue (17%), full thickness soft tissue (40%), full thickness soft tissue and skull (26%), and full thickness soft tissue, skull and dura (11%). Radiation or pre-reconstruction wound breakdown or infection was involved in 32 (52%) and 25 (40%) of cases respectively. The most common method of reconstruction was free tissue transfer (42%) followed by local skin (26%) or fascia (15%) flaps. There was a 16% (10/62) complication rate; 80% of these occurred in radiated tissues and 50% occurred in smokers. Seven of the 10 patients with complications were managed with local wound care while three required a second reconstructive procedure. All patients ultimately achieved a safe outcome with no infection and no bone or dura exposure. **Conclusions:** In addition to defect location and extent, availability of surrounding tissue and wound healing characteristics direct reconstruction. Patients who smoke or who have undergone radiation therapy are at increased risk of complications. Vascularized tissue is particularly important in successful management, making local flaps and free tissue transfer the mainstay of reconstruction.

9:55 Q&A

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

Head & Neck/Laryngology

Moderator: Jacob Pieter Noordzij, MD*, Boston, MA

10:30 Patient Perspectives on Dysphonia following Thyroidectomy for Thyroid Cancer

Maggie A. Kuhn, MD, New York, NY; Gary G. Bloom, BS, Olney, MD; David J. Myssiorek, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the frequency of patient reported voice complaints after thyroidectomy and discuss common presentations, probable causes and appropriate management of post-thyroidectomy dysphonia.

Objectives: To determine the frequency, quality and impact of patient reported dysphonia following thyroidectomy. **Study Design:** Survey to the Thyroid Cancer Survivors' Association's over 12,000 members. **Methods:** Members were asked about their cancer, surgery, postoperative voice, quality of life, treatment and non-identifying demographics in a 36 item electronic questionnaire. Excluded were patients with preoperative hoarseness or vocal fold immobility and those reporting postoperative vocal fold paralysis. **Results:** 2624 members responded (rate 21.9%), and postoperative dysphonia was reported by 38.6%. It was temporary in 87.9% and permanent in 7.7%. Most underwent total (82.5%) or completion thyroidectomy (14.3%) and had papillary thyroid cancer (86.8%). Rates of dysphonia were similar across extent of surgery and histologies. The majority of dysphonic patients described loss of loudness (55.4%) and an inability to shout (56%) or sing (54.4%). One quarter reported damaging effects on their professional (24.7%) or personal lives (23.3%). Specifically, they experienced demotions, firings, relationship stress and depression. Only 36 patients (3.6%) were offered voice therapy of which nearly two-thirds (63.9%) experienced partial or full recovery. **Conclusions:** The rate of permanent hoarseness after thyroidectomy is typically reported as less than 2%. Presumably, many patients are not questioned about voice quality in the absence of obvious hoarseness or paralysis. These survey results highlight the underreported frequency of post-thyroidectomy dysphonia and its profound impact on patients. Also, they underscore the importance of preoperative counseling and support reassuring patients that dysphonia is infrequently permanent. Surprisingly, few patients were offered voice therapy despite its benefit, reflecting an area for improvement in the management of post-thyroidectomy dysphonia.

10:38 Voice Outcomes in Transoral Surgery for Supraglottic Cancer

Joseph F. Goodman, MD, Washington, DC; Sheila V. Stager, PhD, Washington, DC; Mark C. Domanski, MD, Washington, DC; Nader Sadeghi, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate differences in acoustic and aerodynamic measures of voice in patients undergoing transoral supraglottic laryngectomy, compared to normal controls.

Objectives: Demonstrate differences in acoustic and aerodynamic measures of voice in patients undergoing transoral supraglottic laryngectomy, compared to normal controls. **Study Design:** Case series. **Methods:** Case series of five patients who underwent transoral laser microsurgery to remove cancer involving supraglottic structures (epiglottis, vallecula, aryepiglottic folds, false folds, or arytenoid mucosa), but whose true vocal fold function as observed by endoscopic examination was spared. Subjects were assessed using validated self-report assessment tools and a survey asking them to rate their postoperative compared to preoperative voice. **Results:** All patients reported the same or better voice quality post-surgery. Mean V-RQOL was 11.6 and mean GFI was 1. Both of these are within normal limits, which is in agreement with previous studies. The absence of false vocal folds is thought to decrease laryngeal resistance, decrease intensity and increase the phonation threshold pressure (PTP). In our patients, laryngeal resistance was decreased compared to normal controls using the same intraoral pressure. Dynamic range was decreased at frequencies representing 40% and 60% of maximum pitch range. PTP was greater. Increasing the aperture above the vocal folds is thought to result in changes in the location of the formant frequencies. Differences between the first formant and fundamental frequency were larger than for controls, suggesting less resonant production. **Conclusions:** Studying patients with surgical absence of supraglottic structures allowed the testing of hypotheses on how supraglottic structures may affect voice production. These effects are not demonstrable using typical vocal function measures.

10:46 Recurrent Respiratory Papillomatosis: Scaled Assessment of Disease Regression and Voice Improvement after Treatment with a Photoangiolytic Laser

Mong-loon Kuet, BA, Cambridge, UK; Michael J. Pitman, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact on disease regression and voice restoration of photoangiolytic lasers in the treatment of recurrent respiratory papillomatosis. This will be evidenced by use of validated outcome measures.

Objectives: To investigate the efficacy and safety of photoangiolytic lasers in the treatment of recurrent respiratory papillomatosis (RRP) using the Derkay papilloma severity scale, Voice Handicap Index (VHI-10) and GRBAS scale. While previous studies examined the effect of photoangiolytic surgery on voice quality, few studies evaluated the effect on disease regression or utilized accepted and validated scales as outcome measures. **Study Design:** Retrospective case series. **Methods:** Charts were reviewed for patients who underwent in-office unsedated photoangiolytic laser surgery for RRP (2007-2010). Twenty-one patients met the inclusion criteria; 19 underwent treatment with a 532 nm pulsed potassium-titanyl-phosphate laser and two patients with a 585 nm pulsed dye laser. The VHI-

10 and GRBAS score was recorded at the time of the office visit. Derkay scoring was performed via retrospective review of all patient videostroboscopic images. Results at latest followup were compared to findings at initial presentation. **Results:** Twenty-one patients underwent a total of 81 office procedures. Mean followup was 18 months. Data for the VHI-10 was available for 15 patients, GRBAS score for 16 patients and Derkay score for 21 patients. From baseline to latest followup there was a significant improvement in the Derkay score from 6.1 to 3.0 ($p=0.001$), VHI-10 from 24.5 to 16.0 ($p=0.04$) and GRBAS score from 8.6 to 4.9 ($p=0.004$). **Conclusions:** RRP is safely and effectively treated by photoangiolytic lasers in the office. Patients benefited from disease regression and improved voice quality without complications. Photoangiolytic laser treatment of RRP is an effective and non-experimental treatment modality with decreased risk and morbidity.

10:54 Q&A

PANEL

11:00 - 12:00 **Management Options for Unilateral Vocal Fold Paralysis: Making Sense of It**

Moderator: Roger L. Crumley, MD*, Irvine, CA

Panelists: Randal C. Paniello, MD*, St. Louis, MO
C. Gaelyn Garrett, MD*, Nashville, TN
Clark A. Rosen, MD*, Pittsburgh, PA
Gayle E. Woodson, MD*, Springfield, IL

◆ 12:00 Adjourn ◆

Concurrent Session II

Pediatrics/Otology

KIERLAND 3

8:00

Announcements by Vice Presidents

PANEL

8:05 - 9:05

Audiological Management of the Hearing Impaired Child

Moderator: Daniel I. Choo, MD*, Cincinnati, OH

Panelists: Scott C. Manning, MD*, Seattle, WA
Susan Nittrouer, PhD, Columbus, OH
Simon C. Parisier, MD*, New York, NY
Jennifer A. Ratigan, AuD CCC-A,
Queen Creek, AZ

Moderator: J. Paul Willging, MD*, Cincinnati, OH

9:05 **Long Term Audiologic Outcomes following Cisplatin Therapy for Pediatric Cancer**
Michael S. Harris, MD, Indianapolis, IN; Jaimie L. Gilbert, PhD, Bloomington, IN; Allison M. Yancey, MD, Indianapolis, IN; Akinbode Egbelakin, MBBS, Indianapolis, IN; Jamie L. Renbarger, MD, Indianapolis, IN; David B. Pisoni, PhD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize factors associated with hearing loss following cisplatin therapy for pediatric cancer; 2) be cognizant of the large degree of variability that exists in long term audiologic outcomes following cisplatin therapy for pediatric cancer; and 3) consider the possibility that some patients may demonstrate progression of hearing loss after completion of cisplatin therapy.

Objectives: Hearing loss is a well recognized, but incompletely characterized complication of cisplatin therapy for childhood cancer. The objectives of this study were to 1) characterize the degree of hearing loss following cisplatin therapy in a large sample of pediatric cancer patients; 2) focus on a subset of this population comprised of pediatric neuroblastoma survivors to ascertain the degree of stability or progression of hearing loss from the time of completion of cisplatin treatment to the present. **Study Design:** Retrospective cohort analysis. **Methods:** Audiograms of 102 pediatric patients who had completed cisplatin therapy for neuroblastoma, osteosarcoma, hepatoblastoma, or germ cell tumors were scored using Brock's Hearing Loss Scale, a validated measure of cisplatin associated high frequency hearing loss. Demographic and treatment variables such as cumulative dose, dose adjustments, concurrent ototoxic medications, and disease status were compared across children who demonstrated hearing loss (Brock ≥ 1) and children who did not demonstrate hearing loss (Brock score 0) following cisplatin treatment. A subset of this sample, consisting of seven neuroblastoma survivors—an average of 9.3 years old and 6.0 years post-cisplatin treatment—were reevaluated by pure tone audiometry to assess for stability or progression of hearing loss. **Results:** Forty-two percent (43/102) of pediatric cancer patients in our sample demonstrated hearing loss of any severity (Brock ≥ 1) following cisplatin therapy; 28% (29/102) demonstrated a threshold shift of ≥ 40 dB at 4,000 to 8,000 Hz (Brock score ≥ 2) following cisplatin therapy. Factors associated with hearing loss in this sample included male gender ($P = 0.0003$), higher cumulative dose ($P = 0.03$), and younger age ($P = 0.02$). Progression of hearing loss from the end of therapy to the present was demonstrated in 2/7 of the neuroblastoma survivors; stability of hearing loss from the end of therapy to the present was demonstrated in 4/7; and improvement of hearing loss was demonstrated in 1/7. **Conclusions:** These findings reinforce age and cumulative dose as risk factors for development of cisplatin associated hearing loss and introduce male gender as an additional contributory factor, which has not been previously reported. Preliminary data presented here emphasize the importance of long term followup to monitor for progression of cisplatin associated hearing loss.

9:13 **The Effects of Unilateral Cochlear Implantation on the THI**

Hosam A. Amodi, MD FRCSC, Toronto, ON Canada; David B. Shipp, MA FAAA Reg CASLPO, Toronto, ON Canada; Lendra M. Friesen, MSc PhD, Toronto, ON Canada; Julian M. Nedzelski, MD FRCSC*, Toronto, ON Canada; Joseph M. Chen, MD FRCSC, Toronto, ON Canada; Vicent Y. Lin, MD FRCSC, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the effect of cochlear implantation on tinnitus perception and to determine the correlation between the change in Tinnitus Handicap Inventory (THI) and Handicap Inventory (HHI), Hearing in Noise Test (HINT) and short form SF-36 quality of life questionnaires (SF-36) scores.

Objectives: The purpose of this study was to investigate the effect of cochlear implantation on tinnitus perception. To determine the correlation between the change in Tinnitus Handicap Inventory (THI) and Handicap Inventory (HHI), Hearing in Noise Test (HINT) and short form SF-36 quality of life questionnaires (SF-36) scores. **Study Design:** Our study is a prospective longitudinal study of 146 cochlear implant patients. **Methods:** In a longitudinal study in our patients - the THI, self-report measure of perceived tinnitus handicap, was administered to 146 patients pre- and post-implantation. Outcome measures were obtained 6 to 12 months after the implantation. Changes in THI were also correlated with other subjective and objective measures such as Hearing Handicap Inventory (HHI), Hearing in Noise Test (HINT) and short form SF-36 quality of life questionnaires (SF-36) scores. **Results:** Patients demonstrate statistically significant reduction of the total THI score ($p < 0.001$). Furthermore, prior to implantation, 25% of patients described their tinnitus as moderate to catastrophic. Postoperatively, this dramatically reduced to less than 10%. There was no statistically significant correlation between THI changes and HINT scores. THI scores weakly correlated with SF-36 scores. **Conclusions:** Cochlear implants have a marked suppressive effect on tinnitus in most CI users. Although the reduction in the subjectively perceived tinnitus was statistically significant, it didn't correlate with HINT and SF-36 scores.

9:21 **The Right Not To Hear: The Ethics of Parental Refusal of Hearing Rehabilitation**

Andrew G. Shuman, MD, Ann Arbor, MI; Sharon Kileny, MD, Ann Arbor, MI; Paul R. Kileny, PhD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the ethical issues inherent to parental rights of refusal to provide hearing rehabilitation to their children, including the medical, practical and legal matters necessary in order to manage this challenging clinical situation.

Objectives: To explore the ethics of parental refusal of auditory-oral hearing rehabilitation. **Study Design:** Case study with medical ethical discussion and review. **Methods:** Two young brothers being raised by a same sex couple present with severe-to-profound congenital sensorineural hearing loss. The parents, both of whom have normal hearing and work as sign language interpreters, have decided to raise their children with American Sign Language as their only form of communication and have chosen not to pursue cochlear implantation nor support the use of hearing aids. **Results:** This case raises significant questions concerning whether hearing rehabilitation should be mandated, and if there are circumstances in which parental preferences should be questioned or overridden with regard to this issue. In addition, legal concerns are raised regarding the possible need to file a report with child protective services, and the rights of biological/surrogate parental involvement in decision making. While similar cases involving the Deaf community have historically favored parental rights to forego hearing rehabilitation with either cochlear implantation or hearing aids, we explore whether conclusions should be different because the parents in this case are hearing. **Conclusions:** The ethics of parental rights to refuse hearing augmentation are complex and strikingly context dependent. A comprehensive appreciation of the medical, practical and legal issues is crucial prior to intervening in such challenging situations.

9:29 **Q&A**

9:35 **GUEST SPEAKER**

The History of Cochlear Implants

Robert A. Schindler, MD*, San Francisco, CA

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

General

Moderator: Louise Davies, MD MS*, White River Junction, VT

10:30 **Otolaryngology Resident Work Hours: Perception Analysis**

Kulsoom Laeeq, MD, Omaha, NE; Scott A. Infusino, Baltimore, MD; David A. Diaz Voss, MD, Baltimore, MD; Hamid Masood, MD, Flemington, NJ; Mohammad U. Malik, MD, Baltimore, MD; Nasir I. Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to have an understanding of resident's work hours and education. We will present the perception of these work hours and how they can be modified to enhance training and patient safety.

Objectives: The objectives of this study were to 1) identify how residents spend their time during an average week at an otolaryngology residency program; and 2) determine faculty and residents' perception of how the time available to residents should be best utilized. **Study Design:** Cross-sectional education study. **Methods:** Residents from an otolaryngology-head and neck surgery residency program were asked to log their hours into four categories (clinic, conferences, OR, floor, other) in a card on weekly basis. Faculty and residents of the same otolaryngology program were also asked to participate in an online survey. The survey had questions based on a five

point Likert scale regarding work hour limitations and areas where residents can spend more time. **Results:** Our results from the survey indicate that residents on average spend 36.25% of their time in the operating room, 21.16% in clinic, 23.28% on floor, and 19.32% elsewhere. Postgraduate year (PGY) 5 residents were found to spend the greatest amount of time in the operating room (OR), PGY-4 residents spent the most time in clinic, PGY-3 and PGY-2 spent most time in the OR, and PGY-1 residents spent most time on floor. **Conclusions:** Our results showed that residents spend the majority of their time in the OR and a major amount of time in activities like conferences, consults, ER, etc. This study may help create a more education oriented schedule for otolaryngology residents, reducing "scut". This may allow residents to spend more time achieving benchmarks in the six core competencies.

10:38 **L**earning Styles in Otolaryngology Fellowships

David A. Diaz Voss, MD, Baltimore, MD; Mohammad U. Malik, MD, Baltimore, MD; David J. Brown, MD, Milwaukee, WI; Robert A. Weatherly, MD, Kansas City, KS; 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 understand how different learning styles dominate various fellowships in otolaryngology-head and neck surgery.

Objectives: The purpose of our study is to determine whether 1) there is a predominant learning style in each otolaryngology fellowship and 2) if there is a different predominant learning style between subspecialties' fellowships. **Study Design:** Cross-sectional education study. **Methods:** We implemented Kolb's Learning Style Index (LSI) version 3.1 to otolaryngology fellows nationwide. This index is a widely used 12 item questionnaire with four options per item. The participants answered each item in the questionnaire as it applied to their preferred learning method. Results were then analyzed and compared between each subspecialty. **Results:** Our results show that fellowships within the otolaryngology program differ in their predominant learning styles. **Conclusions:** A previous study has reported that three-fourths of otolaryngology residents prefer predominantly the converging and accommodating learning styles. This study has shown that fellowships within the specialty differ in their predominant learning style. This creates an insight of the learning style used in each of the subspecialties and would help program directors guide residents to choose a fellowship that is most compatible with their preferred learning style.

10:46 **H**ead and Neck Injuries due to Golf Cart Trauma

Brandon L. Miller, BS, Augusta, GA; Jennifer L. Waller, PhD, Augusta, GA; Brian J. McKinnon, MD MBA, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the significance, mechanism and severity of golf cart related head and neck injuries, and possible means of prevention.

Objectives: To characterize head and neck injuries due to golf cart trauma. **Study Design:** Retrospective case series with chart review. **Methods:** A level I trauma center's database was queried for golf cart related trauma from 2000 to 2009 and returned 68 patients. Data was obtained from the trauma database and individually reviewing patient charts. **Results:** Of the 68 identified, 55% were male and median age was 13.4. Sixty-nine percent had head injuries with 32% sustaining skull or facial fracture and 20.6% had intracranial hemorrhage. The highest abbreviated injury scale (AIS) by region was the head and neck. Average Glasgow Coma Scale (GCS) was 14.2, injury severity score (ISS) 9.0, hospital stay 4.5 days, intensive care unit (ICU) stay 2.8 days, and 36.8% were admitted to the ICU. Ejection and rollover were the most common mechanism of injury with ejection having a significantly higher head and neck AIS compared to rollover and hitting a stationary object (p-value=0.0055). Alcohol was detected in 59.2% of patients over the age of 16; the average blood alcohol concentration was 182.6 mg/dL. Children were involved 60.3% of the time with an average age of 9.2, and were passengers in the golf cart 69.2% of the time. **Conclusions:** Golf cart trauma can cause significant head and neck injuries, particularly in the pediatric population and adults who consume alcohol.

10:54 **T**he Pursuit for an Ideal Assessment of Professionalism: Our Methodology

Mohammad U. Malik, MD, Baltimore, MD; David A. Diaz Voss, MD, Baltimore, MD; Howard W. Francis, MD, Baltimore, MD; Charles M. Stewart, MD, Baltimore, MD; Charles W. Cummings, MD*, Baltimore, MD; Nasir I. Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to have a clear understanding of definitions and dimensions of professionalism as well as various assessment strategies which could be employed to measure it. We will introduce our assessment tool for evaluating professionalism and its impact on enhancing the quality of professional behavior in otolaryngology residents.

Objectives: The objectives of this study were to 1) define and delineate the elements of professionalism for otolaryngology; and 2) design and validate a tool for assessing professionalism in otolaryngology residents. **Study Design:** Cross-sectional validation study. **Methods:** Twenty-six residents, working at an otolaryngology-head and neck surgery residency program, were evaluated using a newly created professionalism assessment tool. The tool contained eight key domains as elements of professionalism, which were defined for otolaryngology by our faculty members. Each key domain was assigned a behavioral description and evaluated by the faculty on a 5 point Likert scale at the end of each resident's rotation. The results were analyzed and the tool's feasibility and validity were assessed.

Results: Our tool shows feasibility, content and constructs validity as shown by the gradually increasing score with each clinical year. **Conclusions:** By defining weak areas in professionalism we may be able to identify and remediate residents needing coaching in aspects of professionalism. Our assessment methodology appears to demonstrate good construct validity as suggested by the difference in scores of postgraduate year (PGY) 1 and PGY-5 residents; however, the diverse dimensions of professionalism cannot be adequately assessed by a single methodology.

11:02 **Subspecialty Affects Timing of Surgical Case Cancellations in Otolaryngology**

Joseph A. Knowles, MD, Birmingham, AL; Mary T. Hawn, MD, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to compare case cancellations among subspecialties in otolaryngology.

Objectives: Surgical case cancellation results in a significant loss of operating room resources. We investigated variables that influence case cancellations at a tertiary care center and determined which subspecialties can be targeted to improve system based practice. **Study Design:** Retrospective case review. **Methods:** Surgical scheduling reports were collected from 2005 through 2009 and stratified by subspecialty. Explanations for cancellation were classified into one of 6 categories: patient, surgeon, preoperative evaluation, change in treatment plan, insurance and anesthesia. Time of cancellation was subtracted from case start time to determine loss of OR scheduling ability. **Results:** There were 824 of 12,012 otolaryngology cases (6.86%) cancelled over a four year period. Cancellation was primarily attributed to the patient (28.4%), surgeon (26.7%), presurgical evaluation (25.1%), and change in workup/treatment (15.5%) with a minority of cases affected by insurance (2.9%) and anesthesia (1.4%). The average time to cancellation was 9.6 hours for all cases but on average only 2.1 hours due to patient ($p=0.01$), and less than 1 hour when due to anesthesia ($p<0.001$). Among subspecialties head and neck surgery (50.4%) had a significantly higher cancellation rate than endocrine (8%, $p = 0.02$), facial plastics (2%, $p = 0.01$), laryngology (11%, $p=0.03$), otology (10%, $p=0.03$) or sinus surgery (3%, $p=0.01$). However, the average time to cancellation was 9.7 hours for head and neck cases but only 4 hours for sinus and less than 1 hour laryngeal cases ($p<0.0001$). **Conclusions:** Patient and surgeon factors contributed to the majority of case cancellations. Head and neck had a significantly higher cancellation rate than subspecialties.

11:10 **Q&A**

General

Moderator: Andrew H. Murr, MD*, San Francisco, CA

11:15 **Preliminary Evaluation of Junior Medical Students' Exposure and Comfort with Performing the Basic Head and Neck Examination**

Edward C. Wu, BA BS, Irvine, CA; Victor Passy, MD, Irvine, CA; William B. Armstrong, MD*, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to develop a focused department led teaching program to educate junior medical students on performing a complete head and neck exam, as well as to assess their comfort levels in learning proper technique for this complex skill, which will be widely used in their clinical rotations.

Objectives: To assess junior medical students' comfort levels in performing the head and neck physical examination (H&NPE) and perception of the importance of otolaryngology-head and neck surgery (OTO-HNS) in medical training before and after undergoing a department led teaching session. **Study Design:** Anonymous cross-sectional survey study, before and after educational intervention. **Methods:** 104 second year medical students participated in an H&NPE teaching session as part of their preclinical curriculum. Students first watched a 25 minute H&NPE instructional video. Students then participated in lectures (90 minutes) on OTO-HNS subspecialties and faculty and resident led group H&NPE instruction (5-6 students each, 90 minutes) with practice on student partners. Students rated their comfort levels (0-5 point Likert scale) in performing the H&NPE and the importance of OTO-HNS rotations throughout medical training before and after the session. **Results:** 95 and 77 medical students completed pre-surveys and post-surveys, respectively. Before the teaching session, students reported an average comfort level of 2.13 in performing the complete H&NPE, which increased to 3.36 ($p < 0.0001$) after the session. Similar changes were observed for the individual ear, nose, mouth, and neck exams. The longitudinal impact of H&NPE instruction and clinical exposure during third year clinical clerkships on comfort in performing the H&NPE will be presented. **Conclusions:** A specialized teaching session significantly improved medical students' comfort levels in performing the H&NPE and increased their awareness of the importance of OTO-HNS in medical training immediately after the session and months into their clinical clerkships.

11:23 **Use of Portfolios in Otolaryngology Graduate Medical Education**

Richard K. Gurgel, MD, Stanford, CA; Richard J. Smith, MD*, Iowa City, IA; Robert H. Miller, MD*, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the current state of portfolio utilization in otolaryngology training programs and resident attitudes toward portfolios.

Objectives: Learning portfolios, as defined by the Accreditation Council for Graduate Medical Education (ACGME), are professional development tools for resident education. Moreover, the scope of portfolio use is expanding to become a component of the accreditation system, with likely mandatory implementation by 2016. The objective of this study is to describe the extent of portfolio use and usefulness in otolaryngology training programs, as well as resident attitudes toward portfolios. **Study Design:** Cross-sectional survey. **Methods:** All residents in ACGME accredited otolaryngology programs were contacted via email with a link to an online survey. The residents were sent one followup email after initial notification. **Results:** Three hundred eighteen (22%) of the 1,431 invited residents responded to the survey, representing 65 of 103 ACGME accredited otolaryngology training programs. Fifty-eight percent of the programs represented had residents who maintained a portfolio. When asked to what extent portfolios enhanced education, 39% of residents who kept a portfolio found them helpful, 27% were neutral, and 35% did not find them helpful, although 60% plan to use their portfolio after residency. For those residents who did not maintain a portfolio, 70% cited they did not maintain a portfolio because it is not a requirement in their program. Twenty-one percent of all respondents felt that portfolios should be mandatory, while 61% felt that portfolios should be encouraged, but not required. **Conclusions:** Although portfolios are encouraged by the ACGME, and will ultimately become mandatory, they are not yet fully integrated in otolaryngology training programs. Only a minority of residents in this study thought portfolios enhanced education.

11:31 **The Evolution of a Pediatric Aerodigestive Center**

Stephen C. Mauro, MD, Boston, MA; Thomas Q. Gallagher, DO, Boston, MA (Presenter); Christopher J. Hartnick, MD MS*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss 1) the types of patients seen in a pediatric aerodigestive center; 2) the advantages and disadvantages of a comprehensive pediatric aerodigestive center; and 3) the most common diagnoses in a pediatric aerodigestive center.

Objectives: 1) Describe the initial experience of a pediatric aerodigestive center; 2) analyze aerodigestive diagnoses and treatment; and 3) report on parental satisfaction results of an aerodigestive clinic. **Study Design:** Retrospective review of a pediatric aerodigestive center over 5 years. **Methods:** 1777 children were analyzed for presenting symptoms, procedures, procedural findings, and interdisciplinary diagnoses. Initial parental satisfaction surveys were also analyzed. **Results:** A total of 843 procedures on 712 patients were carried out. The most common presenting diagnoses were cough (36%), followed by gastroesophageal reflux (13%) and recurrent croup (9%). Each patient (712) had a rigid direct laryngoscopy/tracheoscopy, flexible bronchoscopy, and flexible esophagogastroduodenoscopy. 27% underwent pH probes, 12% BRAVO probes, and 3% underwent impedance probes. Highlighted sub-analysis revealed: in 62 children presenting with a diagnosis of recurrent croup, 28 (45%) were identified as having tracheomalacia on flexible bronchoscopy where rigid bronchoscopy revealed questionable findings of tracheomalacia. 9% (6/62) with recurrent croup were found to have biopsy proven eosinophilic esophagitis and all improved with treatment. Initial parental surveys demonstrate high satisfaction rates. **Conclusions:** The past decade has seen the creation of comprehensive centers nationwide where pediatric otolaryngology, gastroenterology, and pulmonology care is coordinated in one clinic visit. We report for the first time in the literature a 5 year review analyzing interdisciplinary diagnoses and treatment results along with an initial satisfaction survey. Aerodigestive centers provide cohesive and unified care where diagnosis and treatment are centralized in one location and parents appear satisfied with the care their children receive.

11:39 **Botulinum Toxin in the Treatment of First Bite Syndrome: Review of a Patient Series**

Ilya Likhterov, MD, San Francisco, CA; Gerald T. Kangelaris, MD, San Francisco, CA; David W. Eisele, MD*, San Francisco, CA; Lisa A. Orloff, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical presentation and pathogenesis of First Bite syndrome and appreciate botulinum toxin as an effective treatment modality.

Objectives: First Bite syndrome is a poorly understood pain syndrome believed to be due to salivary gland sympathetic denervation causing hypersensitivity of myoepithelial cells to parasympathetic neurotransmitters, ultimately resulting in supramaximal contraction of myoepithelial cells and subsequent pain with early stage mastication. We previously reported the first documented use of botulinum toxin in the treatment of First Bite syndrome. This series expands on that initial case report, investigates dosing and efficacy across multiple patients, and reviews the literature. **Study Design:** Retrospective case series. **Methods:** We present the clinical courses of five patients treated surgically for parapharyngeal space tumors at a single tertiary care center. Postoperatively, all patients developed radiating pain originating in the preauricular region upon the first bite of every meal that progressively improved throughout the meal. All patients failed various medical regimens to relieve the pain. We review the dosing and technique of botulinum toxin injections and analyze the degree and duration of patient symptomatic relief. We discuss the literature pertaining to the clinical presentation, etiology, and treatments of First Bite syndrome. **Results:** All patients received injections with botulinum toxin type A under ultrasound guidance into parotid gland or locoregional tissue with doses ranging from 25 to 100 mouse units. All patients experienced significant improvement to complete resolution of their pain lasting from one to six months. Multiple injections at varying frequencies were required. **Conclusions:** Botulinum toxin injection is successful in temporarily treating medically refractory pain in patients with First Bite syndrome.

11:47 **Determining the Optimum Threshold for Seeking Consultation with or Referring a Patient to an Otolaryngologist**

Angela C. Tsai, BA, Boston, MA; Ashley B. Decker, BS MA, Boston, MA; Jessica R. Levi, MD, Boston, MA; Meghan E. McGrath, MD, Boston, MA; Kenneth M. Grundfast, MD FACS FAAP*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the differences among patient care providers in the perceived need for consultation with an otolaryngologist.

Objectives: To detect differences among patient care providers including those in emergency medicine, family medicine, primary care-internal medicine, and otolaryngology in the perceived need for consultation with an otolaryngologist. **Study Design:** Cross-sectional survey. **Methods:** Seventeen experienced board certified physicians in emergency medicine, family medicine, primary care-internal medicine, or otolaryngology recorded their opinions on relative need for consultation with an otolaryngologist after having read 75 case vignettes derived from cases actually managed in the emergency department from January 1, 2008 to May 1, 2009. **Results:** The three diagnoses that were perceived most consistently to warrant referral to an otolaryngologist included mastoiditis, peritonsillar abscess, and neck mass. Agreement among otolaryngologists that these patients warrant referral were 91.7%, 83.3%, and 91.7% respectively, compared to 75.0%, 91.7%, 75.0% agreement for emergency medicine physicians, 56%, 94%, 67% agreement for family medicine physicians, and 100% for all internal medicine physicians. Surprisingly, cases involving known or suspected angioedema were perceived to warrant referral at a rate of only 18.75%. The most common diagnosis needing referral to an otolaryngologist among all providers was peritonsillar abscess. The most common reason given 69.3% of the time for not requesting consultation was the perception that management of the patient's manifest condition came within the purview of expertise of the physician initially evaluating the patient. **Conclusions:** This study suggests that there is considerable discrepancy in the perception of the conditions that should be managed entirely in an emergency department or urgent care facility versus those that require the assistance of an otolaryngologist for complete diagnosis and management.

11:55 **Q&A**

◆ Noon Adjourn ◆

12:30 - 2:00 ***Triological Society Thesis Seminar - Powell (open to candidates and potential candidates as well as Fellows of the Society)***

Afternoon ***Golf & Tennis Tournaments
Other Activities/Recreation***

SATURDAY, JANUARY 29, 2011

Concurrent Session I Head & Neck/Laryngology KIERLAND 1 & 2

8:00 **Announcements by Vice Presidents**

PANEL

8:05 - 9:15 **Melanoma - Treatment Controversies**

Moderator: Jesus E. Medina, MD*, Oklahoma City, OK

Panelists: Carol R. Bradford, MD, Ann Arbor, MI
Steven J. Wang, MD*, San Francisco, CA
Brian Nussenbaum, MD*, St. Louis, MO
Paul A. Levine, MD*, Charlottesville, VA

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

9:15 **Outcomes and Adverse Events of Enlarged Tracheoesophageal Puncture after Total Laryngectomy: A 5 Year Retrospective Cohort Study**

Katherine A. Hutcheson, PhD, Houston, TX; Erich M. Sturgis, MD MPH*, Houston, TX; Jan M. Risser, PhD, Houston, TX; Jan S. Lewin, PhD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to explain adverse events in patients with enlargement of the tracheoesophageal puncture (TEP) after total laryngectomy. Participants should also be able to discuss conservative methods of managing leakage around the voice prosthesis in lieu of complete closure of the TEP, as well clinical variables that predict response to these treatments.

Objectives: Enlargement of the tracheoesophageal puncture (TEP) results in aspiration around the voice prosthesis (VP) and may lead to pneumonia. The primary objective was to determine the incidence of enlarged TEP and summarize control of leakage around the VP after conservative management. **Study Design:** Retrospective cohort study. **Methods:** This 5 year cohort included 194 patients who underwent total laryngectomy (\pm pharyngectomy) and TEP. Control of leakage around the VP was analyzed at last followup after enlarged TEP. Adverse events were compared in patients with and without enlarged TEP. **Results:** The incidence of enlarged TEP was 18.6% (36/194, 95% CI: 13.0%-24.1%). Conservative methods commonly attempted in lieu of complete TEP closure included placement of an enlarged flange VP (34/36, 94%), temporary VP removal (14/36, 39%), and TEP site injection (8/36, 22%). At last followup, conservative methods controlled leakage around the VP in 81% (29/36) of patients. Only 2 patients required complete TEP closure due to persistent leakage after enlarged TEP. Unresolved leakage was more common in patients with recurrent cancer after laryngectomy ($p=0.081$) and irregular TEP contour ($p=0.003$). Relative to controls without TEP enlargement, patients with enlarged TEP had higher risk of pneumonia (RR: 3.4, 95% CI: 1.9-6.2) and tracheal aspiration of the VP (RR: 3.3, 95% CI: 0.8-14.1). **Conclusions:** Although the rate of enlarged TEP is relatively low, the complication significantly elevates risk of pneumonia. In most cases, this complication can be managed conservatively, avoiding complete closure of the TEP. We are investigating novel associations between enlarged TEP and cancer recurrence.

9:23 **Oncologic and Functional Outcomes after Total Laryngectomy and Glossectomy**

Cara Hope Heath, MS, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL; Renee L. Desmond, PhD DVM, Birmingham, AL; J. Scott Magnuson, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the morbidity, mortality, and functional outcomes associated with laryngoglossectomy.

Objectives: Total glossectomy and laryngectomy for advanced stage cancer are controversial because they result in significant morbidity with low likelihood of survival. Advances in multimodality therapy and reconstructive strategies have the potential to improve outcomes in this patient population. This study examined functional outcomes, oncologic outcomes, and survival associated with laryngoglossectomy. **Study Design:** Retrospective chart review. **Methods:** A review of 13 patients who required laryngoglossectomy between 2002 and 2010. **Results:** The majority of patients presented with T4 disease (10/13) and recurrent disease (11/13) and all but

one patient presented with squamous cell carcinoma. Histologic margins were negative in 7 patients, close (<1 mm) in 2 patients, and positive in 4 patients. There was pathological evidence of nodal disease in 7 patients. Reconstruction was achieved with rectus free flap (12/13), radial free flap (4/13), or pectoralis free flap (1/13), with 4 patients requiring more than one flap. The median hospital duration was 9 days (range: 5-20) with almost one-third of patients requiring additional operations (38%). At the last followup, 69% of patients were PEG dependent and 62% were capable of oral intake. The primary form of communication was writing for 5 patients and 8 patients were using assisted communication devices. The overall quality of life was 2.3 out of 5. The recurrence rate at 6 and 12 months was 18.4% and 52.2%, respectively. The survival rate at 6 and 12 months was 74.1% and 43.2%, respectively. **Conclusions:** Although laryngoglossectomy is associated with significant morbidity, survival remains acceptable and the procedure is well tolerated.

9:31 Identification of Biomarkers for Papillary Thyroid Carcinoma

Vikas Mehta, MD, New York, NY; Nicolas Kummer, PhD, Valhalla, NY; Theodore S. Nowicki, BS, Valhalla, NY; Stimson P. Schantz, MD FACS*, New York, NY; Codrin Iacob, MD, New York, NY; Jan Geliebter, PhD, Valhalla, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to assess whether KLK7, KLK10 and ALOX5 can be used as diagnostic and prognostic biomarkers for papillary thyroid cancer to increase the sensitivity and specificity of pre-operative FNA and tailor treatment for patients based on their level of expression.

Objectives: To identify biomarkers for papillary thyroid cancer to further increase the sensitivity and specificity of preoperative FNA as well as predict a tumor's invasive potential in order to tailor treatment for patients based on their level of expression. **Study Design:** Prospective study on patient thyroid and papillary thyroid cancer tissue. **Methods:** Using microarrays, samples of PTC and normal thyroid tissue from seven patients were compared to identify genes that are upregulated in PTC and three were chosen due to their demonstrated involvement in neoplastic transformation: 5-lipoxygenase (ALOX5), kallikrein 7 (KLK7) and kallikrein 10 (KLK10). The upregulation of these genes in an expanded set of patient samples was analyzed using quantitative real time PCR (qRT-PCR). The data were segregated into normal, metastatic and localized tumor groups to identify which genes are increasingly expressed in PTC and specifically, highly aggressive disease. Similar comparisons on the protein level were performed using immunohistochemistry (IHC). Forty low grade and forty high grade patient samples were analyzed to achieve statistical significance. Finally, an invasion assay was done comparing BCPAP, a PTC cell line, with ALOX5 transfected BCPAP cells. **Results:** Microarray analysis identified three genes of interest that were overexpressed at least 5 fold in PTC, compared to matched, normal thyroid tissue (ALOX5 = 5.11, $p = 0.004$; KLK7 = 24.7, $p = .002$ fold, KLK10 = 15.6 fold, $p = .002$). These results were confirmed on the RNA level using qRT-PCR on an expanded set of samples. KLK7 and KLK10 RNA in PTC were upregulated approximately 19.07 and 22.42 fold, respectively, compared to patient matched normal thyroid samples. ALOX5 was overexpressed ~22.47 fold, with the upregulation rate coinciding with in vivo tumor invasiveness based on the surgical pathology reports. These results were confirmed on a protein level using IHC, with tumors demonstrating lymph node metastasis or extracapsular invasion staining more readily for ALOX5. Finally, the ALOX5 transfected BCPAP cells showed 2.5 times more invasive potential than normal BCPAP cells. **Conclusions:** These three genes demonstrated significant promise as potential biomarkers for improving the sensitivity and specificity of a FNA sample, where qRT-PCR could be performed on the extracted cells to further elucidate the thyroid tumor type. Additionally, ALOX5 expression has been shown to correlate with an individual PTC's invasiveness and can be used as a potential, predictive biomarker to further tailor treatment for each patient.

9:39 Inhalational Interferon as a Treatment for Severe Recurrent Respiratory Papillomatosis

Peter N. Schilt, MD, Indianapolis, IN; Stacey L. Halum, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss possible indications for inhalational interferon for treatment of recurrent respiratory papillomatosis (RRP).

Objectives: Discuss historical and current treatments of RRP. Introduce inhalational interferon as a treatment option for RRP, discussing the results of utilizing inhalational interferon on an immunocompromised patient with airway obstruction due to severe RRP. **Study Design:** Case report with review of the medical literature. **Methods:** A 68 year old female who had been placed on aggressive medical immunosuppression for her rheumatoid arthritis presented with severe, airway obstructive laryngotracheal RRP. On initial presentation, she required emergent tracheotomy for airway management; extensive debulking of the RRP was also done, with the RRP found to completely obscure her larynx and extend intratracheally down to the level of the carina. Despite attempting to minimize her immunosuppression, she required repetitive surgical removal of the lesions with cidofovir injection every two to three months to maintain her airway, and had immediate RRP recurrence after each surgery. She was subsequently treated with inhalational interferon at a dosage of 3,000,000 units in 5 mL of normal saline administered per nebulizer three times per week. **Results:** The patient had dramatic reduction in her RRP disease on inhalational interferon therapy with no noted side effects. Her airway examination improved from bulky, obstructive lesions extending from the larynx to carina to non-obstructive, sessile disease. There was a dramatically widened interval between surgical removals, with the disease becoming amenable to laser treatments (every 6 months) in the office. **Conclusions:** Inhalational interferon is introduced as a novel treatment for severe recurrent respiratory papillomatosis in an immunocompromised patient; this patient demonstrated excellent response with no side effects.

9:47 Pulsed KTP Laser Photoangiolytic Treatment of Mucosal Squamous Cell Carcinoma in the Hamster Cheek Pouch

James A. Burns, MD*, Boston, MA; Gerardo L. Lopez-Guerra, MD, Boston, MA; James B. Kobler, PhD,

Boston, MA; William C. Faquin, MD PhD, Boston, MA; Matthew L. Leclair, BA, Boston, MA; Steven M. Zeitels, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the effects of pulsed KTP laser energy on malignant lesions in an established animal model.

Objectives: Involution of early glottic cancer has been achieved with initial clinical experience using the 532nm pulsed potassium-titanyl-phosphate (KTP) laser. Selective photoangiolytic of the sublesional circulation that allows for relative sparing of surrounding tissue is the presumed mechanism. No prior controlled animal model study has analyzed the ability of selective lesional microvasculature coagulation with the KTP laser to involute malignant lesions. This study tests the efficacy of photoangiolytic with the KTP laser in treating squamous cell carcinoma in an established animal model. **Study Design:** Randomized prospective study in a hamster model.

Methods: Malignant lesions were induced unilaterally in the cheek pouches of 21 hamsters by applying 9,10-dimethyl-1,2-benzanthracene (DMBA). The opposite cheek pouch served as a control. Weekly lesion measurements and pulsed KTP laser (30W, 15msec pulse width, 2 pulses/sec) treatments were done. Treatment commenced until a uniform white-blanching of the lesion occurred. Hamsters were sacrificed 1 week after the last treatment and cheek pouches were analyzed histologically. **Results:** Nineteen hamsters developed lesions, and 12/19 (63%) of the lesions completely resolved with no evidence of cancer cells on histologic examination. The remaining lesions (7/19, 37%) were still present after 3 treatments. Every lesion (10/10) that initially measured <2mm resolved completely after laser treatment with minimal scarring noted at the treatment site based on histology. Lesions measuring between 2-5mm resolved only 33% of the time (2/6). All 3 lesions that initially measured >5mm still had carcinoma after laser 3 treatments.

Conclusions: Pulsed KTP laser photoangiolytic can effectively involute small malignant lesions, but may be less effective at involuting larger (>2mm) lesions.

9:55

Q&A

◆ 10:00 - 10:15 Break/Poster Viewing ◆

Rhinology/Plastics

PANEL

10:15 - 11:15 **Management of Nasal Allergy and Its Manifestations**

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

Panelists: Michael G. Stewart, MD*, New York, NY
Richard J. Trevino, MD*, San Jose, CA
Karen H. Calhoun, MD*, Columbus, OH

Moderator: Merritt J. Seshul, MD*, Hickory, NC

11:15 **Frontal Sinus Skull Base Defect Repair Using the Pedicled Nasoseptal Flap: A Prospective Study**

Frank W. Virgin, MD, Birmingham, AL; Christopher F. Baranano, MD, Birmingham, AL; Kristen O. Riley, MD, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss reconstructive options for frontal sinus skull base defects and the utility of the pedicled nasoseptal flap for this purpose.

Objectives: Pedicled nasoseptal mucoperichondrial flap repair of anterior skull base defects and cerebrospinal fluid (CSF) leaks is an established and effective reconstructive technique. Because the flap pedicle origin is the sphenopalatine artery, the theoretical limit for complete coverage is the frontal sinus posterior table. Outcomes regarding the success of nasoseptal flap reconstruction of frontal sinus defects have not been systematically evaluated. **Study Design:** Prospective cohort. **Methods:** Patients with skull base defects involving the frontal sinus were prospectively enrolled in the study. Demographics, size of skull base defect, length involving the posterior table, and complications were recorded. Outcome measures included complete defect coverage (intraoperative) and successful repair at 6 weeks (postoperative). **Results:** Nasoseptal flap reconstructions were attempted on sixteen consecutive patients (average age 51) with skull base defects involving the posterior table of the frontal sinus. Average defect size (length vs. width) was 19x13.3mm and average length involving the posterior table was 11.3mm (2-30mm). Only 1/16 patients required additional free grafting due to incomplete overlay. This subject had decreased flap length from a septal perforation and also developed postoperative pneumocephalus requiring a frontal craniotomy for closure. Successful repairs at 6 weeks were achieved in 14/15 patients who completed clinical followup. **Conclusions:** Frontal sinus CSF leaks were closed using nasoseptal flaps in 94% of patients. This study confirms this technique is an effective method for reconstruction of frontal sinus skull base defects and demonstrates flap length is adequate for select

defects involving up to 3 cm of the posterior table.

11:23 **T**ransepithelial Ion Transport Is Suppressed in Hypoxic Sinonasal Epithelium

Angela C. Blount, MD, Birmingham, AL; Shaoyan Zhang, PhD, Birmingham, AL; Daniel F. Skinner, BS, Birmingham, AL; Eric J. Sorscher, MD, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effects of hypoxia on transepithelial ion transport in sinonasal epithelium.

Objectives: Sinonasal respiratory epithelial mucociliary clearance is dependent on the transepithelial transport of ions such as Cl⁻. The objectives of the present study were to investigate the role of oxygen restriction in 1) Cl⁻ transport across primary sinonasal epithelial monolayers; 2) the expression of the apical Cl⁻ channels CFTR and TMEM16A; and 3) the pathogenesis of chronic rhinosinusitis (CRS). **Study Design:** In vitro investigation. **Methods:** Murine nasal septal (MNSE, wild type and transgenic CFTR^{-/-}) and human sinonasal epithelial (HSNE) cultures were incubated under hypoxic conditions (1% oxygen, 5% CO₂). Cultures were mounted in Ussing chambers for ion transport measurements. CFTR and TMEM16A expression were measured using quantitative RT-PCR. **Results:** The change in short circuit current (Δ ISC (μ A/cm²) attributable to both CFTR (forskolin-stimulated) and TMEM16A (UTP-stimulated transport) was significantly decreased by 12 hours in both MNSE [(CFTR, 10.5 \pm 0.5 vs. 18.25 \pm 0.55 (control); TMEM16A, 38.4 \pm 3.4 vs. 54.8 \pm 6.1 (control) p<0.05] and HSNE [(CFTR, 19.6 \pm 0.56 vs. 26.1 \pm 1.0 (control); TMEM16A, 16.75 \pm 0.7 vs. 26.1 \pm 1.3(control) p<0.05]. Hypoxic suppression of TMEM16A mediated ISC was confirmed in transgenic CFTR^{-/-} MNSE. Quantitative PCR (reported as relative mRNA levels \pm S.D.) demonstrated a significant reduction in CFTR (55.2 \pm 16.1 vs. 102.8 \pm 10.3, p<0.05) and TMEM16A (54.6 \pm 12.1 vs. 134.3 \pm 26.1; p<0.05) mRNA expression due to physiologic levels of airway epithelial hypoxia. **Conclusions:** Sinonasal epithelial CFTR and TMEM16A-mediated Cl⁻ transport and mRNA expression were robustly decreased in an oxygen restricted environment. The findings in the present study indicate persistent hypoxia may lead to acquired defects in Cl⁻ transport and may, in part, explain the persistence of mucociliary dysfunction in CRS.

11:31 **R**esveratrol Has Salutary Effects on Mucociliary Transport and Inflammation in Sinonasal Epithelium

Nathan S. Alexander, MD, Birmingham, AL; Neal U. Hatch, BS, Birmingham, AL; Shaoyan Zhang, PhD, Birmingham, AL; Daniel Skinner, BS, Birmingham, AL; Eric J. Sorscher, MD, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss resveratrol's potential role in promoting transepithelial Cl⁻ transport and inhibits KC/IL-8 secretion in sinonasal epithelium, and how that is important in enhancing mucociliary transport and inhibiting inflammation in the treatment of CRS.

Objectives: Therapeutic agents that enhance mucociliary transport (via stimulation of transepithelial Cl⁻ secretion) and inhibit inflammation could provide considerable advantages over conventional treatments for chronic rhinosinusitis (CRS). The objectives of the present study were to investigate whether the polyphenolic compound resveratrol promotes transepithelial Cl⁻ transport and inhibits KC/IL-8 secretion in sinonasal epithelium. **Study Design:** In vitro and in vivo study. **Methods:** Transepithelial Cl⁻ transport was investigated in primary murine nasal septal (MNSE) and human sinonasal epithelial (HSNE) cultures. In vivo activity was also measured using the murine nasal potential difference assay. CFTR R-domain phosphorylation and cAMP levels were examined as a test of cAMP/PKA-dependent activation. In vitro LPS induced KC/IL-8 secretion was quantified and compared to a panel of intranasal steroids. **Results:** Resveratrol (100 μ M) significantly increased CFTR mediated Cl⁻ transport (change in short circuit current DISC) in both MNSE [13.51 \pm 0.77 vs. 4.4 \pm 0.66 (control); p<0.05] and HSNE [12.28 \pm 1.08 vs. 0.69 \pm 0.32 (control); p<0.05]. Cl⁻ secretion across in vivo murine nasal epithelium was also enhanced [-4 \pm 1.8 vs. -0.8 \pm 1.7mV (control), p<0.05]. There was no increase in cellular cAMP or CFTR R-domain phosphorylation detected. Resveratrol also significantly inhibited KC/IL-8 secretion in a dose dependent fashion (pg/ml) in MNSE [181 \pm 39 (100 μ M) vs. 94 \pm 16 (200 μ M) vs. 16 \pm 22 (500 μ M) vs. 1195 \pm 355 (LPS control); p<0.05] with similar results in HSNE [161 \pm 81 (500 μ M) vs. 1255 \pm 315 (LPS control); p<0.05]. The compound robustly abrogated KC/IL-8 secretion when compared to ciclesonide (765 \pm 139), triamcinolone (561 \pm 124), and budesonide (742 \pm 428), but had similar activity to fluticasone furoate (65 \pm 47). **Conclusions:** These in vitro and in vivo findings indicate resveratrol is a potent Cl⁻ secretagogue and anti-inflammatory agent. Future clinical trials for CRS are warranted.

11:39 **A**ctivation of the Innate Immune System Reduces Symptom Duration in a Murine Acute Sinusitis Model

Angela P. Black, MD, Minneapolis, MN; James D. Sidman, MD*, Minneapolis, MN; Jizhen J. Lin, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how activation of the innate immune system can affect acute sinusitis.

Objectives: Determine if activation of the innate immune system can reduce or prevent an acute sinusitis infection. **Study Design:** Controlled animal study. **Methods:** Bioluminescent streptococcus pneumonia was introduced intranasally to induce an acute sinusitis. Animals were divided into 4 groups. ALIIS (an innate immune activator) or control (saline) was given prior to intranasal inoculation or 2 days after infection. Mice were infected with bioluminescent S. pneumo. In vivo imaging was performed every other day to monitor active bioluminescence. Duration of infection was used as an endpoint. **Results:** Duration of infection was the following: group 1 (ALIIS 2

days prior to infection) 4 days, group 2 (control/infection) 5.32 days, group 3 (infection 2 days prior to infection) 5 days, group 4 (infection 2 days prior to control) 7.54 days. **Conclusions:** Innate immune activation (ALIIS) reduced the duration of infection when given after inoculation of bacteria.

11:47 **The Impact of Endoscopic Surgical Techniques on Efficiency in Pituitary Surgery**

Brett T. Comer, MD, Lexington, KY; Thomas J. Gal, MD MPH*, Lexington, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the significance of the development of an endoscopic skull base program for pituitary surgery. The participants should understand the role of endoscopic sinus approaches in the reduction of operative and operating room time. The progression of the role of endoscopic sinus surgery in a neurosurgical practice is discussed.

Objectives: To assess the impact of the introduction of endoscopic surgical techniques into a neurosurgical practice for pituitary surgery on operative efficiency. **Study Design:** Retrospective cohort analysis. **Methods:** Patients undergoing transsphenoidal pituitary surgery over a four year period were identified. The approach over this period evolved from classic transseptal surgery to exclusively endoscopic techniques. Patients were classified as having 1) transseptal surgery; 2) endoscopic approach with microsurgical resection; 3) aborted endoscopic resection with subsequent microsurgery; and 4) exclusive endoscopic techniques. Patient and surgeon demographics, operative times, total operating room times, and room setup time were examined. Univariate analysis and multivariate regression modeling was used to assess outcome measures. **Results:** 107 patients were identified. The use of the endoscope for either sphenoid exposure alone (N=41) or for the entire procedure (N=35) resulted in a significant reduction in operative and room times compared to transseptal approaches (N=25). Exclusively endoscopic techniques resulted in a substantial, significant reduction in operative and room times independent of all other clinical and surgical parameters ($p < 0.001$). Progressive use of endoscopic techniques resulted in a statistically significant progressive reduction in setup time ($p = 0.001$), operative time ($p = 0.04$), and total room time ($p = 0.03$) over the study period. **Conclusions:** The transition from transseptal transsphenoidal pituitary surgery to endoscopic techniques implies a learning process for both neurosurgeon and otolaryngologist. Despite this, a noteworthy reduction in operative times, operating room times, and room setup times is observed. The impact of endoscopic techniques on efficiency in pituitary surgery is discussed.

11:55 **Q&A**

◆ 12:00 - 1:15 Lunch ◆

Concurrent Session II

General

KIERLAND 3

8:00 **A**nnouncements by Vice Presidents

PANEL

8:05 - 9:15 **Robotic Surgery**

Moderator: F. Christopher Holsinger, MD, Houston, TX

Panelists: J. Scott Magnuson, MD*, Birmingham, AL
Eric J. Moore, MD*, Rochester, MN
Christopher H. Rassekh, MD,
Morgantown, WV
Ravi N. Samy, MD, Cincinnati, OH

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

9:15 **C**hange in Epworth Sleepiness Scale after Surgical Treatment of Sleep Apnea

Brandy M. Tacia, DO, Warren, MI; Kathleen L. Yaremchuk, MD*, Detroit, MI; Thomas Roth, PhD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the importance of the Epworth Sleepiness Scale in determining its role in evaluating excessive daytime sleepiness in patients with obstructive sleep apnea. The participants will also be able to discuss the difference in ESS in patients being treated with CPAP vs surgical interventions for OSA.

Objectives: To evaluate the effect of surgical intervention for obstructive sleep apnea (OSA) on patients excessive daytime sleepiness as determined by the Epworth Sleepiness Scale (ESS). The ESS questionnaire is a validated survey for quantifying subjective reports of daytime sleepiness. There have been several studies that have shown that continuous positive airway pressure (CPAP) improves excessive daytime sleepiness in OSA as measured by ESS. **Study Design:** Retrospective study. **Methods:** This is a retrospective study of patients who had uvulopalatopharyngoplasty (UPPP) or UPPP and/or tonsillectomy and radiofrequency ablation of the tongue base for OSA between January 2007 and December 2009. Forty-one patients were identified that met the criteria of having an ESS prior to and after their surgery for OSA. The presenting chief complaints of these subjects consisted of snoring, fatigue, witnessed apneas, and inability to use CPAP after having been diagnosed with obstructive sleep apnea. Of these 41 patients eight are female and thirty-three are male. The average age is 44.8+/-9.5 years old. The average body mass index (BMI) is 33.0+/-6.6. There were twenty-two other patients identified during the retrospective search who also were surgically treated for OSA however, their ESS was incomplete. **Results:** Across all the patients there was a mean reduction of their ESS by 5.6+/-4.1; $t = 8.82$, $p < .001$. Only three of the patients did not improve in their ESS after surgical treatment for OSA. **Conclusions:** Surgical intervention for OSA significantly improves sleepiness in OSA patients as measured by the Epworth Sleepiness Scale. Two meta-analysis of previous randomized controlled studies evaluated patients with mild to moderate OSA treated with CPAP demonstrated an improvement in the ESS of 1.2 points (95% CI, .05 to 1.9, $p=0.001$).¹ and 2.94 points for patients with mild to severe OSA treated with OSA.⁷ The results of this study show an improvement in ESS after surgery that is significantly higher than previously reported with CPAP. .

9:23 **T**he Relationship between Depressive Symptoms and Initial Quality of Life and Function in Head and Neck Cancer

Jason Y. K. Chan, MBBS, Baltimore, MD; Lannah L. Lua, BS, Baltimore, MD; Heather H. Starmer, CCC-SLP, Baltimore, MD; Daniel Q. Sun, BSE, Baltimore, MD; Elizabeth S. Rosenblatt, BS, Baltimore, MD; Christine G. Gourin, MD*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate a relationship between depression and certain aspects of quality of life as measured by UWQOL, VHI and MDADI in pretreatment head and neck cancer patients.

Objectives: To determine the incidence of depression in head and neck cancer patients (HNCA) and the effect of depression on baseline head and neck specific measures of quality of life and function. **Study Design:** Prospective cohort analysis. **Methods:** Two hundred fifty-five patients were prospectively evaluated with the Beck Depression Inventory Fast-Screen (BDI-FS) survey, University of Washington Quality of Life (UW QOL), Voice Handicap Index (VHI), and MD Anderson Dysphagia Inventory (MDADI) questionnaires. Patients with a preexisting diagnosis of depression were excluded. **Results:** Complete data was available for 77 patients with HNCA and 53 controls. Depressive symptoms were identified in 9% of controls and 19% of HNCA patients and were significantly associated

with a HNCA diagnosis (OR=4.1, P=0.044). Among patients with HNCA, depression was significantly more common in black patients (OR=15.8, P=0.017). A significant negative correlation was found between BDI-FS score and UW global QOL score ($r=-0.4$, $P=0.0019$). Depression was significantly associated with poorer UW global QOL ($\beta=-22.46$, $P=0.0004$), UW recreation ($\beta=-13.77$, $P=0.037$), speech ($\beta=-24.05$, $P=0.004$), and MDADI functional ($\beta=-17.31$, $P=0.009$), physical ($\beta=-14.99$, $P=0.032$), and emotional ($\beta=-11.60$, $P=0.049$) domain scores but not with other UW QOL, or VHI domains, after controlling for all other variables. **Conclusions:** Patients with HNCA have a high incidence of depressive symptoms at diagnosis, which is significantly higher in black patients. Depression is significantly related to certain aspects of QOL, highlighting the importance of screening and treatment of depression in HNCA patients on initial presentation. Further prospective study will be needed to elucidate the relationship between depression and QOL and function following treatment for HNCA.

9:31 **Bleeding following Thyroid Surgery: A Meta-Analysis**

Joshua M. Levy, MD MPHTM, New Orleans, LA; Paul L. Friedlander, MD, New Orleans, LA; Bernard M. Jaffe, MD, New Orleans, LA; Ralph P. Tufano, MD, Baltimore, MD; Emad Kandil, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should demonstrate an increased understanding of the incidence, risk factors, time of presentation, and anatomic sources of hemorrhage following thyroidectomy. The safety of ambulatory thyroid surgery will also be discussed.

Objectives: The safety of outpatient thyroid surgery is controversial. While many surgeons cite decreased cost and resource utilization as the rationale for its acceptance, complications, such as postoperative bleeding, remain potentially life threatening. This meta-analysis characterizes the incidence, risk factors, timing, and anatomic sources of hemorrhage following thyroid surgery. **Study Design:** Literature review and meta-analysis. **Methods:** A meta-analysis of the results of thyroid operations published since 1999 was constructed focusing on postoperative bleeding requiring surgical intervention. Twenty-four studies were included and all available information was assimilated for each case. **Results:** Among the 46,729 patients undergoing surgical thyroidectomy, 403 suffered postoperative hemorrhage (0.86%). The most commonly identified risk factors were anticoagulation (including NSAIDs) in 23.3% of cases, preoperative hyperthyroidism or Graves disease in 16.2% and postoperative hypertension in 13.3%. The time after completion of operation to bleeding was <6 hours in 50% of the cases (including 11 patients within 1 hour), 6 to 24 hours in 35.9% and >24 hours in 14.1%. Identified sources of bleeding included the thyroid remnant in 28.4% of cases, an arterial source in 23%, a venous source in 16.2%, soft tissues in 14.9%, no definitive source in 14.9% and diffuse oozing in 2.7%. **Conclusions:** Postoperative bleeding is a relatively rare complication of thyroidectomy. In general, ambulatory thyroid surgery is a safe option, however, the risks of postoperative bleeding should limit these procedures to carefully selected populations. Patient groups at increased risk of hemorrhage include those with early postoperative anticoagulation, hypertension, preoperative hyperthyroidism, and Graves' disease.

9:39 **Utility of Liver Function Tests in the Evaluation of Head and Neck Cancer Patients**

Philip G. Chen, MD, Charlottesville, VA; Cara A. Watts, BA, Charlottesville, VA; James F. Reibel, MD, Charlottesville, VA; Paul A. Levine, MD*, Charlottesville, VA; Mark J. Jameson, MD PhD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of liver function tests in the evaluation of head and neck cancer patients, as well as their role in changing surgical management due to liver metastases.

Objectives: To determine the utility of preoperative liver function tests (LFTs) for detecting liver metastasis in head and neck cancer patients. **Study Design:** Retrospective chart review. **Methods:** Retrospective chart review of patients evaluated by the head and neck surgery service from January 2004 through December 2009. For patients with abnormal alkaline phosphatase, alanine transaminase, or aspartate transaminase, subsequent abdominal imaging was reviewed. **Results:** 1808 patients with head and neck pathology had documented LFTs. Of these, 1447 had malignancy. 161 patients (11.1%) had abnormalities of one or more of the LFTs, and 111 had followup imaging (ultrasound, CT, MRI, or PET). Only 4 patients (2.5% of patients with abnormal LFTs) had evidence of metastasis on imaging: 2 patients with aerodigestive tract squamous cell carcinoma, 1 with recurrent cutaneous squamous cell, and 1 with small cell carcinoma. Hospital charges for the LFTs exceeded \$100,000, and imaging costs approximated \$309,000 the 107 false positive tests. **Conclusions:** While head and neck cancer patients rarely present with liver metastasis, they often have abnormal LFTs. Although the presence of liver metastasis can dramatically change patient management, based on our data, LFTs should not be used as a screen for liver metastasis in all head and neck cancer patients. The use of risk-stratified abdominal imaging may be prudent and cost effective in patients who are at high risk for distant metastasis.

9:47 **Management of the Difficult Airway Using Fiberoptic Intubation: An Otolaryngologic Experience**

Brian F. McGettigan, MD, Philadelphia, PA; Stephen F. Goldberg, BS, Philadelphia, PA; Joseph R. Spiegel, MD, Philadelphia, PA; Maurits S. Boon, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the basic procedure of fiberoptic intubation and appreciate it as a safe and effective method of managing the difficult airway, which can be readily incorporated into practice.

Objectives: Fiberoptic intubation (FOI) is used to secure the difficult airway in anticipated and unanticipated settings. The purpose of this study was to 1) summarize the use of FOI by an otolaryngology service; and 2) demonstrate the efficacy and safety of FOI as a pri-

mary method of difficult airway management. **Study Design:** Retrospective review based on postprocedure data collection checklist completed by the intubating staff member. **Methods:** Adult subjects (n = 50) underwent emergent or elective FOI for various indications over a period of 6 months. Data collected included: training level, hospital setting, intubation route, endotracheal tube size and type, intubation urgency, anesthesia type, total procedure time, number of attempts, indication for intubation, and complications. **Results:** 32 males and 18 females (mean age of 60) were included. 68% were elective and 32% were emergent. The most common indications for intubation were pre-procedure (72%) and respiratory distress (11%). The most common indications for FOI were upper airway abnormality (38%), upper airway neoplasm (24%), and cervical spine instability (14%). Total procedure time averaged 6.2 minutes. 90% of cases had no complications. 75% were performed by junior level residents. There was no significant difference in total procedure time (p = 0.73) or number of attempts (p = 0.32) between levels of training, but there was a significant difference in complication rate (p = 0.00). **Conclusions:** Fiberoptic intubation is an extension of diagnostic and therapeutic endoscopic techniques familiar to otolaryngologists, and can safely and effectively be performed as a primary method to secure the difficult airway in anticipated and unanticipated cases.

9:55

Q&A

◆ 10:00 - 10:15 Break/Poster Viewing ◆

Pediatrics/Otology

PANEL

10:15 - 11:15 **Transtympanic Drug Delivery**

Moderator: David S. Haynes, MD*, Nashville, TN

Panelists: Sujana S. Chandrasekhar, MD*, New York, NY
Abraham Jacob, MD, Columbus, OH
Michael E. Hoffer, MD*, San Diego, CA

Moderator: Amelia F. Drake, MD*, Chapel Hill, NC

11:15 **The Transmastoid Extradural-Intracranial Approach for Outpatient Repair of Transtemporal Meningoencephalocele: A Review of 29 Consecutive Cases**

Maroun T. Semaan, MD, Cleveland, OH; David A. Gilpin, MD, Cleveland, OH; Cliff A. Megerian, MD FACS*, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the indications, techniques and outcome of the described approach.

Objectives: Review the clinical presentation, surgical techniques and outcomes of the transmastoid extradural-intracranial (TMEDIC) approach for the treatment of transtemporal meningoencephalocele. **Study Design:** Retrospective chart review. **Methods:** Patients: 29 consecutive patients diagnosed between January of 2003 and July of 2010 with transpetrous meningo(encephalo)cele, with or without cerebrospinal fluid leak. Intervention: transmastoid intracranial-extradural approach for repairing herniated neural tissue through the tegmen tympani, tegmen mastoideum or posterior fossa plate using the combination of autologous cartilage, fascia and tissue sealant. Fat graft myringoplasty for repair of post-tympanostomy tube tympanic membrane perforation. Main outcome measures: Anatomic location, size and number of defects, presence or absence of herniated brain tissue, pre- and postoperative hearing thresholds and failure rate. **Results:** Mean age was 60 ± 14 years. The etiology was spontaneous in 83%, congenital in 7%, chronic otitis media in 7% and post-traumatic in 3%. Post-tympanostomy tube clear otorrhea was the presenting sign in 69% of patients. The mean duration of symptoms was 33 ± 60 months. The postoperative ABG was 11 ± 10 dB. The defect involved the middle fossa (MF) floor in 89%. Both the tegmen tympani and mastoideum were involved in 30% of patients and multiple dehiscence were seen in 24%. In 44% of cases the size exceeded 1 cm. All surgeries were outpatient. No recurrences were seen. **Conclusions:** The TMEDIC is a safe and effective method to repair transtemporal meningoencephalocele obviating the need for a middle fossa craniotomy.

11:23 **Pediatric Revision Adenoidectomy - Incidence and Choice of Technique**

Christopher R. Grindle, MD, Wilmington, DE; Ryan C. Murray, MD, Philadelphia, PA; Sri K. Chennupati, MD, Philadelphia, PA; Patrick Barth, MD, Wilmington, DE; James S. Reilly, MD*, Wilmington, DE

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the frequency of revision adenoidectomy in a pediatric population. Additionally, they should be able to comment on the various techniques used for this procedure.

Objectives: Adenoidectomy is a frequently performed procedure in the pediatric population. Various methods are available for this procedure, but few reports comment on revision rates and whether initial choice of technique affects these rates. This is discussed in this work. **Study Design:** Retrospective chart. **Methods:** The billing records were queried for all CPT codes that included adenoidectomy in children less than 12 years of age from 1/1/2005 - 3/1/2010. A separate subset of patients was pooled for whom the codes appeared more than once in this time period. **Results:** A total of 23612 occurrences of CPT codes were found. The separate subset of revision patients included 304 records (1.29%). The operative notes of 99 of these patients were available for review via the electronic medical record and technique of adenoidectomy was recorded. One patient required a second revision adenoidectomy. Sixty-one of the patients were male and 38 were female. Average age at first procedure was 2.9 years (290 days - 7.6 years). Average age at second procedure was 4.7 years (445 days - 9.6years). Suction monopolar electrocautery (MEC) was used in 55/100 cases. Suction microdebrider was used in 22/100 cases. Curette was used in 21/100 cases. Coblator was used in 1/100 cases. Suction MEC was used as necessary in all cases to control bleeding. Only one patient required a second revision adenoidectomy. **Conclusions:** Revision adenoidectomy occurs at a rate of 1.3%. Reasons for revision include persistent symptoms ranging from adenoiditis to recurrent otitis to obstructive sleep apnea. Various methods are available for this procedure. Initial technique should be chosen to best fit the patient and address the adenoid hypertrophy.

11:31 **Topical Antibiotic Treatment Reduces Tympanostomy Tube Biofilm Formation**

Robert G. Thomas, MD, Gainesville, FL; Carol Ojano-Dirain, PhD, Gainesville, FL; Patrick J. Antonelli, MD*, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of biofilm formation in post-tympanostomy tube otorrhea and compare the efficacy of different ototopical antibiotic preparations in treatment of these biofilms.

Objectives: Single doses of different ototopical antibiotic preparations (OAPs) have been shown to have an unequal reduction of post-tympanostomy tube otorrhea (PTTO). Microbial biofilm formation on the tympanostomy tube (TT) has been implicated as one cause of PTTO. The goal of this study was to determine if TT exposure to a single dose of OAP reduces biofilm formation by *Pseudomonas aeruginosa*. **Study Design:** Prospective and controlled. **Methods:** Fluoroplastic TTs were briefly exposed to plasma, followed by one of 3 OAPs (ofloxacin, neomycin/polymyxin B/hydrocortisone, or ciprofloxacin/dexamethasone) or saline (20 TT per group). TTs were placed in growth media with *P. aeruginosa* and incubated for 4 days, during which planktonic growth was monitored by media turbidity. At 4 days, planktonic organisms were killed and biofilms were measured with microbial counts. **Results:** Planktonic growth was significantly delayed by OAPs, with the least growth seen with ciprofloxacin/dexamethasone followed by ofloxacin and neomycin/polymyxin B/hydrocortisone ($p \leq 0.0001$). At day 4, planktonic growth was less with ciprofloxacin/dexamethasone than ofloxacin and neomycin/polymyxin B/hydrocortisone ($p < 0.05$). After 4 days, biofilm counts were lower on OAP treated than saline treated TTs ($P = 0.0015$) with both ciprofloxacin/dexamethasone and ofloxacin significantly less than saline ($p < 0.05$). Biofilm counts were not significantly different between OAPs. **Conclusions:** Treatment of TTs with ototopical antibiotic solutions reduces *P. aeruginosa* biofilm formation in vitro. This may, in part, explain the reduction of PTTO observed with single doses of OAPs.

11:39 **Atoh1 Mediated Hair Cells Recovery after Ablation with Kanamycin and Furosemide**

Shannon M. Kraft, MD, Kansas City, KS; Jennifer G. Brantley, Kansas City, KS; Beth Degarmo, Kansas City, KS; Hinrich Staecker, MD PhD, Kansas City, KS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential role of adenoviral vector as a means of regenerating hair cells after cochlear injury.

Objectives: In this study, we examine the ability of an alternate serotype adenoviral vector (Ad28) to deliver the Atoh1 gene to the cochlea of mice that have undergone outer hair cell (OHC) loss. **Study Design:** The OHCs of 8 mice were ablated with kanamycin and furosemide. One cochlea was treated with an adenoviral vector loaded with the Math1 gene cassette. We then examined the cochlea for evidence of hair cell regeneration. **Methods:** OHC ablation was carried out via a single subcutaneous injection of kanamycin (1 mg/g) followed 30 minutes later by an intraperitoneal injection of furosemide (0.4 mg/g). One week after ablation, 2 μ L of Ad28GFAPMath1 vector was injected into the left posterior canal. The right ear was not treated so that it might serve as an internal control. Cochleas were harvested 30 days after treatment to assess for histological evidence of hair cell regeneration via immunohistochemical staining with anti-myosin VIIa antibody. **Results:** Cochleas treated with Ad28 demonstrate intense staining in the inner and outer tunnel of Corti. Intact OHCs are seen on the regenerated side. Inner hair cells (IHC) and supporting cells label intensely, with evidence of supernumerary IHCs. The untreated ear demonstrates inner and outer tunnel labeling, but there are no structurally intact hair cells in the sensory epithelium, only cellular debris. **Conclusions:** The Ad28 serotype adenoviral vector is capable of introducing the Math1 gene to the cochlea and promoting hair cell regeneration.

11:47 **The Results of Temporal Bone Surgery for Advanced or Recurrent Tumors of the Parotid Gland**

Paul W. Gidley, MD*, Houston, TX; Christopher R. Thompson, MD, San Antonio, TX; Dianna B. Roberts, PhD, Houston, TX; Randal S. Weber, MD*, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of temporal bone surgery for advanced or recurrent tumors of the parotid gland.

Objectives: To describe the results of temporal bone surgery in managing advanced or recurrent tumors of the parotid gland. **Study Design:** Retrospective review. **Methods:** Patients with advanced or recurrent tumors involving the parotid gland who underwent either mastoidectomy or temporal bone resection were reviewed for treatment outcomes. **Results:** Forty-nine (49) patients were identified who required either mastoidectomy (n=33) or temporal bone resection (n=16) for malignancies involving the parotid gland. Facial nerve sacrifice was required in 35 patients (71.4%). Perineural invasion was found in 51.1% of patients; and negative margins were achieved in 78.2% patients. Six of 10 patients presenting with normal facial function (House-Brackmann I) and recurrent tumors maintained normal facial function following salvage surgery. Trismus, tumors larger than 4 cm, and the need for mandibulectomy were significantly correlated with higher recurrence rates (p=0.025, p=0.004, and p=0.002, respectively). Patients with preoperative HB I or II had a lower risk for recurrence (p=0.035) and more favorable survival at 3 years (p=0.024). Patients who required parapharyngeal space dissection and those with metastatic neck disease had the poorest survival rates. The overall survival at 3 years was 72.4%. **Conclusions:** Mastoidectomy and temporal bone resection permit preservation of the facial nerve when oncologically safe may help to achieve negative margins, and allow facial nerve grafting when nerve sacrifice is required. Despite the poor prognostic indicators of facial paralysis, recurrent tumors, and perineural invasion, a significant number of patients can be salvaged successfully when a temporal bone procedure is combined with parotidectomy.

11:55 Q&A

◆ Noon - 1:15 Lunch ◆

AFTERNOON SESSION

KIERLAND 1 & 2

RESIDENT BOWL

1:15 - 3:00 **Are You Smarter than an Otolaryngology Resident?**
Match wits with Otolaryngology Programs as they vie for the title of Resident Bowl Champion 2011
Moderators: Michael E. Hoffer, MD*, San Diego, CA
David M. Barrs, MD*, Phoenix, AZ

◆ **3:00 - 3:15 Break/Poster Viewing** ◆

PANEL

3:15 - 4:15 **Lessons and Confessions from 30 Years of Patient Care**
Moderator: David W. Eisele, MD*, San Francisco, CA
Panelists: G. Richard Holt, MD*, San Antonio, TX
 Jack L. Gluckman, MD*, Cincinnati, OH
 Gerald B. Healy, MD*, Boston, MA

PANEL

4:15 - 5:10 **My Proudest Case, and Why . . .**
Moderator: William W. Shockley, MD*, Chapel Hill, NC
Panelists:
Laryngology
 Gayle E. Woodson, MD*, Springfield, IL
Plastics
 Dean M. Toriumi, MD*, Chicago, IL
Otology
 Paul R. Lambert, MD*, Charleston, SC
Cleft Lip/Palate
 David E. Schuller, MD*, Columbus, OH
Pediatrics
 Kenneth M. Grundfast, MD*, Boston, MA

5:10 **I**ntroduction of Vice Presidents-Elect by Section Vice Presidents
David M. Barrs, MD*, Scottsdale, AZ *Western Section*
C. Gaelyn Garrett, MD*, Nashville, TN *Southern Section*
Henry T. Hoffman, MD*, Iowa City, IA *Middle Section*
Michael G. Stewart, MD*, New York, NY *Eastern Section*

5:30 - 7:00 **Meet the Authors Poster Reception**

7:00 **Party/Golf & Tennis Awards**

Scientific Poster Program

General

S1. **P**ost-Tonsillectomy Lingual Artery Pseudoaneurysm

Fred M. Baik, BA, San Diego, CA; Angela A. Chang, MD, San Diego, CA; Douglas A. Green, MD PhD, San Diego, CA; Ramin S. Pakbaz, MD, San Diego, CA; Christopher M. Bergeron, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the mechanism of pseudoaneurysm formation, anatomy and incidence of a common linguofacial trunk, and consider that a medialized common linguofacial trunk may increase the risk of vessel injury during tonsillectomy.

Objectives: To review a case of post-tonsillectomy lingual artery pseudoaneurysm and resultant hemorrhage in a patient with medialized common linguofacial trunk. **Study Design:** Retrospective case report. **Methods:** Case report and review of the literature. **Results:** A 27 year old female presented to an outside emergency department with a two day history of oral bleeding following tonsillectomy ten days earlier. An otolaryngologist was not available at this location so the patient was intubated and airlifted to our institution, where she was taken directly to the operating room. Intraoperative examination noted brisk bleeding emanating from deep within the inferior pole of the left tonsillar fossa. Hemostasis was achieved and she was admitted to the surgical ICU for observation. The patient bled again overnight and was subsequently taken back to the operating room. Hemorrhage was controlled but we elected to take the patient to the interventional radiology suite for angiography. Angiogram revealed pseudoaneurysm of a lingual artery originating from a medialized common linguofacial trunk. The pseudoaneurysm was successfully coiled and embolized. The patient did not experience further bleeding and was discharged after several days. **Conclusions:** We hypothesize that common linguofacial trunks arise from the external carotid artery at a highly medialized angle, placing the lingual and/or facial artery in closer proximity to the tonsillar fossa. In the setting of intraoral surgery such as tonsillectomy, this orientation may increase the risk of iatrogenic vessel injury. Angiography should be considered in cases of delayed recurrent hemorrhage following tonsillectomy.

S2. **M**anifestations of Thalassemia in the Head and Neck

William Henry Barber, MD, Jackson, MS; Scott P. Stringer, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize a number of otolaryngologic manifestations of thalassemia in order to appropriately manage the otolaryngologic sequelae of the disease.

Objectives: To present a case of chronic sinusitis in a patient with thalassemia in order to highlight pertinent head and neck findings associated with the disease process. A review of available literature is performed. **Study Design:** Case report and literature review. **Methods:** Chart and literature review, characteristic CT images are demonstrated. **Results:** Multiple otolaryngologic disease manifestations as a result of phenotypical changes associated with thalassemia have been described. Expansile changes of the frontal, temporal, and facial bones impede pneumatization of the paranasal sinuses. The ethmoid sinuses are characteristically uninvolved. There is a higher rate of dehiscence of the lamina papyracea, which was demonstrated in our patient. There is a high rate of nasal obstruction, sinonasal polyposis, and sinusitis. Extramedullary hematopoiesis has been described within the maxillary sinus and should be considered in this patient population when presenting with a sinus mass or opacification. Hearing impairment results as a conductive loss both due to bony overgrowth and extramedullary hematopoiesis in the middle ear as well as the external canal. Treatment with desferrioxamine leads to high frequency sensorineural hearing loss in a significant percentage of patients. **Conclusions:** Thalassemia is a systemic disease that can have significant manifestations in the head and neck. The otolaryngologist should be aware of the disease process and its effects on sinonasal and skull base anatomy and function in order to determine appropriate management of associated sequelae.

S3. **O**ropharyngeal Stenosis in a Patient with Sarcoidosis: A Case Report

Shethal Bearely, BA, Boston, MA; Avner Aliphass, MD, Boston, MA; Gregory A. Grillone, MD, Boston, MA; Jeffrey S. Berman, MD, Boston, MA

Educational Objective: After viewing this presentation, participants should be able to discuss the rare clinical occurrence of sarcoidosis induced oropharyngeal stenosis.

Objectives: The purpose is to describe the first reported case of oropharyngeal stenosis related to sarcoidosis. We also aim to describe the different etiologies of oropharyngeal stenosis and review the pertinent literature of this condition as it relates to sarcoidosis. **Study Design:** Case report and review of literature. **Methods:** We report a case of oropharyngeal stenosis in a 52 year old female diagnosed with sarcoidosis by lip biopsy and characteristic changes on chest imaging. We review the presenting history, pathology, radiology, and management of this rare disease entity. **Results:** This is the first reported case of oropharyngeal stenosis in a patient with sarcoidosis. The majority of oropharyngeal stenoses in the literature have been secondary to adenotonsillectomies. **Conclusions:** Sarcoidosis is a multisystem granulomatous disease which most often affects the lungs and lymphatic system. In this case, the patient presented with oropharyngeal stenosis and was diagnosed radiologically and pathologically with sarcoidosis. It is presumed this is the

etiology of her oropharyngeal stenosis. The decision was made that a biopsy of her oropharynx was warranted, but it was not done as the patient was lost to followup.

S4. **R**ight Sided Pyriform Sinus Fistula: A Case Report and Review of the Literature

Rachel A. Bell, BS, Burlington, VT; Peter Kasznica, MD, Burlington, VT; William J. Brundage, MD, Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the embryologic origin of third and fourth branchial pouch anomalies as well as their presentation and treatment.

Objectives: Pyriform sinus fistulae arise from disturbances in the development of the fetal third and fourth branchial pouch and are predominantly found on the left side. We report the rare case of a right sided pyriform sinus fistula presenting as a lateral neck abscess in a 24 year old woman. **Study Design:** Case report and systematic review of the literature. **Methods:** A 24 year old woman presented to the emergency department with a two week history of right sided neck abscess. A fluoroscopic sinogram was performed, which revealed a fistulous tract extending from the cervical abscess to the apex of the right pyriform sinus. It was determined the fistula was likely a third or fourth branchial arch remnant, a rare right sided finding. Chemocauterization of the fistulous tract with 40% trichloroacetic acid (TCA) was used to successfully treat the patient. **Results:** Clinically differentiating third from fourth branchial pouch anomalies is difficult, and there are various theories for their embryologic origin. Nonetheless, approximately 93-97% of these uncommon lesions are left sided. Treatment options include surgical excision and cauterization. **Conclusions:** Branchial cleft cyst and pyriform sinus fistula must be considered in the diagnosis of cervical abscess in either side of the neck. Chemocauterization of these lesions with 40% TCA is less invasive than surgical excision and is a relatively safe and effective first line treatment.

S5. **P**ostoperative Pain after Tonsillectomy with PlasmaKnife versus Monopolar Cautery

Timothy L. Clenney, MD MPH, Portsmouth, VA; Peter C. Bondy, MD, Portsmouth, VA; Ashley A. Schroeder, MD, Portsmouth, VA; Allen O. Mitchell, MD, Portsmouth, VA; Thomas S. Rieg, PhD, Portsmouth, VA

Educational Objective: At the conclusion of this presentation, the participants will be able to discuss the use of PlasmaKnife technology in adult tonsillectomy. Specifically, participants will demonstrate an understanding of postoperative pain following PlasmaKnife tonsillectomy in comparison to tonsillectomy performed by monopolar electrocautery.

Objectives: To compare postoperative pain after PlasmaKnife tonsillectomy (PKT) to monopolar cautery tonsillectomy (MCT) in adult patients. **Study Design:** Prospective, randomized, single blinded, self-controlled using paired organs (tonsils). **Methods:** Each patient underwent MCT on one side and PKT on the opposite side. Randomization was used to select the side allocated to receive PKT, with the opposite side receiving MCT. The primary outcome was self-rated daily pain assessed using a 10 point scale. Patients were provided 21 day pain diaries and were phoned twice weekly by a research assistant to assess pain and remind patients to complete diaries. Secondary outcomes included comparisons of operative time, blood loss, and postoperative complications. **Results:** Repeated measures ANOVA comparing PKT to MCT over the 21 day postoperative period revealed no difference in postoperative pain between the two groups ($p = .131$). Additionally, total operative time ($p = .276$) and blood loss ($p = .418$) did not differ significantly between PKT and MCT. **Conclusions:** Subjects undergoing PKT do not experience less postoperative pain in comparison to MCT.

S6. **H**igh Grade Dysplasia of an Enteric Duplication Cyst of the Anterior Tongue

Timothy R. DeKlotz, MD, Washington, DC; Cynthia M.C. DeKlotz, MD, Washington, DC; Bruce J. Davidson, MD FACS, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize and incorporate into their differential diagnosis the possibility of an enteric duplication cyst when evaluating cystic lesions of the anterior tongue.

Objectives: To examine the rare diagnosis of an enteric duplication cyst of the oral tongue as well as the challenging clinical management of dysplasia in this setting. **Study Design:** Case presentation. **Methods:** The chart, imaging, and pathologic findings of the above case presentation were retrospectively reviewed and compared with that reported in the literature. **Results:** A 54 year old male presented with significant swelling of his anterior tongue and tongue base with symptoms of dysphagia, dysphonia, and low grade fevers. Imaging demonstrated a large cystic lesion of the tongue measuring 3.3 x 3.8 cm. Fine needle aspiration of the lesion revealed mucoid contents, but was otherwise nondiagnostic. Marsupialization and biopsy of the cyst wall revealed intestinal type glandular epithelium with areas of high grade dysplasia. Symptoms immediately resolved after decompression of cyst. **Conclusions:** Enteric duplication cysts are rare in adults but should be considered when evaluating cystic lesions of the upper aerodigestive tract. The large size of this lesion and the dysplasia complicate its management.

S7. **S**ecreting Vagal Paraganglioma: A Rare Tumor with Hemodynamic Implications

Brent R. Driskill, MD, Portsmouth, VA; William L. Falls, MD, Portsmouth, VA; Timothy L. Clenney, MD, Portsmouth, VA; William P. Magdycz, MD, Portsmouth, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the signs and symptoms

of a secreting vagal paraganglioma and effectively manage medically and surgically.

Objectives: Vagal paraganglioma is a rare tumor of the head and neck, comprising only 3 percent of all paragangliomas occurring in this region. Hormonally active variants of this tumor (secreting paraganglioma) are exceedingly rare, with only 12 cases documented in the English medical literature since first reported in 1969. Presented here is the case of a 45 year old female with a right sided secreting vagal paraganglioma, manifesting initially as a progressively enlarging right sided neck mass with symptoms of tracheoesophageal compression and catecholamine excess. Elevated urine and serum catecholamines confirmed the presence of a secreting tumor. Computed tomography (CT) demonstrated involvement of the cervical vagal nerve and further testing with metaiodobenzylguanidine (MIBG) scan demonstrated the absence of other secreting paragangliomas. Despite preoperative adrenergic blockade, surgical excision of the tumor was complicated by marked hemodynamic lability. Although the literature suggests that these tumors are rarely hormonally active, this case illustrates the importance of preoperative metabolic screening in all cases of paraganglioma. Additionally, in all cases of secreting paraganglioma undergoing operative management, preoperative and intraoperative adrenergic blockade is warranted. **Study Design:** Case report. **Methods:** Presentation of a case and review of the literature. **Results:** Case report/review of the literature. No results section. **Conclusions:** Metabolically active paragangliomas are very rare, but metabolic screening is indicated. In these cases pre/intraoperative adrenergic blockade is imperative.

S8. Unusual Presentation of a Lingual Dermoid Cyst

Megan L. Durr, MD, San Francisco, CA; Steven D. Pletcher, MD, San Francisco, CA; Annemieke R. Vanzante, MD PhD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the pathologic characteristics of epidermoid, dermoid, and teratoid cysts, identify the presenting symptoms of a lingual dermoid cyst, and discuss the various surgical treatment options.

Objectives: Epidermoid and dermoid cysts are rare benign lesions that are found throughout the body, with 7% occurring in the head and neck and 1.6% occurring in the oral cavity. They represent less than 0.01% of all oral cavity lesions. They are generally slow growing and present as asymptomatic masses in children. We present the case of a 48 year old man with a lingual dermoid cyst presenting as recurrent Ludwig's angina requiring tracheotomy. We hope to highlight the variability of the initial presentation of dermoid cysts, to discuss the surgical treatment options, and to review the pathologic features of these lesions. **Study Design:** A case report and literature review. **Methods:** A thorough review of medical records, imaging, and pathology was performed for this clinical case report. A comprehensive literature review was also performed. **Results:** The patient had a twenty year history of recurrent tongue and floor of mouth abscesses, requiring a tracheotomy and multiple hospitalizations for drainage. An MRI completed between these acute episodes revealed a 1.8cm lesion within the tongue musculature. He then underwent surgical resection of this lesion. Pathology showed a cyst lined by benign squamous mucosa and surrounding sebaceous glands, consistent with a dermoid cyst. The patient has had no recurrent abscesses two years after the resection. **Conclusions:** Dermoid cysts are rare lesions of the head and neck that usually present as asymptomatic, slow growing masses. This case demonstrates that dermoid cysts may present acutely and that they should be considered in cases of recurrent Ludwig's angina.

S9. Skull Osteoma Removal with the Ultrasonic Bone Aspirator

Eric I. Ehieli, BA, Philadelphia, PA; Eli A. Gordin, MD, Philadelphia, PA; Edmund D. Pribitkin, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the first reported case of skull anterior table osteoma removal with the Sonopet ultrasonic bone aspirator, and discuss the Sonopet ultrasonic bone aspirator as a safe and effective alternative to the conventional high speed drill for skull osteoma removal.

Objectives: This is the first case of anterior table benign frontal sinus osteoma (FSO) removal with the Sonopet ultrasonic bone aspirator (SUBA). SUBA has advantages over conventional bone removal techniques and the potential to be more ubiquitously utilized for the removal of skull osteomas. **Study Design:** A 34 year old male with an FSO presented with pain above the orbital rim. He elected to have the osteoma removed using SUBA. **Methods:** An incision was made along the upper margin of the right eyebrow and dissected down to the frontalis musculature. The supraorbital nerve was identified and preserved. A piece of the osteoma was removed for biopsy with a chisel, and the remainder of the osteoma was removed with SUBA down to the frontal sinus anterior table. **Results:** Estimated blood loss was less than ten milliliters. Patient awoke in operating room without complications and was discharged home that day. Surgical pathology confirmed a right FSO. **Conclusions:** Anterior table benign FSOs can cause facial disfigurement and, less commonly, recurrent headaches. Surgeons typically perform either an open or endoscopic osteotomy using a high speed drill, which has disadvantages. Ultrasonic bone removal has been employed by spine and neurosurgeons and is FDA approved for use in head and neck surgery. Ultrasonic bone emulsification and aspiration offers decreased blood loss, preservation of adjacent soft tissue structures and precise bone removal, and presents a significant advance over conventional high speed drill surgery. We report the first case of anterior table benign FSO removal with SUBA, which provides significant advantages over conventional bone removal techniques.

S10. Subcondylar Mandible Fractures, a Review and Evaluation of Outcomes

Lindsay S. Eisler, MD, Minneapolis, MN; Kaitlin Wearda, Minneapolis, MN; Kelsey Romatoski, Minneapolis, MN; Rick M. Odland, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) demonstrate the ability to determine different types of mandible fractures; 2) explain different methods of treatment; 3) discuss possible complications associated with subcondylar fractures and treatment; and 4) compare results of outcomes of patients in different treatment groups.

Objectives: The purpose of this study is to identify patients treated for subcondylar mandible fracture, review preoperative imaging to determine displacement of fracture, review complications, compare treatment groups, and compare outcomes of patients treated with different modalities. **Study Design:** Retrospective review and outcome study of 300 patients at a level trauma center. **Methods:** Ninety-three patients had isolated subcondylar fractures and two hundred and seven had a subcondylar fracture and an additional mandible fracture. All patients' charts were reviewed for mechanism of injury, presence of additional mandibular or facial fractures, treatment plan, complications, and average followup. All imaging was reviewed. Fractures were measured for telescoping, distance between fragments and angulation of the fracture from the condyle. Patients were divided into treatment groups; conservative, maxillomandibular fixation, and open reduction internal fixation. Averages of fracture measurements were determined for each treatment group. All patients were sent followup questionnaires. The questionnaires addressed range of motion, function, occlusion, temporomandibular joint problem, static and dynamic pain, compliance with treatment, facial appearance and overall satisfaction with results. The questionnaires had a four point scoring system. **Results:** No significant difference was observed between treatment groups, suggesting that displacement of fracture from mandibular condyle did not dictate treatment plan. Results from the returned questionnaires showed overall satisfaction with their postoperative range of motion, function, appearance, and occlusion. Patients overall did not suffer from problems with the temporomandibular joint. Patients did however endorse both static and dynamic pain. **Conclusions:** Overall patients were satisfied with their post-treatment results.

S11. **The “Closed Airway Sneeze”: An Unusual Cause of Laryngeal Fracture**

Daniel L. Faden, BS, Bethesda, MD; Alphi P. Elackattu, MD, Boston, MA; Michael P. Platt, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize the clinical presentation and exam findings of a patient with a laryngeal fracture and subcutaneous emphysema; 2) understand the importance of a prompt and accurate diagnosis in achieving successful management; and 3) have a better appreciation for the pressures generated with sneezing and the potential consequences.

Objectives: Report a rare cause of laryngeal fracture due to increased intraluminal pressure during a closed airway sneeze. **Study Design:** Case report. **Methods:** Case report based on patient physical exam, imaging and diagnostic tests with a review of the literature. **Results:** A 38 year old man presented to the emergency department one day following a vigorous “closed airway” sneeze that resulted in throat pain, odynophagia, and hoarseness. Physical examination revealed crepitus of the anterior neck soft tissue without sign of external trauma. CT scan of the neck confirmed an airway injury with a minimally displaced fracture of the thyroid cartilage and extensive subcutaneous air. The patient regained full laryngeal function without complication following conservative medical management. **Conclusions:** Sneezing, particularly closed sneezes, have been associated with numerous sequelae due to rapidly increasing intraluminal pressures. We report the first confirmed case of laryngeal fracture following a sneeze in the English literature.

S12. **Histiocytic Sarcoma and Tumor Lysis Syndrome: An Unexpected Sequela of a Neck Mass**

Elizabeth A. Guardiani, MD, Washington, DC; Stan H. Chia, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize histiocytic sarcoma as a rare, but aggressive cause of a rapidly growing neck mass and to discuss the etiology and clinical course of tumor lysis syndrome.

Objectives: 1) To present histiocytic sarcoma as a rare, but aggressive cause of a rapidly growing neck mass; and 2) to discuss the etiology and clinical course of tumor lysis syndrome. **Study Design:** Retrospective case report. **Methods:** Case report and review of the literature. **Results:** We report the case of a 27 year old Hispanic female who presented with a six week history of odynophagia, fevers and a rapidly enlarging right neck mass. Fine needle aspiration revealed large histiocytes and other inflammatory cells, but no evidence of malignancy. The patient was admitted to the hospital for hydration, parenteral antibiotics and scheduled for an open biopsy. Computed tomography at admission revealed a 6x6 cm neck mass, innumerable lung nodules, and ill defined parenchymal lesions throughout the liver, spleen, and kidneys. Soon after admission, the patient had rapid clinical deterioration with profound lactic acidosis and multiple electrolyte abnormalities, and expired just two days after admission. Her final pathology was consistent with histiocytic sarcoma and cause of death was determined to be tumor lysis syndrome resulting from massive tumor burden. **Conclusions:** Histiocytic sarcoma is a rare aggressive neoplasm of mature tissue histiocytic origin that is not typically in the differential diagnosis of otolaryngologists. Tumor lysis syndrome (TLS) is most commonly associated with the initiation of cytotoxic therapy, but is also known to occur spontaneously. Spontaneous TLS and histiocytic sarcoma are aggressive and life threatening conditions that must be quickly identified if encountered by the otolaryngologist.

S13. **Unique Case of Deep Neck Infection in an Older, Immune Competent Adult**

Cheryl J. Gustafson, MD, Jackson, MS; Christine B. Franzese, MD FACS, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss deep neck abscesses in older adults, including the anatomy, etiology, diagnosis, bacteriology, therapeutic management, and complications.

Objectives: To discuss a unique case of a deep neck abscess in an adult, immune competent patient. Retropharyngeal abscesses in adults are uncommon because the lymph nodes in this region have atrophied by adulthood. In addition, when such infections occur in adults, they are frequently associated with trauma, oral instrumentation, or underlying immune compromised states, especially diabetes and cancer. In the patient case we present, no predisposing factors for the development of retropharyngeal abscess were identified. The case we present is also unique in that the culture results grew neisseria species, which is not a common bacteria isolated from deep neck abscesses. **Study Design:** Case report. **Methods:** A complete chart review was performed on an older adult patient with a deep neck abscess. **Results:** We describe a unique case of a deep neck abscess in an immune competent 57 year old gentleman. The abscess extended anteriorly to the left thyroid cartilage and posteriorly into the retropharyngeal space. The abscess was successfully managed with intravenous antibiotics and surgical intraoral drainage. Culture results were unique in that they grew neisseria species. **Conclusions:** Although the incidence and mortality of deep neck abscesses has declined due to the use of antimicrobial therapy, this potentially fatal infection should not be overlooked. Early diagnosis with prompt treatment by intravenous antibiotics and surgical drainage are key points in the management of this condition.

S14. Amyloidosis of the Nasopharynx and Nasal Cavity Presenting as Severe Epistaxis and Sphenoid Sinus Dehiscence

Sanaz Harirchian, MD, Newark, NJ; Soly Baredes, MD*, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical presentation, clinical course, pathologic and radiographic findings, differential diagnosis, workup and management of nasal cavity/nasopharyngeal amyloidosis.

Objectives: To review the presentation and management of amyloidosis of the nasal cavity and nasopharynx and to present a case with unusual radiographic findings. **Study Design:** Retrospective chart review. **Methods:** Case report and review of the literature. **Results:** Localized amyloidosis involving the head and neck is uncommon. Nasopharyngeal amyloidosis is even rarer, with only a few case reports in the literature. On CT scan, these lesions usually present as a well defined, homogenous, smooth soft tissue mass without any evidence of bony erosion. We present a case of a 33 year old female transferred to our institution for management of persistent epistaxis despite surgical management and nasal packing. CT sinus revealed a soft tissue mass extending from the roof of the nasopharynx with associated dehiscence of the floor of the sphenoid sinus and unilateral sphenoid sinus opacification. Retrospective review of a CT one year prior to presentation for complaints of nasal obstruction revealed the same radiographic finding. Biopsies of the nasopharynx and right lateral nasal wall were consistent with amyloidosis. **Conclusions:** Amyloidosis of the nasal cavity and nasopharynx is a rare disorder that can be associated with bone erosion and can cause severe epistaxis.

S15. First Bite Syndrome after Carotid Endarterectomy

Sanaz Harirchian, MD, Newark, NJ; Brian E. Benson, MD, Hackensack, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical presentation, etiology, and management of First Bite syndrome.

Objectives: We present the first case report of multiple cranial neuropathies, as well as, First Bite syndrome (FBS) following carotid endarterectomy (CEA). **Study Design:** Retrospective chart review. **Methods:** Review of literature. **Results:** FBS is characterized by severe pain in the parotid region after the first bite of a meal. It is a well described complication of parapharyngeal space, carotid, and cervical schwannoma surgery. The etiology of FBS is unknown, however it is thought to be the result of the loss of sympathetic innervation to the parotid gland, with a subsequent denervation supersensitivity related to uninhibited parasympathetic stimulation. A 70 year old man with carotid artery atherosclerosis underwent a left CEA. In the early postoperative period, he experienced left marginal mandibular nerve weakness, hoarseness, and severe pain within the left parotid region when eating. Trismus and left TMJ tenderness were noted on exam, but no parotid mass was palpated. CT of the neck revealed no parotid mass. Videostroboscopy revealed a left vocal fold paresis with glottic incompetence, and hypersensitivity of the left hemilarynx. EMG of the left hemilarynx revealed giant waves. The marginal mandibular nerve weakness resolved spontaneously, and he underwent injection augmentation of the left vocal fold. His FBS was treated with gabapentin and opioid-based analgesics, however, he experienced excessive side effects from the analgesics. He lost approximately 20 pounds, despite nutritional supplements. He underwent ultrasound guided botulinum neurotoxin (BNT) chemodenervation of the left parotid gland, with >90% reduction in his symptoms. **Conclusions:** FBS is a possible complication of CEA, which may respond favorably to BNT treatment.

S16. Extranodal Rosai-Dorfman Disease Presenting as an Intranasal Mass

Chase M. Heaton, 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 the radiologic, pathologic, and clinical appearance of Rosai-Dorfman disease.

Objectives: Rosai-Dorfman disease, also known as sinus histiocytosis with massive lymphadenopathy (SHML), is a rare, idiopathic disorder characterized by a benign proliferation of histiocytes initially thought to be limited to cervical lymph nodes. However, between 30-50% of patients identified with SHML have extranodal manifestations. **Study Design:** We report the case of a 40 year old female with biopsy proven cutaneous extranodal Rosai-Dorfman who presented with symptoms of nasal obstruction. A CT scan demonstrated

lesions of the left inferior turbinate and anterior nasal septum with bony erosion consistent with lymphoma or an inflammatory process. **Methods:** The patient underwent a biopsy of the nasal mass. The specimen was evaluated with flow cytometry, microscopy, and stained for immunohistochemical markers. **Results:** Only several isolated case reports of nasal manifestations of Rosai-Dorfman exist in the medical literature. This report describes a woman with cutaneous extranodal Rosai-Dorfman disease and new nasal cavity involvement. The specimen demonstrated a histiocyte rich environment on microscopy consistent with nonspecific inflammation. Flow cytometry showed a heterogeneous population of cells ruling out lymphoma. Subsequent positive immunohistochemical staining for S-100 protein confirmed the diagnosis of Rosai-Dorfman disease. **Conclusions:** Rarely, Rosai-Dorfman disease may manifest in the nasal cavity with symptoms mimicking that of sinusitis. Otolaryngologists should be familiar with the pathophysiology of the disease, the variability of extranodal involvement, radiologic findings, and the immunohistochemical analysis of Rosai-Dorfman to aid in diagnosis. This presentation will emphasize the radiological, pathological, and clinical appearance of the disease.

S17. Case Report of Acute Calcific Prevertebral Tendinitis: Easily Mistaken for a Retropharyngeal Abscess
Bradley T. Johnson, MD, New Orleans, LA; Knight N. Worley, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical presentation, workup, and management of acute calcific prevertebral tendinitis.

Objectives: The main objective of this case report is to understand the unique clinical presentation, characteristic imaging appearance, and nonsurgical management of acute calcific prevertebral tendinitis. **Study Design:** This study is a single case report of a patient presenting to the emergency department with diabetic ketoacidosis and a one week history of progressively worsening dysphagia, odynophagia, and severe neck pain radiating to his right shoulder that was initially suspicious for a retropharyngeal abscess. **Methods:** Single patient case report accompanied by a brief literature review. **Results:** After realizing that this patient's condition did not result from an infectious etiology, antibiotic therapy was promptly discontinued. The patient's pain was managed symptomatically with nonsteroidal anti-inflammatory drugs (NSAIDs), which is the recommended treatment for this disease entity. He was discharged to home in stable condition and was asymptomatic upon return to clinic three weeks later. **Conclusions:** Acute calcific prevertebral tendinitis is a rare inflammatory disease but has been appearing with increased frequency. This fact could be attributed to improved diagnostic imaging or a higher index of suspicion among clinicians. We believe this case to be the first where the patient presented with a complicating medical condition. A thorough history and physical exam coupled with this disease entity's characteristic imaging appearance allows a timely diagnosis to be made. As a result, patients are not subjected to unnecessary diagnostic tests as well as surgical procedures that carry substantial morbidity and mortality.

S18. Richard J. Bellucci, MD Resident Research Award (Eastern Section)
Bilateral Central Serous Chorioretinopathy Caused by Intranasal Corticosteroids: A Case Report and Review of the Literature

Andrew J. Kleinberger, MD, New York, NY; Chirag Patel, MD, New York, NY; Ronni M. Lieberman, 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 central serous chorioretinopathy and describe its association with intranasal corticosteroid use.

Objectives: To present a case of bilateral central serous chorioretinopathy (CSC) resulting from intranasal corticosteroid use and review the literature regarding this rare side effect. **Study Design:** Case report and literature review. **Methods:** The patient chart, including history, physical examination, clinical course and ancillary studies, was reviewed. A literature search was performed; appropriate papers were identified and reviewed for cases. **Results:** The patient is a 48 year old woman who had been followed over a two year period for chronic rhinosinusitis and allergic rhinitis; treatment included daily intranasal corticosteroid sprays. During the course of therapy, the patient developed intermittent blurry vision in both eyes and was referred for ophthalmologic evaluation. Funduscopy examination and fluorescein angiography confirmed a diagnosis of bilateral CSC. After exclusion of other possible causative factors, the diagnosis was attributed to her use of intranasal corticosteroids. The medication was discontinued with subsequent recovery of normal vision. A search of the English literature revealed only 3 other reported cases of CSC linked to intranasal corticosteroid use. In all 3 cases, clinical improvement was observed after cessation of the steroid agent. **Conclusions:** The relationship between systemic corticosteroid use and CSC has been well established; however, there also appears to be an association with intranasal corticosteroids. Otolaryngologists, as frequent prescribers of intranasal corticosteroids, should be aware of their myriad side effects, including ophthalmologic conditions such as CSC. These risks should be considered prior to initiating and during the course of therapy, as close ophthalmologic monitoring or alternative nonsteroidal treatments may be indicated.

S19. Radiologic Findings and Outcomes of Hyoid Compression Syndrome

Daniel J. Lattin, MS, Los Angeles, CA; Abie H. Mendelsohn, MD, Los Angeles, CA; Claudia Kirsch, MD, Columbus, OH; Dinesh K. Chhetri, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the presentation of hyoid compression syndrome compared to other head and neck pain syndromes and discuss its surgical management.

Objectives: The goal of this study was to elucidate the radiologic findings of hyoid compression syndrome (HCS) and how this uncommon

mon condition is distinguished from related pain syndromes such as Eagle's syndrome or glossopharyngeal neuralgia. Additionally, this study set out to describe treatable symptoms from within the spectrum of HCS associated symptoms. **Study Design:** Prospective open design. **Methods:** HCS patients were collected from a single tertiary academic center within a 12 month period. Surgical planning was done with the collaboration of surgical and radiologic teams. Patients completed the validated Neck Disability Index (NDI) survey as well as a subjective questionnaire preoperatively and 6 months postoperatively. **Results:** Two HCS patients were treated with surgical resection. Preoperative CT imaging revealed impingement of the carotid artery by the greater cornu of the hyoid bone and provocative imaging in the symptomatic position demonstrated carotid artery compression on the affected side. Postoperative imaging showed resolution of impingement. Patients reported overall NDI improvement of 8.7% and 15.6%. While many of the NDI domains failed to show improvement, the headache domain maintained substantial and consistent improvement. Substantial headache improvement was reinforced based on patient subjective data. Both patients displayed postoperative improvement in blurred vision. **Conclusions:** HCS is an uncommon, but significant, cause of head and neck pain. The syndrome typically presents hidden within a constellation of related symptoms which can further complicate the diagnosis. However, prompt radiologic diagnosis should lead to surgical intervention which should demonstrate reduction in headaches and patient specific symptomatic improvement.

S20. Effectiveness of Pillar Implantation in Patients Who Snore after Uvulopalatopharyngoplasty (UPPP)
Douglas D. Massick, MD, Gahanna, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the utility of Pillar implantation for snoring patients who have previously undergone uvulopalatopharyngoplasty (UPPP).

Objectives: Define the role of Pillar implantation and factors associated with successful therapy in patients who continue to snore after uvulopalatopharyngoplasty (UPPP). **Study Design:** Retrospective series of 50 consecutive adult patients who received Pillar implants for continued snoring after having previously undergone uvulopalatopharyngoplasty. Demographic, anatomic, and bed partner satisfaction with the snoring result, and complications underwent analysis. **Methods:** 50 consecutive patient results were evaluated with chart review and post-procedure followup and telephone interviews to an endpoint of 1 year post-procedure. **Results:** A total of 45 of 50 patients' bed partners reported high satisfaction with the reduction in their partner's snoring. This result proved durable to our endpoint of one year post-procedure. Initial apnea/hypopnea index ($P=0.04$) and Friedman tongue position score ($P=.001$) were found to be significantly related to high satisfaction scores. **Conclusions:** Patients who snore after uvulopalatopharyngoplasty can be successfully managed with Pillar implantation.

S21. Isolated Sarcoidosis of the Tonsil: Case Report and Literature Review
Saral Mehra, MD MBA, New York, NY; Catherine Chang, BA, New York, NY; Ashutosh Kacker, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss evaluation, management, and followup when reaching a diagnosis of sarcoidosis in a tonsil specimen in their patient. They should also be able to explain the issues of linking malignancy to focal sarcoidosis.

Objectives: The objective of this report is to present the eighth published case of sarcoidosis presenting as unilateral tonsil hypertrophy; and even more rare, to present sarcoidosis limited only to the tonsil in the absence of a history of acute or chronic tonsillitis. We also review the existing literature as it relates to evaluation, management, and followup of this finding including the association with malignancy. **Study Design:** Case report and literature review. **Methods:** A case is presented with appropriate history, laboratory values, imaging results, and pathology slides. Then the literature on the topic of sarcoidosis of the tonsil is systematically reviewed. **Results:** A 25 year old black woman with no history of acute or chronic tonsillitis presented with unilateral tonsil hypertrophy and had biopsy showing non-necrotizing granulomas consistent with sarcoidosis. She had elevated angiotensin converting enzyme (ACE), but no other systemic signs or symptoms at diagnosis or upon followup evaluation. **Conclusions:** This case and literature review supports the finding of sarcoidosis limited to and presenting as asymmetric tonsillar hypertrophy. However, it is still important that such patients receive appropriate workup, referral, and followup for development of systemic manifestations of sarcoid and to be vigilant for any signs or symptoms of malignancy.

S22. Acetic Acid Sclerotherapy in the Treatment of Head and Neck Lymphangiomas
Mia E. Miller, MD, Los Angeles, CA; Audrey P. Calzada, MD, Los Angeles, CA (Presenter); Anton Mlikotic, MD, Torrance, CA; Maie St. John, MD PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe a new technique for sclerotherapy of head and neck lymphangiomas.

Objectives: 1) To describe the treatment of head and neck lymphangiomas with percutaneous acetic acid sclerotherapy; and 2) to analyze the outcomes of acetic acid sclerosant with more traditional therapies. **Study Design:** A retrospective review of three patients who underwent percutaneous sclerotherapy for cervical lymphangiomas with acetic acid at a single institution. **Methods:** Details of the procedure are reviewed as well as MRI findings and pre- and post-procedure fluoroscopy images. Outcomes are compared with surgery and use of other sclerotherapy agents through literature review. **Results:** Three patients with head and neck lymphangiomas were treated with a combination of acetic acid and contrast injection under fluoroscopic guidance. As described by Won et al., 2004, a pigtail

catheter was placed into the lesion and cystic fluid partially removed. A combination of sclerosant and contrast was injected into the lesion, the patient repositioned to distribute the sclerosant, and a draining pigtail left in place. The first patient was a 16 year old male with a cervical lymphangioma who required revision sclerotherapy after treatment. The second patient was a 35 year old man with a temporal lymphangioma and the third was a 53 year old woman with a supraclavicular lymphangioma; neither required revision therapy. **Conclusions:** Traditional interventional radiologic approaches to head and neck lymphangiomas include bleomycin injection and treatment with OK-432, which can induce pulmonary fibrosis/interstitial pneumonia and shock, respectively. Surgical approaches are often complicated by postoperative neuropathies. Acetic acid is a less caustic substance which can be used with similar success. This treatment has not been previously reported in the head and neck literature.

S23. **O**bststructive Parotitis Secondary to Masseter Muscle Hypertrophy

Ryan P. Reddy, MD, Charleston, SC; David R. White, MD, Charleston, SC; Marion B. Gillespie, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the masseter muscle hypertrophy and its inclusion in the differential for obstructive parotitis.

Objectives: Obstructive parotitis may be caused by a variety of etiologies including salivary stones, strictures, and traumatic injury. The present study investigates in detail three cases of chronic parotitis secondary to an acute bend in Stensen's duct caused by hypertrophy of the masseter muscle. **Study Design:** Retrospective case series. **Methods:** Retrospective case series. **Results:** Three female patients presented with symptoms consistent with obstructive parotitis, including glandular swelling and tenderness with meals and mastication. The 10 year old patient had unilateral facial swelling with mass formation within the masseter muscle and mandible on imaging studies. An acute kinking Stensen's duct secondary to mass effect could be visualized on salivary endoscopy. The patient's parotid swelling resolved following debulking of the masseteric space mass that was consistent with fibrous dysplasia on pathological examination. Two patients, ages 49 and 51 years, with bilateral parotid involvement had bilateral masseteric hypertrophy confirmed by imaging and dental wear facets consistent with bruxism on physical examination. Both patients had bilateral kinking of distal Stensen's duct during jaw closure when visualized with salivary endoscopy. Both patients' symptoms improved significantly following ultrasound guided Botox injection of the masseter and nightly use of a bite guard. **Conclusions:** Acute masseteric bend is a rare cause of obstructive parotitis in adults and children. Diagnosis is aided by direct visualization of the kinked ductal segment by salivary endoscopy. Symptomatic improvement can be achieved by direct surgical reduction or Botox induced atrophy of the masseteric hypertrophy.

S24. **A** Case of Disfiguring Bilateral Parotid Sialosis

Tara E. Song, BA, Burlington, VT; Thomas K. Tamura, MD, Burlington, VT; Abdel A. Elhosseiny, MD, Burlington, VT; William J. Brundage, MD, Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to formulate a comprehensive differential for patients presenting with significant bilateral parotid sialosis. Parotid enlargement may be attributed to benign conditions such as sialosis, defined as painless, diffuse, non-inflammatory, non-neoplastic enlargement of the major salivary glands. The cause for sialosis is not well understood, but diabetes mellitus and alcoholism have been associated with this pathology.

Objectives: Bilateral non-inflammatory sialosis has been associated with a number of systemic pathologies. This paper presents a rare case report of bilateral disfiguring parotid sialosis in a diabetic female with pathologic images and review of the literature. **Study Design:** This is a case report of parotid sialosis with a review of the primary literature. **Methods:** A comprehensive review of the literature was performed. Articles not available online were obtained in print. The literature was reviewed regarding the incidence of parotid sialosis and associated conditions that have been described. **Results:** Histologically, the patient was found to have benign, diffuse fatty infiltration of the parotid glands. Several case reports from the 1950s describe fatty infiltration of the parotid in obese individuals, while more recent reports describe sialosis in association with diabetes mellitus and alcoholism. Many of the recent studies, however, do not provide a review of histology, making it difficult to extrapolate an etiologic relationship with our patient from this data. This report highlights the potential pathologic relationship between diabetes mellitus and fatty infiltration of the parotid gland. **Conclusions:** Bilateral parotid gland swelling secondary to fatty infiltration is rarely discussed in the otolaryngologic literature. A primary cause is not always identified, and in reviewing the literature there does not appear to be a clear pathologic process described in the patients. The most common association is diabetes mellitus.

S25. **A** Pharmacokinetic Approach to Rapidly Titrate Propofol during Drug Induced Sleep Endoscopy for Evaluation of Sleep Apnea

Steven M. Sperry, MD, Philadelphia, PA; Jeff E. Mandel, MD, Philadelphia, PA; Erica R. Thaler, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss a method for performing sleep endoscopy for the evaluation of sleep apnea patients.

Objectives: To describe a method for performing drug induced sleep endoscopy on sleep apnea patients, utilizing a rapid titration of propofol to quickly reach and maintain a goal of moderate airway obstruction, to assist in better diagnosis of the anatomic location of obstruction in sleep apnea patients. **Study Design:** Case series. **Methods:** Sleep apnea patients undergoing initial screening for

possible surgical intervention via transoral robotic surgery were taken to the operating room for sleep endoscopy as part of a prospective trial. The patients were induced with a propofol infusion, which was rapidly titrated to a level of sedation producing moderate obstruction. The pharmacokinetic model of Masui was employed in conjunction with the pharmacodynamic model of Johnson to calculate in real time the propofol infusion necessary to maintain the level of sedation. **Results:** In this series, twelve patients underwent sleep endoscopy induced with a propofol infusion titrated to a moderate level of airway obstruction and maintained at that level of obstruction with an infusion rate calculated in real time by a software program. 11/12 patients completed the endoscopy without a chin lift or jaw thrust performed to correct complete obstruction. The lowest oxygen saturation recorded was 96%. **Conclusions:** Titration of propofol to precise pharmacodynamic endpoints with software utilizing a pharmacokinetic model shows promise in simplifying the challenging task of inducing and maintaining airway obstruction during sleep endoscopy, while making an accurate assessment of the location of obstruction in sleep apnea patients.

S26. Intratonsillar Abscess: Three Case Reports and a Review of the Literature

Andrea S. Wang, MD, New York, NY; Brian J. Stater, BA, New York, NY; Ashutosh Kacker, MBBS*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the clinical presentation and management of intratonsillar abscesses.

Objectives: Intratonsillar abscess (ITA) is a rarely diagnosed infection occurring in both children and adults. Our objective is to review the presentation and management of intratonsillar abscesses. **Study Design:** Retrospective chart review of 3 patients with ITA. **Methods:** 3 case reports of intratonsillar abscess highlighting diagnostic, management and treatment strategies. We then present a review of the medical literature regarding ITAs. **Results:** 2 children and 1 adult were found to have ITA. Treatments include needle aspiration, incision and drainage, and tonsillectomy. **Conclusions:** Intratonsillar abscesses are uncommon, but should be considered in the differential diagnosis of peritonsillar abscess and tonsillitis. CT scan may confirm the presence of an ITA. Management is similar to that of peritonsillar abscess. A full discussion of the clinical presentation, pathophysiology, management and a review of the current literature is presented.

Head and Neck

S27. Sebum Encased by Sebaceous Cells and a Lymphoid Stroma: A Rare Case of Cystic Sebaceous Lymphadenoma of the Parotid Gland

Dunia E. Abdul-Aziz, MD, Boston, MA; Amanda L. Silver, MD, Boston, MA; William C. Faquin, MD PhD, Boston, MA; Kevin S. Emerick, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify radiographic and histologic features of the rare cystic sebaceous lymphadenoma.

Objectives: Although sebaceous cells are found in normal salivary glands, primary sebaceous neoplasms, such as sebaceous adenomas, sebaceous lymphadenomas, and sebaceous carcinomas are rare. Herein, we highlight unique and distinguishing features of sebaceous lymphadenomas. A high degree of clinical suspicion as well as recognition of its pathological characteristics is critical for diagnosis of this rare neoplasm and distinction from other tumors. **Study Design:** Case report. **Methods:** A 65 year old man with a history of multiple cutaneous lipomas presented with a two month history of a nontender, left sided parotid mass not associated with facial paralysis or cervical lymphadenopathy. Outside FNA suggested possible lipoma. CT revealed a well defined, hypodense lesion in the parotid tail. A 3.7x1.8x1.4 cm cyst containing pasty yellow material was removed by left superficial parotidectomy. Histology demonstrated a cystic tumor lined by low cuboidal and squamoid cells with multifocal collections of sebaceous cells within a lymphoid stroma. The lumen of the cyst was predominantly acellular and composed of sebum and histiocytes. No malignant features were identified. The findings were consistent with a cystic variant of sebaceous lymphadenoma. The differential diagnosis includes low grade mucoepidermoid carcinoma which contains mucinous and epidermoid cells rather than sebaceous cells. **Results:** N/A. **Conclusions:** Sebaceous lymphadenoma is an unusual, benign salivary gland neoplasm of uncertain histogenesis, often misdiagnosed preoperatively. Although rare, it should be considered in the differential diagnosis of a solitary parotid mass. Atypical FNA findings should raise clinical suspicion. Microscopic findings of lymphoid tissue with collections of benign sebaceous cells help make the diagnosis. Treatment is with complete surgical excision.

S28. Malignant Immature Teratoma of the Larynx and Trachea with Functional Osteocutaneous Free Flap Reconstruction

Samer Al-khudari, MD, Detroit, MI; Saurabh Sharma, BS, Detroit, MI; Michael J. Simoff, MD, Detroit, MI; Tamer A. Ghanem, MD PHD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss benign and malignant tumors that involve the larynx and trachea and discuss various reconstruction options after resection of these lesions.

Objectives: To present a case of malignant immature teratoma of the larynx and trachea managed by noncircumferential cricotracheal

resection and reconstruction with an osteocutaneous radial forearm free flap. **Study Design:** Case report and literature review. **Methods:** Literature review of tracheal teratoma in adults and methods for partial cricotracheal reconstruction with discussion of a recent representative case within our tertiary health care system. **Results:** We present the case of a 27 year old male who presented with 2 weeks of new onset stridor. He was found to have a 4 cm mass obstructing 90% his subglottis and trachea. A biopsy and intraluminal debulking was performed and a malignant immature teratoma was diagnosed. This tumor involved the trachea, subglottis, thyroid gland, and recurrent laryngeal nerve. He subsequently underwent noncircumferential partial cricotracheal resection including 6cm of trachea, central neck dissection, hemithyroidectomy, and recurrent laryngeal nerve sacrifice and reconstruction with an osteocutaneous radial forearm flap. The osseous portion of the free flap was positioned outside of the lumen and lateral tension sutures were used to provide rigidity and prevent lumen collapse. An intraluminal silicone stent was used for 12 days. After stent removal the lumen was patent and healthy, and his tracheostomy was immediately downsized to a size 4 tracheostomy tube. Postoperatively the patient has been able to cap his tracheostomy and have near normal quality speech. Intraoperative images and radiographic images are provided along with thorough discussion of reconstructive technique. **Conclusions:** Cervical teratomas are rarely encountered in adults. To the best of our knowledge, this is the first reported case of a malignant immature teratoma with involvement of the larynx and trachea. We also present a novel technique at cricotracheal reconstruction using an osteocutaneous radial forearm free flap.

S29. **B**enefits of Immediate Postoperative Extubation in Head and Neck Free Flap Patients

Amir Allak, MD MBA, Charlottesville, VA; Tam N. Nguyen, MD, Charlottesville, VA; David C. Shonka, MD, Charlottesville, VA; James F. Reibel, MD, Charlottesville, VA; Paul A. Levine, MD*, Charlottesville, VA; Mark J. Jameson, MD PhD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the advantages of cessation of ventilatory support immediately after completion of head and neck microvascular free tissue transfer surgery compared to at a later point in the intensive care unit.

Objectives: Extubation (cessation of ventilatory support) is often delayed in free flap patients to protect the microvascular anastomosis, presumably by reducing emergence related agitation. We sought to determine if immediate extubation in the operating room (OR) would improve postoperative course compared to delayed extubation in the intensive care unit (ICU). **Study Design:** Retrospective chart review. **Methods:** Medical records of all patients undergoing free tissue transfer for head and neck reconstruction between January 2009 and July 2010 were reviewed (n=52). Patients extubated immediately postoperatively in the OR (immediate group, n=26) were compared to patients extubated in the ICU (delayed group, n=26). **Results:** Tobacco use, alcohol use, pulmonary history, case length and free flap type were not significantly different between the two groups. While the average ICU stay for the immediate group was significantly shorter than the delayed group (2.0d vs. 3.4d; p=0.008), the reduction in overall hospital stay for the immediate group did not achieve statistical significance (8.2d vs. 9.5d; p=0.21). Use of post-extubation sedatives/anxiolytics (27% vs. 65%) and physical restraints (8% vs. 69%) were significantly lower in the immediate vs. delayed group (p=0.01 and p<0.001, respectively). Although flap related, surgical, and medical complication rates were not significantly different between the two groups, the delayed extubation group had a significantly higher rate of pneumonia (15% vs. 0%; p=0.05). **Conclusions:** Immediate postoperative extubation in the OR following head and neck microvascular free tissue transfer reduces ICU stay, anxiolytic use, restraint use, and incidence of pneumonia without an increase in flap or wound related complications.

S30. **M**alignant Fibrous Histiocytoma Metastatic to the Thyroid Gland: Case Report and Review of the Literature

Akash G. Anand, MD, New Orleans, LA; Christina Yang, MD, New Orleans, LA; Win Naing, MD, Biloxi, MS; Ronald G. Amedee, MD*, New Orleans, LA; Aynaud Foster Hebert, MD, Biloxi, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation and diagnostic workup for malignant fibrous histiocytoma metastatic to the thyroid, as well as different treatment strategies for its management.

Objectives: 1) Understand the presentation and diagnostic workup for malignant fibrous histiocytoma metastatic to the thyroid; and 2) be able to discuss different treatment strategies for malignant fibrous histiocytoma metastatic to the thyroid. **Study Design:** Case report and review of literature. **Methods:** We present a case report of a 52 year old man evaluated for a rapidly enlarging neck mass causing respiratory distress. The patient had a history of primary malignant fibrous histiocytoma at his left lower extremity treated two years prior. Radiographic workup revealed an enlarged left thyroid lobe causing right tracheal deviation and compression. Considering these findings, the patient underwent a left thyroid lobectomy with isthmusectomy. **Results:** Surgical excision yielded a 200 gram left thyroid lobe measuring 9.5 x 7.5 x 5.4 centimeters. Histopathologic analysis revealed a cellular malignant neoplasm composed of spindle cells in a fascicular arrangement, suggestive of high grade metastatic sarcoma. Immunohistochemistry differentiated this lesion from anaplastic thyroid carcinoma and supported a diagnosis of malignant fibrous histiocytoma metastatic to the thyroid. Despite these findings, the patient elected not to proceed with a completion thyroidectomy. **Conclusions:** Malignant fibrous histiocytoma metastatic to the thyroid is a rare clinical entity, with only five cases reported in the literature. However, it merits consideration in the differential diagnosis of patients presenting with rapidly enlarging thyroid masses, especially those with a history of primary malignant fibrous histiocytoma elsewhere in the body. The foundation of treatment is wide local excision with adjuvant radiation and/or chemotherapy utilized on a case by case basis.

S31. **R**acial Disparities in Head and Neck Cancer: The Effects of Hurricane Katrina

Akash G. Anand, MD, New Orleans, LA; Joshua M. Levy, MD, New Orleans, LA; Taimur H. Khan, BS, New Orleans, LA; Anton T. Manasco, BS, New Orleans, LA; Farah A. Arosemena, MPH, New Orleans, LA; Paul L. Friedlander, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the head and neck oncology demographic that emerged as a result of Hurricane Katrina, and also assess the racial disparities within this population.

Objectives: 1) Describe the head and neck oncology demographic that emerged as a result of Hurricane Katrina; and 2) assess the racial disparities within this population. **Study Design:** Retrospective chart review. **Methods:** Retrospective chart review of incident cases of head and neck cancer (n = 88) diagnosed and treated at an academic cancer center from August 30, 2005 — August 29, 2008. Parameters analyzed include date of presentation, route of presentation (clinic vs. emergency room), primary site, T, N, M status, AJCC stage, age, sex, insurance status, race, zip code at primary residence, smoking frequency, and alcohol consumption. Patients were stratified along racial lines and comparisons were made between groups for insurance status, stage at presentation, route of presentation, and zip code at primary residence utilizing chi-squared testing. **Results:** Our demographic yielded a mean age of 62.6 with 36.4% African Americans (AA) and 54.5% whites. 78.4% of patients were male and 21.6% female. Racial disparities were noted across all categories, with 31.8% of African Americans enrolled in Medicaid versus 18.9% of whites [p=.01]. 84.4% of AA presented with advanced stage disease versus 64.6% of whites [p=.04]. 6.2% of AA used the emergency room as their route of presentation compared to 2.1% of whites [p=.01]. 40.6% of AA hailed from an area with 4.7 — 16.5 feet of flooding, compared to 18.8% of whites [p = .06]. **Conclusions:** The head and neck oncology population that remained in our city post-Katrina exhibited measurable racial disparities, with AA occupying a higher burden of disease.

S32. Scrofula Presenting as an Isolated Neck Mass in an Immunocompetent Patient: A Case Report
Mary G. Ashmead, MD, Jackson, MS; Christine B. Franzese, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical presentation, radiologic and pathologic evaluation and workup, and management of scrofula.

Objectives: To report a case of scrofula in an immunocompetent patient who presented with an isolated neck mass. **Study Design:** Case report and literature review. **Methods:** The patient's clinical course was reviewed, including radiographic studies and histopathologic slides. The relevant literature was reviewed. **Results:** We describe a case of a 77 year old man who presented to the emergency room with an isolated neck mass in the posterior triangle of the neck. Computed tomography of the neck revealed an enhancing, partially necrotic lesion in the lower right neck. He was sent to the ENT clinic with the diagnosis of lymphadenopathy with an unknown primary cancer. No abnormalities were found on flexible laryngoscopy. He was taken to the operating room for direct laryngoscopy, which was negative, and fine needle aspiration. Pathology was positive for necrotizing granulomatous inflammation and acid-fast bacilli. Further testing for immunocompromise was negative. **Conclusions:** While workup for malignancy is indicated, other diagnoses must be considered in the immunocompetent patient presenting with a neck mass. As scrofula is more common in immunocompromised patients, a subsequent workup for immune deficiency should be initiated once the diagnosis is made. The mainstay of treatment is triple antibiotic therapy.

S33. Thyroid Disease and Compressive Symptoms
Caroline A. Banks, MD, Charleston, SC; Christopher M. Ayers, BS MPH, Charleston, SC; Marion Boyd Gillespie, MD MS FACS, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the factors associated with compressive symptoms in thyroid disease.

Objectives: Compressive symptoms are common in thyroid disease; however, few studies have focused on the presence, associated factors, and etiology of compressive symptoms. **Study Design:** Retrospective chart review. **Methods:** Patients undergoing thyroidectomy from 2005 to the present were reviewed. The data included demographics, indication for surgery, compressive symptoms, complications, final diagnosis, volume and weight of thyroid gland, presence of inflammation, and followup. **Results:** Two hundred seventy patients were identified. The mean age was 51 years, 81% were female, and an average of 6 months of followup was obtained. The most common indications for surgery were atypical cells (41%) and goiter (37%). Forty-two percent (112) of patients underwent hemithyroidectomy and 58% (n=158) underwent total thyroidectomy. Fifty-two percent (n=140) of patients experienced compressive symptoms preoperatively, including dysphagia (n=107) and shortness of breath (n=66). Twenty-eight percent (n=76) of patients presented with voice changes, and 10% (n=28) complained of odynophagia. Postoperatively, 22 patients (8%) continued to have compressive symptoms. The most common diagnoses associated with compressive symptoms were anaplastic thyroid cancer (75%), lymphocytic thyroiditis (74%), and goiter (60%). The average volume of the gland in patients with compressive symptoms was 78.4 mL compared to 39.6 mL in asymptomatic patients. There was not a significant relationship between compressive symptoms and the presence of inflammation. **Conclusions:** Patients with thyroid disease frequently present with compressive symptoms, and the majority of patients experience relief postoperatively. The volume of the thyroid gland is related to compressive symptoms, though other factors are involved.

S34. Sarcoidosis Presenting as a Lytic Lesion of the Mandible

Rachel A. Bell, BS, Burlington, VT; Thomas K. Tamura, MD, Burlington, VT; William J. Brundage, MD, Burlington, VT; Abdel A. Elhosseiny, MD, Burlington, VT; Edward J. Vanisky, DMD, South Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to broaden their differential diagnosis of bony lesions in the head and neck.

Objectives: Sarcoidosis is a systemic granulomatous disease of unknown origin, which presents with pulmonary manifestations in the overwhelming majority. We report a unique case of sarcoidosis presenting as a lytic lesion of the mandible on MRI. **Study Design:** Case report and systematic review of the literature. **Methods:** A 43 year old man with a history of lichen planus and squamous cell carcinoma of the tongue treated surgically presented to our clinic with dysgeusia. He denied any respiratory symptoms at that time. He received an MRI scan of the head and neck which revealed a lytic lesion of his right mandible. Biopsy of the bony mandibular cyst revealed noncaseating granulomas. The patient had no pulmonary complaints. However, a followup chest x-ray and CT revealed findings consistent with pulmonary sarcoidosis. A review of sarcoidosis and bony involvement is presented. **Results:** Osseous involvement in sarcoidosis occurs in up to 13% of affected patients and is usually a late manifestation. The phalanges of the hands and feet are most commonly involved. However, bony disease has also been reported in the spine, ribs, pelvis, and skull. Sarcoidosis affecting the mandible is exceedingly rare, with only 3 cases reported in the literature, and is even rarer as the presenting finding of sarcoid. **Conclusions:** While malignancy and infection are common causes of lytic bony lesions found on imaging, sarcoidosis is a rare cause which must remain in the differential. Biopsy is therefore necessary to make a diagnosis.

S35. **Superficial Ulnar Artery a Contraindication to Radial Forearm Free Tissue Transfer**

Rachel A. Bell, BS, Portland, OR; Daniel S. Schneider, MD, Portland, OR; Joshua S. Schindler, MD, Portland, OR; Mark K. Schindler, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss anomalous vasculature of the forearm when a patient fails the modified Allen's test.

Objectives: Superficial ulnar artery is a vascular anomaly that may be encountered during elevation of forearm flaps for head and neck reconstruction. This anomaly should be considered in patients with a negative Allen's Test. **Study Design:** Case report and retrospective review of fasciocutaneous forearm flaps. **Methods:** A 72 year old man with a history of total laryngectomy presented for closure of a pharyngocutaneous fistula with radial forearm flap. A negative Allen's Test and an undetectable Doppler over the thenar eminence with radial artery occlusion were noted. A superficial ulnar artery was discovered upon elevation of the ulnar flap. Despite its anomalous course, the artery provided several fasciocutaneous branches, and the flap was successfully used to repair the patient's fistula. A retrospective review of forearm flaps and the incidence of superficial ulnar artery at our institution are presented. **Results:** 690 forearm flaps (571 radial, 51 ulnar, and 68 osteocutaneous radial) were performed from 1998-2010. Superficial ulnar artery was encountered 3 times, suggesting an incidence of 0.43 percent. In each case an ulnar flap was successfully used. **Conclusions:** The ulnar forearm flap is a safe alternative to the radial forearm flap with a negative modified Allen's Test. Vascular anomalies, such as a superficial ulnar artery, may be the cause of a failed test.

S36. **PET/CT Surveillance Identifies HNSCC Recurrence Earlier than Traditional Surveillance Protocols**

Daniel M. Beswick, BS, Pittsburgh, PA; Barton F. Branstetter IV, MD, Pittsburgh, PA; Jonas T. Johnson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the optimal duration of a post-treatment PET/CT surveillance protocol for HNSCC patients.

Objectives: To determine whether combined 18F-fluorodeoxyglucose positron emission tomography and computed tomography (PET/CT) surveillance improves detection of head and neck squamous cell carcinoma (HNSCC) recurrences after definitive chemoradiation therapy (CRT) and to determine recommendations for a post-treatment PET/CT surveillance protocol. **Study Design:** Retrospective review. **Methods:** HNSCC patients who underwent definitive chemoradiation treatment were evaluated for tumor recurrence with PET/CT at 2, 5, 8, and 14 months after completing treatment. Patients were excluded if they had a previous recurrence, were treated primarily with surgery, or had inadequate clinical followup. Recurrence was defined by histopathologic evidence of tumor. **Results:** Three hundred and eighty-eight patients were included. Patients who did not recur were followed clinically and radiographically for a mean of 31 months (95% CI 28.5 - 33.8), median 27 months. Tumor recurrence was discovered in 110 of 388 patients (28%). Recurrences were discovered from 0.3 - 56 months, median 6 months, mean 11 months (95% CI 8.5 - 12.5). Forty-seven percent of recurrences occurred within the first 6 months of surveillance, 74% within the first year, 88% within the first 2 years, and 95% within the first 3 years, 98% within the first 4 years, and 100% within the first 5 years. **Conclusions:** HNSCC patients who are treated with CRT and are followed with routine surveillance PET/CT are most likely to recur within the first 12 months after completing therapy. For patients without clinical signs of recurrence, PET/CT surveillance beyond the first 12 months is of questionable value.

S37. **Tracheotomy in Patients with Microvascular Free Flap Reconstructed Maxillectomy Defects**

Daniel S. Brickman, MD, Portland, OR; Douglas D. Reh, MD, Baltimore, MD; Daniel Schneider, MD, Portland, OR; Mark K. Wax, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants will understand the issues of airway management during microvascular reconstruction of maxillectomy defects.

Objectives: Sinonasal cancers represent 3% of upper aerodigestive malignancies. Combined modality treatment including surgical resection is common. Maxillectomy defects require complex three dimensional reconstructions best suited by microvascular free tissue transfer. Postoperative airway management during this procedure has sparse discussion in the literature. Our primary outcome was to determine the incidence of airway complication and need for advanced airway intervention between groups with and without tracheotomy. Secondary study goals were to assess for patient demographics leading to a higher likelihood of perioperative tracheotomy and whether these influenced a patients' risk of postoperative airway complication. **Study Design:** Retrospective chart review of patients undergoing maxillectomy and microvascular free flap reconstruction from 1999 to 2010. **Methods:** Charts were reviewed for patient age, gender, cardiopulmonary comorbidities, pathology, surgical defect, reconstruction, prior treatments, and postoperative complications. **Results:** 100 patients met inclusion criteria. There was a 10% major airway complication rate overall, but no difference was found between the groups with and without a tracheotomy. Patients with cardiopulmonary comorbidities were more likely to receive perioperative tracheotomy (P value = 0.028). Other patient cofactors did not have an impact on perioperative tracheotomy or airway complication rate. Subgroup analysis combining patient cofactors with tracheotomy failed to show a difference. There was an increased length of hospital stay after tracheotomy. **Conclusions:** Tracheotomy at the time of reconstruction for maxillectomy defects remains at surgeon's preference. Review of our data suggests avoidance of tracheotomy in certain patients can be performed safely.

S38. Use of an Osseointegrated Implant Retained Nasal Prosthesis following Total Rhinectomy for Squamous Cell Carcinoma of the Nasal Dorsum

Neal W. Burkhalter, MD, Jackson, MS; Christine B. Franzese, MD, Jackson, MS; Harold Kolodney, DMD, Jackson, MS; Gary Swedenburg, CDT, Jackson, MS; Karen T. Pitman, MD*, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the use of osseointegrated implants and nasal prostheses for nasal reconstruction following complete or partial rhinectomy.

Objectives: To demonstrate the use of osseointegrated implants and a nasal prosthesis following total rhinectomy in a patient that is a poor candidate for other means of reconstruction. **Study Design:** Case report. **Methods:** A complete chart review was performed on a patient with a large squamous cell carcinoma of the nasal dorsum requiring total rhinectomy. **Results:** This is the case of a 66 year old Caucasian male who was diagnosed with a T4N0M0 squamous cell carcinoma of the nasal dorsum. Multiple biopsies were taken to map out the extent of the tumor yielding the need for a total rhinectomy. The patient was felt to be a poor surgical candidate due to multiple medical comorbidities including vascular insufficiency precluding local or regional flap reconstruction. Prosthetic reconstruction was completed using osseointegrated implants and an implant retained nasal prosthesis. **Conclusions:** The patient had an excellent functional and cosmetic outcome. The use of osseointegrated implants and prosthetic rehabilitation should be strongly considered for reconstruction of head and neck defects, most notably in patients that are otherwise not suitable for surgical reconstruction.

S39. Water-Clear Cell Adenoma Mimicking Parathyroid Carcinoma

David H. Burstein, MD, Brooklyn, NY; Perminder S. Parmar, MD, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the characteristics of water-clear cell parathyroid adenoma and the diagnostic features of parathyroid carcinoma.

Objectives: To report a case of water-clear cell parathyroid adenoma that mimicked parathyroid carcinoma. **Study Design:** Case report with literature review. **Methods:** We report one case from our institution and review the existing literature. **Results:** A 57 year old female with primary hyperparathyroidism was noted to have severely elevated serum calcium (15.9 mg/dL) and PTH (1905 pg/mL) levels. On examination, there was a palpable, 3 cm, firm, immobile mass in the region of the left thyroid lobe. Ultrasound and CT of the neck revealed a large mass compressing the left thyroid lobe. Tc-99m sestamibi scintigraphy showed unusually large uptake in this region. Additional imaging revealed diffuse osteopenia and several bony lesions suggestive of brown tumors. During neck exploration, a left lower parathyroid mass measuring 5 x 3 x 1.5 cm and weighing 22 g was excised. The tumor was firm, encapsulated, and adherent to the thyroid lobe, though there was no infiltration. Histopathologic analysis proved the tumor was a clear cell adenoma. The patient's postoperative course was excellent. Serum PTH and calcium levels normalized within 48 hours. A large parathyroid tumor that presents with a palpable neck mass, severe hyperparathyroidism and hypercalcemia, and significant bony or renal disease is concerning for carcinoma. In this case, the diagnosis was a rare type of benign adenoma. **Conclusions:** Water-clear cell adenomas may present with laboratory and physical findings that suggest parathyroid carcinoma and should be included in the differential diagnosis of primary hyperparathyroidism. To our knowledge, this is the ninth reported case of a water-clear cell parathyroid adenoma.

S40. Testicular Cancer Presenting as a Neck Mass: Case Series and Literature Review

Carrie M. Bush, MD, Augusta, GA; Helen Perakis, MD, Augusta, GA; Lana L. Jackson, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the incidence, diagnosis and management of cervical metastases in testicular cancer.

Objectives: Testicular cancer is the most common cancer in men between the ages of 20 and 35 years of age. On rare occasion, testicular cancer may present initially as cervical metastases. To review the key factors and pitfalls in diagnosis, we report two cases of male patients with testicular cancer who presented to us with the isolated chief complaint of left neck mass. **Study Design:** Case series and literature search. **Methods:** Retrospective review of cases, literature review; Ovid, PubMed. **Results:** Testicular cancer rarely may present initially as a neck mass. In the largest review available, 0.005% (3/665) of patients with testicular cancer had cervical metastases as the first symptom of disease. Within the neck, presence of testicular cancer is most common in left level IV. By definition, presence of neck metastases indicates stage 3 disease for which chemotherapy is the mainstay of treatment. Rarely surgical neck dissection is required for diagnosis or for excision of residual neck disease following chemotherapy completion. **Conclusions:** In young and middle aged men the differential diagnosis of an isolated neck mass should include metastatic testicular cancer. Common tools, including FNA and PET scan, may fail in detecting the correct diagnosis. A high level of suspicion, and use of noninvasive methods (scrotal US, serum tumor markers) may assist diagnosis in ambiguous cases, thus allowing for primary chemotherapy.

S41. An Unusual Cheek Mass: Intramassesterc Chondrolipoma

Bradley H. Byrne, MD, Jackson, MS; Majid Khan, MD, Jackson, MS; Karen T. Pitman, MD*, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the clinical, pathologic, and radiographic features of chondrolipomas of the head and neck.

Objectives: To describe the clinical, radiologic and histological features of a chondrolipoma as a rare cause of an enlarging cheek mass. **Study Design:** Case report. **Methods:** A rare case of a chondrolipoma presenting as an intramassesterc mass is described as well as a review of the literature. **Results:** A 51 year old female presented with a nine month history of an enlarging cheek mass. A CT scan demonstrated a 3 cm mass resembling a lipoma peripherally, but also showed irregular central soft tissue density and calcification. These features and relatively rapid growth were concerning for potential malignancy. Fine needle aspiration biopsy yielded mature adipocytes consistent with a lipoma. Given the discrepancy between imaging and biopsy results, surgical resection was recommended. Histopathology demonstrated mature adipocytes with a focus of central cartilaginous metaplasia consistent with a chondrolipoma. **Conclusions:** Chondrolipomas are rare tumors of the head and neck and have been reported primarily in the oral cavity, oropharynx, and nasopharynx. To the best of our knowledge we report the first case of a chondrolipoma presenting as an intramassesterc mass.

S42. Poorly Differentiated Adenocarcinoma Arising from a Cervical Bronchial Cyst Presenting as a Thyroid Mass

Audrey P. Calzada, MD, Los Angeles, CA; Winnie Wu, MD, Los Angeles, CA; Chi Lai, MD, Los Angeles, CA; Gerald S. Berke, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss cervical bronchial cysts, demonstrate awareness of malignancies arising from cervical bronchial cysts and demonstrate knowledge of the clinical presentation of this rare malignancy as well as its histopathologic characteristics.

Objectives: Poorly differentiated adenocarcinoma arising from cervical bronchogenic origin has been rarely reported. We describe this disease entity in a patient presenting with a thyroid mass, cervical lymphadenopathy, and a preoperative needle biopsy suggestive of well differentiated thyroid carcinoma. **Study Design:** Retrospective case report. **Methods:** The clinical presentation, intraoperative findings, radiographic images, and pathology slides are presented of a patient presenting to a tertiary medical center with adenocarcinoma arising from a bronchial cyst. **Results:** A 32 year old female presented with a 3 month history of throat pain, an enlarging left neck mass and left vocal cord paresis. CT imaging showed a 4.2 x 3.5 cm mass arising from the left thyroid lobe with left cervical lymphadenopathy. Ultrasound guided fine needle aspiration showed papillary thyroid carcinoma. Intraoperatively, the patient had a large left thyroid mass with gross tracheoesophageal invasion and cervical lymphadenopathy adherent to the carotid artery. Histopathology showed a poorly differentiated adenocarcinoma lined by bronchogenic type epithelium with a submucosal smooth muscle layer; immunostaining was positive for p53 and TTF-1, which is consistent with cervical bronchial cyst origin. Postoperative PET/CT scan showed diffuse substernal and pulmonary metastases. Concurrent chemoradiation with Taxol and carboplatin has been initiated. **Conclusions:** Malignancies arising from cervical bronchial cysts are exceedingly rare. To our knowledge, this is the first report of a poorly differentiated adenocarcinoma arising from a cervical bronchial cyst. We present the unique case of a patient with a thyroid mass and a needle aspirate showing well differentiated thyroid carcinoma which was subsequently diagnosed as an adenocarcinoma from cervical bronchial cyst origin.

S43. Primary Hyperparathyroidism with Markedly Elevated Serum Calcium and PTH-Clinical and Surgical Implications for Possible Parathyroid Carcinoma

Kimberly K. Caperton, MD, Oklahoma City, OK; Nathan Hales, MD, Oklahoma City, OK; Niles R. Vasan, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the indicators which lead to suspicion of parathyroid carcinoma, and discuss the role and extent of surgery for extremely elevated hyperparathyroidism.

Objectives: Primary hyperparathyroidism (PHPT) can be caused by a single adenoma, multiple adenomas, hyperplasia, or occasionally by parathyroid carcinoma. Primary hyperparathyroidism associated with grossly elevated serum parathyroid hormone levels (PTH)

and exceptionally high serum calcium levels raise the suspicion for parathyroid carcinoma (PC). We present our series of PHPT with extremely elevated serum calcium and PTH levels. **Study Design:** Case series. **Methods:** Four patients between ages 16 and 66 treated for extreme hyperparathyroidism were retrospectively reviewed and their cases presented. **Results:** Clinical workup and peri-operative management of extreme hypercalcemia and hyperparathyroidism is discussed and operative strategy is suggested. **Conclusions:** The treatment of extreme hypercalcemia and hyperparathyroidism, including the role of en bloc resection with ipsilateral thyroid lobectomy, as well as the importance of intraoperative PTH assay in confirming complete removal are emphasized.

S44. Kikuchi - Fujimoto's Disease in an American of Filipino Descent: A Case Report and Review of the Literature

Jason Y.K. Chan, MD, Baltimore, MD; Jeremy R. Richmon, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to explain and discuss the epidemiology, pathological features and management of Kikuchi - Fujimoto's disease, with a focus on its benign nature and potential differential diagnoses.

Objectives: Kikuchi - Fujimoto's disease is a rare cause of benign cervical lymphadenopathy also known as histiocytic necrotizing lymphadenitis. We present the second documented case of this in an American female of Filipino descent and review the literature. **Study Design:** Case report and literature review. **Methods:** A case report of a 22 year old lady who presented to our clinic with a tender left anterior neck mass of 3 weeks duration associated with fevers, chills and night sweats that were unresponsive to antibiotic therapy. Subsequent excisional biopsy was performed and showed Kikuchi - Fujimoto's disease. A literature review regarding Kikuchi's disease was performed. **Results:** CT neck with IV contrast demonstrated lymphadenopathy with largest node 2x2cm in level II. FNA was non-diagnostic. Excisional biopsy was then performed and showed histiocytic necrotizing lymphadenitis consistent with Kikuchi - Fujimoto's disease and negative for lymphoma, fungal or mycobacterial infections. Conservative management with symptom control was pursued and the tender neck mass resolved. **Conclusions:** Kikuchi - Fujimoto's disease is rare benign cause of cervical lymphadenopathy that should be considered in the differential of neck masses. Given similarity of signs, symptoms and pathological findings to lymphoma one must have an index of suspicion of Kikuchi's disease to avoid unnecessary procedures and treatment.

S45. Laryngeal Chondrosarcoma with Conversion to Spindle Cell Sarcoma of the Larynx

John J. Chi, MD, Philadelphia, PA; Erica Y. Fan, MD, Philadelphia, PA; Paul J. Zhang, MD, Philadelphia, PA; Kathleen T. Montone, MD, Philadelphia, PA; Natasha Mirza, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to have a greater appreciation for a rare head and neck tumor.

Objectives: To present a unique case report, describe the pathogenesis of a rare head and neck sarcoma and discuss management options. **Study Design:** A retrospective case report and review of the literature. **Methods:** A 55 year old male with a history of alcohol and tobacco use presented with hoarseness. Upon further evaluation, he was diagnosed with a low grade chondrosarcoma of the right arytenoid cartilage. The patient was subsequently taken for a laryngofissure to excise the lesion with a posterior cricoid split and rib graft reposition to reconstruct the larynx. The patient was later decannulated, tolerating an oral diet and did well for several years. However, he re-presented with dyspnea and was found to have an obstructing right posterior cricoid lesion on imaging and laryngoscopy. Biopsy confirmed the lesion to be a spindle cell sarcoma. After an extensive discussion of treatment options, the patient was taken for a total laryngectomy. **Results:** Postoperatively the patient did well. On postoperative day number two, he spiked a fever and was treated with antibiotics for a pneumonia. On postoperative day number five, he experienced a flare of his gout which prompted a rheumatology consult and bilateral knee aspirations. On postoperative day number seven, a barium swallow study revealed a minimal right posterior pharyngeal leak. The patient was subsequently discharged home on enteral feedings via a nasogastric tube. At two months followup, the patient is tolerating an oral diet and is awaiting the start of radiation therapy. **Conclusions:** Laryngeal chondrosarcoma is a rare disease entity with a relatively indolent course. Therefore, long term followup and monitoring is appropriate. However, as exhibited in our patient, laryngeal chondrosarcoma can undergo dedifferentiation to a more aggressive sarcoma. Treatment options include observation, radiation, conservative surgery and complete excisional surgery. Given the possibilities for disease progression and the various treatment options, a frank discussion between the physician and patient is of the utmost importance.

S46. WITHDRAWN--Outcomes of Oropharyngeal Carcinoma after Less Than Standard Dose Radiotherapy: A Retrospective Case Series

Naweed I. Chowdhury, BS, Houston, TX; Mihir K. Bhayani, MD, Houston, TX; Erich M. Sturgis, MD*, Houston, TX; Beth M. Beadle, MD PhD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the survival outcomes of patients with oropharyngeal carcinomas who received less than planned dosages of radiation due to premature termination of therapy.

Objectives: To review outcomes of patients with oropharyngeal cancer and prematurely terminated radiotherapy to potentially identify patients that may benefit from lower dose radiotherapy. **Study Design:** Retrospective chart review. **Methods:** Patients at our institution with oropharyngeal carcinoma who received fewer than 30 fractions of radiotherapy from 1980-2008 were analyzed. Patients who

were receiving planned palliation, stopped treatment due to imminent death, failed to followup after therapy, or received <10 fractions were excluded. **Results:** A total of 10 patients met the study criteria, all of whom were without evidence of disease at last clinic visit (median followup of 31.5 months). Four were nonsmokers and 6 were smokers. None of the nonsmokers recurred, while one of the smokers recurred (salvaged with neck dissection). Nonsmokers had a lower median dose (50.1 Gy in nonsmokers vs. 59.1 Gy in smokers), higher TNM stage (4 stage IVA nonsmokers vs. 2 stage III and 4 stage IVA smokers), and higher tumor grade (3 poorly differentiated among nonsmokers vs. zero poorly differentiated among smokers). **Conclusions:** Our data demonstrate that a subset of patients who received less than prescribed definitive doses of radiation therapy for oropharyngeal cancer were able to achieve durable locoregional control. This should be further investigated in the setting of a prospective trial designed to evaluate the efficacy and benefits of dose deescalated treatment. Previous studies suggest that nonsmokers with human papillomavirus (HPV) positive tumors have a particularly good prognosis; this subgroup may be especially amenable to such a study.

S47. **Follicular Adenoma Presenting as Lateral Aberrant Thyroid**

Alan C. Chu, MD, Los Angeles, CA; Anton C. Mlikotic, MD, Torrance, CA; Maie A. St. John, MD PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation the participants should be able to discuss the etiology of lateral aberrant thyroid tissue and demonstrate the proper workup of patients presenting with a lateral neck mass to include the possibility of ectopic thyroid tissue.

Objectives: To illustrate a case report of a patient presenting with lateral thyroid tissue situated at the carotid bifurcation mimicking a carotid body tumor. **Study Design:** Case report and review of the literature. **Methods:** A patient is presented with a lateral neck mass. Preoperative imaging demonstrated a heterogeneous right neck mass centered at the carotid bifurcation. Catecholamine levels, and thyroid function tests were within normal range and FNA was nondiagnostic. Patient underwent preoperative embolization of the neck mass followed by resection. Final pathology revealed findings suggestive of follicular adenoma. **Results:** The patient underwent resection of the right neck mass after successful preoperative embolization without complication. The location of the mass in the lateral neck, the benign histopathology (follicular adenoma), and the distinct separation from the thyroid gland all support the diagnosis of "lateral aberrant thyroid". **Conclusions:** This case highlights the importance of considering lateral aberrant thyroid in the differential of lateral neck mass. Further workup should include characterization of the orthotopic thyroid gland and patients should always be consented for definitive surgical therapy should intraoperative findings or frozen section reveal findings suggestive of malignancy of thyroid etiology.

S48. **B Type RAF Kinase (BRAF) Mutational Status in Metastatic Differentiated Thyroid Cancer**

David J. Crockett, MD, Salt Lake City, UT; Joel S. Bentz, MD, Salt Lake City, UT; Kristi Maas, MD, Portland, ME; Brandon G. Bentz, MD, Salt Lake City, UT

Educational Objective: At the conclusion of this presentation, the participants should be able to more fully understand B type RAF kinase (BRAF), its role in differentiated thyroid cancer, and the need for further research of this mutation in metastatic disease.

Objectives: The most prevalent genetic alteration in differentiated thyroid cancer (DTC) is the B type RAF kinase mutation. It has been associated with increased aggressiveness and metastasis. Little is known about whether a mutation of BRAF is necessary and sufficient to cause metastasis. The study objective was to determine if a mutation of BRAF in a primary DTC was necessary for cervical metastasis. **Study Design:** An analysis was performed on a subset of retrospectively reviewed patients with DTC. **Methods:** Five patients were identified with tissue samples from matched primary and metastatic foci of DTC. A blinded pathologic re-review confirmed the diagnosis. Both pathologic tumor and FNA cytology samples of the metastatic foci were analyzed by fluorescent melting curve analysis for the V600E mutation of BRAF. The mutational status of the primary tumor and the metastatic disease were compared for correlation. **Results:** Of the five patients with matched samples of DTC analyzed in our study, three were found to have mutant primary tumor status. After analysis of the metastatic foci, the two patients with wild-type primary tumors were found to have wild-type metastatic foci. Of the three patients with mutant primary tumors, only one patient's metastatic disease was found to be mutant, whereas the other two patients were found to have wild-type metastatic foci. **Conclusions:** The BRAF mutation may be necessary for support of metastatic events in DTC, but does not seem to be inherent in the metastatic clonal population. Further investigation into this process may lead to novel therapeutic options in metastatic thyroid cancer.

S49. **Systematic Review of 99mTc Human Serum Albumin and 99mTc Sulfur Colloid Studies of Sentinel Lymph Node Biopsy (SLNB) of Cutaneous Head and Neck Melanoma**

Nicole de Rosa, MD, Durham, NC; Gary H. Lyman, MD, Durham, NC; Damian Silbermins, MD, Durham, NC; Matias E. Valsecchi, MD, Durham, NC; Scott K. Pruitt, MD PhD, Durham, NC; Walter T. Lee, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the intrinsic radiotracer properties of 99mTc human serum albumin and 99mTc sulfur colloid and their efficacy in sentinel lymph node biopsy of cutaneous head and neck melanoma.

Objectives: SLNB of head and neck melanoma presents a technical challenge due to the multiplicity of basins and variable lymph node drainage. Intrinsic radiotracer properties determine lymphatic drainage into nodal basins, speed of nodal uptake, and tracer reten-

tion. Human serum albumin (HSA) and sulfur colloid (SC) are commonly used radiotracers with divergent characteristics. The objective was to determine the efficacy of HSA and SC in SLNB of cutaneous head and neck melanoma. **Study Design:** A systematic literature review from 1990 to 2009 was completed. **Methods:** Dual blind data extraction was conducted. Studies were analyzed by radiotracer (HSA or SC). Primary outcomes included identification rate, false negative rate based on completion dissection or nodal recurrence, and probability of recurrence in patients with negative SLNB. **Results:** Eligibility criteria were met for 26 studies (n=2257), 7 prospective and 19 retrospective. Eight studies (n=422) used HSA and 18 (n=1835) used SC. The median identification rates of sentinel nodes for HSA and SC were 91.7% and 97.5%, respectively. The median false negative rate was 12.5% and 12.2% with HSA and SC, respectively. Median probabilities for nodal recurrence in patients with negative SLNB were 3.9% and 2.1% for HSA and SC, respectively. Median probabilities for total recurrence in those with negative SLNB were 12.6% and 11.6% for HSA and SC, respectively. There were no statistically significant differences in these outcome measures between studies utilizing HSA or SC. **Conclusions:** Although HSA and SC have different intrinsic chemical properties, no difference was observed for use in SLNB of cutaneous head and neck melanoma.

S50. Neck Mass Secondary to Heterotopic Ossification after Fibula Free Flap Oromandibular Reconstruction
Adam S. DeConde, MD, Los Angeles, CA; Darshni Vira, MD, Los Angeles, CA; Keith E. Blackwell, MD, Los Angeles, CA; John M. Moriarty, MD, Los Angeles, CA; Vishad Nabili, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation the participants should be able to describe this newly described phenomenon associated with fibula free flap oromandibular reconstruction.

Objectives: To determine the radiographic incidence of heterotopic ossification and the clinical incidence of neck masses secondary to heterotopic ossification in a series of patients who underwent fibula free flap oromandibular reconstruction. **Study Design:** Retrospective review at a university medical center. **Methods:** Patient database of 520 consecutive fibula free flaps between 1995-2010 were reviewed to identify patients who had postoperative CT scans of the neck to further investigate the radiologic presence of heterotopic ossification. Patient chart review was also performed to identify patients who had clinical evidence of neck masses consistent with heterotopic ossification. **Results:** Of the 66 patients who had postoperative CT scans available for radiologic assessment, 43/66 (65%) showed heterotopic ossification of the fibula periosteum. Clinically, 10/520 patients (1.9%) presented with firm, level 1 or 2 neck masses that proved to be secondary to heterotopic ossification. **Conclusions:** Development of a firm neck mass after treatment of head and neck cancer often indicates recurrent tumor. Heterotopic ossification has not been previously reported as a potential etiology of neck masses after fibula free flap oromandibular reconstruction in the head and neck surgery literature. The radiographic incidence of this phenomenon is high, while the clinical incidence of neck masses secondary to heterotopic ossification is low. Heterotopic ossification can be distinguished from recurrent tumor on the basis of physical examination, radiographic assessment, and/or fine needle aspiration biopsy. Awareness of heterotopic ossification should be included in the differential diagnosis of patients with a neck mass who have undergone fibula free flap reconstructions.

S51. Simplified Technique of Tracheoesophageal Prosthesis Placement at the Time of Secondary Tracheoesophageal Puncture
Daniel G. Deschler, MD, Boston, MA; Kevin S. Emerick, MD, Boston, MA; Derrick T. Lin, MD, Boston, MA; Glenn W. Bunting, SLP-CCC, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the advantages, complications and speech outcomes following primary placement of the tracheoesophageal (TE) voice prosthesis at the time of secondary TE puncture.

Objectives: Secondary TE puncture standardly involves placement of a temporary catheter at the time of TE fistula creation. We explore the feasibility of placement of the prosthesis at the time of TE puncture, obviating the need for a subsequent procedure to place the prosthesis and describe this technique. **Study Design:** A retrospective chart review was performed on a consecutive of patients who underwent placement of the TE prosthesis at the time of secondary TE puncture January 2008 to the present at an academic head and neck cancer center. Outcomes included success of placement, prosthesis pull-through and need for repeat attempts, need for repeat puncture, early and late prosthesis dislodgement, other complications and acquisition of voice. **Methods:** Eight patients underwent initial prosthesis placement utilizing modifications of the Seldinger technique for TE puncture and the retrograde method for prosthesis placement. **Results:** All patients underwent successful placement of a 20F 12mm length prosthesis. There were no cases of loss of the puncture tract during placement, prosthesis pull-through requiring another attempt, early or late prosthesis dislodgement. No complications related to placement of the prosthesis were noted. All began successful voicing within 72 hours. **Conclusions:** This initial series demonstrates successful TE prosthesis placement at the time of secondary TE puncture. Specific techniques to avoid TE fistula loss and prosthesis pull-through during primary placement are highlighted. This technique has potential for obviating the need of a later procedure to place the prosthesis, allows earlier voice acquisition and has limited complications.

S52. Quantum Dot Nanoparticle Targeting of Claudin-4 as a Biomarker of Head and Neck Squamous Cell Carcinoma
Vaninder K. Dhillon, MD, Los Angeles, CA; Jacqueline Caputi Weinstein, BA, Los Angeles, CA; Rizwan Masood, PhD, Los Angeles, CA; Uttam K. Sinha, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare claudin-4 expression in early versus advanced stage head and neck squamous cell carcinoma (HNSCC), discuss the role of claudin-4 in disease progression, and explain the utilization of quantum dot nanotechnology in detecting and possibly targeting early staged HNSCC.

Objectives: 1) To establish whether claudin-4 expression levels in HNSCC primary tumors may be correlated with and/or serve as a biomarker for increased invasive potential; 2) to utilize quantum dot nanoparticles to target claudin-4 expressing HNSCC cells as a means of differentiating normal versus cancer cells. **Study Design:** Forty patients with squamous cell carcinoma of the head and neck underwent surgical resection at our institution. Informed consent was obtained from all patients entered into this study through IRB approval. Patients were categorized into early (stage I/II) or late (stage III/IV) disease according to TNM staging classification. Tumor and adjacent normal tissue, as well as lymph nodes in clinically staged nodal disease, were harvested. **Methods:** RNA microarray, Western blot analysis, immunohistochemistry, immunofluorescence, real time PCR, quantum dot bioconjugation with anti-claudin-4 antibody. **Results:** Claudin-4 expression is specific to epithelial cell plasma membranes. Claudin-4 is highly expressed in HNSCC primary tumor and involved lymph nodes. Claudin-4 expression is upregulated in early stage HNSCC primary tumor with lower levels of expression in advanced stage disease. mRNA expression of claudins 1 and 4 is upregulated in HNSCC primary tumor with lower levels of expression in advanced stage disease. Claudin-4 expression is upregulated in early stage HNSCC primary tumor with lower levels of expression in advanced stage disease. Anti-claudin-4 bioconjugated quantum dots preferentially target HNSCC cells. **Conclusions:** As a component of the tight junction complex, claudin-4 expression is restricted to epithelial cell membranes; its expression identifies cells of epithelial origin. Claudin-4 expression is significantly elevated in primary tumor tissue of patients with early stage (stage I/II) HNSCC when compared with normal, tumor free adjacent tissue from the same patient. Primary tumors of advanced stage (stage III/IV) HNSCC without lymph node involvement demonstrate significantly decreased claudin-4 expression levels when compared with patient matched, adjacent, normal tissue or tumor from patients with early stage disease. Among advanced stage patients, those with lymph node involvement demonstrate lower levels of claudin-4 mRNA expression in the primary tumor than those without lymph node involvement. Quantum dot nanoparticles bioconjugated with anti-claudin-4 antibodies preferentially target metastatic HNSCC cells, enabling the differentiation of these cells from noncancerous, normal epithelial cells.

S53. Association of BRCA1 Single Nucleotide Polymorphisms with Risk of Differentiated Thyroid Carcinomas

Phi C. Doan, MA, Houston, TX; Erich M. Sturgis, MD MPH*, Houston, TX; Qingyi Wei, MD PhD, Houston, TX; Guojun Li, MD PhD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the risk of differentiated thyroid carcinoma associated with common BRCA1 single nucleotide polymorphisms.

Objectives: BRCA1 is a vital DNA repair gene, and the single nucleotide polymorphisms of this gene have been studied in diverse cancer types. In this study, we investigated the association between eight common BRCA1 SNPs and risk of differentiated thyroid carcinoma (DTC). **Study Design:** This cancer center based case control study included 303 DTC cases and 511 cancer free controls. **Methods:** A multiplex polymerase chain reaction based restriction fragment length polymorphism assay was performed for genotyping. Multivariable logistical regression analysis was used to calculate odds ratios and 95% confidence intervals, with adjustment for age, sex, ethnicity, family history of cancer, tobacco use, alcohol use and radiation exposure. **Results:** For these eight polymorphisms, we found that the variant genotypes of four polymorphisms (A1988G, T2089C, C33420T, and A34356G) were significantly associated with an approximate 30% reduced risk of DTC compared with their corresponding common homozygous genotypes. Such an association was only borderline significant for the polymorphisms of A33921G and A55298G and not significant for the A31875G and T43893C polymorphisms. When the eight polymorphisms were combined, the variant genotypes of the eight polymorphisms were significantly associated with a reduced risk of DTC, and the number of variant genotypes was associated with a significantly reduced risk in a dose response manner ($P = 0.010$). Furthermore, compared to individuals carrying 6 or less variant genotypes, individuals having more than 6 variant genotypes has a significantly associated 30% reduced risk of DTC. **Conclusions:** These results indicate that the polymorphisms of BRCA1 may individually, or more likely, collectively contribute to the etiology of DTC, but additional large studies are needed to replicate our findings.

S54. Malignant Pilomatrixoma: Case Report and Literature Review

Victor M. Duarte, MD, Los Angeles, CA; Mia E. Miller, MD, Los Angeles, CA; Peter Abosolo, MD, Los Angeles, CA; Maie St. John, MD PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to have a better understanding of the clinical course, pathology, and treatment options of this rare disease.

Objectives: 1) To describe the clinical presentation and treatment of a very rare case of malignant pilomatrixoma; and 2) to compare outcomes of this patient report with those in the literature. **Study Design:** Report of a single case from a tertiary care institution and review of the literature. **Methods:** Report of a patient with malignant pilomatrixoma is presented with radiologic images, treatment course and histopathologic findings. **Results:** A 60 year old male presented with a history of prior excision of a right temporal pilomatrixoma. The lesion recurred and he was scheduled for elective re-resection. When the patient presented to surgery, the lesion had tripled in size. Because of this rapid growth, the excision was deferred and repeat biopsy was performed. Pathology was again consistent with pilomatrixoma. The patient then underwent definitive surgery, including tympanomastoidectomy for facial nerve identification, parotidectomy,

tomy approach through a modified Blair incision, and resection of the temporal pilomatrixoma with a full thickness skin graft for closure. Pathology was consistent with malignant pilomatrixoma with invasive features and the patient scheduled for adjuvant radiation. **Conclusions:** Malignant pilomatrixoma is an exceedingly rare neoplasm. Although it has been described at various anatomical sites, fewer than ten cases have been reported in the head and neck. Although early recognition and treatment is paramount in optimization of outcomes for this aggressive carcinoma, its diagnosis is complicated by shared features with its more common benign counterpart. In patients with recurrence or rapid growth of a pilomatrixoma, pilomatrix carcinoma should be considered in the differential diagnosis.

S55. **Head and Neck Squamous Cell Carcinoma in Pregnant Women: A Case Series with Biomarker Analysis**

Anna M. Eliassen, BS, Ann Arbor, MI; Samantha J. Davis, BS, Ann Arbor, MI; Alice L. Tang, BA, Ann Arbor, MI; Dafydd G. Thomas, MD PhD, Ann Arbor, MI; Thomas E. Carey, PhD, Ann Arbor, MI; Mark E. Prince, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current knowledge regarding head and neck squamous cell carcinoma in pregnant patients. This includes data derived from the case series on tumor biomarkers and HPV status.

Objectives: Head and neck squamous cell carcinoma (HNSCC) has traditionally been known as a disease of older men with a history of tobacco and alcohol abuse. Recently, though, the incidence of this disease in younger patients, especially women, has been increasing. The purpose of this study was to investigate the biology of HNSCC in pregnant women, a population which represents a rare but therapeutically challenging patient subset. **Study Design:** The following is a case series with biomarker analysis. **Methods:** After obtaining IRB approval, a search engine was used to identify women that developed head and neck squamous cell carcinoma during pregnancy. This search identified four patients with oral tongue lesions. Biomarker expression was assessed by immunohistochemistry. **Results:** All tumors were HPV negative by p16 immunohistochemistry. All four tumors exhibited overexpression of EGFR and Bcl-xL. Three of four overexpressed c-MET, an indicator of tumor invasiveness. Staining for p53, ER, PR, and HER-2 was negative. **Conclusions:** Physiologic changes during pregnancy, such as increased metabolism and amplified hormonal responses, have been hypothesized to promote neoplastic growth. Unlike many young patients diagnosed with HNSCC, these patients were HPV negative. ER & PR staining was negative, indicating that neither of these hormonal receptors were upregulated in these patients. The high EGFR and Bcl-xL levels underscore the aggressive nature of these tumors. Improved understanding of the biology of HNSCC in pregnant patients may lead to better, more targeted treatment of this unique patient population.

S56. **The Chicken Thigh Model for Head and Neck Microvascular Training**

Audrey B. Erman, MD, Boston, MA; Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participant should be able to design and execute a learning model for microvascular training using the chicken thigh, and compare the vessel caliber of this model to flaps most often used in head and neck microvascular reconstruction.

Objectives: To describe the relevant vascular anatomy of the chicken thigh, evaluate the anatomical variants of the femoral and popliteal arteries and veins, and highlight the utility of this model in training head and neck microvascular surgeons. **Study Design:** Anatomical dissection, comparative to vessel caliber standards present in the literature. **Methods:** Chicken thighs from a local grocer were dissected using loupe magnification. Vessel characteristics including length, diameter, and anatomical variants were examined and assessed. Results were compared with reported sizes of the vessels in the common free flaps used in head and neck reconstruction: the radial forearm, the fibula, and the anterolateral thigh (ALT) free flap. **Results:** The anatomy of the chicken femoral and popliteal arteries and veins was easily dissectible and constant among specimens. Chicken thigh vessel caliber was comparable to those reported for the radial forearm free flap, the fibula free flap, and the ALT. **Conclusions:** The chicken thigh model is an innovative model for microvascular surgical training, with vascular anatomy comparable to vessels in commonly used flaps for head and neck reconstruction. We offer this technique as a complimentary model (to the standard rat femoral vessel model) with the specific advantages of: ready accessibility, low cost, vivisection avoidance and a vascular pedicle highly similar to the common free flaps in head and neck reconstruction.

S57. **Intraoperative Parathyroid Hormone Monitoring: Advantages of a New On-Site Assay**

Tarik Y. Farrag, MD, Augusta, GA; Paul M. Weinberger, MD, Augusta, GA; Melanie W. Seybt, MD, Augusta, GA; David J. Terris, MD*, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be aware of the IOPTH assay performed inside the operating room.

Objectives: Intraoperative parathyroid hormone (IOPTH) monitoring is emerging as a useful adjunct in parathyroidectomy. It can be performed either in the laboratory or as an on-site assay within the operative suite. We hypothesized that on-site IOPTH assessment will reduce the IOPTH results reporting time compared to in-lab IOPTH assay. **Study Design:** Prospective analysis of consecutive patients undergoing parathyroidectomy at a tertiary care academic medical center. **Methods:** Institutional review board approval was obtained to analyze the data associated with this study. Patients who underwent parathyroidectomy for primary or recurrent hyperparathyroidism were included. Serum samples were run in duplicate using both an on-site PTH assay (Future Diagnostics) and a laboratory assay (Turbo

PTH) at incision and at 5, 10, and 15 minute intervals following removal of suspected parathyroid adenomas. Results reporting time was recorded. **Results:** A total of 74 serum samples were assayed. There was excellent correlation between on-site and in-lab IOPTH results ($r=0.867$ by Pearson correlation, $p<0.001$). The on-site IOPTH results were reported significantly faster than corresponding in-lab results: median of 14.0 min compared to 29.5 min respectively ($p<0.001$). All patients (100%) demonstrated a biochemical cure by end of procedure. **Conclusions:** A rapid, on-site IOPTH assay results in a significant decrease in amount of time for laboratory results to be communicated to the surgical team. This substantially reduced the operative times for parathyroidectomy and adds to the benefits of using IOPTH monitoring.

S58. **Trends in Scientific Interest in Head and Neck Surgery**

Sherry L. Fishkin, MD, Brooklyn, NY; Gady Har-El, MD*, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the trends within the journal "Head and Neck" over the last three decades and compare this to the trends within the field of head and neck surgery.

Objectives: Head and neck surgery has undergone significant changes in its focus over the last several decades. This study observes these changes by examining and quantitating the scientific subject matter published in the journal "Head and Neck". **Study Design:** Literature review. **Methods:** The subject matter of the journal was examined from 1978 to 2008. Each year was represented by the January and July issues. Data were sorted into four domains: anatomy, etiology, treatment modalities, and general topics. Trends were determined by examining the percentage of each topic within a given domain in each of the three decades. **Results:** A total of 582 articles were reviewed with a mean of 18 articles per year. Within the domain of anatomy, statistically significant changes include an increase of articles related to the nasopharynx and a decrease in articles related to skin and facial nerve. In the domain of treatment modalities, an overall decline of surgery related publications was noted whereas articles related to radiation therapy increased significantly. Within the etiology domain, there is a significant increase in cancer related publications whereas noncancer topics (benign tumors, trauma, etc.) decreased in frequency. The general subject domain showed significant increase in basic science, carcinogenesis, and treatment complications. **Conclusions:** The specialty of head and neck surgery, as evaluated by the publications in "Head and Neck", is becoming more cancer oriented and involves significantly more studies in nonsurgical management options, basic sciences, complications, and carcinogenesis.

S59. **Migrating Foreign Body after a Dental Procedure—A Case Report and Literature Review**

Marika Annakay Fraser, MD, Brooklyn, NY; Stephen Tai, MD, Brooklyn, NY; Krishnamurthi Sundaram, MD*, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate that once a broken needle is identified they should be removed because of the potential for migration to vital organs within the head and neck.

Objectives: To report a case and review the literature on the localization techniques and surgical approaches used to retrieve a broken dental needle from the soft tissue of the head and neck. **Study Design:** A case report illustrating the migration of a soft tissue foreign body, a 27 gauge needle which was broken during a dental procedure and within two days had migrated from its point of entry in the oral cavity to the infratemporal fossa and finally its retrieval from the temporalis muscle. **Methods:** We reviewed the literature to identify the use of different needle localization techniques and compare these to the use of intraoperative x-ray use by a surgeon to compliment the surgical plan in retrieval of the broken needle from the soft tissues of the head and neck. **Results:** Identification of a broken needle in the head and neck can be quite difficult depending on the location, timing and mechanism of entry. The use of preoperative and intraoperative radiologic imaging is vital in demonstrating the location of the radiopaque object and can complement the surgical exploration. **Conclusions:** This case report demonstrates that once a broken needle is identified it should be removed because of the potential for migration to vital organs within the head and neck. The incidence of a broken dental needle is quite rare but because of the potential for major complications it is recommended to retrieve the broken needle immediately after discovery.

S60. **Mediastinal Goiter Presenting with Ventricular Tachycardia**

Kevin C. Gilbert, MD, Springfield, IL; Muthuswamy Dhiwakar, MD, Springfield, IL; William S. Stevens, MD, Springfield, IL; Kevin Thomas Robbins, MD*, Springfield, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) consider mediastinal goiter in the differential diagnosis for cases of unexplained cardiac arrhythmia with intrathoracic mass; and 2) anticipate the need for a median sternotomy in combination with a transcervical approach for removal of a mediastinal goiter.

Objectives: We discuss an unusual presentation of an intrathoracic goiter and review the literature regarding diagnosis and management of this entity. **Study Design:** This is a case presentation where the workup was performed at an academic center. Followup was six months. **Methods:** We present an unusual case of a patient with a mediastinal goiter presenting with ventricular tachycardia as the sole clinical manifestation. Review of the clinical presentation, investigations, surgery and outcome was performed. **Results:** A 64 year old male presented with spontaneous onset of ventricular tachycardia. There were no symptoms typical of a goiter such as neck swelling, dysphagia, respiratory difficulty or engorged veins. Emergency treatment was instituted, but this unusual presentation led to initial misinterpretation of imaging studies; unnecessary, invasive diagnostic procedures; and delayed diagnosis. Repeat imaging with additional views to evaluate the whole neck and chest was suggestive of a completely intrathoracic multinodular goiter that abutted cardiac mus-

cle. Excision via a transcervical approach was attempted, however the mass was too large and firm to be delivered through the thoracic inlet. Surgical removal was accomplished by a combined transcervical and median sternotomy approach, and the arrhythmia resolved postoperatively. **Conclusions:** This report demonstrates that although unusual, ventricular tachycardia can be the only feature of a mediastinal goiter. For cases of unexplained cardiac arrhythmia associated with an intrathoracic mass, mediastinal goiter should be included in the differential diagnosis.

S61. **C**linical Impact of Human Papillomavirus in Cervical Metastasis from Unknown Primary

Eli R. Groppo, MD, San Francisco, CA; David W. Eisele, MD*, San Francisco, CA (Presenter); Annemieke Van Zante, MD PhD, San Francisco, CA; Sue S. Yom, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the incidence of p16 positivity in patients with cervical metastasis of unknown primary, and the potential impact this may have on survival.

Objectives: The role of human papillomavirus (HPV) as a causative factor in cervical metastasis from an unknown primary (CMUP) and the impact of the virus on survival is unclear. The goal of this study was to compare outcomes of patients with HPV associated CMUP to those of patients without evidence of HPV. **Study Design:** Retrospective cohort. **Methods:** Patients diagnosed with metastatic squamous cell carcinoma (SCC) with unknown primary after a thorough workup during the last 15 years were studied. Retrospective immunohistochemical staining for p16 (a surrogate for HPV) was performed. Demographic, nodal stage, and survival data were compared based on p16 status. **Results:** Nineteen patients met inclusion criteria and had specimens suitable for p16 testing. Of these, 14 were positive for p16 (74%) and 5 were negative (26%). There were no differences between the two groups with respect to demographics and presenting nodal stage. The median followup period was 73 months for p16 positive patients and 70 months for p16 negative patients. p16 positive patients had a statistically higher overall survival at 5 years compared to p16 negative patients (100% vs. 60%, $p = 0.004$). Differences in 5 year disease free survival did not reach statistical significance (93% vs. 60%, $p=0.17$). **Conclusions:** The incidence of p16 positivity in CMUP is similar to that reported for oropharyngeal SCC. Our data suggests that HPV is a common etiologic agent in CMUP and, similar to other anatomic subsites within the head and neck, p16 positivity appears to confer a better prognosis.

S62. **A**Synchronous Facial Nerve Schwannoma and Neurofibroma: Case Report and Review of the Literature

Brian C. Gross, MD, Rochester, MN; Matthew L. Carlson, MD, Rochester, MN; Bernd W. Scheithauer, MD, Rochester, MN; Colin L.W. Driscoll, MD, Rochester, MN; Eric J. Moore, MD*, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinical presentation, evaluation and treatment of a facial nerve collision tumor involving an intraparotid neurofibroma and a vertical mastoid segment schwannoma.

Objectives: To present the case of a histologically proven facial nerve collision tumor involving an intraparotid neurofibroma and a vertical mastoid segment schwannoma. **Study Design:** Case report and review of the literature. **Methods:** Case report and review of the literature. **Results:** A 29 year old woman presented with a two year history of an asymptomatic left infraauricular mass and normal facial nerve function. Both CT and MRI demonstrated a cystic mass in the deep portion of the parotid gland extending superiorly into the stylomastoid foramen involving the vertical segment of the facial nerve; no other intracranial or skull base tumors were identified. Fine needle aspiration was nondiagnostic. The patient underwent a superficial parotidectomy with biopsy of the intraparotid cystic mass. This was consistent with a neurofibroma on intraoperative frozen section pathology. A mastoidectomy with facial nerve decompression was then performed to the normal appearing tympanic segment. The facial nerve could not be stimulated proximally and the decision was made to perform a segmental resection of the facial nerve involved by tumor with reconstruction using a great auricular nerve interposition graft. Final pathology demonstrated a schwannoma involving the mastoid segment and a neurofibroma involving the proximal intraparotid segment. **Conclusions:** To the authors' knowledge, this is the first report of a facial nerve collision tumor involving a neurofibroma and schwannoma. Although uncommon, these neurogenic tumors of the seventh cranial nerve should be considered in a patient with a parotid mass.

S63. **E**sthesioneuroblastoma: Correlating FDG Uptake on PET/CT with Tumor Histologic Grade

Sanaz Harirchian, MD, Newark, NJ; Arjuna B. Kuperan, MD, Newark, NJ; Nasrin V. Ghesani, MD, Newark, NJ; Neena M. Mirani, MD, Newark, NJ; Erik G. Cohen, MD, Newark, NJ; Soly Baredes, MD*, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the presentation, clinical staging, workup, treatment, and clinical course of esthesioneuroblastoma, as well as discuss the role of PET/CT in initial workup and surveillance.

Objectives: Esthesioneuroblastoma is a rare neoplasm arising from the olfactory epithelium of the upper nasal cavity. It exhibits varied clinical behavior with the potential for locoregional recurrence and metastasis. The utility of PET/CT in the evaluation, staging, and followup of patients with esthesioneuroblastoma has not been well characterized, nor has the relationship between PET findings and histologic grade. This study aims to evaluate the potential clinical utility of PET/CT in predicting the tumor's histologic grade. **Study Design:** Retrospective chart review. **Methods:** Seven patients treated for esthesioneuroblastoma who also had a PET/CT scan were

included in the study. All patients had PET/CT scans 1-6 weeks before surgery, and lesions were assigned a peak SUV (standardized uptake value) that was standardized to the liver uptake. Pathology specimens were categorized into grades 1- 4 according to Hyams histologic grading criteria. The ratio of the lesion to liver uptake was then plotted against the pathological grade of the surgical specimen. **Results:** Six out of seven patients had direct correlation between the degree of lesion uptake on PET/CT and histologic grade. **Conclusions:** This study correlates histologic grade of esthesioneuroblastoma with FDG avidity on PET/CT. Recent data in the literature notes that the Hyams staging system may be an important factor in determining prognosis for tumor recurrence and survival. Although a small series, our study suggests that PET/CT may be utilized to predict the tumor's histologic grade. Lesion uptake on PET/CT may be utilized as a predictor of outcome and the need for postsurgical adjunctive treatment.

S64. **Primary Vertical Partial Laryngectomy for T1-T3 Squamous Cell Carcinoma of the Glottic Larynx**

Christian P. Hasney, MD, New Orleans, LA; Karen P. Miller, MD, New Orleans, LA; Christian D. Jacob, MD, New Orleans, LA; Brian A. Moore, MD, New Orleans, LA; Ronald G. Amedee, MD, New Orleans, LA; R. Brent Butcher, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of vertical partial laryngectomy in the treatment of select cases of laryngeal carcinoma.

Objectives: Squamous cell carcinoma of the glottis represents one of the most common malignancies of the head and neck. Although nonoperative treatment of these lesions has dominated the last two decades, the use of surgical options, particularly transoral laser microsurgery, has recently seen an increase. Considering this paradigm shift, we seek to revisit the therapeutic role of vertical partial laryngectomy and present our experience with its application for T1-T3 glottic carcinoma. **Study Design:** Retrospective chart review of 50 nonconsecutive patients who underwent primary vertical partial laryngectomy between October 1987 and August 2009 for T1-T3N0 glottic carcinoma. **Methods:** Qualifying patients were identified by a search of the medical record at our institution. Those undergoing salvage surgery and those with clinically N+ necks were excluded. Data was then gathered on patient demographics, tumor characteristics, treatment rendered, and followup with an eye toward recurrence of disease. Dysphagia and airway compromise were evaluated via the surrogate measures of dependence on a PEG tube and a tracheostomy, respectively. **Results:** 50 patients were evaluated. By Kaplan-Meier analysis, overall 2 year survival was 93.3%. 2 year disease specific and laryngectomy free survival were 97%. 2 year recurrence free survival was 97%. 2 year locoregional control was 94%. No patients required a PEG tube or tracheostomy following their initial discharge following surgery. **Conclusions:** Although indications for vertical partial laryngectomy are limited in this age of minimally invasive techniques, our data affirms that it is an oncologically sound procedure yielding excellent airway and swallowing function and is deserving of a place in the armamentarium of the head and neck surgical oncologist.

S65. **Occurrence of Flap Related Complications and Outcomes in Reconstruction of Circumferential Defects after Total Laryngopharyngectomy**

Elisabeth J. Henderson, BA, Boston, MA; Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the advantages, complications, and speech and swallow outcomes of the common microvascular free tissue transfer techniques described in the literature for reconstruction of a circumferential defect after total laryngopharyngectomy.

Objectives: We evaluate the published outcomes of techniques for reconstruction of circumferential defects after total laryngopharyngectomy using microvascular tissue transfer. **Study Design:** We conducted a systematic review of PubMed, MeSH, and Embase using the combination of keywords "surgical flaps", "reconstructive surgical procedures", "larynx" and "pharynx" which yielded 1,379 abstracts. Articles not related to free tissue transfer were excluded, resulting in 439 entries. All retrospective or prospective studies were reviewed to determine if they reported complications and outcomes of circumferential defects separately from partial defects. This analysis includes 31 studies, totaling 1,791 patients. **Methods:** The overall rates of fistula, failure, stenosis, perioperative mortality, oral alimentation and tracheoesophageal speech for jejunal, gastro-omental, forearm, thigh and rectus abdominus free flap repair were calculated as weighted averages using sample sizes as weights. **Results:** Fasciocutaneous flaps demonstrated a lower failure and perioperative mortality rate, and a higher tracheoesophageal speech rate compared to enteric options. Patients who underwent a fasciocutaneous repair had a failure rate of 3.3%, death rate of 0.8% and tracheoesophageal speech rate of 29.2% compared to 8.6%, 5.5% and 18.6% among patients who received an enteric repair. However, the rates of fistula and stenosis were higher among patients who received fasciocutaneous flaps (19.8% and 19.0%) compared to enteric transfers (15.5% and 12.2%). The rates of oral alimentation were similar across fasciocutaneous (83.3%) and enteric (87.9%) flaps. **Conclusions:** Numerous successful options currently exist for the reconstruction of the total laryngopharyngectomy defect. Optimal reconstruction depends on a knowledge of the specific advantages/disadvantages and appropriate application in individual clinical cases.

S66. **Comparative Effectiveness of Sirolimus to Temsirolimus**

Melissa S. Hu, MD, Shreveport, LA; Oleksandr Ekshyyan, PhD, Shreveport, LA; Lilantha H. Fernandez, MD, Shreveport, LA; Xiaohua Rong, MS, Shreveport, LA; Gloria Caldito, PhD, Shreveport, LA; Cherie-Ann O. Nathan, MD*, Shreveport, LA

Educational Objective: The mammalian target of rapamycin (mTOR) is a major pathway in cell growth, proliferation, and angiogen-

esis that is dysregulated in many cancers. mTOR inhibition by rapalogues has shown to slow cancer growth and to increase tumor free periods. The main goal of this study is to conduct preclinical comparative effectiveness research between the cheaper non-patented mTOR inhibitor sirolimus and the patented analog temsirolimus in an in vivo animal model.

Objectives: The purpose of this study is to compare the effectiveness of sirolimus, the generic of rapamycin, to the patent drug temsirolimus in preventing head and neck squamous cell carcinoma tumor growth. **Study Design:** This is a randomized controlled study. **Methods:** An established tumor model (ETM) was created by injecting nude mice with FaDu cells. After tumors reached 50-100 mm³, mice were treated with sirolimus or temsirolimus at daily i.p doses of 0, 5, 10, 15 and 20 mg/kg for 3 weeks (5 days/week). Tumor volume was measured three times a week. The minimal residual disease model (MRD) included creating surgical wounds and inoculating 1 x 10⁶ FaDu cells subcutaneously in nude mice. 72 hours following tumor cell inoculation, animals were randomized into two groups, control and treatment with sirolimus 5 mg/kg daily for 5 days per week for 3 weeks. **Results:** There were no significant differences in tumor size between sirolimus and temsirolimus treated groups in the ETM (p<0.01). In the MRD sirolimus significantly suppressed growth of tumors (p <0.05) and improved survival compared with controls (p<0.05). **Conclusions:** In this study we demonstrate that the generic sirolimus produces comparable effects to the patent drug temsirolimus in an established tumor animal model. Furthermore, sirolimus shows promise in slowing growth of tumors in the minimal residual disease model, as temsirolimus has shown in previous studies. Sirolimus has the potential of serving as an economic and comparative targeted agent to temsirolimus in the treatment of head and neck squamous cell carcinoma.

S67. **F**ollicular Variant of Papillary Thyroid Carcinoma: Increasing Rate of Diagnosis and Clinical Behavior

Jason P. Hunt, MD, Salt Lake City, UT; Luke O. Buchmann, MD, Salt Lake City, UT; Elke A. Jarboe, MD, Salt Lake City, UT; Dev Abraham, MD, Salt Lake City, UT

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the different clinical features of follicular variant of papillary thyroid carcinoma compared to its conventional counterpart; and 2) discuss the change in rate of diagnosis over the last several years.

Objectives: Follicular variant of papillary thyroid carcinoma (fvPTC) has a similar prognosis to conventional papillary thyroid carcinoma (cPTC). We present the largest clinical experience of fvPTC with comparison to its conventional counterpart to describe changes in rate of diagnosis and clinical features. **Study Design:** Retrospective chart review at an academic tertiary care hospital. **Methods:** A retrospective chart review from July 2004 through June 2010 of all newly diagnosed papillary thyroid carcinomas evaluated for surgery in the head and neck clinic. fvPTC cases were compared to cPTC cases in terms of demographics, primary tumor characteristics, lymph node and distant metastases. **Results:** There were 221 diagnoses of follicular variants or cPTCs that underwent surgery over six years. There were 97 newly diagnosed fvPTCs and 124 cPTCs. The rate of diagnosis of fvPTC increased from 1 case per month early in the study to 2.35 cases over the last two years of the study. Follicular variant of papillary thyroid carcinoma was similar to cPTC for age at diagnosis (47 vs 43 years old) and gender (70% vs 73% female). Tumor size trended towards smaller tumors in the fvPTC group (1.69 vs 2.02 cm) with fewer cases of extrathyroid extension 5% vs 31%. There were fewer lymph node metastases in the fvPTC group (16% vs 49%). **Conclusions:** The rate of diagnosis of fvPTC is increasing. It appears to have a favorable prognosis as cPTC, but may have fewer lymph node metastases and less aggressive clinical characteristics. Followup studies are needed to determine if management of fvPTC should differ as compared to cPTC.

S68. **A**utophagy and Tumor Cell Dormancy in Head and Neck Cancer

David W. Jang, MD, New York, NY; Alvaro Avivar-Valderas, PhD, New York, NY; Anna M. Banach, BS, New York, NY; Julio Aguirre-Ghiso, PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the concepts of autophagy and tumor cell dormancy, and how these cellular processes may be targeted in order to prolong survival in patients with squamous cell carcinoma of the head and neck.

Objectives: 1) To explain the concept of tumor cell dormancy, in which cancer cells convert to a quiescent state after initial treatment. Dormant cells then revert to a tumorigenic state months or years later, manifesting in the patient as a recurrence; 2) to define the role of autophagy, which is a form of nutrient recycling, as a mechanism by which dormant tumor cells survive nutrient deprivation; and 3) to identify a molecular pathway responsible for the induction of autophagy. **Study Design:** Laboratory based experiments using cell culture techniques. **Methods:** The HEP3 cell line, which is derived from head and neck squamous carcinoma cells, was cultured in the tumorigenic state (THEp3) and the dormant state (DHEp3). Immunofluorescence staining, western blotting, quantitative PCR, and cell viability studies were used to quantify the level of autophagy at baseline and after treatment with chloroquine, an autophagy inhibitor. Cells were also analyzed after activation and deactivation of the pERK pathway, a known survival pathway in dormant cells. **Results:** DHEp3 cells had a significantly higher baseline level of autophagy as compared to THEp3 cells. DHEp3 cells also had higher viability rates after treatment with chloroquine. Activation of pERK in THEp3 cells increased autophagy, while deactivation of pERK in DHEp3 cells decreased autophagy. **Conclusions:** Dormant tumor cells have a higher level of baseline autophagy. Moreover, autophagy is likely a survival mechanism regulated by the pERK pathway. Inhibiting this underlying pathway or directly blocking autophagy may sensitize tumor cells to chemoradiation and prolong survival in patients with head and neck cancer.

S69. **H**amartoma of the Larynx: A Report of Two Cases

David W. Jang, MD, New York, NY; Anthony G. Del Signore, MD, New York, NY (Presenter); Anthony Reino, MD*, New York, NY; Sabina Omerhodzic, MD, New York, NY; Michael Rivera, MD, New York, NY; Jose E. Colon, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the clinical presentation, histopathologic findings, and management strategies of hamartomas occurring in the larynx.

Objectives: Hamartomas of the larynx are extremely rare, we describe two cases, and review the clinical presentation, histopathologic findings and management of this entity. **Study Design:** A case report and review of the literature. **Methods:** Case report and Medline search of the term "hamartoma of larynx". **Results:** Hamartomas are defined as a congenital malformation that consists of a focus of mature, locally derived tissue with abnormal histological architecture. Hamartomas affecting the larynx are extremely rare, with less than twenty well documented cases in the literature. We report the first case in the English language literature of a patient with a laryngeal hamartoma presenting with a vocal cord paralysis secondary to involvement of the recurrent laryngeal nerve. We also report a case of a large supraglottic hamartoma causing airway obstruction and requiring a partial laryngectomy. **Conclusions:** Hamartomas of the larynx are rare benign entities that can be locally destructive and cause airway obstruction. Two patients are presented showcasing the clinical symptoms, workup, management and subsequent followup data.

S70. **A** Pilot Study Analysis of Serum and Saliva by Differential Scanning Calorimetry in Patients with Head and Neck Carcinoma

Nathan D. Joos, MD, Louisville, KY; Nichola C. Garbett, PhD, Louisville, KY; Jeffrey M. Bumpous, MD*, Louisville, KY; Brian S. Shumway, MD DDS, Louisville, KY; Wolfgang Zacharias, PhD, Louisville, KY; Jonathan B. Chaires, PhD, Louisville, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss and evaluate differential scanning calorimetry as a novel diagnostic tool in the evaluation of patients with carcinoma of the head and neck.

Objectives: To evaluate the serum of patients with head and neck cancer for trends in thermogram signature through differential scanning calorimetry (DSC). Additionally, to determine the feasibility of salivary sample DSC processing and interpretation. **Study Design:** Prospective analysis. **Methods:** Twenty-one patients with a new diagnosis of oral or oropharyngeal squamous cell carcinoma and 20 healthy control patients were identified for participation. Each patient provided a serum and salivary sample for DSC testing along with a pertinent medical history questionnaire. Serum samples were tested through DSC, producing a unique thermogram signature for each patient. Using a novel technique, salivary samples were filtered and buffered to standardize them for DSC processing. Thermograms were sorted based upon tumor location and patient demographics, individually analyzed, interpreted against healthy controls. **Results:** Each of the samples successfully produced a unique thermogram signature. When serum thermograms from the test population were evaluated based upon tumor location, clear deviations in peak excess specific heat capacity from healthy controls were observed. These results were observed in all tumor locations with the exception of tonsillar disease. Tumor T stage was also found to significantly alter thermogram patterns in a predictable manner. The novel salivary sample processing protocol proved to be successful and reproducible. The trends identified in serum sample thermograms based upon tumor location and stage were not clearly evident in salivary thermogram interpretation. **Conclusions:** This pilot study suggests that DSC is a valid addition to the proteomic investigational armamentarium. Evaluation of a large patient population is necessary to further evaluate this technology for use as a diagnostic screening test for head and neck carcinoma. Due to the sensitivity of this technology, a more stringent collection protocol may be necessary to more precisely evaluate salivary thermogram trends.

S71. **F**ree Flap Reconstruction in 1999 and 2009: Changing Case Characteristics and Outcomes

Kiran Kakarala, MD, Boston, MA; Kevin S. Emerick, MD, Boston, MA; Derrick T. Lin, MD, Boston, MA; James W. Rocco, MD PhD, Boston, MA; Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the changes in demographics, surgical characteristics, and outcomes for patients undergoing free flap reconstruction at a tertiary academic medical center over a 10 year period.

Objectives: 1) Compare free flap reconstructive cases from 1999 and 2009 with respect to patient characteristics, surgical characteristics, outcomes, and complications; and 2) discuss the evolution in free flap reconstruction at our institution over this time period. **Study Design:** Retrospective cohort comparison. **Methods:** Free flap reconstruction cases from 1999 and 2009 were collected into two cohorts. Retrospective chart review was performed to extract patient characteristics, surgical characteristics, and outcomes. Cohorts were compared with respect to extracted data using the t-test with statistical significance set at $p < .05$. **Results:** There were 39 free flap reconstructions performed in 1999 and 81 performed in 2009. Patients in the 2009 cohort had higher ASA scores and incidence of cardiovascular disease ($p = .0003$ and $.0045$ respectively). Median operative time decreased from 12 hours in 1999 to 9 hours in 2009 ($p < .0001$). Median length of stay decreased from 14 to 9 days ($p = .0006$). The rate of perioperative return to the operating room to manage complications decreased from 30% to 17%. There were 5 unsalvageable flap failures in 1999 (12.8%) compared to 2 failures in 2009 (1.2%). **Conclusions:** Patients undergoing free flap reconstruction are increasingly older and have more medical comorbidities. Despite these challenges, increased efficiency and teamwork stemming from accumulated institutional experience has lead to

decreased operative times, length of stay, and complication rates, and increased overall success rates.

S72. **B**enign Cystic Teratoma of the Parotid Gland

Evelyne Kalyoussef, MD, Newark, NJ; Arie Rosen, MD, Hackensack, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the embryology and histopathology of parotid teratoid tumors and compare this to other cystic parotid masses.

Objectives: 1) A case report of benign cystic teratoma of the parotid gland; and 2) review the histopathology and embryology of parotid teratoid tumors. **Study Design:** This is the sixth reported case of a benign parotid teratoid tumor. **Methods:** A fourteen year old boy presented with a slowly enlarging left preauricular mass over a six month period. On exam, he had a mobile cystic parotid mass just anterior to his left tragus with an associated small preauricular pit. His facial nerve was intact. MRI demonstrated high uptake on T1 but low signal on T2 weighted images with heterogeneous signals. Differential diagnosis included first branchial cleft cyst, angioliopoma or dermoid cyst. The patient underwent a superficial parotidectomy with excision of the parotid mass and the involved external ear canal cartilage. **Results:** Final pathology was consistent with a benign cystic teratoma, with cartilage noted at one pole of the cyst. **Conclusions:** Parotid teratoma is a rare germ cell tumor with malignant potential of all three germ layers. Mature cystic teratomas involving the major salivary glands are extremely rare. We present only the sixth reported case of a benign cystic teratoma of the parotid gland and only the first reported case with cartilaginous involvement. Benign cystic teratomas present a difficult problem of complete safe excision for the surgeon and proper identification by the pathologist. Cystic teratomas should be included in the differential of a cystic parotid lesion. The surgeon should be prepared to remove part of the external ear canal if necessary for complete excision.

S73. **P**rognostic Factors for Minimally Invasive Follicular Thyroid Carcinoma

Gerald T. Kangelaris, MD, San Francisco, CA; Lisa A. Orloff, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare diagnostic and therapeutic factors differentiating minimally invasive from widely invasive follicular thyroid carcinoma to allow for optimal preoperative evaluation, operative management and adjuvant treatment.

Objectives: To identify and contrast prognostic factors associated with outcomes in minimally invasive follicular thyroid carcinoma (MIFTC) and widely invasive follicular thyroid carcinoma (WIFTC). **Study Design:** Retrospective cohort. **Methods:** We performed a retrospective cohort study of 120 patients diagnosed with follicular thyroid carcinoma (82 MIFTC, 38 WIFTC) between 2000 and 2010 at a single academic institution and investigated demographic, histologic, and treatment characteristics. **Results:** The MIFTC and WIFTC cohorts did not differ significantly by age, sex or race. Median tumor size varied significantly (25 mm MIFTC, 45 mm WIFTC, $p < 0.001$) as did histologic grade. Rates of capsular invasion did not vary, but WIFTC displayed increased rates of vascular invasion (46% MIFTC vs. 76% WIFTC, $p = 0.002$) and trended towards increased rates of multicentricity. Rates of upfront or completion total thyroidectomy did not vary between the groups, although 131I was utilized more frequently in WIFTC. Adverse events of locoregional recurrence, distant metastases, and death occurred more frequently in WIFTC. Minimally invasive histology (OR 0.10, $p = 0.004$) and tumor size (OR 1.04, $p < 0.001$) represented independent prognostic variables of adverse events on multivariate analysis. **Conclusions:** Minimally invasive histology, absence of vascular invasion, and decreased tumor size are associated with lower rates of locoregional recurrence, distant metastases, and mortality among patients with follicular thyroid carcinoma.

S74. **R**ole of Thyroid Stimulating Immunoglobulin in Rapidly Progressive Metastatic Thyroid Cancer following Total Thyroidectomy

Gerald T. Kangelaris, MD, San Francisco, CA; Lisa A. Orloff, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the impact of Graves' disease as pertains to the incidence and outcomes of well differentiated thyroid carcinoma and consider thyroid stimulating immunoglobulin as a potential thyroid cancer growth factor.

Objectives: To present a case of rapidly progressive metastatic papillary thyroid carcinoma following total thyroidectomy in a patient with Graves' disease and review the relevant literature. **Study Design:** Case report. **Methods:** We report the clinical course of a 17 year old female with incidentally identified papillary thyroid carcinoma following total thyroidectomy for Graves' disease, who experienced rapidly progressive metastatic disease prior to adjuvant therapy. The literature pertaining to Graves' disease and its effect on the incidence and outcomes of thyroid carcinoma is examined, and we discuss the potential role of thyroid stimulating immunoglobulin as a thyroid cancer growth factor. **Results:** Final pathology following total thyroidectomy was notable for oncocytic variant papillary thyroid carcinoma without extrathyroidal spread or lymphovascular invasion. Postoperatively the patient's TSH was suppressed but TSI remained elevated. Within four months' time and prior to scheduled adjuvant radioactive iodine ablation, the patient was clinically and radiographically identified with diffusely enlarged lateral and central compartment cervical lymphadenopathy, not present preoperatively. Neck dissection yielded 16 positive lymph nodes in multiple levels and the patient was treated with adjuvant radioactive iodine. She remains disease free at 12 months followup. **Conclusions:** The effect of Graves' disease in the incidence and outcome of well differentiated thyroid carcinoma remains controversial. Clinicians should consider thyroid stimulating immunoglobulin as a potential thyroid cancer growth factor.

575. **C**aveats for Anterolateral Thigh Free Flap Reconstruction

Joseph A. Knowles, MD, Birmingham, AL; Mark Wax, MD, Seattle, WA; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss an investigation of ALT flap use in head and neck cancer reconstructions.

Objectives: In North America the anterolateral thigh (ALT) free flap has become increasingly utilized in head and neck reconstruction. It has minimal donor site morbidity and allows for a two team approach. In the western population, the ALT flap has not attained the popularity of East Asian countries. Our objective is to promote use of the ALT flap by investigating patient outcomes. **Study Design:** Case review at two tertiary care institutions. **Methods:** A case review was performed on 2050 patients under going free flap reconstruction from two tertiary care institutions. Retrospective data was collected including operative course, race, sex, age, weight, health comorbidities, smoking history and drug use. **Results:** An ALT flap was explored in 175 of our free flap patients for reconstruction of defects caused by cancers of the head and neck. A total of 156 flaps (89%) were successfully raised without incident. Unilateral ALT exploration using perforators from the descending branches of the lateral circumflex femoral (LCF) artery was less successful compared to bilateral exploration using both descending LCF and alternative flap perforators (89% v 96%, p=0.02). A total of 18 cases required an alternate flap, most commonly the radial forearm (67%) or the rectus (28%) free flaps. Long term survival of all ALT flaps was 98.7%. **Conclusions:** We found that anatomic variation of muscle perforators is the crucial factor affecting successful ALT flap use. In ALT flaps without identifiable descending branches of the LCF artery, successful flap harvests can be performed by making use of superior muscle perforators and by exploration of the contralateral thigh. We recommend prepping bilateral ALT thigh sites prior to surgery and use of superficial perforators if no descending branches of the LCF artery are available.

576. **L**iposarcoma of the Larynx Presenting with Stridor: A Rare Tumor

Herman P. Lam, BS, Boston, MA; Arnold S. Lee, MD, Boston, MA; Elie E. Rebeiz, MD FACS, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants will be able to differentiate between liposarcoma and lipoma. Discuss the diagnosis and management of liposarcomas of the larynx and stridor.

Objectives: To discuss the diagnosis and management of liposarcoma of the larynx and review the literature. **Study Design:** A case report and literature review. **Methods:** Medical record of a patient was reviewed including radiological, intraoperative pictures and pathological studies. A literature review was done through Ovid Medline with the keywords "liposarcoma" and "larynx". **Results:** Patient was transferred from another facility with gradual worsening of hoarseness, dysphagia, and dyspnea without associated weight loss. Initial physical exam revealed an irregular shaped mass arising from the left arytenoid, obstructing the airway. CT of the neck showed the mass with no extension to the soft tissues of the neck and no cartilage invasion. The patient was emergently operated, and the tumor resected endoscopically. Histology of the excision specimen revealed a well differentiated liposarcoma. We will discuss anesthetic and intubation techniques in large obstructing tumors, and specific management of liposarcoma and discuss the literature review of 31 reported cases in the English literature. **Conclusions:** Liposarcoma of the larynx is rare with only 31 reported cases. It represents diagnostic and therapeutic challenges, causing progressive or sudden stridor. It is commonly diagnosed histologically after resection. Imaging is helpful in determining the extent of the lesion and assessment of local invasion. A wide local excision of the lesion with clear margins is the mainstay of treatment. Neck dissection is usually not warranted. Chemotherapy and radiotherapy are not necessary for low grade liposarcomas. Long term surveillance is necessary due to a high incidence of recurrence.

577. **P**araneoplastic Pulmonary Amyloidosis in Head and Neck Cancer: A Case Report

Matthew K. Lee, MD, Los Angeles, CA; Abie H. Mendelsohn, MD, Los Angeles, CA; Paul A. Kedeshian, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of paraneoplastic pulmonary amyloidosis, and its role in the evaluation, diagnosis, and treatment of head and neck cancer.

Objectives: To describe the clinical presentation and treatment of a patient with paraneoplastic pulmonary amyloidosis in the setting of oral cavity squamous cell carcinoma. **Study Design:** Case report. **Methods:** We report an unusual case of a patient with large oral cavity squamous cell carcinoma, who on preoperative workup was discovered to have multiple pulmonary nodules concerning for distant metastasis. Pulmonary biopsies conferred the diagnosis of paraneoplastic pulmonary amyloidosis. **Results:** A 73 year old gentleman initially presented to a tertiary care medical center with complaints of pain in the left floor of mouth and jaw. A basaloid squamous cell carcinoma involving the left paramedian portion of the gingiva with invasion into the mandible was identified. A multidisciplinary treatment plan was formulated, involving a composite mandibular resection with microvascular free flap reconstruction. However, on preoperative imaging, multiple concerning pulmonary nodules were discovered. CT guided lung biopsy was performed, which was diagnostic of pulmonary amyloidosis with no evidence of metastatic disease. Ultimately, the decision was made to proceed with definitive resection and microvascular reconstruction. He was eventually discharged on postoperative day 18 in stable condition and is currently doing well with no evidence of residual or recurrent disease. **Conclusions:** Though rare in the setting of head and neck oncology, it is important to consider paraneoplastic pulmonary amyloidosis in the differential diagnosis while investigating pulmonary nodules found on preoperative imaging.

S78. **U**se of Beta-Tricalcium Phosphate as a Reconstructive Tool for Small Bony Defects in the Mandible

Anya J. Li, MD, Detroit, MI; Tamer A. Ghanem, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the use of a synthetic osteoconductive block as an option for bridging small bony defects (<1.5 cm).

Objectives: To determine if the osteoconductive material ChronOS beta-tricalcium phosphate block (betaTCP) made by Synthes, a synthetic bone substitute made of beta-tricalcium phosphate, is a viable choice for bone grafting. **Study Design:** Case report. **Methods:** We prospectively evaluated the use of the beta TCP in a 50 year old male with a T4N1M0 stage IV squamous cell carcinoma of the right alveolar ridge who underwent wide local excision with segmental mandibulectomy from ramus to ipsilateral parasymphysis and selective neck dissection. The patient was primarily reconstructed with an osseous fibula free flap. His parasymphysial bone margin was found to be positive on permanent section, and the patient underwent a second segmental mandibulectomy, leaving him with a 1.5 cm anterior defect at the symphysis of the mandible. A beta TCP block was utilized to fill the bony gap in the anterior mandible from the fibula to the native mandible. **Results:** The patient healed well postoperatively and was started on a soft diet 1 week postop. He started chemoradiation 3 weeks postop. He is now 9 months postop, without any evidence of disease, and has maintained his preoperative occlusion. His postoperative CT scan shows excellent bony fusion at the reconstructed site. **Conclusions:** The beta TCP block is a useful adjunct for the reconstructive surgeon in small mandibular defects <1.5 cm, and osseous growth is still possible even with postoperative chemoradiation therapy.

S79. **T**ransoral Robotic Surgery (TORS) for Retromolar Trigone and Parapharyngeal Tumors

Adam J. Luginbuhl, MD, Philadelphia, PA; Anthony J. Nguyen, BA, Philadelphia, PA; David M. Cognetti, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the feasibility of utilizing transoral robotic surgery (TORS) as an alternative approach towards the treatment retromolar trigone (RMT) and parapharyngeal lesions.

Objectives: Lesions of the retromolar trigone and parapharyngeal space are challenging areas to approach and often require extensive open procedures. In this study, we present the possibility of performing surgical resection of these difficult to reach tumors utilizing TORS. **Study Design:** Case series at a tertiary referral center. **Methods:** Two patients were treated with TORS excision of parapharyngeal lesions and one patient for a retromolar trigone lesion. Outcome measures included operative times, length of stay, time to full diet. **Results:** Pathology included retromolar trigone squamous cell carcinoma, parapharyngeal low grade mucoepidermoid carcinoma and parapharyngeal pleomorphic adenoma. Mean console operative time was 127 minutes (36-154 minutes). A marginal mandibulectomy was performed on the retromolar trigone resection with robotic closure utilizing a buccinator rotational advancement flap. Stryker navigation was used to aid in the localization of the parapharyngeal/skull base lesion. All patients resumed full soft oral diet on POD #1 without evidence of trismus or dysphagia at the first postop visit. LOS for all three patients was 2 days. **Conclusions:** Preliminary results provide support for the application of TORS in selective retromolar trigone and parapharyngeal tumors. TORS offers a minimally invasive alternative to conventional surgical techniques with the possibility of preserving functional outcomes.

S80. **P**arathyroid Carcinosarcoma: A Case Report

Michael G. Moore, MD, Indianapolis, IN; James L. Taggart, MS4, Indianapolis, IN (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the diagnosis and treatment of parathyroid carcinoma, as well as gain awareness of parathyroid carcinosarcoma, an even more rare clinical entity.

Objectives: Parathyroid carcinosarcoma was first described by Nacamuli et al. in 2002. We present the second case of this rare disease. **Study Design:** We present a case report of a patient with parathyroid carcinosarcoma and review the relevant literature. A 57 year old woman with longstanding right sided vocal cord paralysis presented with a progressive 3 x 2 x 3 cm mass in the right neck. She had previously undergone a total thyroidectomy at an outside hospital, revealing benign pathology. Parathyroid hormone and calcium blood levels were within normal limits. **Methods:** NA. **Results:** The mass was surgically removed with negative surgical margins. Histopathology showed a biphasic pattern with hyperchromatic nuclei with abundant clear cytoplasm and spindle shaped cells with prominent mitoses. Immunohistochemical stains were positive for chromogranin and vimentin supporting the final pathological diagnosis of parathyroid carcinosarcoma. This is the second case of a parathyroid carcinosarcoma. The literature shows six other cases of parathyroid tumors associated with bone malignancy, but only one other case of a parathyroid carcinosarcoma. **Conclusions:** The patient is currently awaiting adjuvant radiation treatment and possible chemotherapy. In the only other reported case of parathyroid carcinosarcoma, the patient died of their disease despite aggressive surgery and adjuvant therapy.

S81. **I**ntratonsillar Metastasis of EBV Positive Nasopharyngeal Carcinoma

Matthew R. Naunheim, AB, Boston, MA; Linda N. Lee, 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 typical metastatic drainage pathways of nasopharyngeal carcinoma, as well as the differential diagnosis of intratonsillar metastasis. Participants will also

understand the importance of routine surveillance in patients with nasopharyngeal carcinoma, as well as the treatment options for primary, metastatic, and recurrent disease.

Objectives: To present an atypical case of EBV positive nasopharyngeal carcinoma metastatic to the tonsil, and a literature review with a focus on recurrent and metastatic nasopharyngeal carcinoma and the differential diagnosis of intratonsillar metastasis. **Study Design:** Case report and review of the literature. **Methods:** Retrospective review of a case of nasopharyngeal carcinoma metastatic to the palatine tonsil. Surgical, radiographic, and histopathologic findings are shown and discussed. **Results:** A 47 year old man with a history of nasopharyngeal carcinoma status post-chemoradiation and neck dissection 3 years ago presented with left sided tonsillar swelling. He underwent a radical tonsillectomy, and pathology revealed a 2.7cm undifferentiated nasopharyngeal carcinoma with lymphovascular invasion. All surgical margins from the oropharyngeal mass were negative, and no recurrent disease was observed in the nasopharynx. In situ hybridization for EBV encoded RNA (EBER) performed on the tonsillar tissue was strongly positive. These findings were consistent with metastasis from his original nasopharyngeal tumor. He was followed closely with flexible fiberoptic nasopharyngoscopy. Two months later, his exam revealed a new ulcerative lesion on the posterior nasopharynx. Biopsy demonstrated recurrent nasopharyngeal carcinoma. The patient is currently undergoing repeat chemoradiation. **Conclusions:** Intratonsillar metastasis from any primary malignancy is a rare occurrence which has previously only been described in malignancies of the skin, lung, breast, kidney, testicle, and gastrointestinal tract. This is the first reported case of nasopharyngeal carcinoma metastatic to the tonsil. This unusual presentation highlights the importance of close followup in patients with nasopharyngeal carcinoma, and it demonstrates that atypical metastatic presentation can be a harbinger of local disease recurrence.

S82. **H**emangiopericytoma of the Parotid: A Case Report

Rachael L. Nowlin, BFA MSII, Los Angeles, CA; Niels C. Kokot, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinical, surgical, radiologic, and histologic features of a rare case of hemangiopericytoma of the parotid gland.

Objectives: Hemangiopericytoma, or solitary fibrous tumor, is a rare soft tissue sarcoma of vascular origin derived from pericytes, which are small spindle cells surrounding capillaries. Hemangiopericytomas rarely present in the head and neck. This report reviews the case of a rare hemangiopericytoma presenting in the parotid region. **Study Design:** Case report. **Methods:** The record of a 27 year old female presenting with a hemangiopericytoma of the parotid region was reviewed. **Results:** A 27 year old female with a growing parotid mass for one year following pregnancy. She presented with a nontender parotid mass with no evidence of facial paralysis. Radiologic studies showed a lobulated 2.5cm preauricular mass at the level of the temporomandibular joint. Histologic examination revealed a spindle cell lesion with 1 mitosis per 10 high power fields that was strongly positive for CD34, FLI-1, focally positive calponin, and CD68. Surgical excision of the tumor from the parotid region was successful with no damage to the facial nerve and no evidence of recurrence at this time. **Conclusions:** Despite the difficulty of obtaining a definitive diagnosis through fine needle aspiration and complications associated with surgical resection of this type of neoplasm, resection of a suspected hemangiopericytoma of the parotid region demonstrates a high degree of treatment success.

S83. **F**unctional Outcomes following Treatment of Paraganglioma and Schwannoma: The Case for Surgical Resection

Noah P. Parker, MD, Minneapolis, MN; Noel Jabbour, MD, Minneapolis, MN; Amy Anne Lassig, MD, Minneapolis, MN; Bevan Yueh, MD, Minneapolis, MN; Samir S. Khariwala, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss functional outcomes following resection of cervical schwannoma and paraganglioma; and 2) discuss methods of voice and swallowing rehabilitation methods useful in this patient group.

Objectives: Paragangliomas and schwannomas are often intimately associated with cranial nerves 9, 10, 11 and 12. As a result, some patients are offered radiation therapy in hopes of avoiding postoperative functional deficits. Here we report functional outcomes following resection of cervical schwannoma or paraganglioma. **Study Design:** Retrospective chart review. **Methods:** A chart review was performed on eligible patients to extract data regarding tumor type, location, associated cranial nerves, and postoperative speech and swallowing outcomes. **Results:** Between 2002 and 2009, 9 patients aged 26 to 68 years underwent resection of cervical schwannoma. Four patients had sacrifice of CNX. Two were gastrostomy tube dependent and dysphonic, but improved with vocal fold (VF) injection and thyroplasty. Two received primary reinnervation leading to normal swallow and voice. Another patient with aspiration and dysphonia improved with VF injection alone. Ten patients aged 26 to 76 years underwent resection of cervical paraganglioma. Tumors were most commonly found at the carotid bifurcation. Postoperatively, four patients had normal function. Dysphonia occurred in 4 patients, mild dysphagia in 3, and gastrostomy dependence in 1. Two of these patients improved with VF injection. Two patients required resection of CNX; aspiration and dysphonia improved with VF injection followed by thyroplasty. **Conclusions:** Resection of cervical paraganglioma and schwannoma can lead to symptomatic speech and swallow deficits. Resection of CNX carries the greatest risk while neuapraxia associated with dissection often improves without intervention. Surgery can be performed safely and removes the possibility of a difficult postradiation dissection. Our study demonstrates that critical components of rehabilitation include: 1) speech and swallowing therapy; 2) surgical reinnervation when possible; and 3) static procedures such as VF injection and thyroplasty.

S84. **M**anagement of a Novel Parotid Collision Tumor

Benjamin C. Paul, MD, New York City, NY; Cameron L. Budenz, MD, New York City, NY; David J. Myssiorek, MD*, New York City, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe a novel collision tumor of the parotid and discuss the complexity in managing similar unexpected operative findings.

Objectives: 1) To present a novel collision tumor of the parotid gland: concurrent squamous cell carcinoma and small cell lymphoma; and 2) to analyze the operative approach to collision tumors. **Study Design:** Case report. **Methods:** A 75 year old male with right ear lobule melanoma was concurrently found to have a left parotid mass and bilateral cervical lymphadenopathy on examination. CT scan of the neck confirmed a 2 centimeter left parotid mass containing both solid and cystic components. Fine needle aspiration (FNA) biopsy of the parotid mass was consistent with carcinoma; whereas samples from the cervical lymph nodes were nondiagnostic. The patient was taken to the operating room for excision of the right ear melanoma, as well as for left superficial parotidectomy and neck dissection in order to obtain a definitive diagnosis. The operation was completed by the diagnosis of a novel collision tumor. The final histopathology revealed components of both squamous cell carcinoma and small cell lymphoma in both the parotid and lymph nodes. Adjunctive chemotherapy and radiation was planned. **Results:** To our knowledge, the combination of a parotid collision tumor containing squamous cell carcinoma and small cell lymphoma has never been described and poses a diagnostic and therapeutic challenge. This particular tumor combination is especially complex as the therapeutic approach to each tumor is distinct: squamous cell carcinoma is most often approached surgically, whereas lymphoma is primarily treated with chemotherapy. In this case, awaiting final pathology and preserving anatomy outweighed a more invasive initial operative management. Ultimately, each tumor must be treated independently, though the order of such treatment is still a path yet uncharted. **Conclusions:** Given the rarity of collision tumors, it is difficult to establish a standardized treatment plan, however, perhaps through future reporting of similar cases better therapeutic recommendations can be made.

S85. Paul Holinger, MD Resident Research Award (Middle Section)

Olfactory Groove Meningioma: Discussion of Clinical Presentation and Surgical Outcomes following Excision via the Subcranial Approach

Jon-Paul Pepper, MD, Ann Arbor, MI; Sarah L. Hecht, BA, Ann Arbor, MI; Steven E. Sullivan, MD, Ann Arbor, MI; Lawrence J. Marentette, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the utility of the subcranial/transglabellar approach for resection of olfactory groove and sphenoid wing meningiomas.

Objectives: The main objective is to describe both short and long term outcomes in a unique patient population. Broadly stated, the study hopes to illustrate the efficacy of the subcranial technique in a large cohort of patients with anterior skull base meningioma. **Study Design:** Retrospective chart review. **Methods:** Approximately 25 patients underwent subcranial/transglabellar approach to meningiomas of the anterior skull base over a fifteen year period of analysis. Hospital and outpatient records underwent detailed review. Outcome variables are largely binary and therefore will be analyzed by Chi-squared test and binary logistic regression where appropriate. The Kaplan-Meier method will be used to calculate survival data. **Results:** 30 day perioperative complication rate, complication type and frequency, overall survival, and disease free survival will be presented and analyzed for predictive factors. **Conclusions:** The long term efficacy of the subcranial approach in a large cohort of anterior skull base meningiomas has not been previously described. These results represent excellent oncologic, clinical, and aesthetic outcomes given the challenging anatomy of this region, and they highlight an effective collaboration between otolaryngology and neurosurgery subspecialties.

S86. The Natural Progression of an Early Stage Tonsil Carcinoma Treated Initially with Alternative Therapy

Helen E. Perakis, MD, Augusta, GA; Carrie M. Bush, MD, Augusta, GA; Lana L. Jackson, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the natural progression of early stage tonsillar squamous cell carcinoma left untreated and discuss alternative naturopathic treatments that are advertised for treatment of this disease.

Objectives: Squamous cell carcinoma of the tonsil, especially those that are HPV positive tend to have an increased sensitivity to radiation therapy and have ten year survival rates of up to 84%. Age, gender and HPV status have been shown to be important prognostic factors for patients with tonsillar squamous cell carcinoma. We will review the case of a patient with a T1N2AM0 SCCA of the tonsil who did not seek western medical treatment initially, and we will review the natural progression of this patient's disease. **Study Design:** Case report and literature search. **Methods:** Retrospective review of case, literature review; Ovid, PubMed. **Results:** A 47 year old male diagnosed with a T1N2AM0 SCCA of the right tonsil was evaluated by a multidisciplinary tumor board whose consensus therapy of choice was radiation with chemotherapy followed by the possibility of a post-treatment neck dissection should his cervical lymphadenopathy not resolve. His biopsy at the time of diagnosis revealed high risk HPV status. This patient decided to pursue naturopathic medicine consisting of dietary supplements and local treatment of cervical lymphadenopathy with Light Induced Enhanced Selective Hyperthermia (LIESH Therapy). Eight months later the patient presented with widespread disease requiring extensive surgery, radiation and chemotherapy. **Conclusions:** With the availability of the internet, a wealth of information as well as misinformation concerning diseases and treatments is available to the public. Patient's who choose alternative treatments based on limited knowledge may inadvertently delay appropriate treatment and subsequently require procedures with increased morbidity while jeopardizing a potential cure.

S87. **U**sefulness of CT and MRI in Predicting Parotid Gland Tumor Histopathology

Helen E. Perakis, MD, Augusta, GA; Brandon A. Miller, BA, Augusta, GA; Lana L. Jackson, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the advantages of using MRI versus CT to image a parotid gland tumor.

Objectives: To determine if radiologic imaging of patients with parotid gland tumors can predict malignant versus benign pathology. To analyze whether CT or MRI is superior at deciphering histologic subtypes. **Study Design:** Retrospective review of medical records. **Methods:** Setting: Academic institution. Patients: From August 2002 to October 2009, 32 patients undergoing primary parotidectomy for mass lesions of undetermined pathology underwent preoperative CT (16), MRI (6) or both (1). Imaging reports were reviewed to determine whether malignancy and specific histologic diagnosis were suggested by the interpreting radiologist. The radiologic interpretation was then compared to the final pathologic diagnosis. Main outcome measures: The positive and negative predictive values (PPV, NPV) for malignancy was determined for both imaging modalities, as was the correlation between radiologic and specific histopathologic diagnosis. False negative and false positive results were also determined. **Results:** CT correctly identified malignancy in 4 of 6 patients for a PPV of 0.67 and an NPV of 0.81, while MR correctly identified malignancy in 1 of 2 patients (PPV=1, NPV=0.8). The false positive rate for CT was 2/15 (13%) and 0/4 for MRI. Both modalities had high false negative rates (CT 43%, MRI 50%). Specific pathologic diagnosis was correctly predicted in 5 of 6 MRI and 4 of 13 CT studies. **Conclusions:** While CT and MRI may be helpful in defining the size, location and extent of parotid masses, neither are able to reliably predict malignancy when used preoperatively. Although the numbers are small, MRI appears to offer an advantage over CT when suggesting a specific histologic diagnosis.

S88. **A**n Atypical Case of an Ulcerative Lesion of the Nasolabial Skin Leading to Erosion of the Nasal Septum: A Case Report and Literature Review

Brandon L. Prendes, MD, San Francisco, CA; Lisa A. Orloff, MD FACS, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the differential diagnosis for an erosive cutaneous facial lesion and devise a diagnostic approach to these lesions.

Objectives: To present a rare case of an ulcerative nasolabial cutaneous lesion eroding through the anterior nasal septum, and discuss the differential diagnosis for this atypical lesion. **Study Design:** Case report and literature review. **Methods:** A 62 year old woman referred for evaluation of an incidental thyroid nodule was found to have an unrelated, large, ulcerative mass involving her upper right lip and extending into the nasal vault with erosion of the cartilaginous nasal septum. We suspected a malignant cutaneous neoplasm and performed a punch biopsy of this lesion. Over the following 10 months two repeat biopsies were performed, and all three revealed acute and chronic inflammation without evidence of malignancy. **Results:** Over an 11 month period a multidisciplinary effort involving otolaryngology, pathology, radiology, rheumatology, and infectious disease experts at our tertiary referral center have been unable to make a definitive diagnosis for this patient's lesion. Microbiology and pathology studies have been nondefinitive. A mildly positive ANCA level prompted consideration of Wegener's granulomatosis, however this was deemed unlikely given an unusual immunological staining pattern, absence of vasculitis, and complete lack of other disease symptoms. The patient has been empirically treated with high dose corticosteroids, which have resulted in dramatic and ongoing improvements. Our presentation will include radiological imaging and photographic documentation of her lesion's progression. **Conclusions:** While erosive lesions of the head and neck immediately raise concern for cutaneous malignancy, the differential diagnosis should remain broad, and a multidisciplinary approach is useful in targeting diagnostic testing and treatment.

S89. **P**ilomatricoma Masquerading as Metastatic Squamous Cell Carcinoma

Brandon L. Prendes, MD, San Francisco, CA; Gerald T. Kangelaris, MD, San Francisco, CA; Annemeike Van Zante, 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 recognize the spectrum of clinical presentations and pathologic features of pilomatricoma and appreciate the possibilities for misdiagnosis.

Objectives: To present a case of head and neck pilomatricoma mistaken for metastatic squamous cell carcinoma and review the relevant literature. **Study Design:** Case report. **Methods:** We present the clinical course of a 46 year old female who presented to a tertiary care center with a newly identified posterior neck mass. We review the literature pertaining to the spectrum of clinical presentations and pathologic features of pilomatricoma and provide cytopathologic imaging. **Results:** Cytopathologic analysis of a fine needle aspirate performed at our institution was consistent with metastatic squamous cell carcinoma. Thorough head and neck and dermatologic examination and radiographic evaluation with CT, MRI and PET/CT failed to show evidence for primary malignancy. The mass was radiographically characterized as a subcutaneous 0.5 cm occipital mass consistent with a lymph node and displaying a maximum SUV of 2.6. Neck dissection was deferred and panendoscopy and excisional biopsy of the neck mass was performed. Final histopathology revealed pilomatricoma. **Conclusions:** Pilomatricoma is a benign tumor commonly found within the pediatric population. It is typically diagnosed clinically but cytopathologic variability can result in confusion with more aggressive neoplasms. Appreciation of this variability may help prevent unintended and unnecessary invasive procedures as a result of erroneous diagnoses.

S90. **D**etection of Brachial Plexopathy in Robotic Thyroidectomy

Edmund D. Pribitkin, MD*, Philadelphia, PA; Adam J. Luginbuhl, MD, Philadelphia, PA (Presenter); Daniel M. Schwartz, D.ABNM, Philadelphia, PA; Anthony K. Sestokas, D.ABNM, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) realize that continuous intraoperative neuromonitoring (IONM) with transcranial electric motor (tceMEP) and somatosensory evoked potentials (SSEP) has gained universal acceptance as a reliable and sensitive method for detecting and preventing neurological injury during spinal and shoulder surgery, yet has not been described in transaxillary thyroid surgery; and 2) incorporate continuous intraoperative tceMEP and SSEP monitoring to detect emerging brachial plexopathy during robotic transaxillary thyroid surgery.

Objectives: Continuous intraoperative neuromonitoring (IONM) with transcranial electric motor (tceMEP) and somatosensory evoked potentials (SSEP) has gained universal acceptance as a reliable and sensitive method for detecting and preventing neurological injury during spinal and shoulder surgery, yet has not been described in transaxillary thyroid surgery. In addition we identify the physiologic mechanisms that may account for previously reported cases of transient arm paralysis and brachial plexus injury following transaxillary thyroid surgery. **Study Design:** Single patient case report with literature review. **Methods:** Patient underwent robotic transaxillary thyroid surgery with continuous tceMEP and SSEP monitoring of brachial plexus function. We present detailed IONM data depicting the emergence of positional brachial plexopathy during surgery. **Results:** Significant amplitude loss of both IONM modalities identified an evolving positional plexopathy which resolved upon patient repositioning and conversion of the operation to an open procedure. No permanent nerve injury was noted following surgery. **Conclusions:** Given the potential for brachial plexus injury during robotic transaxillary thyroid surgery secondary to arm positioning, we recommend that continuous tceMEP and SSEP monitoring be considered during such procedures.

S91. **Expanded Endonasal Approach to the Infratemporal Fossa: A Radioanatomic Study**

John Drew Prosser, MD, Augusta, GA; Ramon E. Figueroa, MD, Augusta, GA; Ricardo L. Carrau, MD*, Santa Monica, CA; Yew K. Ong, MD, Pittsburgh, PA; C. Arturo Solares, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe and compare varied endonasal approaches to the infratemporal fossa.

Objectives: The operative management of infratemporal skull base lesions is challenging. Expanded endonasal approaches to this area have been described to decrease surgical morbidity. Lateral access can be achieved via a septotomy or by an anteromedial maxillotomy (i.e. Denker's approach). We sought to compare a Denker's approach to a contralateral transseptal approach for access to the infratemporal fossa. **Study Design:** Software enabled CT scan measurements. **Methods:** Axial CT scans obtained with sub-millimeter cuts through the skull base were examined. Scans from patients with maxillofacial fractures, sinonasal tumors, sinonasal polyposis, CSF leaks, or notable rhinosinusitis (defined as inflammatory changes that precluded visualization of skull base anatomy) were excluded. Using Kodak Carestream Image Software (Rochester, NY) calculations were performed on axial images at the level of the sphenoid floor. **Results:** Fifty sides were examined. A medial maxillectomy increased the exposure on average by 18.5 degrees (SD 4.28), when compared to maxillary antrostomy alone. When an ipsilateral Denker's approach was used, and additional 33.5 degrees (SD 4.81) of exposure were obtained ($p < 0.0001$). With a Denker's approach, the entire posterior maxillary wall could be accessed in 54% of cases. In contrast, if a contralateral approach was to be utilized, an anterior septotomy would be required at an average of 1.56 cm from the columella. To access the entire posterior maxillary wall the average anterior maxillotomy would be 1.1cm (SD 0.42). **Conclusions:** The use of an ipsilateral Denker's approach allows for excellent access to the infratemporal fossa without the need for a septotomy, and this radioanatomic study provides objective support for its use.

S92. **Positron Emission Tomography in Patients with Warthin's Tumor(s) of the Parotid**

Christopher H. Rassekh, MD, Philadelphia, PA; Jamey L. Cost, MD, Hickory, NC; Jeffery P. Hogg, MD, Morgantown, WV; Mike K. Hurst, MD, Morgantown, WV; Gary D. Marano, MD, Morgantown, WV; Barbara S. Ducatman, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the reasons for doing PET/CT in a subset of patients who have Warthin's; describe the PET/CT findings in Warthin's tumor; understand how to manage different scenarios in care of patients with cancer and coexistent parotid tumors.

Objectives: 1) Identify patients with Warthin's tumor who underwent PET/CT; and 2) determine the SUV values and PET/CT characteristics of Warthin's tumors in this series of patients. **Study Design:** Single institution retrospective study involving patients who had proven Warthin's tumors over a 5 year period. Patients who had a PET/CT scan done at or near the time of diagnosis of the Warthin's tumor were included. **Methods:** Review of computerized medical records, pathology reports and PET/CT scans of the patients who met study criteria. Patients were evaluated for location and extent of tumor, PET/CT findings (particularly SUV values) and history of tobacco abuse and diagnosis of cancer. **Results:** Six patients with Warthin's tumor who met the criteria for the study had adequate PET/CT images. All six of these patients had a history of smoking tobacco. Four of the patients had bilateral tumors. Three of the patients had malignancy, which prompted the PET/CT, and three had other indications for PET/CT which were approved by third party payors. The SUV values for Warthin's varied from 3.4 to 16.1 in these patients, with an average of 7.8 and these SUV values were higher for Warthin's than for the cancers. **Conclusions:** Warthin's tumor is hypermetabolic on PET. In our series, all of the Warthin's tumors were in the parotid, but extraparotid Warthin's can also exist. Both complicate evaluation of head and neck cancer patients and patients with can-

cers outside the head and neck. Other clinical features, CT and FNA findings can help reinforce the diagnosis of Warthin's and facilitate management.

S93. Diagnosis and Management of an Ethmoidal Ossifying Hemangioma

Aaron K. Remenschneider, MD, Boston, MA; Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, participants will understand the clinical course, methods of diagnosis and surgical management of a rare tumor, the ossifying hemangioma of the ethmoid sinus.

Objectives: Ossifying hemangiomas of the head and neck are rare tumors without established standards for diagnosis and treatment. We describe an ossifying hemangioma of the ethmoid sinus and present the salient features of the evaluation, diagnosis and management. **Study Design:** Case report. **Methods:** Retrospective case review. **Results:** A 48 year old woman presented with a left medial canthus lesion, enlarging over 3 months. She underwent sinus CT demonstrating a speculated, osseous destructive lesion with bony and soft tissue components involving the left nasal bone without intracranial or orbital extension. Endoscopic biopsy under general anesthesia revealed ossifying hemangioma. There was not significant bleeding with the biopsy. One month later she underwent a complete excision using a combined endoscopic and external approach via a small Lynch incision and a sagittal saw to remove the specimen en bloc. Endoscopic exam confirmed complete removal. Preoperative embolization was not required. Immediate recovery was uncomplicated. On 3 year followup there has been no recurrence and excellent cosmesis. **Conclusions:** An osseodestructive lesion of the ethmoid sinuses has a broad differential diagnosis, both benign and malignant. Optimal evaluation includes thorough physical exam with endoscopy and imaging with fine cut contrast CT. Tissue diagnosis prior to definitive therapy is recommended in a controlled setting. Once the diagnosis of ossifying hemangioma is obtained, en bloc surgical resection is the treatment of choice.

S94. Early Postoperative Function after Transoral Robotic Surgery

Jeremy D. Richmon, MD, Baltimore, MD; Nishant Agrawal, MD, Baltimore, MD; Kavita M. Pattani, MD, Orlando, FL; Heather M. Starmer, CCC-SLP, Baltimore, MD; Donna C. Tippet, CCC-SLP, Baltimore, MD; Kim T. Webster, CCC-SLP, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the early postoperative course of patients undergoing transoral robotic surgery.

Objectives: To describe the early postoperative course of patients undergoing transoral robotic surgery (TORS). **Study Design:** Prospective cohort study. **Methods:** Early measures of speech and swallow function were recorded on all patients undergoing TORS on postoperative day 1 and 4 weeks after surgery. **Results:** All patients underwent TORS for oropharyngeal cancers (T1-T4). All patients were extubated on or before POD 2. All patients had intelligible speech postoperatively and did not need to rely on assistive communication devices. No patients required tracheotomies. One patient had a percutaneous gastrostomy tube placed in anticipation of radiation. All patients were discharged home tolerating liquid or soft diets. One patient was readmitted for postoperative dehydration that responded to IV fluids and one patient had a postoperative pneumonia. Neither of these patients required placement of feeding tubes. **Conclusions:** Early postoperative speech and swallow function in patients undergoing TORS for oropharyngeal cancer is excellent with early return to intake and intelligible speech.

S95. Intraoperative Tumor Localization with Surgeon Performed Ultrasound Guided Needle Dye Injection

William R. Ryan, MD, San Francisco, CA; Lisa A. Orloff, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the technique and advantages of intraoperative tumor localization with surgeon performed ultrasound guided needle dye injection.

Objectives: To describe our technique and initial experience of intraoperative tumor localization with surgeon performed ultrasound guided needle dye injection. **Study Design:** Prospective case series. **Technique description. Methods:** Using surgeon performed ultrasonography (SP-US) in the operating room prior to incision, 10 tumors were localized (6 lymph node metastases from papillary thyroid carcinoma, 2 metastases of Hurthle cell carcinoma, 1 parathyroid adenoma, and 1 lymph node with lymphoma) in 6 patients. 0.1 ml of 1% methylene blue dye was injected by ultrasound guidance into each targeted tumor. After the injection, the blue color contrast with the surrounding tissue helped guide the dissection and facilitate identification. 6/10 (60%) of dissections were revision cases through scar. We expect to perform additional injections in the coming months. **Results:** Using SP-US and US guided injection with blue dye, 10/10 (100% of cases were successful in retrieving the target tumor with no resulting nerve injury (nerves at risk: recurrent laryngeal (6), marginal mandibular (2), lingual (2), hypoglossal (2), phrenic (2), brachial plexus (2), and vagus (2)). Dye injection technique adds 5-10 minutes of time prior to incision but appeared to increase visual differentiation of tissue and save time during dissection particularly during revision dissections, as well as ensuring successful target retrieval. Injection into a parathyroid adenoma resulted in an overabundance of blue dye in non-tumor tissue. **Conclusions:** Surgeon performed ultrasound guided needle dye injection is particularly helpful in directing the surgeon to the appropriate area for tumor resection in fibrotic areas and thereby possibly reducing surgical time, sampling error, and morbidity. A lower concentration or a different dye may be more helpful for parathyroid adenomas. Further study on this technique is needed and is under way with a larger group of patients.

S96. Use of End to End Anastomosis (EEA) Device for Inferior Anastomosis of Jejunal Interposition Free

Flaps for Total Laryngopharyngectomy (TLP) Defects

Daniel S. Schneider, MD, Portland, OR; Mark K. Wax, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the technical aspects and potential benefits of using an end to end anastomosis device for the inferior anastomosis of jejunal interposition free flaps for total laryngopharyngectomy defects.

Objectives: To demonstrate the technical feasibility and potential benefits of using EEA device at the inferior anastomosis for jejunal interposition free flaps for TLP defects. Additional objective was to determine the fistula and stricture rate for patients that underwent EEA device compared to patients that underwent TLP where jejunum was handsewn. **Study Design:** Retrospective case review.

Methods: Retrospective review of EEA device used for the inferior anastomosis of interposition jejunal free flaps for TLP defects with comparison to 20 jejunal free flaps where all anastomoses were handsewn. **Results:** From 1999 to 2010, 33 patients underwent TLP. 13 had jejunal interposition free flap with EEA device for inferior (jejunal-esophageal) anastomosis while 20 patients had jejunal interposition free flap with handsewn superior and inferior anastomoses. In the EEA group, 0/13 fistulas were observed from the inferior EEA anastomosis while 3/13 fistulas occurred at the superior anastomosis. In the handsewn group, 2/20 patients exhibited fistula (1 superior and 1 inferior). Stricture was identified in 3/13 EEA patients at the inferior anastomosis which required subsequent dilation to assist with oral intake compared to 2/20 patients in handsewn group. **Conclusions:** Use of end to end anastomosis (EEA) device appears to be a safe and effective technique for the inferior anastomosis of jejunal interposition free flaps for TLP defects with a comparable fistula and stricture rate compared to grafts that are handsewn.

S97. **Surgical Management of a Massive Occipital and Posterior Cervical Melanoma**

Andrew G. Shuman, MD, Ann Arbor, MI; Andrew D. Kroeker, MD, Ann Arbor, MI; Timothy M. Johnson, MD, Ann Arbor, MI; Scott A. McLean, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the principles of surgical extirpation and reconstruction of difficult to treat, locally advanced melanoma of the head and neck.

Objectives: To discuss the principles of surgical extirpation and reconstruction of a difficult to treat, locally advanced melanoma of the head and neck. **Study Design:** Case report with review of medical literature. **Methods:** A 55 year old man with a history of posterior neck melanoma presented with a massive, 20 cm x 12 cm ulcerated tumor of the posterior neck and occiput, contaminated by myiasis and extensively involving the outer cortex of the calvarium and the posterior neck soft tissue down to the periosteum of the cervical spinal column. There was no evidence of distant metastatic disease. **Results:** The patient underwent radical resection of the tumor, including skin, soft tissue and muscle, and the outer cortex of the occipital calvarium and skull base, concurrent with bilateral occipital and level V nodal dissection. Pathology revealed extensively recurrent melanoma. The defect was closed with a local advancement flap from the upper back, coupled with vacuum assisted closure device, and subsequent placement of Integra bilayer wound matrix and split thickness skin autografting. **Conclusions:** Locally recurrent melanoma is managed primarily with surgical extirpation. In cases of massive locoregional disease, surgical excision may be beneficial for symptomatic palliation even in the face of a poor prognosis. We discuss the successful removal and reconstruction of a massive melanoma of the head and neck utilizing a combination of wound management strategies to achieve sufficient soft tissue closure.

S98. **Primary versus Delayed Tracheoesophageal Puncture in Patients with Free Flap Reconstruction of Laryngopharyngectomy Defects**

Catherine F. Sinclair, MBBS FRACS, Birmingham, AL; William R. Carroll, MD, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL; Nancy L. McColloch, MS CCC-SLP, Birmingham, AL; J. Scott Magnuson, MD*, Birmingham, AL; Glenn E. Peters, MD*, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the use of primary versus secondary tracheoesophageal puncture (TEP) in patients reconstructed with free tissue transfer after laryngopharyngectomy. Complication rates between primary and secondary TEPs will be compared and predictive factors for TEP failure discussed. Speech outcomes including quality of life measures will be presented. To our knowledge, this is the first comparison of primary and secondary TEP outcomes in this patient population.

Objectives: To assess postoperative complication rates and speech outcomes for patients undergoing primary versus secondary tracheoesophageal puncture (TEP) following free flap reconstruction of total laryngectomy defects. **Study Design:** Retrospective clinical study in a tertiary hospital. **Methods:** Between November 2004 and June 2010, 137 patients underwent a total laryngectomy (TL) or laryngopharyngectomy with pharyngeal free flap reconstruction for malignant disease. Data was collected on patient and operative demographics, postoperative complications, timing of TEP (primary or delayed), TEP speech outcomes, and predictive factors for TEP failure. **Results:** Thirty patients (22%) had a primary TEP performed at the time of TL, 27 patients (20%) received delayed punctures (>3 months post TL), and 80 patients (58%) never received a TEP. Patient and operative demographics were similar between groups ($p>0.05$), apart from the comorbidity of diabetes mellitus which occurred more frequently in primary TEP patients ($p=0.01$). In all groups, the majority of patients underwent salvage TL for recurrent carcinoma post-organ preservation protocols (76%). Complication rates after salvage versus primary TL were similar ($p=0.14$). Most patients received patch radial forearm free flap (RFFF) reconstruction (82%) with comparable distribution of flap types amongst groups. Similar numbers of patients in primary and secondary TEP groups achieved func-

tional speech (68% vs 71%, $p=0.82$). There was a trend toward less postoperative complications (27% vs 46%) in patients who underwent patch RFFF compared with other free flap types ($p=0.22$). **Conclusions:** Primary tracheoesophageal puncture in patients with free flap reconstruction of total laryngectomy defects is safe and effective. Reconstruction with radial forearm patch free flaps achieves good TEP speech outcomes and may be associated with lower complication rates than other forms of free flap reconstruction.

S99. **The Orbitocranial Approach for Treatment of Adenoid Cystic Carcinoma of the Lacrimal Gland**

Matthew E. Spector, MD, Ann Arbor, MI; Kevin F. Wilson, MD, Salt Lake City, UT; P. Daniel Ward, MD, Salt Lake City, UT; Lawrence J. Marentette, MD, Ann Arbor, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that the orbitocranial approach to adenoid cystic carcinoma of the lacrimal gland achieves excellent local and regional control rates, though patients remain at risk long term for distant metastases.

Objectives: Analysis of outcomes in a cohort of patients with adenoid cystic carcinoma of the lacrimal gland treated identically with an orbitocranial approach. **Study Design:** Retrospective review. **Methods:** Retrospective review of seven consecutive patients presenting to a tertiary care academic medical center with adenoid cystic carcinoma of the lacrimal gland from 1995 to 2009. **Results:** The mean and median followup times were 39 and 19 months, respectively (range, 7 to 138 months). Six patients had orbital reconstruction using free tissue transfer and one patient had a split thickness skin graft to line the orbital cavity. Two patients developed distant metastasis at 18 and 29 months after surgery and ultimately died with disease. Five patients are alive without disease. **Conclusions:** The orbitocranial approach achieves excellent local and regional control rates for adenoid cystic carcinoma of the lacrimal gland, though patients remain at risk long term for distant metastases. Orbital bone removal for adequate margins should be a routine part of tumor resection for these malignancies.

S100. **Pretreatment Swallowing Assessment in Head and Neck Cancer Patients**

Heather M. Starmer, MA, Baltimore, MD; Christine G. Gourin, MD*, Baltimore, MD; Lannah L. Lua, BS, Baltimore, MD; Lori M. Burkhead, PhD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss patient characteristics associated with poorer pretreatment swallowing abilities.

Objectives: To discuss patient variables associated with swallowing dysfunction in head and neck cancer (HNCA) patients prior to intervention. **Study Design:** Retrospective, multi-institutional cohort study. **Methods:** All patients included had newly diagnosed head and neck malignancies. Patients undergoing instrumental swallowing evaluations (FEES or MBS) prior to oncologic management were included for analysis. Pretreatment penetration aspiration scores (PAS) were analyzed by primary tumor site, tumor stage, and standard demographic variables. **Results:** The final study sample was comprised of 138 individuals with newly diagnosed HNCA. Patients with advanced primary tumor (T) stage laryngeal/hypopharyngeal tumors had higher mean PAS scores (4.90) in contrast to early stage larynx/hypopharynx (1.97), advanced stage oral cavity/oropharynx (2.45), and early stage oral cavity/oropharynx (1.55, $P<0.0001$), indicative of poorer function. Age, race, and sex were not associated with PAS scores. Multivariate logistic regression revealed significantly poorer PAS scores in patients with advanced primary tumors ($OR=3.99$, $P<0.0001$) and laryngeal/hypopharyngeal primary site disease ($OR=2.35$, $P=.032$), after controlling for all other variables. **Conclusions:** Patients with advanced T stage and laryngeal/hypopharyngeal primaries are at increased risk for dysphagia after chemoradiotherapy. This series demonstrates that swallowing dysfunction in high risk patients may be present in the pretreatment state and should be considered when determining candidacy for organ preservation modalities. These data highlight the importance of instrumental swallowing evaluations prior to intervention, particularly for those individuals with advanced stage and/or laryngeal/hypopharyngeal tumors.

S101. **The Effect of a Coordinated Multidisciplinary Head and Neck Cancer Clinical Model on Compliance with Speech Pathology Treatment**

Heather M. Starmer, MA, Baltimore, MD; Giuseppe Sanguineti, MD, Baltimore, MD; Shanthi Marur, MD, Baltimore, MD; Christine G. Gourin, MD*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to identify factors which impact patient compliance with speech language pathology (SLP) treatment during head and neck cancer management.

Objectives: Determine the effect of referral patterns on compliance with scheduled speech language pathology (SLP) treatment in patients with head and neck cancer (HNCA). **Study Design:** Retrospective cohort study. **Methods:** Patients with newly diagnosed oropharyngeal HNCA referred for pretreatment SLP evaluation comprised the study population. Compliance was measured by participation in SLP therapy during and after head and neck treatment, as well as by the number of missed and completed visits. Outcomes were compared between patients who were initially evaluated through the multidisciplinary head and neck clinic and those evaluated outside of the multidisciplinary clinic format. **Results:** The final study sample included 118 individuals with oropharyngeal primary tumors. All patients were treated with primary radiotherapy with or without chemotherapy. Patients evaluated initially through the multidisciplinary clinic had more SLP visits than those who did not participate in the multidisciplinary clinic (mean, 1.8 versus 0.2, $P<0.0001$). Participation in SLP treatment was significantly greater for patients ≥ 60 years of age ($OR=2.4$, $P=0.032$) and for patients who participated in the multidisciplinary clinic ($OR=19.3$, $P<0.0001$). Tumor stage, sex, race, marital status, and insurance status were not associ-

ated with patient compliance. Multivariate analysis revealed that participation in a multidisciplinary clinic was the only significant variable associated with SLP treatment compliance (OR= 12.9, $p < .0001$), after controlling for all other variables. **Conclusions:** Patients evaluated by a multidisciplinary clinic are more likely to comply with treatment recommendations, regardless of other factors. Compliance with SLP care may impact long term function and quality of life, and therefore, compliance is of paramount importance.

S102. **EGFR Expression in Recurrent Head and Neck Cutaneous Squamous Cell Carcinoma and Its Correlation with Survival**

Larissa Sweeny, MD, Birmingham, AL; Nichole R. Dean, DO, Birmingham, AL; J. Scott Magnuson, MD*, Birmingham, AL; William R. Carroll, MD, Birmingham, AL; Renee L. Desmond, PhD DVM, Birmingham, AL; Eben L. Rosenthal, MD*, Birmingham, AL

Educational Objective: Understand the role of epidermal growth factor receptor (EGFR) expression in predicting survival in cutaneous squamous cell carcinoma (SCC) and implications for anti-EGFR therapy.

Objectives: The significance of EGFR expression in advanced cutaneous SCC of the head and neck remains poorly understood. Despite limited data, anti-EGFR has been proposed for the treatment of aggressive cutaneous SCC. **Study Design:** Retrospective cohort study. **Methods:** Patients who underwent surgical resection for advanced stage (stage III or IV) cutaneous squamous cell carcinoma of the head and neck between 1998 and 2006 ($n = 56$) were included. EGFR expression was assessed by immunohistochemical (IHC) analysis of archived tumor samples and correlations were made with survival and disease stage. **Results:** The average age was 72 and 86% of patients were male. Most patients were diagnosed with stage III (91%) disease, with 46% having positive nodal metastasis and 9% with distant metastasis. The overall 2 and 5 year disease free survival was 57% and 42%, respectively. Immunohistochemical analysis demonstrated EGFR was overexpressed on the membrane (57%) or within the cytoplasm (91%) of tumors. EGFR expression was not associated with an increase in regional or distant metastasis ($p = 0.74$ and $p = 0.56$, respectively). Importantly, no correlation was observed between EGFR expression and survival ($p = 0.56$). **Conclusions:** Unlike mucosal SCC, this data does not suggest a correlation of EGFR expression with survival and does not support the use of anti-EGFR based therapies in this patient population.

S103. **Lymphoepithelial Carcinomystery: A Curious Case of a Rare Parotid Tumor**

Christopher G. Tang, MD, Oakland, CA; Shivan Amin, MD, Oakland, CA; Thomas M. Schmidtkecht, MD, Oakland, CA; Luke J. Schloegel, MD, Oakland, CA; Grace Y. Tang, San Jose, CA; Barry M. Rasgon, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to diagnose lymphoepithelial carcinoma of the parotid gland based on both clinical and immunohistopathological data.

Objectives: To review the histopathology, presentation, and clinical course of a rare case of lymphoepithelial carcinoma (LEC) of the parotid gland. **Study Design:** Case presentation. **Methods:** Review of histopathology slides with various immunochemical stains of a resected parotid tumor and level IIa lymph nodes, as well as review of literature on lymphoepithelial carcinoma. **Results:** A 29 year old female presents from an outside hospital with a 10 month history of an enlarging left facial mass. Workup included a fine needle aspirate (FNA) suggestive of a poorly differentiated neoplasm with spindle cell and epithelioid features and a computed tomography (CT) scan revealing a 4.1 x 2.9 x 3.7 cm mass in the superficial lobe of the left parotid with left cervical lymphadenopathy. The patient received a total left parotidectomy and a selective neck dissection. Histopathological slides reveal LEC positive for cytokeratin, and Epstein-Bar virus (EBV). **Conclusions:** LEC of the parotid is a rare salivary gland tumor accounting for less than 1% of all salivary gland tumors. As reaffirmed in our case, LEC is more common in women, primarily occurs in the parotid gland, and has an ethnic predilection. Histology reveals an infiltrative poorly differentiated tumor nestled in a lymphoid stroma with near 100% EBV positivity in endemic areas. Complete resection of this poorly differentiated carcinoma is essential for local control, and patients often need postoperative chemoradiation.

S104. **Poor Man's Telemedicine: Exploiting Technology in the iPhone Era**

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

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the concept behind telemedicine and its possible benefits for both head and neck surgeons and their patients.

Objectives: Sophisticated patients are increasingly seeking expertise at centers of excellence and are willing to travel greater distances to receive care. The opportunity and convenience for brief followup visits to evaluate simple perioperative issues may therefore be limited. We sought to describe a simple and effective method of remotely evaluating patient conditions using widely available technology. **Study Design:** Planned analysis of a prospectively maintained database was undertaken after IRB approval. **Methods:** Demographic data were obtained and analyzed with attention to age, gender, procedure, postoperative issue of concern, distance from the physician, and resolution of the issue. **Results:** From a single surgeon series of more than 1000 consecutive thyroidectomies and parathyroidectomies, 25 patients with a mean age of 46.8 (range 25 to 70) were identified in which contact was made with the surgeon about an issue of concern. Mean distance between the patient and the surgeon was 1040 miles (range 55 to 4953 miles). Electronic communication of photographic data (all in JPEG format, by either cell phone camera or digital camera) led to a prompt disposition of

the patient; in the majority of cases (21 of 25, 84%) this consisted of reassurance. In 3 patients, antibiotics were initiated and one patient was instructed to go to an ER for prompt drainage of an infected wound. **Conclusions:** Cautious utilization of modern communication technology may lead to substantial convenience for both the patient and the doctor. While there are a number of important legal and privacy considerations, simplified telemedicine is expected to be common in the future.

S105. **R**obotic Facelift Thyroidectomy—A Safer, Easier and Faster Approach

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

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the advantages of a facelift approach to the performance of robotic thyroidectomy.

Objectives: Robotic thyroidectomy was approved in the United States in July of 2009. It has been accomplished by an axillary route with a breast port, and has been associated with a number of dramatic complications including esophageal transection, brachial plexopathy, and massive blood loss. We introduce an access method that is less dangerous, easier to perform, and more direct than an axillary approach. **Study Design:** Planned analysis of a prospectively maintained database with IRB approval. **Methods:** A facelift approach to the thyroid compartment is described with video documentation in a series of patients. Demographic and surgical data were obtained and analyzed with attention to age, gender, pathology, and complications. **Results:** Numerous advantages of the facelift approach over the axillary approach are apparent. These include: easier positioning (without the risk of brachial plexopathy), shorter distance to the thyroid bed (which also allows use of nerve stimulation), no chest wall numbness, clavicle is not obstructing, carotid sheath at much lower risk of injury. The facelift access is easier to master and represents a familiar vector of approach. This resulted in a reduction of mean robotic docking time from 92 to 53 minutes. **Conclusions:** Robotic axillary thyroidectomy has been introduced in the United States with sometimes disastrous results. We describe a safer and easier technique that involves a facelift incision and therefore maintains the advantages of no neck incision, but without the increased risks associated with an axillary approach.

S106. **H**istological Assessment of Cervical Lymph Nodes Provides Prognostic Information for Head and Neck Squamous Cell Carcinoma (HNSCC) and Identifies High Risk Patients Most Likely to Benefit from Surgery Plus Chemoradiotherapy (CRT)

Xiao C. Wan, BS, Pittsburgh, PA; Ann Marie Egloff, PhD MPH, Pittsburgh, PA; Jonas T. Johnson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the relationship between histological cervical nodal status and survival outcome of HNSCC patients; and 2) compare the survival outcome of surgery plus CRT with that of surgery plus radiation or surgery alone in high risk patients that were identified via cervical nodal status.

Objectives: To determine whether the number of positive cervical lymph nodes and/or presence of extracapsular spread (ECS) were prognostic indicators for survival or treatment response. **Study Design:** Cancer registry analysis. **Methods:** HNSCC surgical patients who had tumor resection and neck dissection at our institution from 1980 through 2007 were included in this retrospective study (n=1534). Cases were categorized according to number of positive cervical nodes (no positive nodes (n=719), 1-2 positive nodes (n=459) or 3+ positive nodes (n=351)) and by ECS status as negative (n=1048) or positive (n=415). Differences in disease free survival (DFS) and overall survival (OS) were assessed using Kaplan-Meier and log-rank tests. **Results:** When stratified by ECS status, DFS and OS were significantly reduced with increasing number of positive nodes (both $P < 0.001$). When stratified by node category, presence of ECS tended to be associated with shorter DFS and OS for 1-2 nodes ($p=0.168$ and $p=0.057$, respectively) and for 3+ nodes ($p=0.050$, $p=0.071$ respectively). In contrast to patients who were ECS negative, patients with ECS had statistically significant disease free and overall survival benefit with surgery plus CRT compared to surgery alone ($p=0.001$ and $p < 0.001$ respectively) and compared to surgery plus radiation ($p=0.007$ and $p < 0.001$, respectively). **Conclusions:** The number of cervical nodal metastases was a prognostic indicator independent of ECS status. ECS positive patients demonstrated improved survival when treated with surgery plus CRT compared to surgery alone or surgery plus radiotherapy. Consideration for positive cervical node number and ECS status can provide insight regarding prognosis and help guide treatment selection.

S107. **P**hosphaturic Mesenchymal Tumor—Mixed Connective Tissue Variant in the Parotid Gland: Report of a Case and Discussion of Cytologic Findings

Ryan D. Winters, MD, New Orleans, LA; Abdelmonem Elhosseiny, MD, Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the cytologic findings of phosphaturic mesenchymal tumor—mixed connective tissue variant as observed in the head and neck.

Objectives: To present the first cytologic description of phosphaturic mesenchymal tumor—mixed connective tissue variant in the head and neck. **Study Design:** Case report. **Methods:** Radiology, pathology and clinical findings of the first report of phosphaturic mesenchymal tumor—mixed connective tissue variant of the parotid are discussed. **Results:** The first report of the cytologic and histologic characteristics of phosphaturic mesenchymal tumor—mixed connective tissue variant of the parotid are described. The paraneoplastic syndrome of oncogenic osteomalacia is also described. **Conclusions:** Fine needle aspiration is often one of the first diagnostic tests performed in the evaluation of a new mass in the parotid area and many other areas within the head and neck. Precise diagnosis of spindle-cell lesions based on fine needle aspirate is extremely challenging, and maintaining a broad cytologic differential diagnosis is

paramount. We report the cytologic findings of phosphaturic mesenchymal tumor—mixed connective tissue variant, presenting as an asymptomatic parotid mass. To our knowledge, this represents the first cytologic description within the head and neck literature.

S108. **F**acial Nerve and Mimetic Muscle Composite Mobilization as an Adjunct to Open Skull Base Surgery

Adam M. Zanation, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the composite facial muscle and nerve transfer to maximize tumor exposure and minimize functional outcomes during skull base tumor surgery.

Objectives: Skull base tumor surgery has evolved to provide maximal access to difficult to reach places often requiring a combination of transfacial and transcranial approaches. The primary goal of skull base surgery is tumor removal; however, we should always strive to advance and consider the possible postoperative functional outcomes. The goal of this presentation is to illustrate and discuss the mobilization of the facial nerve and mimetic muscle composite unit during skull base surgical approaches. **Study Design:** Case series and anatomic review. **Methods:** A retrospective case series and anatomic review and illustrations of techniques and outcomes with composite facial nerve and muscle mobilization. **Results:** The facial composite unit mobilization can be divided into lower, midface and upper facial nerve divisions. Each of these anatomic approaches is discussed in seven patients. A novel periocular composite mobilization is shown as an adjunction during facial translocation approaches. In all seven cases, the composite unit remained functional postoperatively. **Conclusions:** Open skull base surgery is a balance between maximal exposure and potential postoperative deficits. Facial nerve and mimetic muscle composite transfer can optimize both of these goals.

Laryngology-Bronchoesophagology

S109. **A** Review of the Diagnosis and Management of Reflux Disease: Toward Creating a Clinical Protocol for the Otolaryngologist

Kenneth W. Altman, MD PhD*, New York, NY; Neil L. Prufer, MD, New York, NY (Presenter); Michael F. Vaezi, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate knowledge of the most recent clinical practice guidelines for reflux disease, be aware of the controversies, and be able to incorporate these into their clinical practice.

Objectives: Reflux disease, including gastroesophageal reflux disease (GERD) and laryngopharyngeal reflux (LPR), is an extremely common condition which is diagnosed and treated routinely in an otolaryngology practice. There is great variability in the methods of both diagnosis and treatment amongst otolaryngologists. Our aim is to review current clinical practice guidelines on reflux disease, to identify areas of agreement and of controversy, and to begin to work toward a clinical protocol for reflux disease for the otolaryngologist. **Study Design:** Literature review with discussion. **Methods:** A PubMed search was performed looking for clinical practice guidelines on either GERD or LPR. 570 articles were identified and the most clinically relevant practice guidelines were selected. **Results:** 13 key articles were identified. 11 of these come from the gastroenterology literature, and none of them come from the otolaryngology literature. There appears to be a consensus on empiric medication trial as first line therapy for presumed uncomplicated GERD and on prioritizing early identification of patients with severe disease complications. Areas of controversy include the definition of GERD and LPR, which diagnostic algorithm to use in which patient, and the long term management of medical therapy. **Conclusions:** While there are many clinical aspects of reflux disease that still remain a mystery, there is enough literature to support a rudimentary clinical protocol at this time. As further data become available from outcomes measurements, such a protocol may result in improved quality and standardization.

S110. **WITHDRAWN**--Recurrence of a Hypopharyngeal, Spindle Cell Lipoma as a Low Grade Liposarcoma

Erik V. Berg, MD, Boston, MA; Pamela D. Dana, MD, Brockton, MA; Nitin Bhatia, MD, Boston, MA; Arnold S. Lee, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to: 1) understand the incidence and presentation of hypopharyngeal liposarcoma; 2) understand the rarity of conversion from spindle cell lipoma to liposarcoma; and 3) Discuss management options for hypopharyngeal liposarcoma.

Objectives: 1. Understand the incidence and presentation of hypopharyngeal liposarcoma; 2) understand the rarity of conversion from spindle cell lipoma to liposarcoma; and 3) discuss management options for hypopharyngeal liposarcoma. **Study Design:** Case report. **Methods:** Case presentation of a 52 year old male, with previous history of hypopharyngeal spindle cell lipoma removed endoscopically followed by, years later, neck radiation for a squamous cell carcinoma of unknown primary, presented with recurrence of symptoms. He underwent a second endoscopic procedure with resection of hypopharyngeal mass. The final pathology was low grade liposarcoma. **Results:** Liposarcoma is rare in the hypopharynx. Conversion of spindle cell lipoma to liposarcomas is controversial in pathology literature based on histologic criteria. Management of low grade liposarcoma can be managed with excision and observation if nonaggressive operative features and low grade histology. **Conclusions:** Hypopharyngeal lipomas and liposarcomas present in similar manner with main symptoms of dysphagia and when attached post-arytenoid region, hoarseness. Conversion of spindle cell lipoma to liposarcoma is controversial based on histologic criteria. Management depends on histologic grade and observed aggressive features.

S111. Endoscopic Staple Assisted Zenker's Diverticulostomy with Esophageal Dilatation: A Novel Approach for Anatomically Challenging Patients

John J. Chi, MD, Philadelphia, PA; Michael L. Kochman, MD, Philadelphia, PA; Erica R. Thaler, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to apply a novel endoscopic approach for the treatment of Zenker's diverticulum in anatomically challenging patients.

Objectives: To describe a novel endoscopic approach for the treatment of Zenker's diverticulum in anatomically challenging patients.

Study Design: A retrospective study of patients who underwent endoscopic staple assisted Zenker's diverticulostomy at an urban tertiary care center. **Methods:** We review a novel approach to the endoscopic treatment of Zenker's diverticulum and concomitant esophageal stricture. Proper endoscopic exposure was not possible in these patients without first addressing the esophageal stricture due to inability to properly seat the endoscopic stapler within the esophageal lumen. In each case, a two team approach was implemented. First, the gastroenterologist performed the esophageal dilatation then the otolaryngologist performed the endoscopic staple assisted diverticulostomy. **Results:** Three patients were surgically treated for Zenker's diverticulum with esophageal dilatation followed by endoscopic staple assisted esophagodiverticulostomy from April 2005 to August 2009. All patients were women with ages ranging from 86 to 89 years. All patients had a preoperative barium esophagram. Preoperative symptoms included dysphagia, aspiration, and regurgitation. There were no immediate postoperative complications related to the procedure. All patients resumed an oral diet within the first 24 hours after surgery and were discharged home on postoperative day one. **Conclusions:** The results of this study suggest that esophageal dilatation followed by ESED is a safe and effective method of surgically correcting Zenker's diverticulum with concomitant esophageal stricture. This study suggests that those patients who previously were not endoscopic treatment candidates due to inability to engage the endoscopic stapler may now be candidates for endoscopic treatment. Since this procedure involves the intervention of both an otolaryngologist and gastroenterologist, appropriate counseling before the procedure is important. Additionally, the potential need for an open approach should be discussed preoperatively. Further studies with longer periods of followup are warranted to evaluate the long term complications, relapse rate and cost efficacy of this approach.

S112. Adductor Spasmodic Dysphonia—Changes in Dosing after Prolonged Injections

Nina Chinosornvatana, MD, New York, NY; Melin Tan, MD, New York, NY; Peak Woo, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the use of botulinum toxin therapy in the treatment of adductor spasmodic dysphonia, and describe expected changes in duration of effect, dosing effects and administration technique over time.

Objectives: Botulinum toxin therapy (BTX) for adductor spasmodic dysphonia (ADSD) requires reinjection. The dosing effects after prolonged treatment are not well reported. We report our ten year experience in the utilization of BTX in ADSD. **Study Design:** Retrospective chart review. **Methods:** From a database of 182 ADSD patients from 1997-2008 treated with BTX, we pulled a subset of 87 patients receiving BTX for greater than 3 visits (average 10.27 visits, range 3-40). We analyzed duration of effect, dosing effects and changes in administration technique. **Results:** This study group was predominantly female (3:1), presenting at mean age 60. All BTX was administered with laryngeal electromyographic guidance. The average starting dose was 2.28 units (range 1.25-3.75). The average dose per injection was 2.15 units (range 0.25-12.5) with an average time interval of 5.6 months between visits. Patients reached a stable dosing regimen at an average of 1.34 months, with 75% optimized after the first visit. There was a trend towards increased average dosage for patients during their 15th treatment visit and up ($p=0.14$), with increased variation in effect (SD 0.95 vs 1.36). Average time interval between visits tended to decrease over time. Patients who began treatment at older ages in the 6th and 7th decade tended to require decreasing dosages over time. 10 out of 87 patients progressed to unilateral injections after an average of 12.5 treatment visits, with 70% efficacy. **Conclusions:** Botulinum therapy in ADSD is stable and safe. Prolonged treatment over 15 visits may require changes in dosing and technique. Unilateral injections provide an effective alternative to bilateral injection.

S113. Gardasil Immunization Effects on Laryngeal Papillomatosis: A Preliminary Study

Herbert H. Dedo, MD*, San Francisco, CA; Krzysztof Izdebski, PhD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to learn about the adjuvant use of Gardasil vaccination in the treatment of recurring laryngeal papillomatosis in adult population treated primarily by meticulous CO2 laser removal every two months. At the conclusion of this presentation, the participants should be able to evaluate the proposed efficacy of Gardasil treatment for laryngeal papillomatosis.

Objectives: Effects of Gardasil immunization on recurrent laryngeal papillomatosis. **Study Design:** Clinical evaluation via laryngovideostroboscopy of 18 consecutive consenting adult patients (12 males and 6 females) with recurrent laryngeal papillomatosis (HPV Types 6 and 11) treated by CO2 laser removal with post-treatment Gardasil immunizations spread over 6 months. Each Gardasil patient served as his/her own control. **Methods:** Clinical exam using laryngovideostroboscopic visualization and acoustics throughout the course of the entire treatment at doubling intervals, 2, 4, and 8 months and then yearly. **Results:** Of the 18 patients studied, 14 were positive for papilloma at the time of the third injection, while four patients were negative. Of the 18 total patients, eight (two females and six males) were negative at the last followup (28-38 months after the third injection). Of these eight patients, one was negative for 84

months in total and continued to be negative for 31 months after the third injection, and one was negative for 32 months after the third injection. Of the remaining 6 negatives one was negative for 8 months, one for 9 months, one for 20 months, one for 26 months, one for 27 months and one for 35 months after the third injection. **Conclusions:** Our data suggests some benefits from Gardasil vaccination in adult patients with chronic laryngeal papillomatosis. No side effects were encountered by any of the 18 cases, and gender specificity was absent in the outcomes, a larger study focused on longer followup and a vaccine designed for papovavirus type 6 and 11 is encouraged.

S114. **Laryngeal Melanosis: Case Series and Review of Literature**

Lauren A. Hansen-Welches, MD, Indianapolis, IN; Charles W. Yates, MD MS, Indianapolis, IN; Stacey L. Halum, MD, Indianapolis, IN; Susan R. Cordes, MD FACS, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to explain what laryngeal melanosis is and recognize the possible association between laryngeal melanosis and concomitant squamous cell carcinoma.

Objectives: The objectives are to explain the rare disorder that is laryngeal melanosis and to make clinicians aware of the possible association between laryngeal melanosis and concomitant squamous cell carcinoma. **Study Design:** Retrospective study. **Methods:** Demographics, history, and examination findings were reviewed from all patients who presented to our institution between 1995 and 2010 with examination and histopathology consistent with laryngeal melanosis. Medline and Ovid searches were then performed to identify all previous case reports of laryngeal melanosis available in the literature to date. **Results:** Eleven patients were identified with laryngeal melanosis at our institution. All patients were African American and all had a history of chronic tobacco use. The most common presenting symptom was throat pain, and examination most often (n=9) revealed flat, hyperpigmented lesions of the supraglottis. Seven patients (60%) had concomitant squamous cell carcinoma (SCC) at adjacent sites (base of tongue, aryepiglottic fold, epiglottis, supraglottis, tonsil, and TVC carcinoma in situ). Upon review of the literature, seventeen previous cases of laryngeal melanosis have been reported by 10 different authors. Overall, previous case reports had similar clinical presentation and reported concomitant squamous cell carcinoma at a rate of 30%. **Conclusions:** Based on our series and review of the literature, laryngeal melanosis is a rare disorder that is associated with chronic tobacco use. Most notably, clinicians should be aware of the possible association between laryngeal melanosis and concomitant squamous cell carcinoma.

S115. **Mucous Membrane Plasmacytosis of the Larynx: A Case Report and Review of the Literature**

Jonathan P. Hayes, MD, Jackson, MS; Christine B. Franzese, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize mucous membrane plasmacytosis of the upper aerodigestive tract as a rare disorder with an often unknown etiology that can be challenging to treat.

Objectives: To report a rare mucosal plasmacytosis of the larynx and discuss treatment options. **Study Design:** Case report and review of literature. **Methods:** We report the case of a 49 year old male who presented with new onset dysphonia and dyspnea. Flexible fiberoptic laryngoscopy revealed supraglottic and glottic laryngeal edema with a verrucous appearance. Biopsy of the lesion showed hyperplastic mucosa with severe chronic inflammation composed mainly of plasma cells. **Results:** Studies to evaluate for plasma cell dyscrasia including protein electrophoresis and free light chains were all normal. A diagnosis of idiopathic mucous membrane plasmacytosis was made. Treatment with systemic steroids and intralesional steroid injection provided temporary improvement in symptoms but no resolution of the lesion. **Conclusions:** Mucous membrane plasmacytosis is a rare, benign, plasma cell proliferative disorder with an unknown etiology. It is a diagnosis of exclusion as there are similar conditions such as extramedullary plasmacytoma which can affect the upper aerodigestive tract. The condition is generally of longstanding duration and management is typically targeted at symptomatic relief.

S116. **Pseudomonas Aeruginosa Chondritis of Laryngeal Cartilage with Recurrent Airway Obstruction**

Andreas Kaden, MD, Indianapolis, IN; Stacey L. Halum, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss recurrent obstructive granulomatous lesions of the larynx due to chronic pseudomonas aeruginosa chondritis.

Objectives: Chronic inflammatory pathology such as laryngopharyngeal reflux, autoimmune disease, vocal abuse, or post-traumatic cartilage exposure have been associated with recurrent laryngeal granuloma formation. The objective of this study is to present a case of recurrent, obstructive granulomatous lesions of the larynx due to chronic pseudomonas aeruginosa chondritis, which has not been previously described in the literature. **Study Design:** Case report with review of the literature. **Methods:** Case report with review of the literature. **Results:** This is a case of a previously healthy 51 year old woman with no history of laryngeal trauma who presented with recurrent airway obstruction from glottic and infraglottic granulomatous lesions. At an outside institution, she had undergone tracheotomy and multiple endoscopic removal procedures, with the lesions rapidly recurring after each removal. At our institution, cultures demonstrated pseudomonas aeruginosa and CT demonstrated a fullness of the laryngeal cartilage. She subsequently underwent resection of the infected cartilage via an external approach and treatment with a prolonged (12 week) course of oral ciprofloxacin. She has now been decannulated and disease free for over nine months. **Conclusions:** Pseudomonas aeruginosa chondritis is a rare but potentially treatable cause of recurrent laryngeal granuloma formation.

S117. **R**hinoscleroma of the Larynx

Evelyne Kalyoussef, MD, Newark, NJ; Soly Baredes, MD*, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss an otolaryngologist's role in the management of rhinoscleroma.

Objectives: 1) To present a case of rhinoscleroma of the larynx; and 2) discuss an otolaryngologist's role in the management of rhinoscleroma. **Study Design:** We present a case of a 36 year old male who presented with complaints of progressively worsening dyspnea and hoarseness. **Methods:** A 36 year old Hispanic male presented to the emergency room with complaints of worsening dyspnea and dysphonia. On flexible fiberoptic examination, the patient was found to have restricted vocal cord mobility bilaterally. He underwent a direct laryngoscopy and biopsy in the operating room and was found to have rhinoscleromatis lesions involving both his supraglottis and subglottis. The patient was treated with IV antibiotics and had initial improvement in his symptoms. However, he experienced a relapse and required placement of tracheostomy ten months after initial diagnosis secondary to progressive airway obstruction. **Results:** Rhinoscleroma is a chronic granulomatous infection of the upper airway caused by klebsiella rhinoscleromatis. It can affect any site within the respiratory tract from the nose to the tracheobronchial tree; laryngeal involvement is relatively rare, particularly in North America. Rhinoscleroma is a slowly progressive disease characterized by periods of remission and relapse as was the case in our patient. **Conclusions:** Rhinoscleroma is a rare chronic granulomatous infection of the upper airway characterized by periods of remission and relapse. Although antibiotics are the mainstay of treatment, surgical intervention is sometimes required secondary to airway compromise.

S118. **A** Murine Model of Airway Granulation and Subglottic Stenosis

Nora Malaisrie, MD, Philadelphia, PA; Ankona Ghosh, BS, Philadelphia, PA; Eugene Einhorn, MD, Philadelphia, PA; Kevin P. Leahy, MD PhD, Philadelphia, PA; Natasha Mirza, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the methodology of the development of a murine model of airway granulation; and 2) describe the histologic findings of trichrome staining of mechanically and chemically injury laryngotracheal complexes.

Objectives: The murine model, in which tracheas are transplanted into the subcutaneous tissue of recipient mice and subsequently studied for signs of granulation tissue, has been particularly successful in studying airway disease. Mouse laryngotracheal complexes will undergo airway injury and transplantation into syngeneic recipient mice in order to develop a functional model of airway granulation tissue and subglottic stenosis. **Study Design:** IACUC (Institutional Animal Care and Use Committee) approved animal study. **Methods:** The laryngotracheal complexes (LTC's) of donor mice underwent direct airway injury through mucosal scraping using a wire brush or through application of hydrochloric acid (HCl) solution to the mucosa. A control group did not undergo any airway injury. LTC's were harvested and transplanted heterotopically into the subcutaneous tissue of syngeneic recipient mice and harvested at three weeks post-transplantation. Harvested LTC's underwent analysis by standard histochemistry using trichrome staining, specifically to highlight collagen formation and thus to examine degree of granulation tissue in the experimental groups compared to the control group. **Results:** At 3 weeks post-transplantation, trichrome staining showed that direct injury of the airway epithelium, both mechanically using a wire brush and chemically using HCl solution, results in the formation of granulation under the disrupted airway epithelium, with narrowing of the airway lumen and evidence of early fibrosis. **Conclusions:** The development of a murine model of airway granulation tissue is an efficient tool for characterizing the process and for establishing strategies to prevent granulation and subglottic stenosis.

S119. **T**he Use of External Retropulsion to Remove a Wedged Metallic Drawer Knob from the Cervical Esophagus in an Autistic Patient

Brandon K. Musgrave, MD, Detroit, MI; Raja Sawhney, MD, Detroit, MI; Matthew M. Smith, BS, Detroit, MI; Vanessa G. Schweitzer, MD FACS*, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to expand their differential diagnosis of dysphagia in pediatric/mentally disabled patients to prevent missing foreign bodies in the esophagus.

Objectives: To expand the differential diagnosis of dysphagia in pediatric/mentally disabled patients to prevent delay in diagnosis of esophageal foreign bodies. **Study Design:** Foreign body ingestion is a common problem in the pediatric/mentally compromised population including items such as coins, safety pins, batteries and dentures. Many foreign body ingestions are asymptomatic. Radiologic imaging is the primary diagnostic modality. We report a case of a 22 year old male with infantile autism/seizure disorder with a one week history of sepsis (fever and leucocytosis), abdominal pain, stool excrement with plastic items, and nausea and vomiting with dehydration. **Methods:** Esophagogastroduodenoscopy demonstrated a completely occluding foreign body in the cricopharyngeal region not retrievable by snare net or balloon catheter. Subsequent rigid esophagoscopy revealed fetid sponge and diaper remnants, covering a metallic night stand door knob 2.5 x 3.5 cm, removed by forceps rotation and retrograde pulsion. **Results:** The patient sustained no postoperative esophageal complications. Retrospectively, delay in diagnosis included inadequate outpatient history and misreading of the admission chest x-ray, clearly demonstrating an unusual radiopaque cervical foreign body. **Conclusions:** A previous case report described an ingested drawer knob lodged in the pharynx/larynx but no prior esophageal reports. Foreign body ingestion should be on the differential diagnostic list for pediatric/mentally/verbally compromised patients presenting with dysphagia, odynophagia, drooling, and

gastrointestinal symptoms.

S120. **Management of Partially Obstructing Airway Foreign Bodies**

Byron K. Norris, MD, Jackson, MS; John M. Schweinfurth, MD*, Jackson, MS; Christine B. Franzese, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the management of partially obstructing foreign bodies and understand the associated diagnostic dilemmas and the need for urgent removal.

Objectives: To present a series of hollow bore, spherical airway foreign bodies and review the associated diagnosis and management.

Study Design: Retrospective case series. **Methods:** Patients who presented with suspicion of hollow bore bead inhalation were identified. Initial management included thorough history and physical exam and plain film radiography. **Results:** All three patients were able to adequately ventilate through the hollow bore of the foreign body. One patient experienced rapid decompensation due to positional change in the bead lumen. Computed tomography of the chest was performed in one patient due to low suspicion based on normal physical exam and nondiagnostic chest x-ray. All three cases underwent uncomplicated removal of the foreign body either through direct laryngoscopy or rigid bronchoscopy. In one case, the center bore of the foreign body allowed for its eventual removal.

Conclusions: Patients who inhale hollow bore foreign bodies may be able to ventilate through the lumen of the object delaying diagnosis. Patients who initially appear stable may decompensate depending on the position of the bead and urgent surgical intervention is recommended to prevent potential airway compromise. Smooth, spherical objects may require specialized techniques for successful removal.

S121. **Case Report of Madelung's Disease with Upper Airway Obstruction**

Bukola Ojo, BS, New York, NY; David W. Jang, MD, New York, NY; Vivek V. Gurudutt, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation and management of Madelung's disease, including the rare case of upper airway obstruction.

Objectives: To describe a case of Madelung's disease presenting with upper airway obstruction and review the presentation and management of Madelung's disease. Madelung's disease is a rare disorder characterized by the presence of multiple, symmetric, nonencapsulated lipomas involving various parts of the body. The disorder is considered to be benign with aesthetic consequences but there have been rare cases in the literature of aerodigestive tract involvement and management in such cases. **Study Design:** Case report and literature review. **Methods:** A 62 year old man with a history of alcohol dependence and obstructive sleep apnea presented to our facility in respiratory distress. Imaging demonstrated diffuse lipomatosis involving the superficial and deep fascial planes of the neck extending into the mediastinum. Tracheostomy with debulking of fat was performed to secure the airway. **Results:** Direct laryngoscopy revealed near complete obliteration of the upper airway by fatty infiltration of the soft tissue. Pathological examination of the resected specimen revealed multiple, partly circumscribed collections of adipose tissue, consistent with the diagnosis of Madelung's. The post-operative course was unremarkable and the patient has been tracheostomy-dependent. **Conclusions:** Madelung's disease is a rare disorder with a wide spectrum of clinical signs and symptoms. We describe a unique case of this condition in a patient who presented with acute upper airway obstruction due to fatty infiltration of the soft tissues of the airway.

S122. **Supraglottic Stenosis Caused by Tuberculosis: A Case Report**

Marc Rubinstein, MD, Irvine, CA; Jonathan W. Boyd, MD, Irvine, CA; Edward C. Wu, BS, Irvine, CA; Esther L. Fine, MD, Irvine, CA; Brian J.F. Wong, MD PhD*, Irvine, CA; Roger L. Crumley, MD MBA*, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential complications of laryngeal tuberculosis, including supraglottic stenosis and the complications caused by multiple surgical interventions.

Objectives: The purpose of this study is to present a case of recurrent supraglottic stenosis caused by laryngeal tuberculosis, treated with complications and resultant serial laryngeal stent placements and laryngoplasties. **Study Design:** Retrospective review of a case of supraglottic tuberculosis causing subsequent laryngeal stenosis. The study was conducted at a university-affiliated medical center. **Methods:** An 18 year old female with a known history of tuberculosis presented with hoarseness, stridor, and airway obstruction. Awake tracheostomy was performed followed by surgical endoscopy which identified severe scarring and supraglottic stenosis. Supraglottoplasty using CO2 laser was then performed bilaterally. The patient re-presented five months afterwards with additional hoarseness and exertional dyspnea and supraglottic stenosis. Stenting and conservative excision with CO2 laser was performed, and Mitomycin-c was placed locally. Six weeks later the laryngeal stent was removed. The patient subsequently required two laryngoplasty procedures as well as laryngeal stenting. **Results:** After several months the stent was removed and the patient was decannulated. One year after removal, the patient was able to phonate and on fiberoptic examination the arytenoid processes and the vocal folds were mobile with an adequate glottic aperture and minimal non-obstructive webbing of the supraglottic region was seen. **Conclusions:** Although tuberculosis in the larynx has been considered to be relatively rare, recent evidence suggests that its incidence is increasing. This case demonstrates the pitfalls of utilizing a single aggressive surgical modality for laryngeal tuberculosis and the potential for multiple invasive interventions to treat this complication.

S123. Malignant Phosphaturic Mesenchymal Tumor of the Larynx: Case Report and Review of the Literature
Douglas Ryan Sidell, MD, Los Angeles, CA; Sunita M. Bhuta, MD, Los Angeles, CA; Chi K. Lai, MD, Los Angeles, CA; Dinesh K. Chhetri, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the radiological and histological features of a rare laryngeal neoplasm; and 2) differentiate this lesion from the more common giant cell tumor of the larynx.

Objectives: To describe the clinical presentation, radiological and histological features, and management of a rare case of malignant phosphaturic mesenchymal tumor of the larynx. **Study Design:** Case report and review of the literature. **Methods:** A detailed review of patient medical records, radiologic studies, and histopathology was performed. A comprehensive literature review was performed using PubMed. The epidemiology, clinical characteristics and natural history of this disease is outlined. Treatment options and patient management concepts are discussed. **Results:** A 24 year old female presented with acute airway obstruction requiring urgent tracheostomy. Direct laryngoscopy revealed a transglottic mass originating at the cricoid cartilage and extending to the supraglottis. Initial biopsy was interpreted as giant cell neoplasm and endoscopic resection was performed. Rapid and locally aggressive tumor regrowth stimulated repeat biopsies. The patient was subsequently diagnosed as having a malignant phosphaturic mesenchymal tumor of the larynx. She was treated with neoadjuvant chemotherapy, including doxorubicin, docetaxel, and gemcitabine. This was followed by a total laryngectomy. **Conclusions:** Phosphaturic mesenchymal tumors are rare neoplasms with the potential to incite osteomalacia from paraneoplastic processes. Malignant variants are exceedingly rare and often share several histologic characteristics with giant cell tumors. Despite these similarities, malignant phosphaturic mesenchymal tumors have several unique characteristics; failure to recognize this neoplasm as distinct entity may have significant treatment implications. This report describes the first reported case involving the larynx, and emphasizes the importance of vigilance in both histopathological and clinical actions so that appropriate treatment can be provided in a timely manner.

S124. Voice Quality following Photofrin Mediated Photodynamic Therapy for Treatment of Early Stage Laryngeal Malignancies

Melissa L. Somers, MD, Detroit, MI; Vanessa G. Schweitzer, MD FACS*, Detroit, MI; Glendon M. Gardner, MD, Detroit, MI; Alice K. Silbergleit, PhD CCC-SLP, West Bloomfield, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the use of photofrin mediated photodynamic therapy for treatment of early stage laryngeal malignancies. The participants should be able to explain the effects of photodynamic therapy on voice quality following treatment.

Objectives: To analyze voice quality following photofrin mediated photodynamic therapy (PDT) for the treatment of Tis through T1N0M0 squamous cell carcinoma (SqCCa) tumors of the larynx. **Study Design:** This is a prospective study of 10 patients with Tis-T1N0M0 SqCCa tumors of the larynx treated with photofrin mediated PDT. Videostroboscopy examination was performed prior to and following PDT therapy. **Methods:** Videostroboscopy exams were randomized and were analyzed by our speech therapist and laryngologist for voice function. The exams were scored based on glottic closure, supraglottic activity, vertical level approximation, vocal fold edge, amplitude, non-vibrating portion, phase closure, and phase symmetry. **Results:** There was a significant worsening in the non-vibrating portion of the affected vocal fold in the first 5 weeks following treatment with PDT, which is expected. Ten weeks following PDT therapy, there was notable improvement from the baseline in the amplitude, mucosal wave, and non-vibrating portion of the affected vocal fold but the changes were not statistically significant. **Conclusions:** Photofrin mediated photodynamic therapy has been used as a primary modality to treat Tis-T1N0M0 tumors of the larynx and for treatment for those that have failed prior surgery and/or radiation therapy. PDT allows for preservation of function and structure to maintain voice with absence of systemic toxicity.

S125. Atypical Case of Fungal Laryngitis

Kimberly N. Vinson, MD, Nashville, TN; C. Gaelyn Garrett, MD*, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the most common organism isolated in acute fungal laryngitis and discuss the signs, symptoms, and treatment for laryngeal blastomycosis.

Objectives: To present a rare case of laryngeal blastomycosis in an immunocompetent patient in the absence of inhaled corticosteroid use. **Study Design:** Case report. **Methods:** A review of the patient's medical record was performed to detail the patient's clinical presentation, diagnostic testing performed, and the patient's response to treatment. **Results:** A patient with no history of pulmonary disease presented to the laryngology clinic with hoarseness and severe odynophagia. The patient was found to have laryngeal inflammation and an exophytic mass in the posterior larynx on laryngovideostroboscopy. After completion of a steroid taper, she had progression of her symptoms, developing stridor. The differential diagnosis included inflammatory and infectious processes, but there was concern for malignancy due to the finding of a laryngeal mass. Direct microlaryngoscopy and biopsies were performed. Pathology revealed yeast forms, and the patient's urine was positive for blastomycosis antigen. The diagnosis of laryngeal blastomycosis was made. Although she required long term therapy with oral fluconazole, the patient had dramatic resolution of both her symptoms and her laryngeal findings within one week of initiating treatment. **Conclusions:** Fungal laryngitis has become a more frequent diagnosis in the immunocompetent patient due to the increased use of inhaled steroids for obstructive pulmonary disease. We present a rare case of laryngeal blastomycosis in a patient without this risk factor. When appropriate treatments for inflammatory processes are not successful or routine

biopsy results do not reveal malignancy, the otolaryngologist must be mindful of the possibility of fungal laryngitis and diligent to investigate for its presence.

S126. An Unusual Cause of Hoarseness: Laryngeal Rhabdomyosarcoma

Darshni Vira, MD, Los Angeles, CA; Chau Nguyen, MD, Ventura, CA; Sarah Mowry, MD, Ventura, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the management for an unusual cause of hoarseness and be able to discuss the histologic findings and treatment options for laryngeal rhabdomyosarcoma.

Objectives: 1) Learn the unique causes for hoarseness; 2) understand the management for an unusual cause of hoarseness; and 3) discuss the histologic findings and treatment options for rhabdomyosarcoma. **Study Design:** Case report. **Methods:** Case report of a 30 year old man presenting with orthopnea and hoarseness. **Results:** The patient was found to have spindle cell rhabdomyosarcoma of the larynx and was treated with frontolateral partial laryngectomy followed by chemotherapy and radiation. **Conclusions:** Multiple pathological conditions can cause hoarseness with laryngeal rhabdomyosarcomas being a rare occurrence in the adult population. Management of these individuals should consider voice preservation surgery with an aggressive adjuvant treatment regimen to optimize patient outcomes.

S127. Retrospective Evaluation of the Use of Airway Stents and Tracheostomy Tubes in the Management of Patients with Airway Disease

William G. Young, MD, Detroit, MI; Raja Sawhney, MD, Detroit, MI; Glendon Gardner, MD, Detroit, MI; Javier Diaz Mendoza, MD, Detroit, MI; Michael Simoff, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the subset of patients whose airway management requires the simultaneous usage of both an airway stent and a tracheostomy appliance. The participants should also be able to describe the indications for the simultaneous usage of both the tracheostomy and airway stent and the early complications that may arise.

Objectives: The objective of the study is to describe the subset of patients whose airway management requires the simultaneous usage of both an airway stent and a tracheostomy appliance, the indications for the usage of both devices, and the early complications that may arise. **Study Design:** This study is a retrospective case series of patients whose airway management required the use of both a tracheostomy and an airway stent, with at least one of the devices placed at our tertiary care center between 2004 and 2010. **Methods:** Via chart review of 38 patients, the study addresses the time of stent placement relative to tracheotomy, the mechanical interface between the tracheostomy appliance and the silastic pulmonary stent, and the incidence of airway complications. **Results:** Of the 38 patients identified, common reasons for stent placement and tracheotomy were tracheal stenosis (42%), tracheobronchomalacia (39%), and ventilator dependent respiratory failure (73%). Tracheotomy was preformed first in 57% of the patients. Four patients' airways could not accommodate both devices secondary to air leakage, and two patients had airway stents placed such that physical interaction with the tracheostomy appliance did not occur. In the first ten days of simultaneous usage of both devices, 28% of the patients required tracheobronchoscopy for management of airway problems and 28% also had tracheostomy changes within the same time period. **Conclusions:** Airway management requiring the use of both a tracheostomy and an airway stent requires knowledge of their indications and possible mechanical interactions. Tracheobronchoscopy will often be required for the diagnosis of respiratory distress in the early postoperative period.

Otology

S128. Diplopia Due to Skew Deviation following Vestibular Schwannoma (VS) Resection

Maura K. Cosetti, MD, New York, NY; Mohammad Fouladvand, MD, New York, NY; J. Thomas Roland Jr., MD*, New York, NY; Anil K. Lalwani, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) increase understanding of diplopia due to skew deviation following vestibular schwannoma resection; 2) discuss pathophysiology and proposed neural pathway for skew deviation following acute vestibular deafferentation; 3) recognize skew deviation among the differential diagnoses of diplopia following surgery of the cerebellopontine angle (CPA); and 4) discuss evaluation, diagnosis and natural history of skew deviation.

Objectives: Diplopia following cerebellopontine angle (CPA) surgery is usually attributed to neuropathy of III, IV or VI cranial nerves. Diplopia in the absence of cranial neuropathy following CPA surgery has not been reported. We present a series of patients who developed vertical diplopia from skew deviation following VS resection. Primarily associated with brainstem lesions, this vertical misalignment of the visual axis is postulated to result from unilateral disruption of supranuclear input from the otolithic organs. **Study Design:** Retrospective review of patients with complaints of diplopia following CPA surgery. **Methods:** Patients underwent neuroophthalmologic consultation and examination, including optokinetic testing, confrontational visual field assessment, color plate, pupillary reflex, slit lamp examination and head tilt test. **Results:** Four patients with significant residual hearing preoperatively developed skew deviation immediately following unilateral VS resection. Neuroophthalmologic exam demonstrated intact extraocular movements, and 3-6 mm prism diopter hypertropia on both primary gaze and head tilt testing. In all cases, skew deviation resolved spontaneously with normalization

of the neuroophthalmologic examination within 6 weeks. **Conclusions:** Patients undergoing CPA surgery can develop postoperative diplopia due to skew deviation as a consequence of acute vestibular deafferentation. Patients with significant hearing preoperatively, a probable marker for residual vestibular function, are specially at risk for developing skew deviation. As vestibular ablation occurs routinely with CPA surgery, skew deviation likely occurs more frequently than is currently diagnosed. Complaints of diplopia should prompt neuroophthalmologic consultation to reliably diagnose skew deviation and exclude cranial neuropathy. Patients can be reassured as spontaneous resolution typically occurs within 6 weeks.

S129. The Revivescent Patulous Eustachian Tube Revisited; Di Bartolomeo's Syndrome of Orthostatic Pneumo-Tinnitus

Joseph R. Di Bartolomeo, MD*, Santa Barbara, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to readily identify orthostatic autophony in the clinical setting as distinct from closed eustachian tube disorders.

Objectives: To demonstrate the unique clinical symptom complex of Di Bartolomeo's syndrome: the pathognomic symptom of autophony or amphoric sounds, in the upright position. In the milder form, semipatulous, the soft signs include a complaint that one's ear is "plugged", "stuffed with cotton", or "air rush". **Study Design:** The author, principle investigator in the FDA IND #40,202, 10 year study of the cause(s) of the Orphan Disorder # 969-988, patulous eustachian tube and related symptoms. **Methods:** Patulous eustachian tube (PET) anomaly. Patients were enrolled in a double blind, controlled study through phases I, II, and III. **Results:** The structural patulous eustachian tube determined not to be rare, but to be rarely diagnosed. The post-marketing experience confirmed autophony in the upright position, stable body weight, and made worse by exercise or certain medications, are the cardinal symptoms of Di Bartolomeo's syndrome. The otoscopic kinetic examination of the patient in the upright position, observed during forced nasal inspirations, may reveal the respiratory excursions of the ipsilateral tympanic membrane. **Conclusions:** Di Bartolomeo's syndrome is atavistic of the musculoskeletal anatomy of the open tube by Bartolomeo Eustachio in 1563, and the clinical presentation of the geometric tubal anomaly under exceptional phenomenon of acoustics, physics and rheology with the pathognomic symptom of orthostatic autophony.

S130. MASTOIDECTOMY VIRTUAL REALITY SIMULATOR: A CASE REHEARSAL TOOL

David A. Diaz Voss, MD, Baltimore, MD; Howard W. Francis, MD, Baltimore, MD; Kulsoom Laeeq, MD, Omaha, NE; Mohammad U. Malik, MD, Baltimore, MD; Charles W. Cummings, MD*, Baltimore, MD; Nasir I. Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to have an understanding of the potential role of a mastoidectomy virtual reality simulator in acquiring surgical competency. We will explain how the simulator enhances residents' surgical competency when used as a rehearsal tool prior to their assigned mastoidectomy cases.

Objectives: The purpose of our study is to 1) introduce the mastoidectomy virtual reality simulator to the otolaryngology residency as a potential asset in training programs; and 2) show whether it enhances residents' surgical skills when used as a case rehearsal tool. **Study Design:** Cross-sectional validation study. **Methods:** The participants of our study were residents of an otolaryngology-head and neck surgery residency program. The role of the simulator in this study was to generate case specific surgical scenarios with the patient's CT scans. Residents who had not proven competency in the OR were asked to demonstrate competency in medial thinning of the EAC cortex for their specific case using the simulator. Their performance on the simulator and in the OR was evaluated using our previously published and validated mastoidectomy assessment tool. The evaluations were then compared and analyzed to see if there was a correlation between both scores for each resident. **Results:** Our results show that using the mastoidectomy virtual reality simulator as a specific case rehearsal tool enhances residents' objectively measured surgical skills. **Conclusions:** It is pertinent that surgical programs provide residents with the best tools possible to enhance surgical competency. Virtual reality simulators are fairly new in the medical field, but this study has shown their potential when used as a specific case rehearsal tool.

S131. USING A VIRTUAL REALITY MASTOIDECTOMY SIMULATOR TO ENHANCE SURGICAL COMPETENCY IN PROCEDURAL TASKS

David A. Diaz Voss, MD, Baltimore, MD; John P. Carey, MD, Baltimore, MD; Howard W. Francis, MD, Baltimore, MD; John K. Niparko, MD*, Baltimore, MD; Charles W. Cummings, MD*, Baltimore, MD; Nasir I. Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to have an understanding of how the mastoidectomy simulator helps residents sharpen their surgical skills when used for specific procedural tasks.

Objectives: The purpose of our study is to 1) identify the potential role of a mastoidectomy virtual reality (VR) simulator in transfer of surgical skills for a particular task from the simulator to the operating room (OR); and 2) evaluate the reliability and validity of this novel tool in evaluation of surgical skills. In this study, the specific task assessed within the mastoidectomy surgery was the sharpening of the EAC cortex to a predetermined competency level. **Study Design:** Cross-section validation study. **Methods:** Residents rotating in the otology department at an otolaryngology-head and neck residency program were asked to participate in this study. Using our previously published and validated mastoidectomy assessment tool, otology faculty evaluated residents' performance on sharpening the

EAC cortex both on the simulator and in the OR. Residents were allowed to unlimited practice of the task on the simulator and were evaluated by the faculty once the resident felt they were competent in performance of the task. Participants were evaluated both in the simulator trials and the OR, and their outcomes were analyzed to find a correlation between their performances in both scenarios. **Results:** Our results indicate that competency achievement on a simulator for a particular task is transferred to the performance in OR. **Conclusions:** Using a VR simulator, residents can enhance their skills in specific mastoidectomy tasks and acquire surgical competency. This study shows promise in incorporating simulators as a routine educational tool in the near future.

S132. **Temporal Bone Venous Malformations in CHARGE Syndrome**

David R. Friedmann, MD, New York, NY; Lawrence R. Lustig, MD, San Francisco, CA; John A. Germiller, MD, Philadelphia, PA; Christine M. Glastonbury, MD, San Francisco, CA; Bidyut K. Pramanik, MD, New York, NY; Anil K. Lalwani, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the commonality of venous abnormalities in CHARGE syndrome and anticipate its surgical implications in otology.

Objectives: CHARGE syndrome is a genetic disorder with prominent otolaryngologic features including choanal atresia and inner ear malformations. Venous malformations of the temporal bone have not previously been recognized as a feature of this syndrome. We sought to define the spectrum of venous abnormalities in CHARGE and their surgical implications in otology. **Study Design:** Retrospective review of medical and radiologic records from databases of patients with CHARGE syndrome from three tertiary care academic medical centers. **Methods:** Review of 20 patients with CHARGE syndrome for whom temporal bone CT scans were available. **Results:** Venous malformations of the temporal bone were present in 8 of 20 (40%) patients. The most common abnormality (n=3) was persistence of a large emissary vein that normally involutes during development and was associated with a hypoplastic sigmoid venous sinus or jugular foramen. Other abnormalities included an aberrant petrosal sinus, venous lakes in proximity to the lateral venous sinus, condylar canal veins and jugular bulb abnormalities including a high riding bulb obscuring the round window and a dehiscence jugular bulb. In some cases, the course of the aberrant vessel necessitated a change in the surgical approach such as a cochleostomy posterior to the facial nerve in cochlear implant surgery. **Conclusions:** Venous abnormalities are a common feature in CHARGE patients and may be seen in association with other anatomic malformations. The pattern of venous abnormality suggests a correlation between the failure of the sigmoid sinus/jugular bulb to fully develop and the persistence of emissary veins that normally regress. Identification and avoidance of these abnormal venous structures during otologic surgery is critical to avoiding potentially catastrophic bleeding.

S133. **The Effect of Acute Introduction of Fine Structure Processing on Music and Speech Perception in Adult Cochlear Implant Users**

Andrew P. Johnson, BS, Milwaukee, WI; Christina L. Runge-Samuels, PhD, Milwaukee, WI; David R. Friedland, MD PhD*, Milwaukee, WI; Hilary A. Gazeley, AuD, Milwaukee, WI; Linda S. Burg, AuD, Milwaukee, WI; Jamie W. Jensen, AuD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the effects of fine structure processing (FSP) and high definition continuous interleaved sampling (HDCIS) in novel mapping strategies on music and speech perception in an acute setting.

Objectives: The primary objective of the study is to investigate the effects of FSP on music and speech perception. **Study Design:** This is a prospective study comparing outcomes within subjects. **Methods:** Patients with Med El Sonata or Pulsar implants underwent acute programming for a pair of reduced frequency maps (70-1500 Hz). One map possessed only the HDCIS strategy, containing information about the envelope component of sound. The other contained both HDCIS and FSP strategies, providing additional information regarding the fine structure for lower frequencies. Maps were loaded into the processor randomly, with both the tester and the subject blinded to the use of each map. For each map, instrument identification (timbre), vowel perception, and music quality were assessed. **Results:** Subjects were able to perceive differences between the two maps. Differences in vowel identification scores did not reach statistical significance. Instrument identification was poor for both maps which is consistent with data from cochlear implant users in previous studies. Differences in music quality were apparent to subjects and are undergoing further analysis. **Conclusions:** The acute addition of FSP in a novel reduced frequency map did not appear to make a significant difference in performance on music and vowel tests, although subjects were able to perceive differences in sound quality. Longer term use of FSP in standard maps may show performance benefit and is being investigated.

S134. **ART's in Postoperative Atresia Patients: An Intact Efferent System?**

Bradley W. Kesser, MD*, Charlottesville, VA; Lincoln C. Gray, PhD, Harrisonburg, VA; Debra L. Hildebrand, AuD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate that crossed acoustic reflex thresholds (ART's) can be recorded postoperatively from some but not all patients undergoing surgical repair of unilateral aural atresia; seek explanations for when ART's can and cannot be recorded; understand the implications for central auditory pathways of the presence of ART's in these patients.

Objectives: Demonstrate that crossed acoustic reflex thresholds (ART's) can be recorded postoperatively from some but not all patients undergoing surgical repair of unilateral aural atresia. Seek explanations for when ART's can and cannot be recorded. Understand the implications for central auditory pathways of the presence of ART's in these patients. **Study Design:** Prospective recording of acoustic reflex thresholds (ART's) in patients undergoing surgery for congenital aural atresia. **Methods:** Patients who underwent surgery to correct unilateral aural atresia at a tertiary academic medical center also underwent ART testing. With postoperative measurements in the normal (non-atretic) ear, ipsilateral reflex thresholds (stimulus in the normal ear) and contralateral thresholds (stimulus in the newly reconstructed atretic ear) were recorded at 500, 1000, and 2000 Hz. **Results:** Of 11 patients, five demonstrated normal ipsilateral thresholds postoperatively but did not have crossed reflexes. Three patients with normal ipsilateral reflex thresholds preoperatively demonstrated crossed acoustic reflexes postoperatively. Initial pilot data suggest that about a third of atresia patients have crossed ART's postoperatively. The presence or absence of crossed reflexes did not correlate with age or postoperative pure tone thresholds. Of those patients with recordable crossed reflexes, the thresholds for those reflexes were correlated with postoperative pure tone thresholds. **Conclusions:** Crossed acoustic reflexes can be recorded from some but not all postoperative atresia patients, and the thresholds for those reflexes correlate with the postoperative audiogram. The presence of acoustic reflexes implies a normal brain-stem acoustic reflex arc despite early unilateral sound deprivation.

S135. **M**astoid Obliteration for Cochlear Implantation in an IgM Deficient Patient

Glenn W. Knox, MD JD*, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how mastoid obliteration can facilitate cochlear implantation in the face of immunodeficiency states such as IgM deficiency.

Objectives: To review the indications, efficacy and outcomes of cochlear implantation in an IgM deficient patient. **Study Design:** Case report. **Methods:** A 50 year old Caucasian female with IgM deficiency presented with a long history of bilateral chronic suppurative otomastoiditis and sinusitis. The patient has previously undergone multiple bilateral tympanomastoidectomy surgery and revisions due to the severe nature of her illness. The patient had slowly progressive severe-to-profound bilateral mixed hearing loss. A comprehensive literature review failed to reveal a case of cochlear implantation in the face of IgM deficiency. After sequential bilateral mastoid obliteration, the patient underwent a staged left cochlear implantation three months after left mastoid obliteration. The technique of obliteration was sequential bilateral radical mastoidectomy and petrosectomy, eustachian tube occlusion with bone, autologous fibrin glue and HA cement, blind sac closure of the external auditory canal, and cavity obliteration with temporalis muscle flap and abdominal fat. **Results:** At one year followup, the patient had stable bilateral obliterated cavities. The patient's left cochlear implant is being used successfully with significant improvement in speech discrimination scores. **Conclusions:** For patients with severe bilateral chronic suppurative otitis media and progressive bilateral hearing loss as a result of IgM deficiency, obliteration with temporalis muscle rotation flap and abdominal fat graft appears to be an effective technique to facilitate safe cochlear implantation. Aggressive eustachian tube occlusion may be a key factor in a successful outcome in a rare case such as this, as well as in other types of immunodeficiency.

S136. **A** Comparison of Mastoidectomy Learning Curves in Otolaryngology-Head and Neck Surgery Residents

Hamid Masood, MD, Flemington, NJ; David A. Diaz Voss, MD, Baltimore, MD (Presenter); Mohammad U. Malik, MD, Baltimore, MD; Kulsoom Laeeq, MD, Omaha, NE; Scott A. Infusino, Baltimore, MD; Charles W. Cummings, MD*, Baltimore, MD; Nasir I. Bhatti, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to have an understanding of the possible difference in mastoidectomy learning curves between residents in otolaryngology-head and neck surgery. We will explain how residents are evaluated for acquiring essential surgical skills to become competent in mastoidectomy surgery, and whether a difference exists amongst residents' learning curves.

Objectives: The purpose of our study is to identify the mastoidectomy learning curves of otolaryngology residents and to determine whether a difference exists amongst residents' learning curves. **Study Design:** Prospective longitudinal study. **Methods:** Evaluations were conducted in the operating room (OR) on otolaryngology head and neck surgery residents from postgraduate year (PGY) 2 to PGY-5 over a period of 3 years. Surgical performance was measured over time using our previously validated and published task based checklist (TBC) developed for assessment of mastoidectomy skills. Learning curves were generated using logarithmic analysis of mean number of cases residents needed to attain competency. The learning curves were assessed and compared to determine whether a difference exists between residents in achieving competency. **Results:** Our results have shown that significant difference in mastoidectomy learning curves exist amongst otolaryngology residents. This difference is multifactorial but interest in otology fellowship strongly impacted the learning curve to achieve competency at a faster rate. **Conclusions:** Our results can show differences in mastoidectomy learning curves between slow and fast learners and how motivation and interest for a specific field in otolaryngology can help achieve the learning curve of certain surgical procedures at a faster rate.

S137. **T**he Sagging Tegmen: Computed Tomographic Analyses

Kevin K. Motamedi, MD, Atlanta, GA; Wendell N. Todd, MD FACS FAAP*, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to quantitatively understand the sagging tegmen based on CT images of temporal bones, and its potential correlation with the extent of temporal bone pneumatization.

Objectives: Background: Low lying tegmen often limits surgical access especially for congenital aural atresia, and transmastoid work at the superior semicircular canal. Heretofore, the sagging tegmen has been assessed by gestalt on studying imaging of the temporal bone. Objective: To quantitatively study the sagging tegmen to elucidate inter-observer agreement, bilateral symmetry, and its potential correlation with the extent of temporal bone pneumatization. **Study Design:** Postmortem material analysis. **Methods:** From 41 adult crania without clinical otitis, the five with the largest mastoids, and the five with the smallest mastoids, were assessed by high resolution computed tomography, 0.625 mm slices, both direct axial and direct coronal. Three quantitative depictions of sagging tegmen were assessed: short distance from tegmen to head of malleus; and, on the axial image through the topmost portion of lumen of the superior semicircular canal (SSCC), the amounts of bone included in the image directly lateral, and posterior-lateral to the SSCC, were measured. **Results:** The metrics of sagging tegmen trended with one another and the extent of mastoid pneumatization. The closeness of tegmen with head of malleus trended with the axial CT image showing less bone lateral and posterior-lateral to SSCC. Three of six Spearman correlations for right ears, and 2 of 6 for left, had $P < .05$, $N = 10$. For these optimally positioned crania, difficulty of landmark identification may explain the fair-good interobserver agreements (Spearman r ranged from .43 to .86). **Conclusions:** In these adult cranial specimens, sagging tegmen was associated with small extent of temporal bone pneumatization. About one-third of tegmen sagging can be accounted for by the extent of mastoid pneumatization.

S138. **A**ssessment of Air Quality during Mastoidectomy

Byron K. Norris, MD, Jackson, MS; Aimee P. Goodier, MD, Jackson, MS; Thomas L. Eby, MD*, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential occupational hazards associated with bone dust exposure during mastoidectomy and review the regulatory guidelines for use of particulate respirators.

Objectives: The Occupational Health and Safety Administration (OSHA) outlines specific requirements governing the use of respiratory protection for workers dealing with dust or other aerosolized compounds. Health care workers may be exposed to bone dust produced during otologic procedures creating an occupational hazard. The purpose of this research was to quantify the total suspended particulate matter (TSPM) and respirable particulate matter (PM5) created during cortical mastoidectomy and verify the efficacy of a particulate surgical respirator. **Study Design:** Cadaveric study to assess air quality during cortical mastoidectomy. **Methods:** A simple mastoidectomy was performed on three cadaveric temporal bones. Suspended particulate concentration was measured using gravimetric filter methodology for TSPM and PM5. Concentration of particulate exposure was compared between mannequins positioned near the surgical field with a standard surgical mask, surgical respirator, or controls. **Results:** The average total particulate matter concentration during cortical mastoidectomy was 1.89 mg/m³. The average quantity of respirable particles was below detection levels. The calculated particulate exposure concentrations for TSPM and PM5 did not exceed OSHA's requirement for respirator use. The particulate respirator prevented exposure to bone particulates compared to controls ($p = 0.028$). **Conclusions:** The concentration of bone dust produced during cortical mastoidectomy is below regulatory guidelines for use of particulate respirators. However, the use of a surgical respirator significantly decreases particulate exposure in test mannequins.

S139. **F**lexible Optical Fiber CO2 Laser Stapedotomy for Otosclerosis: Results of 108 Consecutive Cases

Robert M. Owens, MD*, Dallas, TX; Cherie L. Booth, MD, Dallas, TX (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the results of CO2 laser stapedotomy utilizing a new flexible optical fiber to deliver laser energy safely to the stapes footplate.

Objectives: The CO2 laser has been utilized in stapedotomy surgery for many years. It offers a high degree of safety and is an effective instrument in performing stapedotomy. Historically CO2 laser energy has been delivered by micromanipulators attached to surgical microscopes, but recently a new flexible optical fiber has been developed that enables surgeons to deliver CO2 laser energy in a handheld instrument, greatly enhancing precision. Our objective is to demonstrate our results in all patients undergoing primary stapedotomy for otosclerosis utilizing the flexible fiber. **Study Design:** Retrospective chart review. **Methods:** Medical records of all patients undergoing CO2 laser stapedotomy utilizing the flexible fiber from January 2008 through July 2010 were reviewed. **Results:** Data were available for 108 consecutive cases of CO2 laser stapedotomy utilizing the flexible fiber. The average followup was 164.15 days. The average postoperative air bone gap was 3.51 dB. The air bone gap was closed to less than 10 dB in 89% of patients and to less than 15 dB in 94% of patients. There were no patients that experienced a "dead ear" postoperatively. **Conclusions:** CO2 laser stapedotomy has a long track record as a safe and effective technique. The new flexible fiber allows surgeons the ability to utilize the CO2 laser as a handheld instrument and provides excellent precision. Our results in 108 consecutive cases demonstrate that the technique is extremely safe and effective. Utilizing the fiber in performing stapedotomy in this cohort of patients provided for excellent improvement in hearing with no incidence of total sensorineural hearing loss.

S140. **B**ilateral Bifid Labyrinthine Facial Nerve Anomalies Associated with Agenesis of the Oval Window: Case Report and Review of the Literature

Andrew K. Patel, MD, San Diego, CA; Thomas H. Alexander, MD, San Diego, CA; Roberto A. Cueva, MD*, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize possible facial nerve anatomical variations associated with congenital hearing loss.

Objectives: Anomalies of the course of the facial nerve have been reported in association with middle and inner ear malformations. This case highlights the importance of vigilance regarding facial nerve anatomical variations encountered during middle ear surgery thus avoiding inadvertent damage. **Study Design:** A rare facial nerve anomaly was incidentally discovered during the workup of a congenital conductive hearing loss in a pediatric patient associated with unilateral agenesis of the oval window. **Methods:** We describe the CT appearance of this anomaly and discuss its possible embryology. **Results:** The bilateral labyrinthine segments of the facial nerve were noted to bifurcate just proximal to the geniculate ganglion bilaterally. Bifurcation of the intratemporal portion is a rare malformation in which focal splitting of one or more facial nerve segments occurs. **Conclusions:** Congenital hearing loss may be associated with facial nerve anomalies. Facial nerve bifurcation is important to recognize in patients undergoing evaluation for congenital hearing loss and other congenital ear malformations. Otolaryngologists should be cautious when exploring patients with conductive congenital hearing loss.

S141. Outcomes Using PEDD in Refractory and Treatment Naïve Meniere's Disease

Rounak B. Rawal, BA, Boston, MA; Anand K. Devaiah, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of patient education, diet, and diuretic therapy in refractory and new patients with Meniere's disease.

Objectives: Diet and diuretic is a first line Meniere's disease (MD) treatment. However, a paradigm using patient education, diet, +/- diuretic therapy (PEDD) in patients referred with refractory (RR) MD has not been studied. This study examines the outcome of this paradigm in RR and in "treatment naïve" patients (TN). **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review of patients from July 2002 to November 2009 was performed to screen for diagnostic and demographic information, including having TN or RR MD. All patients were investigated for other causes for their symptoms. A treatment paradigm was applied to these patients that favors PEDD first. Patient response was assessed using the American Academy of Otolaryngology Committee on Hearing and Equilibrium (AAO-CHE) guidelines. Pre- and post-treatment audiometric thresholds were determined. Exclusion criteria included incomplete records and symptoms inconsistent with AAO-CHE definitions of MD. **Results:** Thirty-eight patients (27 TN, 11 RR) met inclusion criteria. An average 5.7 dB hearing improvement, median functional level of 1, and a median improvement of 2 functional levels was found. TN patient symptom abatement with PEDD was 92% (25/27 patients). RR symptom abatement was 45% (5/11 patients) on PEDD. All patients who did not respond to PEDD were successfully treated with other modalities. **Conclusions:** Patients referred with refractory symptoms may still benefit from engaging in PEDD before moving on to other treatment options. Management of MD in RR and TN patients should start with this approach. However, RR patients are at higher risk of failing PEDD and may need different treatments.

S142. Francis Lederer, MD Resident Research Award (Middle Section)
Do Contemporary Temporal Bone Fracture Classification Systems Reflect Concurrent Intracranial and Cervical Spine Injuries?

Gordon H. Sun, MD, Cincinnati, OH; Nael M. Shoman, MD, Cincinnati, OH; Ravi N. Samy, MD FACS, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the epidemiology of temporal bone fractures (TBFs) diagnosed at a level I trauma center using two common classification systems; 2) report the prevalence of concurrent intracranial and cervical spine injuries in patients with TBFs using either classification system; and 3) discuss the utility of current TBF classification systems in predicting the occurrence of synchronous intracranial and cervical spine injuries.

Objectives: 1) Determine the prevalence of intracranial and cervical spine injuries in patients with temporal bone fractures (TBF), using both the traditional longitudinal/transverse/mixed and otic capsule sparing-versus-violating classification systems; and 2) discuss the predictive value of TBF classification systems in identifying concurrent intracranial and cervical spine pathology. **Study Design:** Retrospective review. **Methods:** The records of all patients diagnosed with a basilar skull fracture at a level I trauma center from 2004 to 2009 were reviewed. Only patients at least 18 years of age sustaining TBFs were included for study. Patient demographics, mechanism of injury, and Glasgow Coma Scale (GCS) scores were analyzed. Imaging studies were reviewed to classify TBFs and identify intracranial and cervical spine injuries. **Results:** Of 1,279 patients, 202 (15.8%) met study criteria. Sixteen (7.9%) patients had bilateral TBFs. There were 160 (79.2%) males. Falls (66, 32.7%) represented the most common mechanism for TBF. Longitudinal (96, 44.0%) and otic capsule sparing (209, 95.9%) fractures were the most prevalent subtypes. One hundred eighty-four patients (91.1%) had intracranial injuries, while 18 (8.9%) of 183 with available spinal imaging demonstrated cervical spine injuries. No TBF subtype had a statistically significant correlation with mechanism of injury, GCS, or concomitant intracranial or cervical spine injuries ($P > 0.05$). **Conclusions:** A significant number of patients with TBFs have serious concomitant intracranial and cervical spine injuries, and current TBF classification systems do not correlate with these outcomes. A more sophisticated classification system utilizing a global approach by encompassing radiographic and clinical findings may better predict neurologic and neurologic complications.

S143. Anatomic Dimensions of the Bony External Auditory Canal

Edward C. Wu, BA BS, Irvine, CA; Reza Jahanbakhshi, MD, Irvine, CA; Kristina Coale, BA, Irvine, CA; Shawn Zardouz, BA, Irvine, CA; Hamid R. Djalilian, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to perform standardized measurements of the bony external auditory canal, as well as appreciate the anatomic variations between individual patients, especially across different age groups. Participants should be able to use this data for guiding surgical procedures or for fitting suitable in the ear devices (e.g., hearing aids).

Objectives: To determine measurements of the external auditory canal (EAC) to aid in the design of hearing devices. **Study Design:** Retrospective review of radiology database. **Methods:** We conducted a retrospective review of high resolution computed tomography images of the temporal bones of 60 patients (120 ears) between the ages of 5 and 85 (mean 29.1). Dimensions of the EAC were taken at 0.6 mm-1 mm slices from the annulus to the border of the cartilaginous canal. Measurements were made on the coronal, axial, and sagittal images. **Results:** The average length of the EAC was 8.3mm (range, 0.8-17.4mm). The mean height of the EAC was 8.6mm (range, 4.0-16.2mm). The height of the EAC at the midpoint between the maximum height and the anterior wall was 7.2mm (range, 3.5-13.4mm). The height posteriorly was 7.3mm (range, 3.4-13.7mm). The mean anterior-posterior (AP) dimension of the EAC at the midpoint and perpendicular to the maximum superoinferior height was 5.3mm (range, 2.2-12.5mm). The AP dimension at the midpoint between the maximum AP dimension and the top of the EAC was 4.7mm (range, 1.6-9.4mm). The AP dimension inferiorly was 4.5mm (range, 1.6-9.1mm). Data on different age groups will be presented. **Conclusions:** Standardized anatomic dimensions of the bony EAC provide important measurements for design of novel in the canal hearing aids and specialized ear plugs as well as guide surgical procedures.

S144. **E**ffects of Stimulation Rate on Speech Perception in Elderly Cochlear Implant Users

Haogang Zhang, BS, Milwaukee, WI; Christina Runge-Samuelson, PhD, Milwaukee, WI; David Friedland, MD PhD*, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the differences in speech perception at different stimulation rates between older and younger cochlear implant (CI) users. They will also be able to discuss the potential implication on programming and how rate may be optimized for elderly CI users.

Objectives: To determine the acute effects of stimulation rate on speech perception between elderly and young CI users. **Study Design:** Prospective case control study. **Methods:** All subjects used Advanced Bionics (AB) devices. There were two groups of 9 subjects, a younger (<65 years of age) and older group (≥ 65 years of age). The subjects were acutely programmed with a novel 5 channel map at stimulation rates of 800, 1200, 2000 and 3000 pps and underwent speech perception testing with sentences in quiet (HINT) and noise (BKB SIN) with each rate. We compared speech perception scores as a function of stimulation rate within and between groups. **Results:** Speech perception performance varied greatly for all subjects, however some trends were observed. In quiet, speech perception scores for the younger group improved with increasing stimulation rate, while for the elderly group better performance was observed at lower stimulation rates. In noise, performance tended to decrease in both groups with increasing stimulation rate. These results did not reach statistical significance. **Conclusions:** Preliminary results indicate that stimulation rate can affect speech perception performance for individual subjects, with elderly CI users potentially benefiting from slower rates in quiet. Faster rates tended to benefit all subjects in noise, consistent with benefits of higher fidelity information in difficult listening situations. This study highlights consideration of individual performance when determining programming parameters. Also, given the acute nature of this study it is possible that long term use of maps with different rates along with auditory training may yield different results.

Pediatrics

S145. **I**mage Guidance Improves Treatment of Pediatric Deep Neck Space Abscesses

Terah J. Allis, MD, Omaha, NE; Trent W. Quinlan, MD, Omaha, NE; Donald A. Leopold, MD*, Omaha, NE

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the appropriate conditions where CT image guidance may be of benefit to the patient and the surgeon. Additionally, the audience will have an appreciation of the vital structures of the deep neck spaces and the importance of careful, complete surgical dissection in the retropharynx, and adequate drainage of the abscess.

Objectives: To better define the use of image guidance in the drainage of retropharyngeal and parapharyngeal abscesses and attempt to characterize benefit to this technique by comparing a control group versus an image guided group of patients and by assessing variables including abscess recurrences, EBL, operative time spent identifying the abscess, total operative time with set up and use of image guidance, patient's return to health and discharge home after surgery. **Study Design:** Retrospective analysis of the medical records of all patients at a tertiary care pediatric hospital with deep neck space abscesses managed surgically with and without Stealth CT guidance over a three year time period. **Methods:** 12 patients underwent surgical deep neck space abscess drainage over a three year time period. Stealth CT image guidance was utilized for 5 of these patients forming the study group. The remaining 7 patients not utilizing the image guidance formed the control group. Variables from each group including age, sex, side and size of abscess on CT, aspirate volume (cc), EBL, total OR time (minutes), OR incision to close, cultures, WBC trend, reoperation, and postoperative day number until home were summarized in a table and analyzed statistically between groups (with PC SAS version 9.2). **Results:** No demographic statistical difference between the groups, including age, sex, and side of abscess was detected. Average operative time from incision to close was 42.4 min. for the image guided group and 30 min. for the control group which was nonsignificant. Total OR time was 70.4 min.

for the image guided group and 60.6 min. for the control which was nonsignificant. Reoperation in the control group occurred in three of the seven patients while no reoperations were required in the image guided group. While this was not statistically significant, it has clinical relevance and demonstrates the utility of image guidance in adequately draining the abscess. No other complications were reported in the study group while the control group had one postoperative fever requiring an ER visit. Average length of hospital stay from operation to discharge was lower in the study group, 2 days compared to 5 days in the control group which impacts the cost of treating these abscesses. No significant difference was appreciated between groups in EBL and WBC pre and post drainage.

Conclusions: Deep neck space abscesses that require surgical management are relatively uncommon but necessitate the otolaryngologist's attention. Stealth CT image guidance is useful for intraoral approach to abscesses and safe, with comparable operative times. Image guidance may serve as a helpful addition in more challenging cases (high, lateral appearance, or a second attempt at drainage) as reflected by a trend towards less recurrences and quicker discharge in the patients who underwent image guided drainage. Image guidance may inspire the surgeon to more thoroughly dissect the abscess pocket and visually confirm that the abscess pocket has been entered.

S146. **The Effects of Prematurity on Incidence of Aspiration following Supraglottoplasty for Laryngomalacia**

Lauren C. Anderson de Moreno, MD, Indianapolis, IN; Bruce H. Matt, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to explain to patient families certain risk factors for the development of aspiration following supraglottoplasty.

Objectives: Determine if patients who were born premature have a higher incidence of aspiration following supraglottoplasty compared to patients born full term. **Study Design:** Retrospective study. **Methods:** Two thousand three hundred sixty (n=2360) patient charts from a tertiary care children's hospital were reviewed retrospectively. Patients had already been treated for laryngomalacia with supraglottoplasty by the primary investigator. Estimated weeks gestational age at birth was recorded for each patient. Prematurity was stratified as mild (32-36 weeks gestational age [WGA]), very (28-31 WGA), or extremely (<28WGA). Patients were excluded from the study if they had suspected aspiration with chronic cough, pneumonia, chronic lung disease or documented aspiration prior to supraglottoplasty. **Results:** Seventy-five patients (n=75, 3.2%) had aspiration following supraglottoplasty. 20 of these patients were preterm infants at birth. The rate for aspiration following supraglottoplasty for former premature infants was statistically significant (5.9%, OR=2.3, p=0.0032). **Conclusions:** Children who were born premature have a higher rate of postoperative aspiration following supraglottoplasty; however, supraglottoplasty should still be considered as treatment for laryngomalacia as the rate is still relatively low (5.9%).

S147. **Management of Supraglottic Dysgenesis Presenting as Laryngomalacia with Laser Supraglottoplasty**

Behrad B. Aynehchi, MD, Brooklyn, NY; Nira A. Goldstein, MD, Brooklyn, NY; Ari J. Goldsmith, MD, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the embryology, diagnosis, surgical management, and prognosis of laryngomalacia associated with supraglottic dysgenesis.

Objectives: Laryngomalacia and subglottic stenosis are common sources of stridor and can lead to significant upper airway obstruction and feeding disturbances in infants. We describe the presentation and management of acquired subglottic stenosis combined with a unique supraglottic dysgenesis in a previously premature infant. **Study Design:** Case study. **Methods:** Endoscopic findings, management, proposed classification, and embryologic origins of this unique anomaly are described. A review of the literature and utility of various techniques when approaching complex pediatric airway pathology are discussed as well. **Results:** An 11 month old infant with a history of prematurity and tracheostomy presented with a prominent "s-shaped" epiglottis with both posterior edges fused to the right aryepiglottic fold/arytenoid complex. Subglottic suprastomal granulation tissue was identified as well. The patient underwent a two staged correction involving a carbon dioxide laser supraglottoplasty followed by management of the subglottic stenosis with balloon dilatation after removal of granulation tissue with a microdebrider. Subsequent decannulation and followup for eight weeks revealed no further respiratory compromise. She is continuing to undergo outpatient fiberoptic examinations. **Conclusions:** The supraglottic dysgenesis most likely took place during days 32 through 35 of gestation where the primitive arytenoid swellings and hypobranchial eminence give rise to the aryepiglottic folds and epiglottis, respectively. While the overall presentation is most consistent with a Lee group III, unilateral fusion of the epiglottis is not accounted for by any of the current laryngomalacia classification schemes. Despite the unique presentation, standard approaches for more common lesions, in particular CO2 laser supraglottoplasty, were effective means of definitive management.

S148. **Fusobacterium Necrophorum in a Pediatric Retropharyngeal Abscess: A Case Report and Review of the Literature**

Jeffrey Cheng, MD, New York, NY; Andrew J. Kleinberger, MD, New York, NY; Andrew Sikora, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the microbiology of fusobacteria in the pediatric head and neck as well as to explain the current management of similar deep space neck infections in the pediatric population.

Objectives: Report a case of a pediatric retropharyngeal abscess with Fusobacterium necrophorum, not manifest as Lemierre's syn-

drome, and review the literature on the microbiology of fusobacteria in the pediatric head and neck. **Study Design:** Case report and review of the English literature. **Methods:** Case report and review of the English literature. **Results:** Discussion of case report and results of English literature search. **Conclusions:** Fusobacterium necrophorum is an uncommon pathogen causing pediatric deep neck space infections, even more so when not manifest as Lemierre's syndrome. It is associated with a favorable prognosis when identified early, and management with directed antibiotic therapy and surgical drainage when indicated is appropriate. In addition, in cases of pediatric neck space infection, initial empiric antibiotic coverage should avoid macrolide antibiotic use, as Fusobacterium necrophorum may be involved and is often resistant.

S149. Actinomycosis Mastoiditis Complicated by Sigmoid Sinus Thrombosis and Labyrinthine Fistula

Kathryn L. Colman, MD, Pittsburgh, PA; Jeffrey P. Simons, MD, Pittsburgh, PA (Presenter); Michael S. Cohen, MD, Pittsburgh, PA; Philana L. Lin, MD, Pittsburgh, PA; Miguel Reyes-Múgica, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify actinomyces as a rare pathogen that can be responsible for complications of chronic mastoiditis and to recognize that complications of mastoiditis should be considered in pediatric patients presenting with nausea and headache.

Objectives: To describe the unique presentation of a pediatric patient with complications of chronic otomastoiditis caused by actinomycosis. **Study Design:** Case report. **Methods:** Case presentation including discussion of clinical course, imaging studies, management, and pathologic findings. **Results:** A ten year old male with no otologic history presented with a two month history of nausea, vomiting, headache, and malaise, and a one week history of a tender left neck mass. He denied all otologic symptoms including hearing loss, vertigo, tinnitus, and otalgia. Initial contrast-enhanced neck CT revealed left internal jugular vein thrombosis. Additional imaging including MRI and temporal bone CT demonstrated left middle ear and mastoid opacification, erosion of the ossicles and lateral semicircular canal, and sigmoid sinus thrombosis (otogenic Lemierre's syndrome). Audiometry demonstrated left profound sensorineural hearing loss. The patient underwent left mastoidectomy with decompression of the sigmoid sinus and repair of the lateral semicircular canal fistula, as well as left myringotomy with tube placement. Histological analysis revealed actinomycosis mastoiditis. Further treatment included long term antibiotics and anticoagulation. **Conclusions:** This pediatric patient had an erosive process of the temporal bone caused by actinomycosis, a rare but significant pathogen that can cause serious complications of chronic mastoiditis. He had a complex and confusing presentation, with initial vague symptoms, a subsequent tender neck mass, and a final diagnosis of actinomycosis mastoiditis complicated by sigmoid sinus and internal jugular vein thrombosis and a labyrinthine fistula. Intratemporal and intracranial complications of mastoiditis should be included in the differential diagnosis of children presenting with nausea, vomiting, and headache.

S150. Pediatric Giant Juvenile Xanthogranuloma in the Parotid Gland

Allen S. Ho, MD, Palo Alto, CA; Melynda Barnes, MD, Palo Alto, CA; Prashant S. Malhotra, MD, Palo Alto, CA; Alan G. Cheng, MD, Palo Alto, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate knowledge of the manifestations of juvenile xanthogranuloma (JXG), distinguish it from Langerhans histiocytosis, and delineate management of JXG.

Objectives: To describe an unusually rare pediatric case of giant JXG arising in the parotid and occluding the ear canal. **Study Design:** Case report. **Methods:** A full term, asymptomatic 10 month old infant presented with a nontender parotid mass from birth. Imaging as well as expectant management with steroids was undertaken. After the lesion continued to persist, surgical biopsy was performed for diagnosis and treatment. **Results:** An MRI revealed a 5.0x4.0x3.9cm mass within the parotid, involving the mandibular condyle and extending through the middle ear overlying the otic capsule. Large vascular flow voids and scattered hemosiderin deposits were noted with gadolinium enhancement, suggestive of atypical hemangioma. Prednisolone partially reduced the size of the lesion. A superficial parotidectomy was ultimately performed, demonstrating sheets of foamy histiocytes, Touton type giant cells, and lymphocytes. Immunohistochemical stains for S-100 protein and CD1a were negative, ruling out LCH and confirming JXG. **Conclusions:** JXG is an uncommon benign fibrohistiocytic proliferative disorder, and is classified within the non-Langerhans cell group of histiocytoses. It is characterized as a yellow-orange cutaneous nodule that tends to regress, resolving completely or leaving a residual atrophic scar. Distinguishing JXG from the more ominous Langerhans cell histiocytosis (LCH) requires histopathology and specialized immunohistochemistry staining techniques, with the typical phenotype of Factor XIIIa(+)/Fascin(+)/CD68(+)/CD163(+)/CD14(+)/CD1a(-)/S100(-). Given its similarity to other conditions, its self-limiting nature, and implications for treatment, JXG warrants careful consideration in the context of pediatric parotid masses. Definitive diagnosis requires biopsy, with conservative management recommended unless critical structures such as the facial nerve are involved.

S151. Obstructive Sleep Apnea and Pseudotumor Cerebri in a Young Girl

Evelyne Kalyoussef, MD, Newark, NJ; Huma Quraishi, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the relationship between idiopathic intracranial hypertension and obstructive sleep apnea.

Objectives: 1) To present a case of idiopathic intracranial hypertension (IIH) and obstructive sleep apnea (OSA) relieved by adenotonsillectomy; and 2) to review the literature regarding the relationship between IIH and OSA. **Study Design:** We present a case report of a nine year old obese female who presented to us with severe intractable pseudotumor cerebri, also known as idiopathic intracranial

hypertension (IIH). **Methods:** The patient had multiple ER visits and hospital admissions for headaches and diplopia related to her IIH. She was followed by the ophthalmology service for papilledema and had undergone treatment with acetazolamide with minimal improvement in her symptoms. The patient was also found to have obstructive sleep apnea, with an RDI of 21 events per hour. Despite maximal medical therapy, the patient continued to complain of severe headaches and visual difficulties. A literature search was performed and an association between IIH and OSA was identified. In an effort to improve her symptoms, an adenotonsillectomy was performed. **Results:** The patient experienced immediate symptomatic relief of her headaches and diplopia postoperatively. **Conclusions:** Obstructive sleep apnea is suggested to be an independent risk factor in the worsening of idiopathic intracranial hypertension. Obesity is a risk factor for both OSA and IIH. A diagnosis of OSA should be investigated in patients with IIH, particularly if they are overweight and unresponsive to medical therapy.

S152. **P**ediatric Unilateral Profound Sensorineural Hearing Loss from Non-Meningogenic Labyrinthitis Ossificans

Laura A. Kirk, MSPAS PA-C, San Francisco, CA; Christine M. Glastonbury, MBBS, San Francisco, CA; Kristina W. Rosbe, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) demonstrate knowledge of the causes of pediatric sensorineural hearing loss; 2) identify the causes of labyrinthitis ossificans and explain the pathologic mechanisms of this condition; 3) explain the appropriate investigation of pediatric disequilibrium, with and without hearing loss; and 4) discuss therapeutic options for prevention of labyrinthitis ossificans.

Objectives: Profound sensorineural hearing loss is a potentially serious and irreversible complication of viral labyrinthitis. We present our case report to highlight the challenges in early diagnosis of unilateral deafness in a young child. We would advocate for early, comprehensive audiologic testing and subsequent temporal imaging in children presenting with vestibular symptoms in association with an upper respiratory infection. **Study Design:** Case report with medical record review and review of the current literature. **Methods:** All medical records, audiograms, and imaging were reviewed. A literature review was performed using PubMed and search terms: labyrinthitis ossificans, unilateral hearing loss, pediatric hearing loss, pediatric disequilibrium, temporal bone CT. **Results:** Ear examination and head computed tomography (CT) were reportedly normal at the initial presentation of ataxia. An interval screening audiogram was normal. After the patient presented with subjectively worsening hearing and failed a repeat hearing screening, an audiogram was ordered which demonstrated profound, unilateral sensorineural hearing loss (SNHL) and a temporal bone CT demonstrated extensive, unilateral labyrinthitis ossificans. **Conclusions:** Diagnosis of young children with unilateral hearing loss can be challenging. We propose that in children presenting with sustained vestibular symptoms in the setting of a URI, serial audiograms should be performed and imaging studies added to the diagnostic algorithm if SNHL is identified. The role of steroid therapy is unproven, but potentially beneficial in preventing development of labyrinthitis ossificans after infectious labyrinthitis or meningitis.

S153. **P**ediatric Sinonasal Inverted Papilloma: An Uncommon Occurrence and Its Proposed Management

Maggie A. Kuhn, MD, New York, NY; Benjamin Y. Rafii, MD, New York, NY (Presenter); Elana I. Opher, MD, New York, NY; Jessica W. Lim, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate that inverted papilloma (IP) is uncommon but can arise in children. Discuss diagnostic and management strategies of IP in the pediatric population.

Objectives: Sinonasal inverted papillomas (IP) are uncommon and are particularly rare in children. We present a case of recurrent nasal IP in a child and review its characteristic radiographic and histologic appearance, then suggest an appropriate management and surveillance strategy. **Study Design:** Case report and literature review. **Methods:** Review the clinical, radiologic and histopathologic findings of nasal IP in a child and review cases of pathologically confirmed pediatric IP in the English literature. **Results:** A 10 year old girl presented with recurrent left sided nasal obstruction and rhinorrhea following two prior resections of a left nasal mass. Nasal endoscopy revealed a papillomatous lesion in the left nasal cavity. CT of the paranasal sinuses demonstrated soft tissue filling the left nasal cavity with extension into the nasopharynx. At the time of surgery, the lesion was found to be filling the left posterior nasal cavity and nasopharynx, with a narrow pedicle along the nasal floor. The lesion was resected endoscopically with negative margins. Histological examination showed a Schneiderian (inverted) squamous papilloma. Review of the English literature identified fewer than 20 cases of IP in children. No pediatric cases of squamous cell carcinoma arising from an IP have been reported. However, these benign neoplasms demonstrate a high propensity for recurrence. **Conclusions:** Inverted papilloma is present not only in adults but may also occur in children. Clinical and radiographic findings mimic other benign sinonasal pathologies so diagnosis is based on histopathology following surgical excision. We propose complete endoscopic resection of unilateral papillomatous sinonasal masses in children and close surveillance for recurrence.

S154. **C**ase Report of a Congenital Lingual Leiomyomatous Hamartoma: New Epidemiologic Findings and a Review of the Literature

Arjuna B. Kuperan, MD, Newark, NJ; Huma A. Quraishi, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the epidemiology of lingual leiomyomatous hamartomas in addition to being aware of the differential diagnosis of lesions in the same anatomic location. Participants should also understand the radiologic and histologic findings of this rare lesion and its surgical management.

Objectives: To provide a more current analysis of the epidemiology of lingual leiomyomatous hamartomas previously under reported in the literature, in addition to describing its radiologic and histologic findings, and surgical management. **Study Design:** Case report. **Methods:** Case report and review of the literature. **Results:** The differential diagnosis of a congenital midline tongue mass near the foramen cecum includes thyroglossal duct cyst, lingual thyroid, and rarely, lingual hamartoma. We describe an interesting case of a 5 month old male who presented with a posterior midline tongue mass; ultrasound imaging showed a normal thyroid gland, and surgical excision yielded pathologic findings consistent with a leiomyomatous hamartoma. A comprehensive literature review revealed twenty-six cases of leiomyomatous hamartoma, a number much greater than previously reported. A more current analysis of the epidemiology, radiologic and histologic findings, and surgical management of lingual leiomyomatous hamartomas will be discussed. **Conclusions:** Congenital lingual leiomyomatous hamartomas are thought to be quite rare, however, a comprehensive literature review indicates that they are nearly twice as common as previously indicated. It is therefore important to consider this lesion in the differential of congenital tongue masses.

S155. **Parapharyngeal Space Abscess as a Rare Complication of a Pediatric Tonsillectomy: A Case Report and Review of the Literature**

Arjuna B. Kuperan, MD, Newark, NJ; Huma A. Quraishi, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the possible etiologies of a parapharyngeal space abscess after tonsillectomy. In addition, they should be able to recognize the clinical and radiologic features of this complication and the most efficacious antibiotic and surgical management.

Objectives: To report a previously undocumented case of a pediatric post-tonsillectomy parapharyngeal space abscess, and understand the possible etiologies via a literature review of similar cases documented in adults. To review the clinical and radiologic presentation, as well as medical and surgical management, of this rare complication. **Study Design:** Case report. **Methods:** Case report and review of the literature. **Results:** Few reports of post-tonsillectomy parapharyngeal space abscesses exist, but those documented support injection or suture needle violation through the tonsillar fossa as a potential etiology. **Conclusions:** A post-tonsillectomy parapharyngeal space abscess is indeed a rare complication previously undocumented in children. Care must be taken to avoid intraoperative contamination of the parapharyngeal space. Rapid identification of this complication is essential to initiate surgical drainage and antibiotic treatment.

S156. **Childhood Tracheomalacia Treated with Ipratropium Bromide**

Stephen C. Maturo, MD, Boston, MA; Thomas Q. Gallagher, DO, Boston, MA (Presenter); Christopher J. Hartnick, MD MS*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss 1) the most common presenting symptoms of tracheomalacia; and 2) a possible medical treatment, ipratropium bromide, for tracheomalacia.

Objectives: 1) Evaluate the treatment results of ipratropium bromide in tracheomalacia; and 2) analyze the most common presenting symptoms of tracheomalacia presenting to a multidisciplinary aerodigestive clinic. **Study Design:** Retrospective chart review of children diagnosed with tracheomalacia in a pediatric aerodigestive center over 3 years. **Methods:** 52 children were treated with ipratropium bromide after undergoing rigid and flexible bronchoscopy and being diagnosed with tracheomalacia. All children had symptoms that were either severe enough to warrant bronchoscopy or for symptoms that were refractory to prior medical therapy. Presenting symptoms, previous diagnoses, disease severity, and results with ipratropium bromide were analyzed. **Results:** There were 22 girls and 30 boys with an average age of 4.2 years. The most common presenting symptom was cough (28), followed by recurrent croup (19), stridor (4), and recurrent pneumonia (1). The most common presenting diagnoses were asthma refractory to standard treatment (14) and recurrent croup (3). Mild tracheomalacia was diagnosed in 34 (65.3%) children while moderate tracheomalacia was seen in 18 (34.7%). Overall 32 (61.5%) children had improvement in their symptoms following treatment; 20 (58.8%) and 12 (66.6%) showed improvement in the mild and moderate groups respectively. **Conclusions:** Symptoms attributed to mild/moderate tracheomalacia show improvement when treated with ipratropium bromide. Although the clinical symptoms of tracheomalacia overlap with many common pediatric aerodigestive diagnoses, we have found a thorough multidisciplinary approach with appropriate medical treatment can help most children alleviate their symptoms. Further controlled studies are warranted in order to optimize medical treatment strategies for children with tracheomalacia.

S157. **Recurrent Juvenile Active Ossifying Fibroma Requiring Radical Maxillectomy and Palatal Prosthesis**

Steven Michael Olsen, MD, Rochester, MN; Cody A. Koch, MD PhD, Rochester, MN; Eric J. Moore, MD*, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to diagnose and understand the treatment of juvenile active ossifying fibroma.

Objectives: To improve clinical understanding of the diagnosis and treatment of juvenile active ossifying fibroma, a rare variant of fibrous tumor. **Study Design:** Case report and literature review. **Methods:** Disease presentation, imaging, intraoperative findings, pathologic specimens, and clinical outcomes are reviewed for a case of recurrent JOAF in a four year old girl. A Medline search

for all reports of JOAF was performed and the results were summarized. **Results:** JOAFs usually present in the craniofacial bones of children. Although benign, these lesions tend to grow aggressively destroying and remodeling adjacent tissue. Histologically, JOAFs consist of a cell rich fibrous stroma with bands of cellular osteoid. Tumors are unencapsulated but tend to be well demarcated from surrounding tissue. Once identified, lesions should be surgically removed en bloc if possible. Despite aggressive surgical resection, there is a high recurrence rate. **Conclusions:** JOAF is an aggressive benign fibroosseous tumor of children. Despite being benign, incomplete resection often results in recurrent disease requiring repeat surgery with the potential for significant morbidity.

S158. The Novel Use of Pedicled Submental Flaps in the Treatment of Recurrent Fourth Branchial Cleft Anomalies in the Pediatric Population

Anju K. Patel, BA, Washington, DC; Eric M. Jaryszak, MD PhD, Washington, DC; Skye M. Stewart, College Park, MD; Rahul K. Shah, MD*, Washington, DC; Arjun Joshi, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of novel, aggressive treatment options for persistent fourth branchial anomalies.

Objectives: Fourth branchial cleft anomalies are rare and can present in a variety of ways in the head and neck. Limited data exists on the treatment of complex recurrent fistulas. We present a unique case utilizing a pedicled submental flap in the management of a persistent fourth branchial anomaly, and discuss the use of pedicled flaps in the pediatric population. **Study Design:** Retrospective chart review. **Methods:** Patient data was collected from a tertiary care pediatric facility records. **Results:** An 8 year old patient presented to our institution with a history of recurrent left neck infections and multiple failed incision and drainage procedures. Conservative surgical measures failed. She eventually underwent a complete resection of the fistula with partial pharyngectomy, left selective neck dissection, and two layered closure of the pharyngotomy defect with an oversewn pedicled submental island flap. The surgery was uneventful and the patient is without evidence of recurrence 7 months postoperatively. **Conclusions:** Treatment options for fourth branchial anomalies include incision and drainage, endoscopic cauterization via direct laryngoscopy or open neck surgery with complete sinus tract excision and thyroidectomy. Persistent disease requires aggressive management with partial pharyngectomy with/without the use of additional soft tissue for coverage. For significant pharyngeal defects, submental pedicled flaps can be utilized in repair and closure. To our knowledge this is the first reported case of a pedicled submental flap for closure of a pharyngotomy defect in the pediatric population. The use of the submental flap in this group is feasible, with few to no complications, and offers very acceptable cosmesis.

S159. Complete Peripartum Airway Management of a Large Epignathus Teratoma: EXIT to Resection

Brianne B. Roby, MD, Minneapolis, MN; Andrew R. Scott, MD, Boston, MA; Timothy A. Lander, MD, Minneapolis, MN; James D. Sidman, MD*, Minneapolis, MN; Robert J. Tibesar, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss epignathus teratomas and the complex nature of diagnosing and treating these tumors.

Objectives: 1) To familiarize the reader with the ex utero intrapartum treatment (EXIT) procedure, including the multidisciplinary approach for planning and carrying out this procedure; 2) to educate the reader on epignathus teratoma, including the embryology and pathology of this type of tumor; and 3) to discuss the surgical management of epignathus teratomas. **Study Design:** Case report. **Methods:** A single case was reviewed, including prenatal 3D ultrasound and MRI, photos during EXIT procedure, and video recording of endoscopic tumor excision. A literature review of epignathus teratomas was also completed. **Results:** We present a case of a female infant who was diagnosed on prenatal ultrasound with an oral mass, and subsequently underwent a planned EXIT procedure and tracheotomy to secure the airway. Ultimately the epignathus teratoma was excised at 3 days of age using endoscopically assisted transoral resection. The number of cases in which neonates have survived epignathus teratomas has increased in the past decade as prenatal imaging techniques have improved and with the development of the EXIT procedure. However, as of 2008, there were only 8 cases in the literature of true epignathus teratomas that had been successfully excised. **Conclusions:** This case report demonstrates the importance of a multidisciplinary approach including obstetricians, perinatologists, neonatologists, anesthesiologists, and otolaryngologists that must be established when a prenatal diagnosis raises concern for airway compromise in a neonate. Once a safe airway was secured, a comprehensive workup could be completed to plan for definitive management of epignathus teratoma.

S160. Temporo-Orbital Cranial Fasciitis in a Pediatric Patient

Tara L. Rosenberg, MD, Jackson, MS; John Mark Reed, MD, Jackson, MS; Holly L. McIntire, MD, Houston, TX; Bret C. Allen, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the clinical and histological features and management of masses consistent with cranial fasciitis.

Objectives: The clinical history of a pediatric patient with a temporo-orbital mass consistent with cranial fasciitis is reviewed. Histology of cranial fasciitis and previously reported cases are examined to allow for comparison of this rare diagnosis. **Study Design:** Case report and literature review. **Methods:** A two year old female presented with a rapidly enlarging right temporo-orbital mass that resulted in pain. CT findings revealed erosion of the lateral orbital wall with mild compression of the globe. **Results:** Surgical intervention included incisional biopsy of the mass for diagnosis. Intraoperatively, the mass was found to be bright white in color and had minimal

bleeding. It was well encapsulated with an obvious border. Final pathology revealed cranial fasciitis. Postoperatively, the patient did well, and a repeat CT scan (approximately three months after initial scan) revealed a significant decrease in the size of mass with almost complete resolution. No further surgical intervention was required. **Conclusions:** Pediatric cranial fasciitis is a rare diagnosis. Treatment may require complete surgical resection if spontaneous resolution does not occur.

S161. Acute Myelogenous Leukemia (AML) Presenting as Atypical Mastoiditis

Kelli Lynn Rudman, MD, Milwaukee, WI; Robert H. Chun, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to consider malignancy in the differential diagnosis for atypical mastoiditis, become familiar with the presentation of granulocytic sarcoma, and consider surgical options in otologic manifestations of leukemia.

Objectives: To describe a case of acute myelogenous leukemia presenting as acute otitis media with atypical mastoiditis and granulocytic sarcoma of the temporal bone and sigmoid sinus. **Study Design:** Case report. **Methods:** Case report and review of the literature. **Results:** Acute otitis media is a rare presentation of acute leukemia. Our patient also presented with granulocytic sarcoma involving the superior sagittal sinus, skull base, sigmoid sinus and internal jugular vein. Literature review describes similar cases; 75% (6/8) had associated facial nerve paresis. Intervention in these cases varied from observation and treatment with chemotherapy to mastoidectomy. **Conclusions:** This is the eighth case of acute leukemia presenting as acute otitis media reported in the literature. Though rare, acute leukemia or relapsed leukemia should be considered in the differential diagnosis for atypical otitis and mastoiditis. Because granulocytic sarcoma of the temporal bone may mimic mastoiditis or sigmoid sinus thrombosis, complete hematologic and radiologic workup is necessary prior to surgical intervention. Malignancy should be considered in the differential diagnosis of patients who present with atypical symptoms of mastoiditis. Surgical management of otologic manifestations of acute leukemia should be considered for biopsy in unknown diagnosis or treatment of infection in the presence of leukemia. As demonstrated in our patient and literature review, many of the otologic findings in leukemia improve with chemotherapy.

S162. Atypical Presentation of Recurrent Thyroglossal Duct Cyst in a Pediatric Patient

Gennadiy Vengerovich, MD, Brooklyn, NY; Gregory Dibelius, MS4, Brooklyn, NY; Gady Har-El, MD*, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participant should be able to describe the appropriate presurgical evaluation of a pediatric patient with a recurrent neck mass, appreciate the anatomic and functional considerations with particular regard to atypical location, as well as describe surgical management.

Objectives: 1) Describe the embryologic origins of congenital pediatric neck masses; 2) present an atypical case of recurrent thyroglossal duct cyst; and 3) discuss surgical management of this entity. **Study Design:** Case report. **Methods:** We present a case of a 9 year old boy with a recurrent lateral neck mass diagnosed as thyroglossal duct cyst, which presented a diagnostic and surgical dilemma. **Results:** A 9 year old male with a history of excision of a lateral neck mass 3 years ago presented for evaluation of a draining level II neck mass over the anterior border of the right sternocleidomastoid. CT scan demonstrated a small right level II mass without identifiable fistula or sinus tract. The diagnosis of third less likely second branchial cleft cyst was made and the patient underwent surgical excision. Intraoperatively, the sinus tract was identified and traced medially and superiorly into the midsection of the hyoid bone. The patient subsequently underwent Sistrunk procedure.

Conclusions: Lateral neck masses in pediatric patients can present a diagnostic and surgical dilemma. Even though most cases of thyroglossal duct anomalies have distinct presentations, occasional cases do not conform to the standard picture. Previous surgical intervention can cause anatomic distortion and can furthermore contribute to atypical location on presentation. The surgeon must be conscious of the wide spectrum of differential diagnoses for a pediatric neck mass, ensure adequate preoperative evaluation including thyroid imaging and be prepared to modify surgical management based on intraoperative findings.

S163. First Report of Multiple Branchial Cleft Anomalies in Conjunction with a Congenital Dermal Fistula of the Lower Extremity

Ryan D. Winters, MD, New Orleans, LA; J. Lindhe Guarisco, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the first case of multiple branchial cleft anomalies in conjunction with a peripheral dermal fistula tract of the ipsilateral lower extremity.

Objectives: To describe the first reported case of 1st and 2nd branchial cleft anomalies in conjunction with an ipsilateral peripheral dermal fistula of the lower extremity. **Study Design:** Case report. **Methods:** Multiple branchial cleft anomalies in a single patient are a rare occurrence and have never been reported in conjunction with a peripheral dermal fistula tract. Our description of such a peripheral dermal fistula of the lower extremity represents only the second report of this peripheral phenomenon in the literature. **Results:** The first report of a child with a right 1st branchial cleft fistula and a right 2nd branchial cleft fistula, occurring in conjunction with an ipsilateral peripheral dermal fistula, connecting the skin of the calf with the skin of the dorsal foot, is detailed. Genetic testing revealed nothing consistent with a known syndrome, and possible embryologic etiologies are discussed. **Conclusions:** Despite extensive genetic testing and clinical and laboratory workup, no definitive syndrome was identified. We present the first case of multiple ipsilateral branchial cleft anomalies together with an ipsilateral, lower extremity cutaneous dermal fistula.

S164. **Propranolol Treatment for an Isolated, Obstructing Subglottic Hemangioma**

Yi-Hsuan E. Wu, MD, Boston, MA; Jan C. Groblewski, MD, Providence, RI

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of propranolol as a first line therapy for isolated subglottic hemangiomas.

Objectives: To present a patient with an isolated subglottic hemangioma who responded successfully to propranolol therapy; to discuss and review pertinent literature. **Study Design:** Case report and literature review. **Methods:** 1) Retrospective review of patient records and endoscopic photodocumentation; and 2) review of the medical literature pertinent to the use of propranolol in subglottic and airway hemangiomas. **Results:** A 6 month old, previously full term male with no history of prior intubations was admitted for evaluation of respiratory distress, biphasic stridor and recurrent "croup". Microlaryngoscopy and bronchoscopy revealed a subglottic hemangioma obstructing 90% of the subglottic airway. Propranolol and prednisone therapy was immediately initiated following cardiology evaluation. The patient's stridor and respiratory distress rapidly resolved, and a repeat airway evaluation 3 days following the start of propranolol showed 80% airway obstruction. Four days later, the hemangioma had contracted further to 60% obstruction. The patient remained asymptomatic and the subglottic hemangioma slowly decreased in size over the ensuing 4 months after the patient was weaned from prednisone. No additional therapy was necessary for management of this patient's subglottic hemangioma. **Conclusions:** Propranolol should be considered for first line therapy in the treatment of isolated subglottic hemangiomas. Although most patients with subglottic hemangiomas demonstrate a positive response to propranolol, the rate and degree of response are unpredictable, with some patients still requiring more traditional therapies or surgical intervention.

Plastics-Aesthetics

S165. **Frontal and Lateral Facial Attractiveness: Is There a Correlation?**

David Avila, BS, 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 relationship between frontal and lateral facial attractiveness and identify key features that can lead to discordant attractiveness between these two portrait views.

Objectives: To determine the relationship between frontal (F) and lateral (L) facial attractiveness, and identify anatomic features that may lead to discordance between F and L facial beauty. **Study Design:** Computer based basic research study. **Methods:** Paired frontal and lateral facial synthetic basis portraits of 240 Caucasian women (18-25 age range) were evaluated by a validated internet based focus group (n=600) on an attractiveness scale of 1-10. Paired F and L facial attractiveness scores (AS) were correlated and further qualitatively analyzed where a percent difference greater than 20% was present. **Results:** AS varied from 3.4 to 9.5 and 3.3 to 9.4 for F and L images respectively. When plotting AS for F and L images, a correlation coefficient of R=0.75 was obtained. Scatter plots signified stronger correlation for average to more attractive faces, while unattractive faces shared a weaker relationship. A thin upper lip, convex nose, blunt cervical mental angle were facial characteristics that contributed to pairs with discordant F and L attractiveness scores. **Conclusions:** The goal of this study is to understand the relationship between frontal and lateral facial attractiveness, in an effort to augment the plastic surgeons' approach in managing overall facial attractiveness. We found a stronger correlation between frontal and lateral facial images in the average to more attractive faces, suggesting that facial attractiveness may be consistently easier to identify than unattractiveness. Further, specific facial landmarks leading to greater discordance between frontal and lateral facial attractiveness scores were identified, suggesting that the correction of these landmarks may increase facial harmony and attractiveness.

S166. **Identifying Ideal Brow Shape: An Empiric Analysis of the Three Archetypes**

Ashley A. Hamamoto, BS, Irvine, CA; Tiffany W. Liu, GED, Irvine, CA (Presenter); Zlatko Devcic, BS, San Francisco, CA; Brian J.F. Wong, MD PhD*, Irvine, CA

Educational Objective: This study aims to provide a better understanding of ideal eyebrow shape and design, which will have application in aesthetic brow lift procedures where surgeons can control brow position and geometry.

Objectives: Brow lifts counteract aging effects, correct ptosis, and optimize forehead aesthetics. While surgeons have control over brow shape, metrics defining ideal brow shape are subjective. This study aims to empirically determine whether three expert brow design stratagems are aesthetically equivalent using expert focus group analysis and its impact on brow surgery. **Study Design:** Computer based basic research study. **Methods:** A comprehensive literature search identified three dominant brow design methods (Westmore, Lamas, and Anastasia) heavily cited, referenced and/or internationally recognized in either medical literatures or lay media. Westmore's method, cited by surgical texts, contends the brow arch should be perpendicular to the lateral limbus. Lamas' method defines the arch as located on a line drawn from the base of the nose tangent to the iris. Anastasia, popular with media and celebrity clientele, suggests the arch be positioned on a line starting from the center of the nose through the center of the pupil. Using the guidelines from these three methods, brow shape was modified (Photoshop) for 10 female faces. A total of 30 modified images were created with 10 controls (original images). A focus group of 50 makeup artists ordinaly ranked the four images relative to each other for attractiveness. **Results:** The more contemporary methods (Anastasia, Lamas) laterally display the brow arch further than Westmore (classic), and are considered the

trend in facial aesthetics, but this was not supported empirically. No significant difference was observed in beauty score for the different methods - no single method consistently rated most or least attractive. Statistical models confirm no method is superior (F-value = 2.67, F-statistic = 0.769). **Conclusions:** Despite each method claiming to be the “best” approach, none achieved statistical significance in optimizing attractiveness, though each can be used effectively as a tool in designing eyebrow shape during brow lift procedures. Overall, the three methods can be used interchangeably.

S167. **B**olsterless Management of Primary and Recurrent Auricular Hematoma

Kiran Kakarala, MD, Boston, MA; David A. Kieff, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with a bolsterless technique effective in the management of primary or recurrent auricular hematoma.

Objectives: 1) Describe the author’s experience with a bolsterless technique for the management of primary or recurrent auricular hematoma; and 2) discuss the management options for primary or recurrent auricular hematoma and the comparative benefits of the bolsterless technique. **Study Design:** Retrospective case series. **Methods:** Patients presented with initial or recurrent auricular hematoma following traditional treatment with incision and drainage and bolster placement. Incision and drainage was performed and then auricular skin was stabilized using through and through absorbable horizontal mattress sutures using 4.0 or 5.0 plain or fast absorbing gut sutures. Patients were seen in followup at 2 weeks and 6 weeks to evaluate for recurrence and assess cosmetic results. **Results:** 28 patients were treated for auricular hematoma (15 primary and 13 recurrent) using the bolsterless technique over a 12 year period. There were 18 males and 6 females. There were no recurrences in followup and cosmetic results were judged to be excellent by both patient or guardian and surgeon. **Conclusions:** Bolsterless management of auricular hematoma using absorbable mattress sutures has been described intermittently in the otolaryngology literature since 1991 but is not widely utilized. In this series, patients presenting with recurrent auricular hematoma following failure of traditional bolster management were effectively managed with the bolsterless technique. This technique is well tolerated by patients and allows for early return to activity with no need for the care or dressing involved in a standard bolster technique. This technique of auricular hematoma management is less prone to fail than traditional bolster methods.

S168. **A**nalysis of Lip Dimensions and Facial Beauty: A Novel Method to Quantify Ideal Lip Size

Natalie A. Popenko, GED, Irvine, CA; Zlatko Devcic, BS, San Francisco, CA; Koohyar Karimi, BS, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand ideal lip dimensions in the overall facial archetype, and then implement the guidelines identified in this study on patients undergoing lip enhancement procedures.

Objectives: Identifying aesthetic ideal lip dimensions is critical to facial plastic surgery, as lip modification is an increasingly popular office based procedure. This study’s objectives are to determine: 1) ideal lip dimensions of the Caucasian female; and 2) ideal ratios of the upper and lower lips, and the total lip relative to the lower third of the face. **Study Design:** Computer based basic research study. **Methods:** Using facial processing software, digital portraits of 20 Caucasian females (ages 18 - 25) were adjusted to create a gradient of five faces with minimized to maximized lips, as well as five faces in which only the lower lip was minimized and maximized relative to the upper lip. A total of 200 faces were ordinally ranked by 100 evaluators. Normalized lip dimensions were quantified by surface area (SA) and linear measurements and correlated with attractiveness scores. **Results:** An optimal lip SA exists for every Caucasian face. Deviation from the ideal SA is linearly correlated with decreasing facial attractiveness. Furthermore, facial attractiveness is maximized with only modest enhancement of SA (+52.5%) and ideal ratios of upper to lower lip are 1/3rd to 2/3rd. **Conclusions:** Clinically, this study aims to generate a method for facial plastic surgeons to evaluate the effect of lip modification on overall facial attractiveness. Results suggest there is an ideal lip SA which maximizes facial beauty, and there are definite limits to improving facial attractiveness in both lip enlargement and reduction. Furthermore, the lip dimensions and ratios derived in this study provide validated guidelines in improving overall facial aesthetics.

S169. **A**natomical Investigation of the Lower Eyelid Tarsus

Estelle S. Yoo, MD, Shreveport, LA; Sunny S. Park, MD MPH, Shreveport, LA; Timothy S. Lian, MD, Shreveport, LA; Fred J. Stucker, MD*, Shreveport, LA; John W. Mooring, MD, Shreveport, LA; Fleurette W. Abreo, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize and compare gross and microscopic anatomy of the lower eyelid tarsus to that of the upper eyelid tarsus and to describe and compare patterns of collagen I, II, and III expression in upper and lower tarsi.

Objectives: 1) To characterize and compare gross and microscopic anatomy of the lower eyelid tarsus to that of the upper eyelid tarsus; 2) to describe and compare patterns of collagen I, II, and III expression in upper and lower tarsi. **Study Design:** Descriptive anatomical comparison study. **Methods:** Total of 16 human cadaver right upper and lower eyelids were harvested. Upper tarsi were used as a comparison. Height, width, and weight of these formalin-fixed tarsi were measured. Six male and four female upper and lower tarsi were processed for histology using hematoxylin and eosin stain. Immunohistochemistry for collagens I, II, and III were performed. Gross and microscopic anatomy and immunohistochemistry characterization of the upper and lower tarsi were compared. **Results:** The

gross anatomic evaluation of the upper and lower eyelids demonstrated height and weight difference of $0.54 \pm 0.12\text{cm}$ and $0.19 \pm 0.07\text{mg}$, respectively. Mean density of upper $1.15 \pm 0.16 \text{ mg/cm}^3$ vs. lower $1.76 \pm 0.21 \text{ mg/cm}^3$ showed statistically significant difference ($p = 0.000014$). Immunohistochemistry to collagen I and III revealed stronger uptake of collagen I and III in lower eyelid tarsi compared to upper eyelid tarsi. Collagen II stained non-specifically. **Conclusions:** Gross examination of the inferior tarsus revealed shorter height but statistically significant higher density. Similar patterns of distribution of collagen I and III in both upper and lower tarsal plates confirm the comparable histological integrity of the upper and the lower tarsi, but the lower eyelid tarsus has more dense stromal collagens and abundant extracellular matrix.

Sinus-Rhinology

S170. Treatment Strategies for Lateral Sphenoid Sinus Recess Cerebrospinal Fluid Leaks

Nathan S. Alexander, MD, Birmingham, AL; Kristen O. Riley, MD, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss concepts critical to achieving successful repair of a skull base defect in the lateral sphenoid sinus recess using the transpterygoid approach and avoiding intracranial complications.

Objectives: The management of lateral sphenoid sinus recess (LSR) cerebrospinal fluid (CSF) leaks presents unique challenges to the otolaryngologist. This study highlights concepts critical to achieving successful repair and avoiding intracranial complications. **Study Design:** Prospective observational cohort. **Methods:** Patients with LSR CSF leaks were prospectively evaluated from 6/2008 to 7/2010. Demographics, prior procedures, surgical approaches, intracranial pressure measurements, and complications were recorded. **Results:** Eleven patients were treated with the endoscopic transpterygoid approach for 12/13 LRS CSF leaks. Eight patients had one or multiple failed attempts at repair prior to presentation [4 endoscopic sphenoidotomies and 4 middle cranial fossa (MCF) approaches]. One patient presented with a temporal lobe abscess following hydroxyapatite "obliteration" to seal off the LRS. This required a combined MCF/transpterygoid approach to drain the abscess, remove the encephalocele and hydroxyapatite, seal the skull base defect, and establish adequate drainage for the LRS. In 2 cases, the LRS was left patent due to concerns of inadequate extirpation of mucosa. Median followup was 5.08 months (0.4 to 17). One patient experienced a failure (2 months post-repair), which was successfully sealed on the second attempt. Postoperative ICP measurements were recorded on 8 patients (average $26.7\text{cmH}_2\text{O}$). Nine patients had postoperative intervention for intracranial hypertension (5 ventriculoperitoneal shunts, 4 maintained on acetazolamide). **Conclusions:** This study provides support for the endoscopic transpterygoid procedure as the definitive approach to LRS skull base defects. Obstruction of the LRS without repairing the skull base defect and exenterating the mucosa leads to poor outcomes and potential intracranial complications.

S171. Epidemiologic Factors and Surgical Outcomes in Patients with Polyps and Asthma

Carrie M. Bush, MD, Augusta, GA; Jason P. Champagne, MD, Augusta, GA; Eyad Khabbaz, 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 the role of epidemiologic factors on outcomes in endoscopic sinus surgery.

Objectives: To evaluate the role of epidemiologic factors in the surgical outcome of patients with chronic rhinosinusitis (CRS), polyps and asthma. **Study Design:** Prospective cohort study. **Methods:** Clinical and demographic records of 72 patients (27 male, 45 female) who underwent endoscopic sinus surgery (ESS) for treatment of CRS with polyps and asthma were collected. Data was also collected on a control population of patients with CRS without polyps and asthma. At time of initial presentation patients underwent grading via Lund-Kennedy nasal endoscopy and Lund-Mackay computed tomography (CT) standardized scoring methods. Patients also completed pre- and postoperative Sinonasal Outcome Test - 20 (SNOT-20) surveys. Data was analyzed by means of paired T-test to calculate statistical significance. **Results:** Preoperatively females had higher SNOT-20 scores than males ($p < 0.05$). Following surgery both males and females had significant improvement in SNOT-20 scores ($p < 0.05$). African American and Caucasian subgroups had no difference in preoperative SNOT-20 scores, and both subgroups had a significant improvement in SNOT-20 scores postoperative. No difference was present amongst subgroups in preoperative Lund-Mackay CT and Lund-Kennedy endoscopy scores. **Conclusions:** Epidemiologic factors have been shown to impact the surgical outcome of patients with subsets of rhinologic pathology. Understanding these factors and their significance may add to the postoperative management of patients with chronic sinus disease.

S172. Transnasal Endoscopic Resection of a Recurrent Pleomorphic Adenoma of the Sphenoid Sinus and Anterior Skull Base

Adam S. DeConde, MD, Los Angeles, CA; Marvin Bergsneider, MD, Los Angeles, CA; Arthur W. Wu, MD, Los Angeles, CA; Marilene B. Wang, MD*, Los Angeles, CA

Educational Objective: At the conclusion of this presentation the participants should be able to discuss the risk factors for recurrent pleomorphic adenoma and explain a transnasal endoscopic approach to such a tumor of the anterior skull base.

Objectives: To illustrate a case report of a rare location for recurrence of a primary parotid pleomorphic adenoma (PA) and to demon-

strate via video the transnasal endoscopic approach for resection of tumors of the anterior skull base. **Study Design:** Case report and review of the literature. **Methods:** A patient presented with recurrent PA, originally with a right sided deep lobe parotid and parapharyngeal space tumor that was resected 18 years ago. Her first recurrence was discovered in 2001, and since then she has had multiple recurrences in the peri-parotid tissue, the neck, and the nasopharynx for which she has undergone five separate surgeries as well as radiation. The patient presented right sided trigeminal pain and numbness. MRI demonstrated a large enhancing mass in the sphenoid sinus with erosion of the clivus, displacing the pituitary and optic chiasm. There was widening of the foramen ovale as well as involvement of the right cavernous sinus and Meckel's cave. **Results:** The patient underwent a transnasal endoscopic resection of the sphenoid and anterior skull base mass in piecemeal fashion without complication. Postoperatively, no residual enhancing tumor was seen within the remaining sphenoid sinus and adjacent nasopharynx. **Conclusions:** Recurrent PA is a difficult disease to treat with great morbidity secondary to repeat operations and the tendency for the disease to recur. For lesions of the anterior skull base, endoscopic resection is safe and preferable, carrying less morbidity compared to open procedures. The open cavity allows easy access for regular inspection for recurrent disease.

S173. **Superiorly Based Orbital Subperiosteal Abscess: A Case Report and Literature Review**

Adil A. Fatakia, MD, New Orleans, LA; Ryan Winters, MD, New Orleans, LA; John L. Guarisco, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the spectrum of orbital infections and identify them on radiographic imaging. Finally, they should also be able to discuss the medical and surgical management options for the treatment of a subperiosteal abscess.

Objectives: To review a case of a 14 year old boy with a right superiorly based subperiosteal orbital abscess with associated sinusitis. To review the management of subperiosteal orbital abscess based on a search of the most recent and pertinent publications in the ENT/ophthalmology literature. **Study Design:** Single case review and review of recent literature pertaining to subperiosteal orbital abscesses. **Methods:** Case review and literature search. **Results:** We find that in the case of superiorly based subperiosteal orbital abscesses, external drainage or a combination of external and endoscopic surgery is necessary. **Conclusions:** Subperiosteal orbital abscesses are best diagnosed with CT scan. Treatment is medical or surgical. Within the surgical arm, endoscopic or external approaches can be utilized. Location of the abscess is the most important factor in determining the necessity of an external approach.

S174. **Modified Draf IIB with Frontal Intersinus Septectomy for Contralateral Frontal Sinus Disease: A Cadaveric Study**

Mark E. Friedel, MD MPH, Newark, NJ; Arjuna B. Kuperan, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to define the accessibility of the frontal sinus via a modified Draf IIB with frontal intersinus septectomy and understand its potential application to recalcitrant frontal sinus disease in select cases.

Objectives: Frontal sinus disease has historically been one of the most challenging aspects of endoscopic sinus surgery. In select cases, anatomic variations may hinder access using traditional endoscopic approaches. We propose a modification of the standard Draf IIB procedure which incorporates a frontal intersinus septectomy to access and manage recalcitrant contralateral frontal sinus disease. Additionally, we propose a case where this modification obviates the need for more extensive endoscopic or external approaches. **Study Design:** Anatomic cadaveric dissection study. **Methods:** Endoscopic dissection was performed on 3 fresh cadaveric heads to demonstrate the Draf IIB (resection of the frontal sinus floor from the lamina papyracea to the nasal septum) with the addition of frontal intersinus septectomy and to determine the feasibility of this approach to access contralateral disease. High quality endoscopic pictures and high definition videos were obtained. **Results:** Each dissection was successfully performed with adequate access to the contralateral frontal sinus. The Draf IIB allowed ample access for instrumentation and resection of the intersinus septum in each of the dissections. **Conclusions:** The modified Draf IIB with frontal intersinus septectomy was demonstrated to be a feasible approach and potential alternative to more traditional ipsilateral endoscopic procedures. This modification will be useful in addressing difficult to access unilateral frontal disease in those cases with limited access via traditional frontal sinusotomy approaches.

S175. **Endoscopic Treatment of Silent Sinus Syndrome: A Case Report**

Jonathan R. George, MD MPH, San Francisco, CA; Megan L. Durr, MD, San Francisco, CA; Steven D. Pletcher, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the epidemiology, clinical presentation, pathophysiology, and surgical treatment of silent sinus syndrome, or chronic maxillary atelectasis. Based on this case, they will become familiar with the possibility that endoscopic sinus surgery without staged orbital floor reconstruction may be sufficient to restore the bony architecture of the atelectatic maxillary sinus.

Objectives: Chronic maxillary atelectasis (CMA), also known as silent sinus syndrome, refers to a persistent decrease in sinus volume from retraction of the maxillary sinus walls. The objective of this paper was to describe a single patient case in which the deformed maxillary sinus walls spontaneously resolved after FESS aeration of the sinus alone. **Study Design:** Single institution case report, with

review and critical analysis of the literature. **Methods:** We report on a 28 year old female with chronic sinusitis, right chronic maxillary atelectasis (CMA) and ipsilateral enophthalmos. She was found on CT to have CMA. Functional endoscopic sinus surgery (FESS) for her chronic sinusitis was performed without surgical manipulation of the posterior maxillary sinus wall or correction of enophthalmos. Following surgery there was dramatic resolution of the osseous changes of the right posterior maxillary sinus wall, confirmed on CT scan. **Results:** Based on a review of the literature, this appears to be the first known case of spontaneous resolution of the bony deformities of the affected maxillary sinus through FESS alone. Prior literature suggests that the standard approach to CMA is through a two staged approach involving FESS and orbital floor reconstruction. **Conclusions:** In this case, we demonstrated dramatic resolution of chronic maxillary atelectasis through FESS aeration alone. Resolution of the osseous changes of CMA without manipulation of the maxillary sinus walls has not been reported. This calls into question the need for two stage facial bony reconstruction involving orbital floor reconstruction.

S176. **The Management of Refractory Epistaxis**

Satish Govindaraj, MD, New York, NY; Jean A. Eloy, MD, Newark, NJ; Aman Patel, MD, New York, NY; Greg Goldstein, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the treatment paradigm for patients with refractory epistaxis and know which patients may benefit from surgery versus embolization.

Objectives: To understand the management of patients with refractory epistaxis in a setting where embolization is available. **Study Design:** A retrospective review of patients presenting with refractory epistaxis from a tertiary care institution was performed. A review of the literature will help formulate an algorithm for management of this condition. **Methods:** A cohort of patients treated at a tertiary care institution was evaluated treated by either embolization or surgical intervention. A review of the literature was performed to create an algorithm in the management of patients with refractory epistaxis. **Results:** All patients were successfully treated by either embolization or surgical intervention. One patient had recurrent epistaxis after unilateral sphenopalatine artery and anterior ethmoid artery ligation which was treated with embolization. One patient with severe peripheral vascular disease suffered loss of vision after embolization. **Conclusions:** The management of epistaxis has evolved to incorporate the use of embolization into the treatment algorithm. Proper knowledge of which patients would benefit from either modality is imperative in the decision making process.

S177. **Superiorly Based Chondromucosal Septal Flap: A Novel Technique in the Transseptal Sublabial Approach to the Sphenoid Sinus**

Christian P. Hasney, MD, New Orleans, LA; Akash G. Anand, MD, New Orleans, LA; R. Brent Butcher, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the basic technique and indications for the superiorly based chondromucosal septal flap in the transseptal sublabial approach to the sphenoid sinus.

Objectives: The transseptal sublabial approach to the sphenoid sinus is a time honored technique in pituitary surgery. This technique is generally well tolerated but presents a small but significant risk of septal perforation. Revision procedures, particularly, bear an increased risk of septal perforation. It is our objective to define a novel technique designed to minimize the risk of septal perforation while affording the same degree of surgical exposure as traditional transseptal sublabial approaches to the sphenoid sinus. **Study Design:** Case series of patients who have undergone revision transseptal sublabial approach to the sphenoid sinus for resection of pituitary adenoma utilizing the superiorly based chondromucosal septal flap. We also describe the technique in those who have undergone this procedure following previous septoplasty and in those with preexisting septal perforation. **Methods:** All patients underwent resection of pituitary adenoma via open sublabial transseptal approach to the sphenoid sinus. Rather than performing a traditional transseptal approach, a superiorly based chondromucosal septal flap was fashioned and displaced intact in order to provide adequate surgical exposure and to avoid excessive dissection in order to decrease the risk of septal perforation. **Results:** This approach to the sphenoid sinus affords excellent surgical exposure for resection of pituitary adenoma. No septal perforations were noted in followup. **Conclusions:** Utilizing this superiorly based chondromucosal septal flap allows the same degree of surgical exposure as the standard sublabial transseptal approach while maintaining the structural integrity of the cartilaginous septum and, thus, potentially decreasing the risk of septal perforation.

S178. **Radiofrequency Volumetric Tissue Reduction of the Inferior Turbinate in a Sheep Model**

Kiran Kakarala, MD, Boston, MA; William C. Faquin, MD PhD, Boston, MA; Michael J. Cunningham, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the comparative tissue effects of four energy based techniques for inferior turbinate reduction as demonstrated in a sheep model.

Objectives: 1) Validate the sheep model of endoscopic nasal surgery, including description of sheep acoustic rhinometry findings; and 2) compare immediate and early postoperative histopathologic effects of four electrosurgical techniques for turbinate reduction using this model. **Study Design:** Pilot study comparing four electrosurgical devices for inferior turbinate reduction using a sheep model. **Methods:** Three radiofrequency devices (one monopolar and two bipolar) as well as standard monopolar electrosurgery were used for

inferior turbinate reduction in a sheep model. Procedures were performed according to device manufacturer guidelines using standard endoscopic technique. Normative acoustic rhinometry data was obtained both pre- and postoperatively. Histopathologic analysis of turbinate specimens was performed at postoperative day 0 and 21. **Results:** Turbinate reduction was performed on seven sheep, one procedure on each side. Acoustic rhinometry was validated in the sheep model with demonstrative increased nasal volumes following decongestion and turbinate reduction. Histopathologic examination of the fourteen turbinate specimens revealed destruction of seromucinous glands and venous sinusoids with subsequent submucosal fibrosis as the common mechanism of action for all electrosurgical devices. Epithelial disruption was documented with all devices on postoperative day 0. Squamous metaplasia and normal respiratory epithelial regeneration was seen variably between devices at postoperative day 21. **Conclusions:** The sheep model is useful for the study of the histopathologic effects of turbinate reduction procedures. Standard endoscopic techniques and acoustic rhinometry can be used in this model with reproducible results. Compared to monopolar electrosurgery, radiofrequency devices for inferior turbinate reduction may have benefits in terms of preservation of normal nasal mucosal respiratory epithelium.

S179. **E**xtensive Multifocal Rosai-Dorfman Disease Involving the Central Nervous System and Paranasal Sinuses

Grace G. Kim, MD, Newark, NJ; Mark E. Friedel, MD, Newark, NJ (Presenter); Jean Anderson Eloy, MD, Newark, NJ; Robert W. Jyung, MD, Newark, NJ; James K. Liu, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the pathophysiology, presentation, diagnosis, and management of multifocal Rosai-Dorfman disease.

Objectives: Rosai-Dorfman disease (RDD) is a rare benign lymphocytic disorder characterized by idiopathic histiocytic proliferation affecting lymph nodes. RDD in the central nervous system (CNS) without nodal disease is exceedingly uncommon. We describe a rare case of extensive multifocal RDD involving the CNS, skull base, and paranasal sinuses. We review the literature and propose a surgical strategy to manage extensive multifocal disease. **Study Design:** Case report. **Methods:** This 39 year old male with known RDD and multiple previous surgeries for intracranial and spinal RDD lesions presented with worsening spasticity, gait dysfunction, left facial pain and numbness, and mild dysphagia. Neuroimaging demonstrated multifocal enhancing dural based lesions in the brain including right frontal, right temporal, right cerebellopontine angle, left clinoidal, left petroclival and bilateral Meckel's cave lesions. There was progressive growth of the left petroclival lesion causing symptomatic brainstem compression. The patient also had obstructive sleep apnea due to RDD occupying the entire nasal and paranasal sinuses. **Results:** The patient underwent a left sided retrolabyrinthine transpetrosal-transstentorial approach to remove the left petroclival tumor and decompress the brainstem. The mass was carefully dissected off of cranial nerves IV through XI with excellent decompression of the brainstem. Endoscopic resection of the paranasal sinus mass was performed at a later date. Histologically, both masses were consistent with RDD. **Conclusions:** Extensive multifocal RDD involving the brain, spine, and paranasal sinuses is exceedingly rare and often mimic meningiomas on imaging. Surgical management can be challenging. We recommend a conservative approach with close observation and reserve surgical treatment for enlarging symptomatic lesions.

S180. "Pott's Puffy Tumor": Medical/Surgical Management in the New Sinus Era

Danny M. Meslemani, MD, Detroit, MI; Vanessa G. Schweitzer, MD*, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to diagnose and treat Pott's Puffy tumor with medical and surgical management.

Objectives: Case report of an adult male with a 5 year history of frontal sinusitis presenting with "doughy" left frontal forehead swelling that required frontal osteoplastic flap approach for frontal sinus osteomyelitis despite prior endoscopic maxillary/ethmoid surgery. **Study Design:** Case report and literature review. **Methods:** Surgical case report with digital pictorial preoperative/intraoperative/postoperative displays. Literature review completed for causation, diagnosis, radiologic imaging, treatment, and potential complications of Pott's Puffy tumor since first described by Sir Percival Pott (1771). **Results:** Preoperative CT/MRI imaging demonstrated ground glass opacifications of the frontal sinuses that involved anterior table wall erosion with posterior table wall dehiscence without intracranial involvement. The management of the large frontal mucopyocele included intravenous antibiotics (vancomycin and ertapenem) for 8 weeks, endoscopic surgical debridement and cultures, emergency frontal sinus trephination, osteoplastic flap approach for purulent drainage, frontal sinus reconstruction with mesh graft, and fat obliteration. Traditional 6 foot Caldwell-Luc template view was NOT accurate for surgical bone flap mapping and elevation due to severe neo-osteogenesis. Inadvertent misplaced twist drill created a pinhole CSF leak repaired with bone wax. **Conclusions:** Pott's Puffy tumor is rare with new century antibiotic therapy and sophisticated radiologic imaging. Unfortunately, with increasing outpatient antibiotic use with subsequent microbial resistance and frontal sinus disease refractory to endoscopic sinus surgery, patients may require combined anterior skull base/neurosurgical treatment.

S181. **E**ndonasal Endoscopic Resection of Clival Chordomas

Jagmeet S. Mundi, MD, Los Angeles, CA; Marilene B. Wang, MD*, Los Angeles, CA; Marvin Bergsneider, MD, Los Angeles, CA; Neil Martin, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the technique, risks, and benefits of endonasal endoscopic approach for excision of clival chordomas.

Objectives: Cranial base chordomas are locally aggressive midline skull base lesions which are difficult to treat via a traditional transcranial approach. We present a series of patients who underwent an endonasal endoscopic approach (EEA) for excision of clival chordomas, a novel, less invasive procedure with significantly reduced morbidity and similar efficacy when compared to transcranial alternatives. **Study Design:** Case series. **Methods:** Records were reviewed from a consecutive series of patients treated at a tertiary medical center who underwent EEA for resection of clival chordomas. Clinical course, imaging, and histopathology were examined. **Results:** Six patients underwent EEA for clival chordomas. The mean age was 55 years old. The mean tumor volume was 12.1 cm³. Three patients had their lesions discovered as incidental findings on MRI obtained for other indications: two with tinnitus and one patient with visual changes. Three presented with cranial nerve deficits, two with abducens palsy and one with a trigeminal palsy. Complete tumor resection was accomplished in four patients. One of the patients with incomplete resection had disease involving the cavernous sinus, and the other had involvement of the petrous portion of the carotid artery. Two patients experienced CSF leaks, both of which required operative repair. There were no other major complications. **Conclusions:** The EEA represents a safe, less invasive and more direct approach to resection of clival chordomas than transcranial resection. While larger series and longer followup is needed, our data suggest that this is a technically feasible approach with successful outcomes and a low complication rate.

S182. A Graduated Multi-Angle Approach for Endoscopic Access to the Infratemporal Fossa: A Cadaveric Study

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Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the different approaches for endoscopic access to the infratemporal fossa and the advantages of each technique.

Objectives: The infratemporal fossa (ITF) has historically been one of the more difficult regions of the head and neck to access surgically. Available open approaches are complex, associated with high morbidity, and do not always afford optimal visualization. Endoscopic access to the ITF provides an improvement in visualization for management of the many sinonasal and lateral skull base lesions involving this region. The purpose of this study is to evaluate a graduated multi-angle approach for endoscopic access to this region. **Study Design:** Cadaveric dissection. **Methods:** Endoscopic dissection was performed on 6 sides of 3 fresh cadaveric heads. Four different approaches to the ITF were studied: ipsilateral endonasal, contralateral endonasal via septotomy, Caldwell-Luc and Gillies. High quality endoscopic pictures and high definition videos of each technique were obtained in order to document the differences in access achieved with each approach. **Results:** The combination of the four different endoscopic techniques allowed complete access to all areas of the ITF. The contralateral septotomy approach resulted in excellent far lateral access, the Caldwell-Luc improved antero-posterior access, and the Gillies incision allowed postero-superior visualization and instrumentation. The maxillary nerve, mandibular nerve, and middle meningeal artery were identified in each cadaver. Other structures accessed included the eustachian tube, the upper cervical carotid artery, and the mandibular condyle. **Conclusions:** Endoscopic access to the ITF can be accomplished by each of the four methods described. A multi-angle, graduated approach can provide surgeons the ability to customize surgical access depending on the location of a specific lesion within the ITF.

S183. Delayed Postoperative Pituitary Apoplexy after Endoscopic Transsphenoidal Resection of a Pituitary Macroadenoma

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Educational Objective: At the conclusion of this presentation, the participants should be able to describe the presentation, diagnosis, and management of postoperative pituitary apoplexy.

Objectives: Postoperative pituitary apoplexy (PPA) after pituitary tumor resection is rare and has only been reported to occur after subtotal resection of giant pituitary macroadenomas (greater than 4 cm) in the immediate postoperative period (within 12 hours). All of the previously reported cases demonstrated acute neurologic worsening with eventual fatal outcomes due to massive tumor swelling, intratumoral hemorrhage and residual tumor infarction. We describe a unique case of delayed PPA occurring on the third postoperative day from spontaneous hemorrhage into a small residual tumor. Early detection and immediate intervention resulted in gross total removal of the residual hemorrhagic tumor, decompression of the optic chiasm, and a favorable neurologic outcome. **Study Design:** Case report. **Methods:** A 59 year old male underwent an endonasal endoscopic transsphenoidal removal of a giant suprasellar pituitary macroadenoma causing progressive visual loss. Postoperatively, the patient's vision improved, and neuroimaging demonstrated decompression of the optic chiasm with some residual tumor in the left cavernous sinus. **Results:** On the third postoperative day, the patient experienced acute worsening of vision with bitemporal hemianopsia from spontaneous hemorrhage into the residual tumor. Emergent endoscopic transsphenoidal exploration was performed to remove the remaining hemorrhagic tumor and decompress the visual apparatus. Postoperatively, the patient regained his vision back to baseline. **Conclusions:** This represents a unique case of PPA occurring in the delayed postoperative period, successfully treated with emergent transsphenoidal decompression of the visual apparatus and complete tumor removal. The authors review the literature of PPA and emphasize the importance of rapid diagnosis and intervention in order to achieve a favorable neurologic outcome.

S184. The First Report of Basilar Invagination and Brainstem Compression as a Complication of Head and Neck Radiation: Options for Treatment and Techniques for Endonasal Clivectomy and Odontectomy

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the techniques for transnasal clivectomy and odontoidectomy and be aware of serious rare life threatening complications of head and neck radiation.

Objectives: Advanced stage oropharyngeal carcinoma is commonly treated with multimodality therapy. It is estimated that between 5 and 15% of head and neck radiotherapy patients will have late tissue complications from radiotherapy. We report the first case of cervical instability and basilar invagination as a rare complication of primary radiation therapy for head and neck cancer. **Study Design:** A case report. **Methods:** A 66 year old female with a history of advanced tonsillar carcinoma treated with primary radiation therapy and a right radical neck dissection presented with neck pain and falls. She was found to have basilar invagination and cervical instability as a late complication of primary radiotherapy. Given her significant trismus, standard transoral odontoidectomy was not an option. The patient underwent an endoscopic transnasal transclival approach for removal of the displaced odontoid process to decompress the brainstem. Postoperatively, she was placed in a halo prior to subsequent occipitocervical fusion. **Results:** There were no surgical complications including cerebrospinal fluid leak, large vessel injury, or spinal cord injury. Postoperative CT and MRI showed excellent resection of the odontoid process and decompression of the brain stem. Options for treatment of basilar invagination including novel endoscopic transnasal approaches are discussed. **Conclusions:** Basilar invagination and brainstem compression can be a rare complication of radiation therapy of the head and neck. Transnasal odontoidectomy is an effective approach for anterior decompression of the craniovertebral junction, and especially valuable in cases where a transoral approach is precluded.

S185. **Use of a Flexible CO₂ Laser with Balloon Dilation for Acquired Nasopharyngeal Stenosis: A Novel Technique**

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Educational Objective: At the conclusion of this presentation, the participants should be able to describe a novel technique for the dilation of secondary nasopharyngeal stenosis.

Objectives: Acquired nasopharyngeal stenosis is a considerable risk to those patients receiving external beam radiation to the head and neck. Patients may present with nasal airway obstruction, phonatory changes and/or generalized discomfort. Several methods of treatment exist, including local flaps, laser excision, obturator placement, and combinations thereof. Unfortunately, despite the chosen method of treatment, the postoperative course is frequently complicated by scarring and restenosis. As a result, nasopharyngeal stenosis repair often necessitates multiple revision surgeries over a long term basis. The objective of this study is to report a novel endoscopic approach, employing the use of a flexible CO₂ laser in combination with balloon dilation, allowing for the successful treatment of nasopharyngeal stenosis with lasting results. **Study Design:** Case series. **Methods:** A transnasal esophagoscope is passed to the location of nasopharyngeal stenosis. A flexible CO₂ laser is then inserted via the working channel of the scope. Precise radial incisions are made using the optical laser under direct visualization. The laser is then removed. A balloon dilation device is then inserted, advanced to span the segment of stenosis, and inflated to achieve adequate dilation. The balloon is then deflated and removed. Mitomycin-C is then applied to area of dilation. Hemostasis is achieved topically. **Results:** During a 7 month period between August 2009 and March 2010, three individuals underwent nasopharyngeal dilation using a combination of a flexible CO₂ laser for radial incision and subsequent balloon dilation. All patients underwent successful dilation of secondary nasopharyngeal stenoses. **Conclusions:** Acquired nasopharyngeal stenosis can be successfully repaired with durable results, using an optical CO₂ laser and balloon dilation.

S186. **Repair of CSF Leaks in the Lateral Recess of the Sphenoid Sinus: Transsphenoid vs. Transpterygoid Approach**

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Educational Objective: At the conclusion of this presentation, the participants should be able to comprehend the advantages and disadvantages of the transsphenoid and transpterygoid approaches for lateral sphenoid recess CSF leaks.

Objectives: Cerebrospinal fluid leaks involving the lateral extension of the sphenoid sinus create unique challenges for the endoscopic approach. Such defects are typically inaccessible through a typical transethmoid or transsphenoid approach. Recently an endoscopic transpterygoid approach to the lateral sphenoid recess has been adopted and reported by several groups. However, this technique requires extended surgical time and can put the sphenopalatine ganglion and maxillary division of the trigeminal nerve at risk. In the current study we detail our experience with an extended transnasal transsphenoid approach to lateral sphenoid sinus CSF leaks and meningoencephaloceles. **Study Design:** Case series. **Methods:** Retrospective review of medical records of patients treated with the transnasal transsphenoid or partial transpterygoid approach to the lateral sphenoid recess. **Results:** The transnasal transsphenoid approach was performed on 6 patients with either CSF leak or meningoencephalocele. The procedure was well tolerated with no significant complications. None of the repairs have required revision surgery. **Conclusions:** Access to the lateral recess of the sphenoid sinus can be difficult with standard endoscopic techniques. We have used both the transsphenoid and transpterygoid approaches to access CSF leaks in this region with similar results. In our experience, the transpterygoid approach can be avoided in most cases, resulting in reduced risks and morbidity to patients.

S187. **Idiopathic Granulomatous Hypophysitis Presenting as Pituitary Apoplexy**

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Educational Objective: At the conclusion of this presentation, the participants should be able to describe idiopathic granulomatous hypophysitis and pituitary apoplexy and understand the proper management and workup of this condition.

Objectives: Granulomatous hypophysitis is an inflammatory disorder of the pituitary gland characterized by the formation of intrasellar giant cell granulomata. In the absence of underlying systemic disease, such as sarcoidosis, tuberculosis, or syphilis, it is classified as idiopathic. Idiopathic granulomatous hypophysitis (IGH) is an extremely rare disorder with few cases reported in the literature. We report a case of IGH manifesting as pituitary apoplexy in a young woman, diagnosed preoperatively on MR imaging as pituitary macroadenoma.

Study Design: Case report. **Methods:** This 36 year old woman presented with the sudden onset of left sided retroorbital headaches, diplopia, and left ptosis. On examination, she had a partial left oculomotor nerve palsy. Magnetic resonance imaging demonstrated an enhancing sellar mass with suprasellar extension and mass effect on the left cavernous sinus. The dorsal aspect of the lesion displayed a smaller nonenhancing area of low signal on T2 weighted imaging, consistent with recent hemorrhage. **Results:** Clinical pituitary tumor apoplexy was suspected and the patient underwent an emergent transsphenoidal removal of the tumor to decompress the optic nerves and the left cavernous sinus. Postoperatively, the patient's diplopia and oculomotor palsy resolved completely. Histologic examination demonstrated chronic granulomatous inflammation with caseous necrosis. Stains were negative for mycobacteria, fungi and bacteria. Systemic workup for sarcoidosis, tuberculosis, syphilis, and Wegener's granulomatosis was negative. **Conclusions:** IGH is a rare lesion of the pituitary gland and an uncommon presentation of pituitary apoplexy. In the presence of caseous necrotizing granulomas, a thorough workup for tuberculosis, sarcoidosis, and other granulomatous etiologies is warranted.