

# 2007 COMBINED SECTIONS MEETING PROGRAM

## WEDNESDAY, FEBRUARY 14, 2007

- 8:00 - 5:00 *Ultrasound Course - Islands A-D (registration closed)*
- 4:00 - 8:00 *Speaker Ready Room - Key West*
- 5:00 - 8:00 *Registration - Islands E Foyer*
- 6:00 - 7:30 *WELCOME RECEPTION - Tiki Terrace (Islands F-J backup)*

## THURSDAY, FEBRUARY 15, 2007

- 7:00 - 5:00 *Registration - Islands E Foyer*
- 7:00 - 5:00 *Speaker Ready Room - Key West*
- 7:00 - 7:50 *Opening of Exhibit Hall & Poster Exhibition with  
Breakfast - Collier Hall*
- 7:00 - 1:00 *Exhibit Hall Open/Poster Viewing*
- 8:00 - 11:00 *Spouse Hospitality - Captiva*
- 8:00 - 12:30 *SCIENTIFIC SESSION - Islands A-D*
- 12:40 *Adjourn*
- 1:00 - 2:30 *“Building Your Triological Thesis: Planning, Starting & Finishing”  
Seminar for Triological Society candidates and potential candidates (lunch provided)  
Maureen Hannley, PhD, Durham, NC - Islands A-D*
- 6:00 - 7:30 *MEET THE AUTHORS POSTER RECEPTION - Collier Hall*

## SCIENTIFIC SESSION - Islands A-D

- 8:00 **Welcome by Vice Presidents**  
**Derald E. Brackmann, MD\*, Los Angeles, CA,**  
**VP Western Section**  
**Margaret A. Kenna, MD\*, Boston, MA,**  
**VP Eastern Section**  
**Peter S. Roland, MD\*, Dallas, TX, VP Southern Section**  
**Richard J. Wiet, MD\*, Chicago, IL, VP Middle Section**
- 8:05 **Introduction of and Address by President**  
**David F. Wilson, MD\*, Portland, OR**
- 8:15 **Southern Section Introductions by Peter S. Roland, MD\***  
**Guests of Honor: Bruce Mickey, MD, Dallas, TX**

George Conner, MD, Dallas, TX

**Citation Awardee:** Charles G. Wright, PhD, Dallas, TX

**8:20 Middle Section Introductions by Richard J. Wiet, MD\***

**Guests of Honor:** Galdino Valvassori, MD, Chicago, IL  
J. Gail Neely, MD\*, St. Louis, MO

**Citation Awardees:** Arvind Kumar, MD\*, Hinsdale, IL  
Yehoash Raphael, PhD, Ann Arbor, MI

**1st Annual George L. Adams Award Presentation**

**8:30 Eastern Section Introductions by Margaret A. Kenna, MD\***

**Guests of Honor:** James Y. Suen, MD, Little Rock, AR  
Charles D. Bluestone, MD\*,  
Pittsburgh, PA

**Citation Awardees:** Robert Seibert, MD, Little Rock, AR  
Margaretha L. Casselbrant, MD PhD\*,  
Pittsburgh, PA

**8:35 Western Section Introductions by Derald E. Brackmann, MD\***

**Guests of Honor:** Fred D. Owens, MD,\* Dallas, TX  
C. Gary Jackson, MD\*, Nashville, TN

**Citation Awardees:** M. Jennifer Derebery, MD\*,  
Los Angeles, CA  
Antonio de La Cruz, MD\*,  
Los Angeles, CA

**8:40 Introduction of and Address by Keynote Speaker**

**“The Art of Happiness, Compassion and Excellence in Clinical Practice”**

**Howard D. Cutler, MD, Phoenix, AZ**

## **FACIAL PLASTIC & RECONSTRUCTIVE SURGERY**

### **Islands A-D**

**MODERATOR**

**John S. Rhee, MD MPH\*, Milwaukee, WI**

**9:30 - 9:38 CROSSEAL Fibrin Sealant Provides an Enhanced Sustained Delivery System for Gene Uptake and Expression**

Esther Vivas, MD, Portland, OR  
Shelly R. Winn, PhD, Portland, OR  
Amanda J. Seversen, BSC, Portland, OR  
Xi A. Gong, MD, Portland, OR  
Julianna E. Hansen, MD, Portland, OR  
Mark K. Wax, MD, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the various methods of delivering plasmids to a wound bed and how a carrier agent improves their efficacy.

**Objectives:** Many methods of bone regeneration have been investigated as alternatives to autografts or free tissue transfer. Recombinant proteins either viral or nonviral mediated gene therapy have all been tested. Gene therapy has been documented to deliver DNA in the localized wound bed. Nonviral mediated gene therapy is limited by a low transfection rate. Enhancing the nonviral mediated gene therapy by improving uptake and expression is clinically attractive. We wish to evaluate the use of a sustained delivery system of a condensed circular DNA plasmid encoding a green fluorescent protein (GFP) within a poly cation complex, jet PEI contained with the human fibrin sealant, CROSSEAL. Transfection efficiencies were measured at 2, 4, and 7 days. **Study Design:** Laboratory investigation. **Methods:** Plasma DNA expressing enhanced green fluorescent protein reporter gene was condensed within a poly cation complex, jet PEI, mixed with human fibrin sealant, CROSSEAL, and loaded within 8 mm circular polylactic acid porous scaffolds.

These complexes along with controls and a GFP; FU gene 6 group were evaluated in vitro for their ability to transfect and express GFP into BHK cells following transfer at 2, 4, and 7 day intervals. Four groups were tested: Group 1. CROSSEAL/PLA (negative control); Group 2. GFP and CROSSEAL/PLA; Group 3. GFP; jet PEI and CROSSEAL/PLA; and Group 4. GFP; FU gene 6 and CROSSEAL/PLA. Transfection efficiencies were determined by a FACS scan instrument. Data was measured as a mean percent +/- standard deviation of cells expressing GFP versus total cell number. **Results:** The mean percent of BHK cells expressing GFP for the negative control was +/- 0%. Group 2 exhibited transfection efficiencies of 0.6, 1.2, 1.9 at 2, 4, and 7 day intervals. Group 3 and 4 demonstrated transfection efficiencies at 4.9, 17.4, and 16.1, 8.1 and 21.2 at the 2, 4, and 7 day interval. Group 3 exhibited the highest transfection efficiency at 4 and 7 days, while Group 4 exhibited the highest transfection efficiency at 2 days. **Conclusions:** The combination of GFP; jet PEI and CROSSEAL appears to improve the functional stability and release duration of incorporated DNA polymer complexes in the present in vitro studies. These results have improved on our previous studies evaluating resorbable gene activated matrix formulations. Future studies will evaluate outcomes with the present configurations in standard animal models of bone regeneration.

### **9:38 - 9:46 Microvascular Flap Reconstruction by Otolaryngologists: A Survey of Prevalence and Postoperative Care and Monitoring Techniques**

Jeffrey H. Spiegel, MD, Boston, MA

Julia K. Polat, BS, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss how many otolaryngology training programs have microvascular surgeons and to compare postoperative monitoring and care regimens amongst the various programs.

**Objectives:** To discover 1) how many academic otolaryngology departments have a microvascular reconstructive surgeon on their faculty; and 2) to review postoperative flap monitoring regimens amongst these physicians. **Study Design:** A cross-sectional survey to all academic otolaryngology departments in the United States was sent out. **Methods:** Survey respondents were asked to comment on the number of microvascular surgeons in their group, the volume of flaps, the incidence of complications, the postoperative monitoring regimen, and the postoperative pharmaceutical regimen. **Results:** The average number of free flap surgeons and their volume per department is reported. Additionally, we are able to report great variance in the complexity, safety, and expense of postoperative treatment and observation plans amongst physicians without a clear difference in flap failures. **Conclusions:** Postoperative free flap monitoring plans vary considerably amongst otolaryngologists doing microvascular free tissue transfer. Some surgeons have elaborate, expensive, and in some cases possibly unnecessary components to their postoperative regimen.

### **9:46 - 9:54 The Use of Integra Artificial Dermis in Head and Neck Reconstruction: A Case Series**

Kapil Saigal, MD, Philadelphia, PA

Chaiya Laoteppitaks, BS, Philadelphia, PA

Edmund Pribitkin, MD\*, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the role of Integra artificial dermis in the reconstruction of complex head and neck defects following oncologic resection.

**Objectives:** Integra artificial dermis is a biomaterial used in head and neck reconstruction that has significantly altered the management of head and neck tumors. **Study Design:** Integra artificial dermis (Integra Lifesciences, Plainsboro, NJ) is a bovine collagen based epidermal/dermal substitute that functions as an alternative to autologous skin transplantation and optimizes outcomes with minimal morbidity. **Methods:** Illustrative case series and review of the literature. **Results:** In a series of 11 patients Integra was used effectively to facilitate closure of complex head and neck defects and improved cosmesis in patients following the oncologic resection of cutaneous tumors. Integra permitted application of full thickness skin grafts with 100% take rate in 4 of 4 applications to cortical bone, a historically difficult area to insure graft viability. Integra also provided temporary tissue coverage and excellent skin graft survivability in irradiated fields with an improvement in operative time and minimal donor site morbidity. Moreover full thickness skin grafts applied to areas prepared with Integra also successfully survived subsequent radiation therapy without the need for regrafting. **Conclusions:** Integra artificial dermis is an advanced, minimally invasive reconstructive option for complex acute wounds following extirpative and reconstructive head and neck surgery.

### **9:54 - 10:02 Does Suture Material and Technique Really Matter? Lessons Learned From 800 Consecutive Blepharoplasties**

Arjun S. Joshi, MD, Washington, DC

William H. Lindsey, MD\*, Reston, VA

Neil S. Tanna, MD, Washington, DC

Sasa A. Janjanin, MD, Bethesda, MD

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss different surgical techniques for blepharoplasty and their associated complications.

**Objectives:** To evaluate established suture techniques for blepharoplasty closure and present lessons learned during our 5 year experience involving more than 800 blepharoplasties. **Study Design:** A prospective study of a large sequential series of patients undergoing upper blepharoplasty who were treated by the same senior author over a 5 year period. **Methods:** During the preoperative evaluation, patients were assigned one of four established techniques for incision closure based on the senior author's experience. Patients underwent extensive perioperative evaluation to study the results of various suture techniques. Complications and revision rates were noted and addressed. **Results:** Over a 5 year period, 866 upper blepharoplasties were performed. In 198 patients who had closure with a running subcuticular Prolene, 5 (2.5%) presented with milia, and 11 (5.5%) had a standing cone deformity (SCD) which required revision. A running cutaneous locked Prolene was used in 45 patients, which resulted in 8 patients (17%) with milia and 2 patients (4.4%) requiring revision of a SCD. In 177 patients closed with a running 6-0 plain suture, 12 patients (6.7%) developed milia and 5 patients (2.8%) had unsightly scarring. In 446 patients closed with 2 interrupted 6-0 Prolene sutures and a running 6-0 fast absorbing gut, 5 patients (1%) presented with milia and there were no scar revisions. **Conclusions:** Blepharoplasty is safe, effective, and can be performed successfully using several established techniques. In our experience, closure with 2 interrupted 6-0 Prolene sutures and a running 6-0 fast absorbing gut resulted in the lowest complication and revision rates.

### **10:02 - 10:10 Modified Retrograde Approach to Upper Eyelid Static Loading**

David W. Kim, MD, San Francisco, CA

Mir J. M. Ali, MD, San Francisco, CA (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the technique, indications, and advantages of the modified retrograde approach to upper eyelid static loading for paralytic lagophthalmos.

**Objectives:** Upper eyelid static weight loading is the most common surgical technique employed to treat paralytic ectropion. The traditional approach using the pretarsal crease incision leads to interruption of the anterior levator muscle fibers which attach to the face of the tarsus at its upper two-thirds. This disruption can lead to permanent upper eyelid blepharoptosis. The retrograde approach avoids this problem, but results in an incision at the lid margin—the dependent aspect of the weight. This increases the risk of implant extrusion. This study's objective is to review the safety and efficacy of a modified retrograde approach to upper lid loading, a newly described technique which avoids the pitfalls of other approaches. **Study Design:** 8 patients who underwent the modified retrograde approach to upper lid loading were reviewed for complications, effectiveness, and patient satisfaction. **Methods:** Preoperative and 6 month postoperative photos with the eyes in the open and closed positions were evaluated for degree of lagophthalmos and blepharoptosis. Patients were evaluated for development of complications such as implant extrusion, pain, or infection. The surgical technique employs a supratarsal skin crease incision, supramuscular dissection to the lid margin, entry into the tarsal plane at its inferior-most aspect, creation of a pocket for implant insertion, and layered closure. **Results:** All patients had complete correction of lagophthalmos. No patients developed major complications. One patient developed 2 mm of blepharoptosis which is improving with time. **Conclusions:** The modified retrograde approach to upper eyelid static loading for paralytic lagophthalmos provides advantages over other techniques described. It is a safe, efficacious procedure, well tolerated by patients.

### **10:10 - 10:15 Q&A**

### **10:15 - 10:45 Break in Exhibit Hall - View Posters**

#### **MODERATOR**

**Edmund A. Pribitkin, MD\*, Philadelphia, PA**

### **10:45 - 10:53 Consensus Assessment of Nasal Profile Analysis Among Expert Rhinoplasty Surgeons**

Mark A. Checcone, MD, Miami, FL

Brian S. Jewett, MD, Miami, FL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand basic nasal analysis of the radix, dorsum and tip projection of patient images in profile view. They should recognize the variability of aesthetic judgments among rhinoplasty surgeons. They will appreciate the potential of computer photo morphing software as a tool to evaluate nasal aesthetic analysis.

**Objectives:** We seek to study consensus opinions among expert rhinoplasty surgeons performing nasal analysis from photographs of patients seeking cosmetic changes to their nose and to study consensus opinions of nasal analysis by expert rhinoplasty surgeons after being aided with a graphical morphing software program. **Study Design:** This is a prospective methodological interrater reliability study. **Methods:** A web based survey was created to facilitate nasal analysis of four patients with variable deformities of the nasal radix,

dorsum, and tip. The survey was completed by experts in the field of facial plastic surgery to determine the level of agreement after evaluating projection of radix, dorsum and tip from static images of patients seeking rhinoplasty. The experts were then asked to view videos simulating modifications of the preoperative nasal deformities. The experts then reassessed the patients' original static images. Responses before and after video viewing were compared and the statistical measure, interrater reliability was calculated to assess expert consensus. **Results:** Five experts responded to the survey. Consensus agreement when evaluating projection of the radix, dorsum and tip was 90%, 95%, and 70% respectively. After morphing simulation video, expert consensus was 90% [change 0%], 90% [change -5%], and 75% [change +5%] respectively. **Conclusions:** There exists a high degree of consensus among expert rhinoplasty surgeons using this web based survey. The highest degree of agreement was found analyzing the radix and dorsum in particular, while analysis of the tip showed slightly less consensus. Morphing software simulation did not improve interrater reliability.

### **10:53 - 11:01 Nasal Valve Suspension—A University Experience**

Michael J. Nuara, MD, Salt Lake City, UT

Steven R. Mobley, MD, Salt Lake City, UT

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the role of nasal valve suspension and discuss how the advantages and disadvantages of this procedure aid in appropriate patient selection.

**Objectives:** Nasal valve suspension (NVS) is a simple technique to correct nasal valve obstruction or collapse by providing a lateral vector of pull on the nasal sidewall. The purpose of this research is to review our experience with NVS and its use in the patient with facial paralysis. The objectives are to determine patient satisfaction and complication rates following NVS. **Study Design:** A retrospective review of patients 18 years and older who had NVS from 2003 to 2006 with a followup of at least 1 month is performed. **Methods:** Data was collected on diagnosis, surgical outcomes, complications, and treatments required. Complications include adverse outcomes, infections, and the need for repeat surgery or treatments. **Results:** Of 17 charts reviewed, 9 (53%) had nasal valve collapse as a result of facial paralysis and 8 (47%) had previous nasal surgery. Followup ranged from 1 to 30 months with a mean of 16.5. Moderate to complete resolution of obstruction was reported by 82% of patients or for 88% of procedures. Sustained relief was observed in 2 of 8 patients who had previous nasal surgery and 6 of 9 who had no previous nasal surgery ( $p=0.1$ ). Infection occurred in 4 patients (24%) and 5 total suspensions (21%) and ranged from 1.5 to 7 months. Six patients (35%) experienced a loss of suspension at 6 to 22 months. **Conclusions:** NVS is a simple, reversible procedure particularly useful in the patient with facial paralysis. The efficacy is excellent in the short term yet appears to diminish with time.

### **11:01 - 11:09 Delayed Reconstruction of a Large Human Bite Induced Soft Tissue Deficit of the Nasal Tip With Full Thickness Skin Grafts**

Christopher J. Schmidt, MD, Syracuse, NY

Sherard A. Tatum, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) compare and contrast reconstructive options of large nasal tip deficits; 2) explain and discuss alternatives in reconstructive treatment options including postsurgical care with differing modalities; and 3) demonstrate management of human bite trauma to their head and neck region including infectious disease implications.

**Objectives:** To report a case of delayed reconstruction with full thickness skin grafts of a large human bite induced soft tissue deficit of the nasal tip. **Study Design:** Case report and review of literature of both human bite facial trauma and nasal tip reconstruction. **Methods:** A report of a 26 year old groom evaluated after a human bite wound to his nasal tip on his wedding night. The patient presented with a resultant deficit sized at 2.5 cm x 3 cm with involvement of the lower lateral nasal cartilage. Initial treatment consisted of initial debridement, intravenous antibiotics and antiviral therapy. Delayed reconstruction of this large deficit occurred using full thickness skin grafts and postoperative hyperbaric oxygen therapy. **Results:** The patient's initial deficit, short- and long-term results are presented as are the other options considered in management. Initially the wound required minor debridement. Full thickness skin grafts of bilateral posterior auricular skin were harvested and used for reconstruction. The minimal donor site deficit and subsequent nasal aesthetics were acceptable to the reconstructive team, the patient and his new bride. Supplemental hyperbaric oxygen therapy was utilized postoperatively for three days to promote graft viability. **Conclusions:** Nasal tip soft tissue deficits are areas with challenging aesthetics and multiple options for reconstruction. We present results in a patient using full thickness skin grafting techniques at the upper limits in size traditionally reported. Long- and short-term results of his treatment and reconstruction are presented.

### **11:09 - 11:17 Incision and Drainage Followed by Mattress Suture Repair of Auricular Hematoma**

William C. Giles, MD\*, Columbia, SC

Kenneth C. Iverson, BS, Columbia, SC (Presenter)

Anna L. Bouknight, MD, Columbia, SC

Frank C. Hill, MD, Columbia, SC

Jonathan D. King, MD, Columbia, SC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate the option of treating auricular hematoma with incision and drainage followed by mattress suture without bolsters and to discuss the comparison of the results of several treatments that have been implemented in our series of patients.

**Objectives:** Auricular hematoma is a condition requiring early and effective treatment to prevent pathogenesis of the unsightly cauliflower ear. The objective of this study is to review cases of auricular hematoma and present incision and drainage followed by through and through whip-type mattress sutures without bolsters as an effective treatment. **Study Design:** Retrospective chart review of auricular hematoma cases. **Methods:** A five year retrospective evaluation of auricular hematomas presenting to a private otolaryngology group was performed. Patients' charts were reviewed and data regarding the treatment and followup of auricular hematomas were assembled and analyzed. **Results:** Twenty-one patients were found to present with auricular hematoma. One patient was lost to followup. Twenty-seven treatments were performed on 22 ears. Four ears were treated initially with needle aspiration, 2 were treated initially with incision and drainage with iodoform wick placement, and 16 were treated initially with incision and drainage followed by mattress sutures without bolsters. There were 5 hematoma reaccumulations requiring an additional procedure after treatment by an otolaryngologist. Three followed needle drainage; 1 followed incision and drainage with wick placement, and one followed incision and drainage with mattress sutures without bolsters. One major complication was skin loss with a reaccumulated hematoma after needle aspiration followed by incision and drainage. **Conclusions:** Incision and drainage followed by through and through mattress sutures without bolsters appears to be a superior method of treatment with rare reaccumulation of hematoma. This method of treatment was shown to be simple, well tolerated, and with few complications.

### 11:17 - 11:25 **The Skin Cancer Index: Clinical Responsiveness and Predictors of Quality of Life**

John S. Rhee, MD MPH\*, Milwaukee, WI  
B. Alex Matthews, PhD, Milwaukee, WI  
Marcy Neuburg, MD, Milwaukee, WI  
Brent R. Logan, PhD, Milwaukee, WI  
Mary Burzynski, RN, Milwaukee, WI  
Ann B. Nattinger, MD MPH, Milwaukee, WI

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the quality of life issues that are specific to patients with nonmelanoma skin cancer, understand potential predictors of poorer quality of life, and appreciate the new quality of life instrument specific for this disease process.

**Objectives:** To establish the clinical responsiveness of the Skin Cancer Index (SCI), a new disease specific quality of life (QOL) instrument and to assess demographic and clinical factors which impact QOL in patients with nonmelanoma skin cancer (NMSC). **Study Design:** Prospective study of 183 patients with NMSC of the face and neck referred to a tertiary care Mohs surgery clinic. **Methods:** The SCI is a 15 item, validated, disease specific QOL instrument with 3 distinct subscales—emotion, social, and appearance. Higher scores reflect better QOL. The SCI and the Dermatology Life Quality Index (DLQI), a general dermatology instrument, was administered at initial consultation and 4 months after surgical treatment. Multivariate analysis was conducted to assess demographic and clinical factors predictive of QOL for both instruments. **Results:** The SCI total score and all 3 subscale scores increased with treatment, demonstrating strong evidence of responsiveness over time ( $p < 0.001$ ) in contrast to the DLQI ( $p = 0.46$ ). Predictors of poorer QOL for the SCI included female gender and cancers located on the lip. Patients who demonstrated greatest improvement in QOL with treatment included those who were younger ( $< 50$  years) and had lower reported household income. Also first time NMSC patients and those patients that underwent less extensive reconstructions demonstrated greater improvements in QOL. **Conclusions:** The SCI is a sensitive and responsive QOL instrument for patients with NMSC. Distinct demographic and clinical variables that impact QOL have been demonstrated using this multidimensional, disease specific instrument.

### 11:25 - 11:30 **Q&A**

### 11:30 - 12:40 **PANEL: CLOSING PROBLEM HOLES TO THE FACE AND NECK**

**Moderator:** David Brian Hom, MD\*, Minneapolis, MN  
**Panelists:** Fred J. Stucker, MD\*, Shreveport, LA  
William W. Shockley, MD\*, Chapel Hill, NC  
Stephen S. Park, MD\*, Charlottesville, VA

12:40 **Adjourn**

1:00 - 2:30 **“Building Your Triological Thesis: Planning, Starting & Finishing”**

*Seminar for Triological Society candidates and potential candidates (lunch provided)  
Maureen Hannley, PhD, Durham, NC - Islands A-D*

6:00 - 7:30 **MEET THE AUTHORS POSTER RECEPTION - Collier Hall**

## **FRIDAY, FEBRUARY 16, 2007**

7:00 - 5:00 *Registration - Islands E Foyer*

7:00 - 5:00 *Speaker Ready Room - Key West*

7:00 - 7:50 *Business Meetings (Members Only)*  
*Southern Section Members - Caxambus 1*  
*Western Section members - Caxambus 2*

7:00 - 12:30 *Exhibit Hall Open - Collier Hall*  
*Poster Viewing - Collier Hall*

7:00 - 7:50 *Continental Breakfast with Exhibitors*

8:00 - 11:00 *Spouse Hospitality - Captiva*

8:00 - 12:00 *Scientific Sessions*  
*Otology - Islands AB*  
*Laryngology/Bronchoesophagology - Islands C-D*

1:00 *Golf, Fishing & Tennis Tournaments*

## **CONCURRENT SESSION I - OTOLOGY - Islands AB**

8:00 - 8:05 **Announcements by Vice Presidents**  
**Peter S. Roland, MD\*, and Margaret A. Kenna, MD\***

### **MODERATORS**

**Peter S. Roland, MD\*, Dallas, TX**  
**David M. Barrs, MD\*, Phoenix, AZ**

8:05 - 8:13 **EASTERN SECTION RESIDENT RESEARCH AWARD WINNER - 1st Place**  
**Active Noise Reduction Audiometry - A Prospective Analysis of a New Approach to Noise Management in Audiometric Testing**  
**Matthew A. Bromwich, MD, University of Western Ontario, London, ON Canada**  
Lorne S. Parnes, MD FRCS\*, London, ON Canada  
John H. Yoo, MD FRCS, London, ON Canada

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the mechanism of active noise reduction and discuss the benefits of its use with respect to screening audiometry. Participants should be able to compare standard audiometry with ANR audiometry.

**Objectives:** To develop a new method of screening audiometry that reduces the adverse affects of low frequency background noise by using active noise reduction (ANR) headphone technology. **Study Design:** Prospective testing within an anechoic chamber evaluated the physical properties of ANR headphones. A prospective clinical crossover study compared standard audiometry with ANR headphone audiometry. **Methods:** BOSE Aviation X circumaural ANR headphones were tested for both active and passive attenuation properties in a hemi-anechoic chamber using a head and torso simulator. 60 otology clinic patients then underwent standard audiometry and ANR audiometry which was performed in a 30 and 40 dB sound field. **Results:** Objective ANR headphone attenuation levels of up to 15-25 dB were achieved at frequencies below 2000 Hz. In standard audiometric testing, 40 dB of narrow band background noise

decreased patient pure tone thresholds by 30 dB at 250 Hz. The use of ANR technology provided 20dB of additional attenuation. This resulted in a significant improvement in test results despite the 40 dB of background noise ( $p < 0.001$ ). In a 30 dB sound field, standard audiometric thresholds were shifted down by an average of 13 dB. The use of ANR technology completely attenuated this effect and resulted in a significant improvement in results ( $p = < 0.01$ ). These results were identical to those obtained in a quiet sound booth. **Conclusions:** Despite a 30 dB sound field ANR audiometry can produce an audiogram identical to that obtained in a double walled sound booth. ANR headphone audiometry improves the sensitivity of audiometric screening for mild low frequency hearing loss. This technology may have new and important applications for screening in schools, industry and community practices.

**8:13 - 8:21 SOUTHERN SECTION RESIDENT RESEARCH AWARD WINNER - 2nd Place**

**G. SLAUGHTER FITZ-HUGH RESIDENT RESEARCH AWARD**

**Effect of Otological Medications on Tympanostomy Tube Biofilms**

*Kevin S. Oxley, MD PharmD, West Virginia University School of Medicine, Morgantown, WV*

Hassan H. Ramadan, MD MSc\*, Morgantown, WV

John G. Thomas, PhD, Morgantown, WV

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the response of tympanostomy tube biofilms to the different otological medications in terms of colony forming units and biofilm density.

**Objectives:** Examine how otological medications affect biofilms on fluoroplastic tympanostomy tubes. **Study Design:** In vitro comparison of different otological medications against a clinical isolate of *Pseudomonas aeruginosa* biofilm on tympanostomy tubes treated for 5, 10, 14, and 21 days. **Methods:** Under sterile conditions 21 tympanostomy tubes were cut in half. These were attached to pegs of two Calgary Biofilm Devices via rubber cement. Device one evaluated microbial growth as colony forming units (CFUs). Device two evaluated presence of biofilms. Tubes were prepped for biofilm growth, incubated and stressed for 72 hours. Afterwards one tube per device was removed and forcefully washed. One was sonicated for 5 minutes, serially diluted, and plated for CFUs. Formalin preserved the other for biofilm evaluation by scanning electron microscopy. Next, tubes were exposed to 5 drops of ciprofloxacin, Ciprodex, dexamethasone, Floxin, or saline for one hour. Otologicals were then removed and sterile broth placed in the wells as a nutrient. This was repeated every 12 hours for 5, 10, 14, and 21 days of treatment. Prior to the last dose of treatment intervals, a streak plate was performed to evaluate for microbial growth in the wells. The tubes were evaluated for CFUs and biofilms at each interval as previously described. **Results:** Microbial activity in CFUs decreased by day 5 and continued through day 21 for the antibiotic containing drops. Despite treatment the biofilm was never eradicated and continued to progress. **Conclusions:** Infectivity of the biofilm is neutralized by antibiotic otologicals; however, the biofilm will progress despite treatment.

**8:21 - 8:29 MIDDLE SECTION RESIDENT RESEARCH AWARD WINNER - 2nd Place**

**JOHN R. LINDSAY RESIDENT RESEARCH AWARD**

***Pseudomonas Aeruginosa* Lipopolysaccharide Induces Osteoclastogenesis Through a Toll-Like Receptor 4 Mediated Pathway in Vitro and Vivo**

*Lei Zhuang, MD, Washington University School of Medicine, St. Louis, MO*

Jae Y. Jung, MD PhD, St. Louis, MO

Eric W. Wang, MD, St. Louis, MO

Lisette Ramos, MD, St. Louis, MO

Mary Pashia, MS, St. Louis, MO

Richard A. Chole, MD PhD\*, St. Louis, MO

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the basic mechanisms behind *Pseudomonas aeruginosa* LPS induced bone resorption, as well as to having a better understanding of the important roles that different receptors and ligands participate in this intricate process.

**Objectives:** Bacterial infections near bone result in localized inflammatory osteolysis, a significant complication of chronic ear infections. While many bacterial products may be involved, lipopolysaccharide (LPS) has been implicated as a major mediator of inflammation and osteolysis. However, the mechanisms by which LPS promotes bone resorption have not been clearly established. There is no consensus on whether LPS acts directly or indirectly on osteoclast precursors (bone marrow monocytes) to induce bone resorption. In light of the role of *Pseudomonas aeruginosa* (PA) in chronic ear infections, we investigated the effects of PA LPS on osteoclastogenesis in vivo and vitro. **Study Design:** Combined with Methods section. **Methods:** Wild type C57BL/6J and toll-like receptor 4 knockout (TLR4<sup>-/-</sup>) mice received subcutaneous calvarial injections of 250ug of *P. aeruginosa* LPS or PBS only (n=5 per group). Osteoclastic bone resorption was assessed histologically. Effect of PA LPS on bone resorption was assessed in vitro using combinations of bone marrow monocytes and osteoblasts with and without functional TLR4. **Results:** In vivo, PA LPS induced robust osteolysis and that this effect was completely abrogated in mice lacking expression of toll-like receptor 4 (TLR4). In vitro, PA LPS failed to induce osteoclast development directly in bone marrow monocytes. However, PA LPS did stimulate osteoclastogenesis in bone marrow monocyte-osteoblast cocultures. **Conclusions:** PA LPS acts indirectly through osteoblast to induce bone resorption. Optimal osteoclastogenesis

in vitro required functional TLR4 expression in both bone marrow monocytes and osteoblasts.

**8:29 - 8:37 Microbiology of Chronic Otitis Media With Effusion in Children With and Without Cleft Palate**

Patrick J. Antonelli, MD\*, Gainesville, FL

David W. Stroman, PhD, Dallas, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the possible role of microorganisms in the pathogenesis of chronic otitis media with effusion in children with and without cleft palate.

**Objectives:** Molecular markers of bacteria have been found in a large percentage of chronic otitis media with effusion (COME) cases in children without cleft palate (CP) which supports a role for chronic low grade infection. Most CP children have COME which is thought to be due to mechanical obstruction of the eustachian tube rather than chronic infection. The purpose of this study was to determine if the microbiology of COME is different in children with and without CP using molecular microbiological techniques. **Study Design:** Prospective, controlled, and blinded. **Methods:** Middle ear effusions were procured from children with and without CP during tympanostomy tube placement. Samples were analyzed for the presence or absence of bacteria and fungi using recombinant microbiological techniques. **Results:** Effusion samples were obtained from 32 children without CP and 28 children with CP. Markers of microorganisms were found in 31% of effusions from non-CP COME and 43% of CP COME. Fungal markers were found in 6% of non-CP and 25% of CP COME ( $p < 0.05$ ). Bacterial markers were found in 25% of non-CP and 21% of CP COME. **Conclusions:** Molecular markers of microorganisms are commonly found in COME of both CP and non-CP patients. Fungal elements are more commonly isolated from COME of patients with CP. This may reflect inherent differences in the pathogenesis of COME in CP and non-CP patients.

**8:37 - 8:45 The Incidence of Mitochondrial DNA Mutations Leading to Aminoglycoside Toxicity in Nicaragua**

James E. Saunders, MD\*, Oklahoma City, OK

John H. Greinwald, MD, Cincinnati, OH

Sharon A. Vaz, RN, Oklahoma City, OK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand mitochondrial DNA mutation in gentamicin toxicity in developing countries.

**Objectives:** Sensorineural hearing loss due to gentamicin exposure remains a major problem in poorly developed countries accounting for 3-30% of childhood hearing loss in some areas. Recent evidence has also suggested that some populations are more susceptible to gentamicin toxicity due to a mutation in the A1555 of mitochondrial DNA (mtDNA). It is unclear therefore whether the high incidence of gentamicin ototoxicity in poorly developed countries is related to increased genetic susceptibility or the unregulated use of the medication. This study attempts to identify the prevalence of A1555 mtDNA mutation in a pooled sample of serum from rural Nicaragua children with aminoglycoside related hearing loss. **Study Design:** Prospective study. **Methods:** Mitochondrial DNA was isolated from serum collected from 31 Nicaraguan deaf children with childhood or in utero exposure to gentamicin and amplified with polymerase chain reaction. The mtDNA was then sequenced and analyzed for mutations of the A1555 gene. **Results:** No known pathological mutations of the A1555 gene were identified in this population of Nicaraguan deaf children with gentamicin exposure. **Conclusions:** These results suggest that the high rate of gentamicin ototoxicity in this population is most likely due to unrestricted access to gentamicin rather than increased genetic susceptibility to the drug. Studies should be performed in other populations with gentamicin ototoxicity to determine if genetic susceptibility may play a role. Significant reductions in the incidence of gentamicin ototoxicity in developing countries will require improved education of healthcare providers and restricted access to this medication.

**8:45 - 8:50 Q&A**

**MODERATORS**

**David S. Haynes, MD\*, Nashville, TN**

**Anil K. Lalwani, MD\*, New York, NY**

**8:50 - 8:58 Surgical Management of Mastoid Congenital Cholesteatoma**

Frank M. Warren, MD, Salt Lake City, UT

Clough Shelton, MD\*, Salt Lake City, UT

Katherine S. Blevins, MD, Salt Lake City, UT

Karen L. Salzman, MD, Salt Lake City, UT

Richard H. Wiggins, MD, Salt Lake City, UT

H. Ric Harnsberger, MD, Salt Lake City, UT

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the clinical presentation, radi-

ologic characteristics and surgical management of congenital cholesteatomas of the mastoid.

**Objectives:** Congenital mastoid cholesteatomas are rare lesions of the temporal bone. The clinical presentation of these lesions is variable, making them difficult to identify preoperatively. We evaluated our series of mastoid congenital cholesteatomas in an effort to better define the clinical presentation, imaging characteristics and surgical challenges specific to this lesion. **Study Design:** Retrospective chart review. **Methods:** The medical records of patients with the diagnosis of mastoid congenital cholesteatoma on radiologic imaging over a fifteen year period were reviewed. All had surgical and pathologic confirmation and preoperative CT. Four also underwent MR scanning. Demographic information, clinical presentation, imaging results and operative findings were recorded. **Results:** Nine patients with the diagnosis of mastoid congenital cholesteatoma satisfying the inclusion criteria were found. Clinical findings were variable, with the most common presentation being a neck mass with or without associated infection. Imaging findings were more uniform. All CT scans demonstrated an expansile, well circumscribed mass in the mastoid. All MR scans showed a well circumscribed mass with high intensity on T2 weighted images with T1 sequences showing the lesion to be isointense or slightly hyperintense to CSF. Operative findings included lateral mastoid cortex erosion, sigmoid sinus exposure, inner ear fistula, ossicular destruction, facial nerve exposure and associated postauricular abscess. Management of these lesions is reviewed. **Conclusions:** Congenital mastoid cholesteatomas have a variable and nonspecific clinical presentation. Surgical challenges arise from the indolent nature of this clinical entity which belies the extent of otologic involvement. Preoperative imaging is helpful in detecting and delineating the extent of these lesions.

### 8:58 - 9:06 Chronic Ear Surgery in Syndromic Patients

Matthew R. O'Malley, MD, Nashville, TN  
David M. Kaylie, MD, Nashville, TN  
Marc L. Bennett, MD, Nashville, TN  
C. Gary Jackson, MD\*, Nashville, TN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss clinically pertinent aspects of chronic ear surgery in syndromic patients including an understanding of which syndromes are frequently encountered in otologic practice, potential complications, and outcomes from surgery.

**Objectives:** To identify the characteristics, outcomes, and complications of syndromic patients who underwent ear surgery for chronic ear disease. **Study Design:** Retrospective chart review of patients with known syndromes who underwent ear surgery for chronic ear disease. **Methods:** The charts of syndromic patients who underwent surgery for chronic ear disease at a tertiary referral center from 1970-2003 were reviewed. The analyzed data included the type of surgery, operative findings, audiometric data, surgical outcomes, and the occurrence of complications. Syndromes were classified as either having or not having craniofacial anomalies. **Results:** 7733 charts were reviewed identifying 74 syndromic patients who underwent 96 surgeries over 34 years. 55 patients were treated with a single surgery, 16 patients required two surgeries, and 3 patients required three surgeries. Down syndrome was the most common syndrome in this series (n=26). Minor complications occurred in 15% of cases most commonly postoperative otorrhea. There were no major complications. Many patients were successfully managed with a canal intact procedure. Three out of five patients with Marfan's syndrome underwent a canal wall down procedure; none experienced meatal narrowing. Preoperative and postoperative audiometric data were reviewed and the success of ossicular chain reconstruction is reported. **Conclusions:** Surgery for chronic ear disease in patients with known syndromes can be performed safely without high rates of serious complication. Successful eradication of disease can be achieved in a single surgery in many patients. Outcomes for syndromes with or without craniofacial anomalies are discussed. Improved hearing function can also be attained.

### 9:06 - 9:14 The Clinical Significance of the Jahrsdoerfer Grading Scale in Surgery for Congenital Aural Atresia

David C. Shonka, MD, Charlottesville, VA  
William J. Livingston, MD, Rochester, NY  
Robert A. Jahrsdoerfer, MD\*, Charlottesville, VA  
Bradley W. Kesser, MD, Charlottesville, VA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to predict audiometric outcomes in patients undergoing surgery for congenital aural atresia based on computed tomographic temporal bone anatomy, as graded by the Jahrsdoerfer scale.

**Objectives:** To determine the predictive ability of the Jahrsdoerfer grading scale in congenital aural atresia surgery by comparing the postoperative audiometric outcomes between patients with different preoperative Jahrsdoerfer scores. **Study Design:** Retrospective chart review. **Methods:** Student's t-test was performed comparing one month postoperative four tone pure tone averages (PTA) and speech reception thresholds (SRT) between patients scoring 6 or below, 7, and 8 or above on the Jahrsdoerfer grading scale. **Results:** Eighty-eight ears were evaluated; 7 ears with a preoperative Jahrsdoerfer score of 6 or less, 36 with a score of 7, and 45 with a score of 8 or above. There was no significant difference in preoperative four tone PTA or SRT across all scores ( $P > 0.1$  for all comparisons; Student's t-test). The postoperative four tone PTA and SRT were significantly greater for ears with a score of 6 or less compared to

ears with scores of 7 and above ( $P < 0.02$  for all comparisons; Student's t-test). There was no significant difference in postoperative four tone PTA or SRT between ears with a score of 7 and those scoring 8 or above ( $P > 0.5$  for all comparisons; Student's t-test). **Conclusions:** Compared to patients with a Jahrsdoerfer score of 7 or greater patients scoring 6 or less had significantly worse hearing postoperatively. There was no difference in postoperative hearing between patients with Jahrsdoerfer scores of 7, 8 or 9. The Jahrsdoerfer grading scale is an excellent predictor of hearing outcomes in patients with congenital aural atresia.

#### **9:14 - 9:22 Effects of Albumin and Plasma on Biofilm Formation in Cochlear Implant Models**

Christopher M. Sarno, MD, Gainesville, FL

Patrick J. Antonelli, MD\*, Gainesville, FL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the effects on cochlear implant devices of treatment with plasma or albumin. They will be able to compare the effect of removable magnets to sealed magnets on biofilm formation.

**Objectives:** Determine whether exposure of cochlear implants to albumin or plasma affects the rate of biofilm formation. **Study Design:** Basic science original research. **Methods:** 3 models were designed and built representing cochlear implants with or without removable magnets. Samples were then coated with albumin, plasma, both, or neither. The samples were inoculated with *S. aureus* containing broth and incubated. Biofilms were observed with electron microscopy and the rate of biofilm formation was quantified. **Results:** No statistically significant effect on the rate of *S. aureus* biofilm formation was demonstrated with the addition of plasma or albumin to our cochlear implant models. There was however a statistically significant difference in the rate of biofilm formation based on the presence or absence of a removable magnet. **Conclusions:** Biofilms on implantable devices represent a clinically important problem. Cochlear implants with removable magnets are more susceptible to biofilm formation than implant devices with sealed magnets. Pretreatment of the devices with albumin or plasma had no demonstrable effect on biofilm formation.

#### **9:22 - 9:30 Infectious Complications in Pediatric Cochlear Implants**

Michael T. Hopfenspirger, MD PhD, Minneapolis, MN

Samuel C. Levine, MD\*, Minneapolis, MN

Frank L. Rimell, MD, Minneapolis, MN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the unique risks for wound infection in pediatric cochlear implant recipients.

**Objectives:** Cochlear implants have been indicated in the treatment of severe-to-profound bilateral sensorineural hearing loss. Infectious complications may cause significant delay in device usage and be a source of additional morbidity. We reviewed our experience with infectious complications in the pediatric age group to determine specific causes not seen in adults. **Study Design:** A retrospective analysis. **Methods:** Cases of pediatric cochlear implants were reviewed for data on infectious complications. Complications were identified as 'major' or 'minor', 'early' or 'delayed'. Information was gathered regarding any comorbid, chronic health condition. Data related to the causative organism(s) were collected. The incidence of complications was calculated. **Results:** Two hundred forty-seven cases of pediatric implants were reviewed. Seventeen cases were identified (an infection rate of 6.9%); all classified as "major". The majority, 12, were classified as "delayed" complications. Sixteen cases required explantation with 11 successfully reimplanted. Five cases (in 4 patients) or 29% were associated with a specific chronic pediatric condition including two children with tracheostomies; the majority of these were successfully reimplanted. Two cases were associated with an identified episode of "head trauma" associated with pediatric play. The remainder could not be correlated to an event or condition. Resistant bacterial infections were not identified. **Conclusions:** Our data compare well with the published data. However, specific issues in the pediatric age group resulted in 35% of our complications in this group, a risk factor not previously identified in the literature. These children should be carefully observed postoperatively. Overall, cochlear implantation in children continues to be associated with a low risk of infectious complications.

#### **9:30 - 9:35 Q&A**

#### **9:35 - 10:05 Break with Exhibitors/View Posters**

#### **10:10 - 11:15 PANEL: CHALLENGES IN MIDDLE EAR RECONSTRUCTION**

**Moderators: D. Bradley Welling, MD PhD\*,  
Columbus, OH**

**David M. Barrs, MD\*, Phoenix, AZ**

**Panelists: Simon C. Parisier, MD\*, New York, NY**

**Joel A. Goebel, MD\*, St. Louis, MO**

David M. Barrs, MD\*, Phoenix, AZ  
Paul R. Lambert, MD\*, Charleston, SC  
Fred D. Owens, MD\*, Dallas, TX

#### MODERATORS

Patrick J. Antonelli, MD\*, Gainesville, FL  
Paul R. Lambert, MD\*, Charleston, SC

#### 11:15 - 11:23 Cochlear Implant Electrode Insertion Through The Round Window

Peter S. Roland, MD\*, Dallas, TX  
Charles G. Wright, PhD, Dallas, TX  
Brandon Isaacson, MD, Dallas, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to assess the merits and limitations of the round window approach for insertion of cochlear implant electrode arrays.

**Objectives:** 1) To determine if a cochlear implant electrode array can be inserted safely through the round window; and 2) to determine if round window insertion can be achieved without any drilling at all using an endoscopic technique. **Study Design:** Anatomic study utilizing cadaveric human temporal bones. **Methods:** Cochlear microdissection permits visualization of the delicate bony modiolar wall and osseous lamina as well as soft tissue structures such as the basilar membrane and spiral ligament. Microvideography was used to evaluate multiple electrode insertions into microdissected temporal bones. Additional electrode insertions were performed using fresh, intact cadaveric temporal bones which were subsequently dissected to assess electrode trauma. Previously embalmed cadaveric temporal bones were utilized to determine whether insertions can be achieved without drilling by passing an electrode through the round window membrane with the aid of endoscopic visualization. **Results:** If an electrode is to conform to the spiral shape of scala tympani, some contact of the array with either the modiolus, basilar membrane or lateral wall is inevitable. With round window insertion, the modiolus is typically the first structure to be contacted by the electrode. However, our insertion trials showed that, in most cases, serious trauma, such as modiolar fracture, did not occur. **Conclusions:** Although the anatomy of the round window niche is highly variable, our results indicate that in the majority of cases electrodes can be passed into scala tympani without any drilling. However, this approach does require a transcanal tympanomeatal flap.

#### 11:23 - 11:31 What Are Predictors for Poor/Excellent Speech Discrimination Post-Cochlear Implantation in Adults

Daniel K. Bodmer, MD PhD, Toronto, ON Canada  
David B. Shipp, MA FAAA, Toronto, ON Canada  
Judy A. Ostroff, PhD, Toronto, ON Canada  
Amy H.C. Ng, MSc Aud (C), Toronto, ON Canada  
Joseph M. Chen, MD FRCSC, Toronto, ON Canada  
Julian M. Nedzelski, MD FRCSC\*, Toronto, ON Canada

**Educational Objective:** At the conclusion of this presentation, the participants should be able to highlight reliable predictors for poor/excellent speech discrimination post-cochlear implantation in adults.

**Objectives:** The vast majority of cochlear implant recipients realize significant improvement in speech perception. However there continue to be a small group who do not realize such benefit. In an effort to identify possible predictors we have compared pre- and post-implant audiologic data using HINT, CUNY and CID scores for 445 consecutive English speaking adult patients followed for a minimum of one year post-implantation in two distinct groups, notably poor versus excellent. **Study Design:** Retrospective. **Methods:** Poor performers were those who realized either a worsening, no improvement or an improvement of less than 10%. This group numbered 58 (13%). High performers consisted of a cadre of 194 (44%) patients who scored between 91 and 100% post-implantation. Demographic data relating to onset of deafness, education exposure, etiology, etc., were evaluated. **Results:** Of the poor performers, 33 (57%) were pre-/perilingual deafened. Of these 85% were not consistent hearing aid users nor had realized any auditory/oral training in childhood. On the other hand, a total of 109 implantees were individuals who were pre-/perilingual deafened. Of these 24 were in the high performer category. All were identified early, consistently used hearing aids and were graduates of a strong auditory/oral education. Of the high performers 70 (88%) were late deafened. Other findings will be discussed in both groups. **Conclusions:** The study which examines a large number of individuals from a single institution reaffirms the fact that in the setting of pre-/perilingual onset of deafness the major predictor of poor speech recognition post-cochlear implantation relates to the educational experience.

#### 11:31 - 11:39 Visual-Motor Integration Skills of Prelingually Deaf Children After Two or More Years of Cochlear Implant Use: Relations to Age at Implantation and Speech Perception

David L. Horn, MD, Indianapolis, IN  
Mary K. Fagan, PhD, Indianapolis, IN

Caitlin M. Dillon, PhD, New Haven, CT  
David B. Pisoni, PhD, Indianapolis, IN  
Richard T. Miyamoto, MD\*, Indianapolis, IN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss theoretical and clinical implications of observed relations between age at implantation, visual-motor integration skills and speech perception performance with a CI.

**Objectives:** To assess relations between age at implantation, speech perception scores, and visual-motor integration skills in prelingually deaf children with cochlear implants (CIs). **Study Design:** Cross sectional correlation study. **Methods:** Participants were 25 prelingually deaf children, ages 6 to 14 years. All had received a CI prior to age 6 years, had used their device for at least 2 years, and were enrolled in education/habilitation programs that emphasized oral communication. Two standardized tasks were used to assess visual-motor integration skills. The first task assessed accuracy in reproducing a series of 2 dimensional geometric figures. The second task was a timed maze tracing task in which accuracy and speed were assessed. For both tasks scaled scores and percentile ranks were calculated based on a normative sample of hearing children. Measures of open set speech perception and demographic information including age at implantation were obtained. **Results:** The visual-motor tasks were not significantly correlated suggesting that these tasks assess different aspects of visual-motor integration. Analyses revealed that both visual-motor tasks were significantly and negatively correlated with age at implantation: children implanted later in life had lower scaled scores on both visual-motor integration tasks. Strong and highly significant correlations were also observed between design copying scaled scores and open set speech perception scores. In contrast the correlations between maze tracing and speech perception did not reach significance. **Conclusions:** Earlier access to auditory information may lead to more typical visual-motor skills in deaf children with CIs. Nonverbal sensorimotor integration abilities may be predictors of speech perception skills with a CI.

### **11:39 - 11:47 Cochlear Implantation in Children With CHARGE Syndrome: Therapeutic Decisions and Outcomes**

Biana G. Lanson, MD, New York, NY  
Janet E. Green, MS, New York, NY  
J. Thomas Roland Jr., MD\*, New York, NY  
Susan B. Waltzman, PhD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to evaluate patients with sensorineural hearing loss associated with CHARGE syndrome and make informed therapeutic decisions regarding the feasibility and appropriateness of cochlear implantation surgery in this patient population.

**Objectives:** Ear anomalies and deafness are associated with CHARGE syndrome, which also presents with a cluster of features including coloboma of the eye, heart defects, atresia of the choanae, developmental retardation, and genitourinary abnormalities. The aim of this study is to explore the therapeutic decisions for treatment of sensorineural hearing loss in children with CHARGE syndrome and to assess the outcome of cochlear implantation. **Study Design:** Retrospective chart review. **Methods:** Ten children presenting with severe to profound sensorineural hearing loss associated with CHARGE syndrome were the subjects of this study. Routine audiometric measurements, closed and open set measures of speech perception, and the Infant Toddler Meaningful Auditory Integration Scale (IT-MAIS) were performed pre- and postoperatively. In addition, the degree of the subjects' cochlear deformity and cognitive skills were measured and correlated to outcome. **Results:** All patients had varying degrees of ear anomalies, nine of the ten patients suffered from coloboma of the eyes, two patients had heart defects, four exhibited choanal atresia, nine showed developmental retardation, and four had genitourinary abnormalities. Nine of the children underwent cochlear implantation with complete insertion of the electrode array without complication and were followed over a 6 month to a 6 year period. The tenth child was not implanted due to severe retardation. All of the implanted children showed varying degrees of auditory benefit as measured by routine audiometry, appropriate speech perception tests, and the IT-MAIS. **Conclusions:** Careful treatment planning for children with sensorineural hearing loss and CHARGE syndrome can lead to varying degrees of auditory benefit with no increase in surgical complications.

### **11:47 - 11:55 Cochlear Implantation in Organ Transplantation**

D. Michael Patterson, MD, Miami, FL  
Adrien A. Eshraghi, MD, Miami, FL  
Sarah S. Connell, MD, Miami, FL  
Annelle V. Hodges, AuD, Miami, FL  
Fred F. Telischi, MD\*, Miami, FL  
Thomas J. Balkany, MD\*, Miami, FL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the potential safety and effectiveness of cochlear implant therapy among patients maintained on chronic immunosuppression after organ transplantation.

**Objectives:** Cochlear implantation is a well established treatment for deafness. Initially used in very selective cases the indications of this procedure have broadened considerably. Compared to immunocompetent patients those with compromised immune function, such

as organ transplant recipients, may experience higher rates of postoperative complications and/or poorer auditory rehabilitation potential. In order to describe the potential safety and effectiveness of cochlear implant therapy among patients maintained on chronic immunosuppression after organ transplant, we reviewed our experience with this group of patients. **Study Design:** Retrospective case series. **Methods:** Records of all cochlear implantations performed at our institution from January 1, 1992, until August 31, 2005, were reviewed. Five patients were identified who had previously undergone organ transplantation and were being maintained on chronic immunosuppressive medication. Our clinic's standard evaluation, surgical technique and followup schedule were followed. The transplant team was consulted preoperatively in each case. Both inpatient and outpatient clinic notes were reviewed for the incidence of wound complications and speech discrimination scores were compared to our average experience. **Results:** There were no postoperative complications noted. Two patients however required exchange of implant after hard failure. Auditory outcomes compared favorably to our clinic's normative data. **Conclusions:** This series suggests that cochlear implantation with standard technique can be safe and effective therapy among individuals maintained on chronic immunosuppression after organ transplant.

**11:55 - 12:00 Q&A**

**12:00**      *Adjourn*

**AFTERNOON**      *Golf tournament*  
*Tennis Tournament*  
*Fishing Tournament*

*Evening free to accommodate attendees returning to hotel late after activities.*

## **CONCURRENT SESSION II - LARYNGOLOGY AND BRONCHOESOPHAGOLOGY - Islands CD**

**8:00 - 8:05**      **Announcements by Vice Presidents**  
**Richard J. Wiet, MD\*, and Derald E. Brackmann, MD\***

### **MODERATORS**

**Marshall Strome, MD\*, Cleveland, OH**  
**Mark C. Weissler, MD\*, Chapel Hill, NC**

**8:05 - 8:13**      **Effect of pH on Activity and Stability of Human Pepsin 3b: Implications for Reflux Attributed Laryngeal Disease**  
Nikki S. Johnston, PhD, Milwaukee, WI  
Peter W. Dettmar, PhD, Hull, UK  
Bimjhana B. Bishwokarma, MA, Winston-Salem, NC  
Jamie A. Koufman, MD\*, New York, NY  
Mark O. Lively, PhD, Winston-Salem, NC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the effect of pH on the activity and stability of human pepsin 3b and discuss implications for reflux attributed laryngeal disease.

**Objectives:** Exposure of laryngeal epithelia to pepsin during extraesophageal reflux is known to cause depletion of laryngeal protective proteins, carbonic anhydrase isoenzyme III (CAIII) and squamous epithelial stress protein Sep70. The first objective of this study was to determine whether active pepsin is required to deplete these proteins. The second objective was to investigate the effect of pH on the activity and stability of human pepsin 3b under conditions that might be found in the human esophagus and larynx. **Study Design:** Prospective translational scientific study. **Methods:** Using a porcine in vitro model we studied the effects of pH on pepsin activity and its ability to deplete CAIII and Sep70. The activity of purified human pepsin 3b was determined using a kinetic assay over a range of pH from pH1.5 to pH8.0 by measuring the rate of hydrolysis of a synthetic peptide substrate. **Results:** Enzymatically active pepsin is required to deplete laryngeal CAIII and Sep70. Maximal hydrolysis of the peptide substrate was observed at pH2.0. Interestingly pepsin was found to be stable for up to 24 hours at pH 7.0, at 37°C, with retention of 74% activity following reacidification at pH 3.0. As previously reported, pepsin did not attain "irreversible denaturation" until exposed to pH 8. **Conclusions:** Pepsin present in laryngeal epithelia, following a reflux event, could theoretically remain stable at neutral pH and be reactivated by introduction of a new source of hydrogen ions.

**8:13 - 8:21**      **Quantifying the Physiology of Upper Airway Stenosis: Changes in Pulmonary Mechanics in**

## **Response to Graded Extrathoracic Resistive Loading**

S. A. Reza Nouraei, MBBChir, London, UK

Claire Winterborn, FRCA, London, UK

S. Mahmoud Niouiraei, FRCS, Newcastle Upon Tyne, UK

Dino A. Giussani, PhD, Cambridge, UK

David J. Howard, FRCS, London, UK

Guri S. Sandhu, FRCS, London, UK

**Educational Objective:** To study changes in pulmonary dynamics in response to precise changes in extrathoracic airway resistance, to develop and validate quantitative indices for physiological diagnosis and monitoring of upper airway stenosis.

**Objectives:** To develop a controlled model of extrathoracic airway obstruction to study the impact of precise changes in airway resistance on pulmonary dynamics, to devise and validate quantitative indices of upper airway obstruction to diagnose and physiologically monitor patients with laryngotracheal stenosis through treatment. **Study Design:** Experimental and clinical studies. **Methods:** We developed six airway resistors whose characteristics, determined with a flow pressure device, mirrored the selective impediment to inspiratory airflow that occurs with laryngotracheal stenosis (LTS). Maximum effort flow volume loops were obtained from 15 healthy subjects with the different resistors, supplied at random, placed in series with the spirometer. The diagnostic and monitoring performance of different flow volume indices were assessed with Receiver Operator Characteristic and Analysis of Variance respectively, and subsequently applied to a population of 15 patients with LTS. **Results:** The ratio of peak expiratory and inspiratory flows (PEF/PIF) and maximal expiratory and inspiratory flows at 50% vital capacity (MEF50/MIF50) had sensitivities of 82.5% and 94% respectively. The best diagnostic index however was the ratio of areas under the expiratory and inspiratory plots (ratio of integrals) which had a sensitivity of 100% and a specificity of 95.2% for diagnosing LTS when applied to a population of patients with this condition. Both PEF/PIF and ratio of integrals could identify increases in airway resistance over 10cmH<sub>2</sub>O.sec.L-1 from baseline (p<0.05; ANOVA). **Conclusions:** Flow volume loop studies are noninvasive and simple to perform as part of routine clinical practice and can be used to quantify the diagnosis and physiological monitoring of patients with laryngotracheal stenosis throughout treatment, and the ratio of area under the expiratory and inspiratory curves appears to be the optimal index.

## **8:21 - 8:29 Comparison of Pullout Strength of Resorbable Screws and Titanium Screws in Human Cadaveric Laryngeal Cartilage**

Byron P. Windham, MD, Jackson, MS

James R. Jordan, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the differences in linear pullout strength of titanium screws versus resorbable screws from human laryngeal cartilage as well as the effect of screw size and drill hole size on pullout strength.

**Objectives:** To compare the pullout strength of titanium screws and resorbable screws from human fresh frozen cadaveric laryngeal cartilage. The importance of drill hole diameter, screw diameter, and whether or not the drill hole was tapped (resorbable screws only) was also determined. **Study Design:** Prospective. **Methods:** Sixteen cartilage specimens were tested after debridement of connective tissue and perichondrium. Linear pullout strength of screws from the central part of the thyroid lamina of cadaveric thyroid cartilage specimens was measured using a load cell. Titanium and resorbable screw sizes of 1.5mm and 2.0mm were tested using drill hole diameters of 1.1mm and 1.5mm. For the resorbable tapped group screw diameters of 1.5mm and 2.0mm were tapped with 1.5mm and 2.0mm taps respectively. All tested screws were 6mm in length. **Results:** We found a uniformly constant difference between the three screw types (p<0.001). Post hoc analysis using a Bonferroni adjustment for the multiple testing indicated a significant difference between the resorbable-untapped screw and the resorbable-tapped screw. We failed to find a significant difference between the resorbable-untapped screw and the titanium screw or between the titanium screw and the resorbable-tapped screw. In addition to main effects for screw type, a comparison of the three screw sizes failed to demonstrate a significant effect (p=0.1051). **Conclusions:** This study demonstrates that resorbable screws in combination with untapped drill holes result in higher resistance to linear loads than resorbable screws with tapped holes and are at least as strong as titanium screws. Drill hole and screw diameter combinations did not result in significant differences.

## **8:29 - 8:37 Comparison of Gender, Height and BMI to Glottic, Supraglottic and Proximal Tracheal Diameter**

Travis L. Shaw, MD, Richmond, VA

Jason G. May, MD PhD, Livonia, MI

Laurence J. DiNardo, MD\*, Richmond, VA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe differences with regards to gender, height and BMI when comparing glottic, supraglottic and proximal tracheal diameter.

**Objectives:** Compare gender, height and BMI to glottic, supraglottic and proximal trachea AP diameter and area, and to evaluate these variables as possible predictive factors of laryngeal diameters. **Study Design:** Retrospective analysis. **Methods:** 41 patients (16 women and 25 men) at a tertiary care center underwent CT scans (2cm frames) at time of admission as a trauma patient. Retrospectively measurements of apertures at the supraglottis, glottis and subglottis were taken. Tracheal diameter was also measured. Measurements were taken of AP diameter and area at the glottic aperture, at the subglottis as defined as 4cm below glottic aperture, and at the proximal trachea as defined as 10cm below the glottic aperture. Student's t-test was used to analyze for significant difference between variables. Predictive value of each patient's gender, height, BMI were calculated for measurements at each level. **Results:** 41 trauma patients (16 women and 25 men) were admitted at a tertiary care center. Average age of female patients was 44.69 years and male patients was 39.48 years. Average height for was 164.799 cm (female) and 179.47 (male). Average weight was 68.407 kg (female) and 82.923 kg (male). Average BMI was 25.2 (female) and 22.152 (male). Average glottic aperture AP diameter was 17.59(female) and 22.1 52 (male), and glottic aperture area was 0.9582 (female) and 1.3999 (male). Average subglottic AP diameter was 16.350 (female) and 20.500(male), and average subglottic area was 1.5093 (female) and 1.9870 (male). Average proximal trachea AP diameter was 15.3500 (female) and 19.3320 (male), and average proximal trachea area was 1.8474 (female) and 2.5226 (male). **Conclusions:** Gender was the only variable that showed significant difference between laryngeal AP diameter and area. Height was the least predictive variable. Future studies could also include neck length, though some correlation between neck length and height (which was least predictive) would be expected.

### **8:37 - 8:45 Preparation Techniques for the Injection of Human Autologous Cartilage: An Ex Vivo Feasibility Study**

Jacob Pieter Noordzij, MD\*, Boston, MA  
Justin M. Cates, MD PhD, Vanderbilt, TN  
Seth M. Cohen, MD MPH, Durham, NC  
W. Russell Ries, MD\*, Nashville, TN  
C. Gaelyn Garrett, MD\*, Nashville, TN  
Robert H. Ossoff, DMD MD\*, Nashville, TN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare different techniques for creating an autologous cartilage slurry for injection. The participants should also be able to discuss the injection properties for each cartilage preparation technique presented.

**Objectives:** To determine the optimum donor site and preparation technique for injecting human autologous cartilage as a potentially permanent implant material for vocal fold medialization. **Study Design:** Prospective ex vivo experimental model. **Methods:** Human nasal septal and auricular cartilage was obtained from eight surgical cases after institutional review board approval. The auricle and nasal septum were chosen as potential donor sites because of ease of accessibility, volume of cartilage potentially available, and minimal subsequent cosmetic deformity following the tissue harvesting procedure. Various preparation techniques readily available in most operating rooms were tested for their efficacy in generating an injectable cartilage slurry. The various cartilage slurries were injected through sequentially smaller needles and examined cytologically. **Results:** The best injection properties for both nasal septal and auricular cartilage were obtained by drilling the cartilage down with a 5 millimeter otologic cutting bur which allowed free passage through an 18 gauge needle. Cytologic examination of drilled septal cartilage showed good uniformity of cartilage pieces with an average greatest diameter of 0.44 +/- 0.33 millimeter and 33% of lacunae contained viable appearing chondrocytes. Cytologic examination of drilled auricular cartilage was similar, except only 10% of lacunae were occupied by chondrocytes. Other techniques tested (knife, morselizer and cartilage crusher) did not yield injectable cartilage slurries. **Conclusions:** Both nasal septal and auricular cartilage can be prepared for injection via an 18 gauge needle using a cutting otologic bur. Further testing of in vivo viability and long-term volume retention is needed.

### **8:45 - 8:50 Q&A**

#### **MODERATORS**

**Albert L. Merati, MD\*, Milwaukee, WI**  
**Paul W. Flint, MD\*, Baltimore, MD**

### **8:50 - 8:58 The Practice Patterns, Safety and Rationale for Tracheotomy Tube Changes: A Survey of Otolaryngology Training Programs**

Abtin Tabaei, MD, New York, NY  
Tali Lando, MD, New York, NY (Presenter)  
Scott Rickert, MD, New York, NY  
Michael G. Stewart, MD MPH\*, New York, NY  
William I. Kuhel, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the current practice patterns and rationale for routine tube changes following tracheotomy for long-term ventilation and to discuss the safety issues related to this procedure.

**Objectives:** The performance of tracheotomy for long-term ventilation is common in the hospital setting. Although the postoperative care is often perceived as routine, practice patterns and complications related to tube changes are poorly described, and complications may be significant. **Study Design:** Survey of chief residents in accredited otolaryngology training programs. **Methods:** The survey was performed to determine the management strategies, rationale and complications associated with postoperative tracheostomy tube changes. **Results:** The first tube change was performed after a mean of 5.3 days (range, 3-7 days) following the procedure, most frequently by junior residents. The first change was performed in a variety of locations including the intensive care unit (88%), step down unit (80%) and regular floor (78%) and 25% reported performing these changes at night/weekends. The most frequently reported rationale for performing routine tracheotomy changes was examination of the stoma for maturity (46%), prevention of stomal infection (46%) and confirmation of stability for transport to a less monitored setting (41%). Twenty-five respondents (42%) reported a loss of airway and 9 respondents (15%) reported a death as a result of the first tube change. A significantly higher incidence of airway loss was reported by respondents who reported performing the first tube change on the floor (96% vs. 64%,  $p=0.004$ ). **Conclusions:** There is significant variability in the approach to postoperative tracheostomy tube management. The occurrence of major complications from tube changes requires an examination of the rationale and safety of the current practice patterns.

### **8:58 - 9:06 Vocal Fold Immobility: A Longitudinal Analysis of Etiology Over 20 Years**

Laura H. Swibel Rosenthal, MD, Detroit, MI

Robert H. Deeb, BS, Detroit, MI

Michael S. Benninger, MD\*, Detroit, MI

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the current most common causes of unilateral and bilateral vocal fold immobility and how the etiology has been changing. The clinical implications for workup and management will be addressed.

**Objectives:** To determine the current etiology of vocal fold immobility, identify changing trends over the last 20 years, and compare to historical reports. **Study Design:** The present study is a retrospective analysis of all patients seen within a tertiary care institution between 1996 and 2005 with vocal fold immobility. The results were combined with a previous study of patients within the same institution from 1985 through 1995. Results were compared to the literature. **Methods:** The medical records of all patients assigned a primary or additional diagnostic code for vocal cord paralysis (478.3) were obtained from the electronic database. The data collected were analyzed using Microsoft Excel pivot tables. **Results:** 827 patients were available for analysis (435 from the most recent cohort), which is by far the largest reported series to date. Vocal fold immobility was most commonly associated with a surgical procedure (37%). Non-thyroid surgeries (66%), such as anterior cervical approaches to the spine and carotid endarterectomies, have surpassed thyroid surgery (33%) as the most common iatrogenic causes. These data represent a change from historical figures in which extralaryngeal malignancies were considered the major cause of unilateral immobility. Thyroidectomy continues to cause the majority (80%) of iatrogenic bilateral vocal fold immobility and 30% of all bilateral immobility. **Conclusions:** This 20 year longitudinal assessment revealed that the etiology of unilateral vocal fold immobility has changed such that there has been a shift from extralaryngeal malignancies to non-thyroid surgical procedures as the major cause. Thyroid surgery remains the most common cause of bilateral vocal fold immobility.

### **9:06 - 9:14 Management of Supraglottic Squeeze in Adductor Spasmodic Dysphonia: A New Technique**

Nwanmegha O. Young, MD, New York, NY

Andrew Blitzer, MD\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the management of hyperadduction of the supraglottis.

**Objectives:** Spasmodic dysphonia is a disabling disorder of the voice characterized primarily by involuntary disruptions of phonation. Botulinum toxin injections of the thyroarytenoid muscles have been the treatment of choice for ADSD. We describe a new technique to address the problem of compensatory or supraglottic hyperadduction in these patients. **Study Design:** Case series. **Methods:** 4 patients with ADSD were seen for evaluation of botulinum toxin injection. On fiberoptic exam it was noted that they had type I hyperadduction of the true vocal cords with a significant type II and/or type III hyperadduction of the supraglottis. After standard management of the thyroarytenoid muscles the strained/strangled voice continued. On fiberoptic exam it was noted that the vocal folds were weakened, but the supraglottic hyperfunction persisted. The patients were treated by speech therapists to unload their supraglottis without success. All patients then had their oblique portion of the LCA muscles injected with BTA through a thyrohyoid approach. This was done in the office under EMG control. **Results:** Upon followup, all patients demonstrated improvement in the quality of the voices (as compared to TA injections alone). **Conclusions:** We describe a new technique for injection of the supraglottic portion of the LCA muscles. We demonstrate this can be done safely and successfully in an office setting with EMG control.

### **9:14 - 9:22 532nm Pulsed-KTP Laser Treatment of Laryngeal Papillomatosis Under General Anesthesia**

James A. Burns, MD, Boston, MA  
Steven M. Zeitels, MD\*, Boston, MA  
Lee M. Akst, MD, Chicago, IL  
Matthew S. Broadhurst, MD, Boston, MA  
Robert E. Hillman, PhD, Boston, MA  
Rox R. Anderson, MD, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the use of the 532nm pulsed-KTP laser in the treatment of laryngeal papillomatosis.

**Objectives:** Angiolytic lasers have been demonstrated to be an effective treatment strategy for laryngeal papillomatosis. These lasers precisely target hemoglobin within the microcirculation of these papillary lesions. We have previously demonstrated the advantages of the fiber based pulsed 532nm Potassium-Titanyl-Phosphate (KTP) laser in an office setting (local anesthesia). This investigation provides the first report of the pulsed-KTP laser during microlaryngoscopy under general anesthesia. **Study Design:** A prospective pilot study was done in 42 adult cases with laryngeal papillomatosis to determine disease response. **Methods:** During suspension microlaryngoscopy, a solid state 532nm pulsed-KTP laser was used (15 millisecond pulse width, 5.25 J/pulse max output, 2Hz repetition rate, .4mm fiber, approximately 20-80 J/cm<sup>2</sup> fluence) to treat laryngeal papillomatosis. All patients underwent postoperative stroboscopy to assess mucosal wave function, and a previously utilized rating scale was used to assess disease regression. **Results:** Twenty-eight patients underwent 42 procedures. Near term followup with an early postoperative evaluation was available in 16 patients (23 procedures). Twelve patients (19 procedures) were geographically distant and only returned after developing symptoms with significant disease recurrence. Of the 23 procedures in which near term followup was available, >90% disease regression was achieved in 17/23 (74%), 75-89% disease regression was 4/23 (17%), and 50-74% disease regression was 2/23 (9%). Anterior commissure disease was present in 39/42 cases (93%) and no new webbing/synechia occurred. Judgments of postoperative stroboscopy revealed enhanced mucosal wave vibration in all patients. **Conclusions:** The 532nm pulsed-KTP laser was effective for treating recurrent respiratory papillomatosis. Our impression is that this method is an improvement over prior laser technologies.

### **9:22 - 9:30 Endoscopic Microflap Laryngoplasty for Anterior Commissure Web Formation in Patients With Recurrent Respiratory Papillomatosis**

Lee M. Akst, MD, Maywood, IL  
Matthew S. Broadhurst, MD, Boston, MA  
James A. Burns, MD, Boston, MA  
Steven M. Zeitels, MD\*, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should understand a novel technique for restoring vocal fold length by anterior commissure laryngoplasty in patients with recurrent respiratory papillomatosis.

**Objectives:** Patients with recurrent respiratory papillomatosis (RRP) of the glottis may develop an anterior commissure web after repeated treatment with injudicious use of any modality. These synechia can obscure disease on the undersurface of the web and more caudally in the subglottis. This study presents a novel endoscopic laryngoplasty technique designed to lengthen the glottal aperture and enhance exposure of the subchordal and subglottic airway. **Study Design:** Prospective nonrandomized. **Methods:** Patients were selected who presented with substantial anterior commissure web formation with RRP on its undersurface. The anterior commissure laryngoplasty was comprised of a cold instrument lysis of the web. Subsequently an inferiorly based microflap comprised of papillomatous epithelium was dissected. An advancement-rotation of the microflap was done by suture stabilizing it to the anterior commissure tendon, which separated the two vocal folds. Papillomatous disease not associated with the microflap was treated with an angiolytic laser after the glottal aperture was lengthened. A second stage laser procedure was done to treat the residual disease in the microflap. Microlaryngoscopy and telescopic videostroboscopy were used to assess outcomes. **Results:** Four cases of endolaryngeal anterior commissure laryngoplasty were done. All patients had enhanced exposure of the undersurface of the anterior commissure and all had substantial lengthening of the glottal aperture of at least 4mm. **Conclusions:** Endoscopic microflap laryngoplasty utilizing redundant papillomatous epithelium is an effective strategy for lengthening the glottal aperture and enhancing anterior glottic/subglottal exposure for future RRP treatment. This approach combines precise cold instrument phonomicrosurgical techniques to manage the web while using an angiolytic laser to precisely involute the diseased epithelium.

**9:30 - 9:35 Q&A**

**9:35 - 10:05 Break with Exhibitors/View Posters**

**10:10 - 11:15 PANEL: LARYNGOLOGY: MAKING THE DIAGNOSIS**

**Moderator:** C. Gaelyn Garrett, MD\*, Nashville, TN  
**Panelists:** Michael M. Johns, MD, Atlanta, GA  
Barbara Jacobson, PhD, Nashville, TN  
Michael S. Benninger, MD\*, Detroit, MI  
Peak Woo, MD\*, New York, NY

#### MODERATORS

Steven M. Zeitels, MD\*, Boston, MA  
Jonathan Aviv, MD\*, New York, NY

#### 11:15 - 11:23 Myosin Heavy Chain Composition and Fiber Size of the Cricopharyngeus Muscle in Achalasia Patients and Normals

Melinda V. Davis, BS, Milwaukee, WI  
Albert L. Merati, MD\*, Milwaukee, WI  
Safwan Jaradeh, MD, Milwaukee, WI  
Joel H. Blumin, MD, Milwaukee, WI

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify the differences between the cricopharyngeal muscle in normals and patients with cricopharyngeal achalasia. The participants will also be able to explain the potential functional implications of these differences.

**Objectives:** Dysphagia continues to be a dominant clinical issue in otolaryngology. Myosin heavy chain (MHC) isoform type composition is a key determinant of muscle function. In the normal state the cricopharyngeus muscle (CPM) is tonically contracted and composed predominantly of type I (slow twitch) fibers. The fiber type composition of the CPM in cricopharyngeal achalasia has not been described. The hypothesis tested in this investigation is that there is a difference between the MHC isoform composition of the CPM in patients with the clinical diagnosis of cricopharyngeal achalasia (CA) and historical controls. **Study Design:** Retrospective review. **Methods:** Patients undergoing myotomy for CA are identified; their clinical characteristics and muscle histopathology are reviewed. Patients that had received prior botulinum were excluded. MHC fiber type composition was determined by myosin adenosine triphosphatase (ATPase) stained samples at pH 10.2, 4.6, and 4.3. Fiber size was also measured. CPM specimens from cadavers served as controls. **Results:** Eleven CA patients (6 male, 5 female, mean age 62); a mean of 151 fibers were counted for each specimen. Five control CPM were analyzed (3 male, 2 female, mean age 67). There were relatively fewer type I fibers (62%) in patients with cricopharyngeal achalasia compared to controls (75%) though the difference was not significant ( $p < 0.40$ , t-test). Type I fibers were smaller in CA patients (39 microns) vs. controls (55 microns) ( $p < 0.10$ ). Of the 11 CA patients, 4 had type II predominance a feature seen in only 1 of 5 normals. **Conclusions:** Patients with cricopharyngeal achalasia have relatively fewer type I fibers, though the difference was not statistically significant; several specimens had type II predominance. This is the first investigation of fiber typing of the cricopharyngeus in achalasia patients.

#### 11:23 - 11:31 Clinical Presentation, Evaluation, and Treatment of Somatoform Dysphagia

Natasha T. Mirza, MD, Philadelphia, PA  
Jeffery P. Staab, MD, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) to describe the clinical presentation of somatoform dysphagia, including its predisposing factors, precipitants, and pathophysiologic mechanisms; and 2) to describe a successful treatment approach using modern laryngologic, psychiatric, and speech therapy techniques.

**Objectives:** 1) To describe the clinical presentation of somatoform dysphagia, including its predisposing factors, precipitants, and pathophysiologic mechanisms; and 2) to describe a successful treatment approach using modern laryngologic, psychiatric, and speech therapy techniques. **Study Design:** Case series and review of the literature. **Methods:** Four cases of debilitating dysphagia that persisted despite aggressive laryngologic interventions were reviewed in detail to identify medical and psychological factors that triggered and sustained swallowing dysfunction. The outcomes of multidisciplinary interventions were analyzed to determine the most effective strategies for treatment. **Results:** Coexisting medical and psychologic factors were identified in all cases. Patients had three findings in common 1) evidence of laryngeal or pharyngeal diseases (e.g., laryngopharyngeal reflux, tonsillitis, sinonasal allergies) that required treatment, but were not severe enough to explain the full extent of symptoms; 2) hesitation when initiating swallowing, despite normal function of intrinsic swallowing mechanism; and 3) a strong predisposition to anxiety. Positive outcomes required treatment of the laryngeal conditions, aggressive antianxiety interventions with anxiolytic antidepressants, benzodiazepines, and cognitive therapy, and pharyngeal desensitization with swallowing therapy. **Conclusions:** Somatoform dysphagia is a syndrome of persistent swallowing dysfunction most often precipitated by a biological event (e.g., laryngologic illness, choking) in patients with a premorbid anxiety diathesis. Conditioned hypersensitivity to pharyngeal sensations and anxiety related inhibition of normal swallowing processes sustain this

debilitating syndrome. Coordinated laryngologic, psychiatric, and swallowing therapy interventions produce the most favorable clinical outcomes.

**11:31 - 11:39 WITHDRAWN**

**How I Do It: Endoscopic Division of Zenker's Diverticulum With Harmonic Scalpel**

Roy F. Thomas, MD, Tacoma, WA  
Stephen W. Bayles, MD, Seattle, WA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate understanding of the technique of using the harmonic scalpel for endoscopic management of Zenker's diverticulum. They should be able to compare this method against current management options in practice and specific advantages and indications for its use.

**Objectives:** Zenker's diverticulum is a well known etiology of dysphagia, with multiple treatments currently in practice, to include excision via external approach and endoscopic division with CO2 laser or endovascular stapling devices. Often with the endoscopic approach using a stapler the distal portion of the cricopharyngeal bar presents problems for division due to limitations of the stapling device. We present a novel method for endoscopic management of Zenker's diverticulum. **Study Design:** Case series of 6 patients. **Methods:** A series of patients with proven Zenker's diverticula were managed endoscopically with a combination of endovascular stapling and division with harmonic scalpel. Technique is discussed and patient outcomes are reviewed. **Results:** All patients had significant reduction in their dysphagia postoperatively, including one patient who was revised following previous open cricopharyngeal myotomy and one patient who had failed division with the endovascular stapler. To date there have been no recurrences. Average hospital stay was one day with no complications. **Conclusions:** Harmonic scalpel assisted cricopharyngeal myotomy is a novel method for dealing with troublesome dysphagia resulting from Zenker's diverticulum. It has proven efficient and safe at our institution and should be considered for use in endoscopic management of this disease process, particularly when concern arises for esophageal violation due to a shallow cricopharyngeal bar.

**11:39 - 11:47 Transnasal Esophagoscopy (TNE) in the Private Practice Setting**

Roger D. Cole, MD, Hickory, NC  
Dawn E. Griesen, MD, Hickory, NC  
Willard C. Harrill, MD, Hickory, NC  
Merritt J. Seshul, MD\*, Hickory, NC  
William A. Jarrett, MD, Hickory, NC  
Mark S. Katz, PA-C, Hickory, NC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the application of TNE in a private practice setting and its medical economic impact.

**Objectives:** To present 3 years of outcome data for TNE in a private practice setting and to present the medical economics of incorporating TNE into a private practice. **Study Design:** Retrospective review of 371 TNE performed in our practice from July 2002 to June 2005. **Methods:** Charts were reviewed for the indications, diagnostic studies used, post-procedural diagnosis, and outcomes. Implementation costs of TNE and medical economics data are also reviewed. **Results:** Patient tolerance was excellent, accurate diagnosis was obtained allowing for more efficient disease management. Procedure specific advantages included no need for sedation, more efficient use of patient and physician time and significant cost savings. **Conclusions:** TNE is safe, well tolerated and easy to perform in a private practice setting. There is a significant cost savings to the industry and can easily be added to outpatient private practice otolaryngology.

**11:47 - 11:55 Nasal and Oral Aerodigestive Measurement Discrepancies: The Transnasal Esophagoscopy**

**Documentation Dilemma**

Justin M. Garner, MD, Jackson, MS  
John M. Schweinfurth, MD, Jackson, MS  
John M. Faust, MD, Jackson, MS  
Warren L. May, PhD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the documentation dilemma of transnasal esophagoscopy due to inherent anatomical length differences of the oral and nasal aerodigestive systems and be able to convert esophagoscopy measurements reported from either the incisors or nares.

**Objectives:** To clarify gaps in the literature regarding standardized landmark measurements and documentation techniques in transnasal esophagoscopy, as opposed to traditional transoral esophagoscopy, by determining radiographically the inherent anatomical length difference between the nasal and oral aerodigestive systems. **Study Design:** Prospective radiographic cohort study. **Methods:** Digital com-

puterized tomography measurement techniques were used to determine the inherent anatomical length difference between the nasal and oral aerodigestive system. Using sagittal plane images from consecutive patients, the mean nares cricoid (NC) and upper incisor cricoid (IC) distances were determined. The mean difference between these two measurements was calculated as well. Male, female, and overall distances and differences were calculated. Mean difference data was then applied to known standard oral esophagoscopy landmark measurements to convert to standard landmark measurements reported from the nares. **Results:** Overall mean NC and IC distances were 17.4cm and 14.7cm, respectively. For males these mean distances were 18.4cm and 15.4cm, respectively. For females these mean distances were 16.6cm and 14.1cm, respectively. Overall mean NC to IC difference was 2.7cm. The mean NC to IC difference for males and females was 3.0cm and 2.5cm, respectively. **Conclusions:** Historically, landmark and report measurements in esophagoscopy have been measured and standardized from the upper incisor. This study demonstrates and clarifies the inherent anatomical length difference of the nasal and oral aerodigestive system and the resultant documentation dilemma produced by transnasal esophagoscopy techniques. The presented data can be a basis for conversion of esophagoscopy measurements reported from either the incisors or nares providing better communication between endoscopists of different disciplines and techniques.

*11:55 - 12:00 Q&A*

*12:00 Adjourn*

*AFTERNOON Golf tournament  
Tennis Tournament  
Fishing Tournament*

*Evening free to accommodate attendees returning to hotel late after activities.*

## **SATURDAY, FEBRUARY 17, 2007**

*7:00 - 5:00 Registration - Island E Foyer*

*7:00 - 5:00 Speaker Ready Room - Key West*

*7:00 - 7:50 Business Meetings (Members Only)  
Southern Section Members - Capri 1  
Western Section Members - Capri 2  
Middle Section members - Caxambus 1  
Eastern Section Members - Caxambus 2*

*7:00 - 12:30 Exhibit Hall Open - Collier Hall  
Poster Viewing - Collier Hall*

*7:00 - 7:50 Continental Breakfast with Exhibitors*

*8:00 - 11:00 Spouse Hospitality - Captiva*

*8:00 - 12:00 Scientific Sessions  
Pediatric Otolaryngology - Islands AB  
Head and Neck - Islands CD*

*12:00 Adjourn*

*1:30 - 5:00 "Otology Icons of the 20th Century: Addressing Unresolved Issues"  
Islands AB*

*6:30 Margaritaville Beach Party - Tiki Beach  
Children's Parties - Location TBN*

## **CONCURRENT SESSION I - PEDIATRIC OTOLARYNGOLOGY - Islands AB**

**8:00 - 8:05** Announcements by Vice Presidents - Derald E. Brackmann, MD\*, and Margaret A. Kenna, MD\*

### **MODERATOR**

**Dana M. Thompson, MD\*, Cincinnati, OH**

**8:05 - 8:13** **Behavior and Obstructive Sleep Apnea in Children: Is Obesity a Factor?**

Emily F. Rudnick, MD, Richmond, VA

Ron B. Mitchell, MD, St. Louis, MO

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate the prevalence of behavioral problems in both overweight and normal weight children with OSA, and explain the impact (if any) of obesity on behavior in these children.

**Objectives:** Children with obstructive sleep apnea (OSA) frequently exhibit behavioral and neurocognitive problems. There is a high prevalence of OSA among overweight (obese) children. This study aims to evaluate the relationship between OSA and behavioral problems in overweight as compared to normal weight children (controls). **Study Design:** Prospective, nonrandomized, controlled study of overweight children with OSA presenting to a tertiary medical center for adenotonsillectomy. **Methods:** All study participants underwent preoperative polysomnography to document OSA. "Overweight" (obese) was defined as age and gender adjusted body mass index (BMI) 95th percentile. Behavior was evaluated using the Behavior Assessment System for Children (BASC). Preoperatively, the Behavioral Symptoms Index (BSI), a global measure of behavior, and BASC scores for overweight and normal weight children were compared using a repeated measures ANOVA. **Results:** The study population included 52 children, 18 (35%) of whom were overweight. The mean age of overweight children was 8.6 years (range 2.0-14.9). The mean age of normal weight children was 6.4 years (range 2.1-12.9). Demographics were otherwise similar. The mean apnea hypopnea index for overweight children was 17.2 (5.0-38.0) and for normal weight children was 15.7 (5.3—88.0). The BSI score was 55.3 (SD 15.9) for overweight and 55.9 (SD 15.0) for normal weight children. Seven (38.9%) overweight and 12 (35.3%) normal weight children had clinically significant or abnormal behavior. Similar results were seen for the BASC scales of atypicality, depression, hyperactivity and somatization in both groups. **Conclusions:** Behavioral problems are highly prevalent in children with OSA. However these problems exist independently of whether children are overweight or normal weight.

**8:13 - 8:21** **Acoustic Rhinometry in Pediatric Sleep Apnea**

Monica N. Okun, MD, New York, NY

Ana C. Krieger, MD, New York, NY

Nicos Hadjiangelis, MD, New York, NY

Kelvin C. Lee, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the efficacy of noninvasive methods of diagnosing pediatric sleep apnea.

**Objectives:** The purpose of the study was to compare the diagnostic utility of a noninvasive acoustic rhinometry to polysomnography, the gold standard, in the diagnosis of obstructive sleep apnea in children. **Study Design:** Prospective cohort study. **Methods:** Patients aged 3-10 years, whose parents reported loud snoring, breath holding at night, daytime hyperactivity, and/or persistent mouth breathing consistent with sleep disordered breathing were included in the study. All patients were evaluated using acoustic rhinometry and polysomnography. Nasal area and nasopharyngeal volume were measured using acoustic rhinometry in the upright and supine position. Conventional polysomnographic indices diagnostic of OSA including AHI, RDI, and ODI were then related to measurements obtained from the acoustic rhinometer. Statistical significance using multivariate regression analysis was determined for each variable. **Results:** 20 patients were recruited for the study. 20 patients had acoustic rhinometry measurements. 15 patients were diagnosed with OSA based on formal polysomnography. There was no difference severity of OSA and acoustic rhinometry measurements. However there was a significant decrease posterior nasal area, nasal pharyngeal area, and nasal pharyngeal volume from the upright position to the supine position. **Conclusions:** Although acoustic rhinometry has not been shown any correlation to the degree and diagnosis of OSA, the nasal area does show changes between upright and supine positions. This is the first study to quantify the difference.

**8:21 - 8:29** **Adenotonsillectomy for Obstructive Sleep Apnea in Children Under 37 Months of Age**

Aylon Y. Glaser, 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 role and outcomes of adenotonsillectomy for obstructive sleep apnea in children under 37 months of age.

**Objectives:** To examine outcomes of adenotonsillectomy for obstructive sleep apnea (OSA) in children less than 37 months of age. **Study Design:** Retrospective review of children less than 37 months of age who had undergone adenotonsillectomy for OSA between January 2000 and October 2005 in a tertiary care setting. **Methods:** Comorbidities, pre- and postoperative polysomnography results, and complication rates were statistically analyzed. **Results:** 21 children met the study criteria. The mean age was 29.6 months. Thirteen patients (61.9 %) had medical comorbidities, but only six had comorbidities associated with the neuromuscular system. Six patients had postoperative complications and these were not correlated to patient comorbidities. Overall there was a statistically significant decrease in respiratory disturbance index (RDI;  $p=0.001$ ), but the mean postoperative RDI indicated presence of residual mild OSA (mean=5.3). However most patients without neuromuscular associated comorbidities had complete resolution of their OSA (mean postoperative RDI = 3.8,  $p=0.005$ ). Only 4 of these children had a postoperative RDI  $\leq 5$ . **Conclusions:** Little outcome data exist for adenotonsillectomy for OSA in children less than 37 months of age. Only one previous study examined polysomnography results in this age group. In that study 80% of patients had medical comorbidities and postoperative PSG results indicated a higher than expected rate of residual OSA. Our study demonstrates a more successful outcome, more consistent with outcomes in older children. Our results indicate that pre-existing comorbidities and their nature may be more important than age itself in determining treatment expectations in adenotonsillectomy for OSA.

### **8:29 - 8:37 Intracapsular Versus Extracapsular Tonsillectomy - Comparison of Postoperative Pain**

Michael S. Cohen, MD, Philadelphia, PA  
Anne E. Getz, MD, Philadelphia, PA  
Glenn C. Isaacson, MD\*, Philadelphia, PA  
John P. Gaughan, PhD, Philadelphia, PA  
Wasył Szeremeta, MD, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the differences in postoperative pain in children undergoing intracapsular tonsillectomy vs. extracapsular tonsillectomy.

**Objectives:** To measure differences in postoperative pain in children undergoing intracapsular tonsillectomy vs. extracapsular tonsillectomy. **Study Design:** Prospective clinical trial carried out at a metropolitan children's hospital over one year. The study group included 30 patients with obstructive sleep apnea and adenotonsillar hypertrophy aged 5-19, 15 undergoing extracapsular tonsillectomy and 15 undergoing intracapsular tonsillectomy. **Methods:** Tonsillectomy was performed in either an intracapsular or extracapsular fashion using bipolar scissors and monopolar suction cautery for hemostasis. All operations were performed by residents under faculty supervision. Postoperative pain was assessed using the Wong-Baker Faces Pain Scale through postoperative day ten and was the main outcome measure. Quantity of postoperative pain medicine consumed over the study period was considered a secondary outcome measure. Data collection was via a survey completed by the parents and submitted at the two week postoperative visit. **Results:** Average postoperative pain over the entire study period for extracapsular tonsillectomy was 5.26 on a ten point scale vs. 2.94 for intracapsular tonsillectomy ( $p < 0.0001$ ). Average daily pain remained less than 4.0 after postoperative day two for intracapsular tonsillectomy and postoperative day eight for extracapsular tonsillectomy. **Conclusions:** In children undergoing tonsillectomy for obstructive sleep apnea secondary to adenotonsillar hypertrophy, intracapsular tonsillectomy with bipolar scissors results in less postoperative pain than extracapsular tonsillectomy.

### **8:37 - 8:45 WESTERN SECTION RESIDENT RESEARCH AWARD WINNER**

#### **SHIRLEY BARON RESIDENT RESEARCH AWARD**

#### **Imaging of the Pediatric Airway Using Optical Coherence Tomography**

*James M. Ridgeway, MD, University of California Irvine College of Medicine, Irvine, CA*

Shuguang Guo, PhD, Irvine, CA  
Jorge Perez, MS, Irvine, CA  
Gurpreet S. Ahuja, MD, Irvine, CA  
Zhongping Chen, PhD, Irvine, CA  
Brian J. F. Wong, MD PhD, Irvine, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the microscopic characteristics of normal, benign, and pathologic tissues in the pediatric airway using optical coherence tomography as well as understand the potential application of this noninvasive imaging modality in assisting operative biopsy, monitoring disease, and directing medical therapy.

**Objectives:** Optical coherence tomography (OCT) is a nonionizing imaging modality that combines interferometry with a broadband light source to produce high resolution cross sectional images in living tissue (8-20  $\mu\text{m}$ ). A study of normal, benign, and pathologic tissues in the pediatric airway was conducted to assess the utility of OCT technology in the characterization of various tissue states. **Study Design:** Prospective clinical trial. **Methods:** Fifteen pediatric patients underwent surgical endoscopy and OCT for various air-

way disorders. OCT imaging was performed using a 1.3  $\mu\text{m}$  broadband light source at a frame rate of 1 Hz to produce images 1.6 mm x 6 mm in vertical and horizontal dimensions. The epithelium, lamina propria, and unique tissue microstructures were visualized and measured using optical micrometry. Direct comparison of OCT images to endoscopic photography was performed. **Results:** Systematic imaging of the oral cavity, oropharynx, hypopharynx, and larynx was performed in all 15 patients revealing differences in backscattering properties as related to the turbidity of the tissues examined. Normal microstructures identified included papillae, ducts, glands, and blood vessels, while pathologic conditions included distinct zones of mature scar, granulation tissue, mucous cysts, edema, and papillomatosis. Endoscopic photographs were well correlated with OCT images. **Conclusions:** OCT is noncontact imaging technology capable of obtaining high resolution in vivo tissue imaging of the pediatric airway. OCT clearly identifies the epithelium and lamina propria while offering detailed information concerning benign and pathologic tissues. The diagnostic potential of this technology makes OCT a promising imaging modality in current pediatric and future neonatal patient populations.

#### 8:45 - 8:53 **WITHDRAWN**

##### **Neonatal Tracheotomy—A 20 Year Look at a Single Tertiary Children’s Hospital’s Experience**

Mark R. Rowe, MD, Loma Linda, CA

Rachelle G. Wareham, MD, Loma Linda, CA (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) explain the differences in surgical placement of a neonatal tracheotomy compared to that of an adult; 2) explain the different indications for a tracheotomy in the neonatal age group compared to that of older children or adults; 3) understand the potential complications from a neonatal tracheotomy; 4) discuss ideal ways have handling the potential complications which may arise from the surgical procedure; 5) demonstrate an understanding of the increased mortality in this age group.

**Objectives:** Retrospectively review the last 20 years of neonatal (defined as age under one year) tracheotomy surgery at a single institution. Review the complications, management, and mortality of this age group undergoing this procedure. Review indications for the procedure. **Study Design:** 20 year retrospective chart review. Compare indications, complications, management to adult population. **Methods:** Chart review with subclassification into age under one year. Categorizing complications and attempting to compare to the older child and adult. **Results:** Approximately 100 neonatal tracheotomies were performed in the last 20 years at our institution. We found the complication rate and the mortality rate to be significantly higher than that in the older childhood age group. **Conclusions:** Neonatal tracheotomy is becoming more common as increasingly younger infants are able to be stabilized. The complication rate and mortality is higher than older populations and a good NICU airway team is useful in lowering many of the complications.

#### 8:53 - 8:58 *Q&A*

#### **MODERATORS**

**Reza Rahbar, MD\*, Boston, MA**  
**Blake C. Papsin, MD\*, Toronto, ON**

#### 8:58 - 9:06 **Allergy and Pediatric Sinus Disease**

Tanya Fancy, MD, Morgantown, WV

Hassan H. Ramadan, MD\*, Morgantown, WV

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand and compare the effect of sensitivity to various classes of allergen on the severity of sinus disease among the pediatric population.

**Objectives:** To determine the relationship between allergy test results (type of allergen) and the severity of sinus disease in the pediatric population. **Study Design:** A retrospective review of data from outpatient charts in an otolaryngology clinic at a tertiary care center. **Methods:** One hundred and eighty-six pediatric patients of the 378 who underwent endoscopic sinus surgery over a ten year period at our facility had positive allergy testing. CT score (Lund-Mackay) was used as a measure of severity of sinus disease. Patients with predisposing medical conditions or with less than one year of postoperative followup were excluded. Patients with CT scans performed at facilities other than our own were also excluded. Thirty patients met inclusion criteria. Age, gender, history of asthma, parental smoking, allergy test results (by type of allergen) and eventual treatment outcome were analyzed for their effect on CT score. **Results:** Using the chi-square test of independence, presence of asthma and parental smoking were found to have no effect on severity of sinus disease. Among the allergen groups, weeds ( $p=0.03$ ), inhalants ( $p=0.05$ ) and animal products ( $p=0.04$ ) had a statistically significant association with a high CT score, whereas trees, molds and grasses did not. **Conclusions:** Reactivity to certain allergens (weeds, inhalants and animal products) may contribute to more severe sinus disease in the pediatric population. These patients may therefore benefit from more aggressive management of their sinus disease and perhaps even from earlier surgical intervention.

#### 9:06 - 9:14 **Failures of Adenoidectomy for Chronic Rhinosinusitis in Children. Who and When Do They Fail?**

Hassan H. Ramadan, MD\*, Morgantown, WV

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify those children who are most likely to fail adenoidectomy for the treatment of chronic rhinosinusitis and how long before salvage endoscopic sinus surgery is necessary.

**Objectives:** To determine which children and how long will it take them to require endoscopic sinus surgery (ESS) after adenoidectomy for chronic rhinosinusitis (CRS). **Study Design:** Retrospective chart review of prospectively collected data in a tertiary pediatric otolaryngology service. **Methods:** One hundred forty-three children had adenoidectomy for CRS over a ten year period. Followup was available on 121 children. Sixty-one children failed the procedure. Data was available on fifty-five children who underwent ESS after failing adenoidectomy for the treatment of CRS. Mean time from adenoidectomy to ESS was determined. Factors such as age, allergic rhinitis, asthma, CT score, and gender were evaluated for effects on this time. **Results:** Using Cox regression analysis, the mean time from adenoidectomy to ESS was 24 months, ranging from 4 to 77 months. The presence of asthma ( $p<0.04$ ) and age less than seven years ( $p<0.01$ ) were predictors of earlier failure. Allergic rhinitis ( $p<0.3$ ), CT score ( $p<0.9$ ), and gender ( $p<0.3$ ) showed no effect. **Conclusions:** Failures of adenoidectomy for CRS who require ESS are mainly children who are younger than 7 years of age and have asthma. They seem to require a salvage ESS at a mean of 24 months after the adenoidectomy.

### 9:14 - 9:22 Utility of Image Guidance in Pediatric Sinonasal Surgery

Sanjay R. Parikh, MD, Bronx, NY  
Hernando Cuellar, MD, Bronx, NY  
Babak Sadoughi, MD, Bronx, NY  
Olga Aroniadis, BS, Bronx, NY  
Marvin P. Fried, MD\*, Bronx, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the technology, utility, and safety of navigation systems for pediatric sinonasal surgery.

**Objectives:** To determine the utility and safety of a surgical image guidance system for pediatric sinus surgery over a 5 year period. **Study Design:** Observational, retrospective chart review. **Methods:** All patients less than 18 years of age who underwent image guided endoscopic sinus surgery over a 5 year period were identified at one institution. The means and ranges of age, preoperative setup time, gender distribution, and indications for surgery were determined. Operative time, anatomic regions explored, and intraoperative complications were also analyzed. **Results:** Thirty-three patients underwent image guided surgery. The mean age of patients was 12 years with 23 males and 10 females. Mean operative time and preoperative setup time were 128 minutes and 43 minutes respectively. The most common diagnoses included chronic (30.3%) and acute (12.1%) rhinosinusitis, nasopharyngeal angiofibroma (9.1%), allergic rhinosinusitis (9.1%) and allergic fungal sinusitis (9.1%). No complications were noted. **Conclusions:** In the pediatric population image guidance is a safe adjunct for complex sinonasal surgery and may be particularly useful in advanced dissection and distorted anatomy as reflected in our series.

### 9:22 - 9:30 Feasibility of Endoscope Guided Pharyngeal pH Monitoring in Infants

Camysha N. Holmes-Wright, MD, Galveston, TX  
Seckin O. Ulualp, MD, Galveston, TX  
Sarah Rodriguez, MD, Galveston, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand a new technique for pharyngeal pH monitoring in infants with extraesophageal reflux disease and assess the value of pharyngeal pH monitoring in the evaluation of extraesophageal reflux disease in infants.

**Objectives:** An accurate and practical pharyngeal pH probe placement technique is needed to eliminate the need for x-ray and esophageal manometry for pharyngeal pH monitoring in infants with extraesophageal reflux disease (EERD). We describe the feasibility of endoscope guided pharyngeal pH probe placement in infants. **Study Design:** Description of a new technique and case series at a tertiary care children's hospital. **Methods:** Infants with EERD who underwent endoscope guided pharyngoesophageal pH monitoring was included in the study. The pharyngeal pH probe placement technique is described and data analysis included number of acid reflux episodes and percent acid exposure in the pharynx and esophagus. **Results:** Six infants with suspected EERD (3 boy, 3 girl, age range: 2 week - 7.5 month) underwent flexible fiberoptic laryngoscopy guided pharyngeal pH probe placement. Pharyngeal pH probe was placed in the laryngopharyngeal region under direct vision in all infants. Esophageal pH probe was located 5cm distal to the pharyngeal probe. Duration of pharyngoesophageal pH monitoring ranged from 17-24 hour. Of the six infants four had pharyngeal acid reflux and six had esophageal acid reflux. The number of acid reflux ranged from 4-81 in the pharynx and from 5-173 in the esophagus. The percent acid exposure time was between 0%-1.2% in the pharynx and between 0.1%-11.5% in the esophagus. **Conclusions:** Pharyngeal pH probe placement under direct vision during flexible fiberoptic laryngoscopy is feasible in infants. Findings documented that not all proximal esophageal acid reflux reach the pharynx. Endoscope guided pharyngeal pH monitoring can be used to detect pharyngeal acid

reflux exposure in infants with suspected EERD.

### **9:30 - 9:38 Effects of Two Surfactants on the Penetration of Otopical Through Tympanostomy Tubes**

Samuel A. Reyes, MD PhD, Miami, FL

Lee P. Smith, MD, Miami, FL

Ramzi T. Younis, MD, Miami, FL

**Educational Objective:** At the conclusion of this presentation, audience members should be able to describe the effects of docusate sodium and beractant on the penetration of otopical through tympanostomy tubes.

**Objectives:** To evaluate the ability of surfactants to increase the penetration of otopical through tympanostomy tubes (TT). **Study Design:** An in vitro model was used to test the penetration of otopical with and without two surfactants (docusate sodium and beractant) through fluoroplastic and titanium tympanostomy tubes. **Methods:** As described in a prior study, an in vitro model was created by placing a TT through a perforation (myringotomy) in a model of the tympanic membrane (silastic sheet) fixed between the ends of two 1 mL syringes. Measurements were recorded of the maximum height various solutions (distilled water, 2% soapy water, ofloxacin otic, ciprofloxacin/dexamethasone otic) achieved before penetrating the TTs (1.27mm Reuter Bobbin titanium, 1.27 mm fluoroplastic). These same measurements were then performed with the addition of docusate sodium and beractant to the distilled water and each of the otopical solutions. **Results:** The addition of docusate sodium significantly increased the penetration of water and ofloxacin otic through both types of tubes. It significantly increased penetration of iprofloxacin/dexamethasone otic through fluoroplastic tubes and a trend toward increased penetration in titanium tubes. Docusate sodium increased penetration in these solutions such that the fluid column heights were below the measurable limits, similar to 2% soapy water. Adding beractant ofloxacin otic and ciprofloxacin/dexamethasone showed a trend toward increased penetration. **Conclusions:** These results demonstrate that the penetration of otopical can be increased by the addition of docusate sodium and might be increased by the addition of beractant. Increasing the penetration of otopical may make them more effective in treating tube otorrhea.

### **9:38 - 9:46 Laser Adenoidectomy vs. Curettage Adenoidectomy: Incidence of Postoperative Otorrhea and Complications After Concurrent PET Placement for COME**

Newland Knight Worley, MD, New Orleans, LA

Arman A. Abdalkhani, MD, New Orleans, LA

Ron G. Amedee, MD\*, New Orleans, LA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the postoperative rate of otorrhea after PET placement and 980nm laser adenoidectomy vs. curettage adenoidectomy, discuss the technique of laser adenoidectomy, and explain the theory for the statistically significant difference between the two surgical groups.

**Objectives:** 1) Measure the rate of postoperative otorrhea after PET placement with laser adenoidectomy vs. curettage adenoidectomy; and 2) determine the safety and efficacy of 980nm laser adenoidectomy with PET placement compared to a control group. **Study Design:** A prospective study of 100 pediatric patients undergoing laser (50 patients) or curettage adenoidectomy (50 patients) with PET placement for COME in a children's hospital outpatient setting. **Methods:** All patients received the same perioperative anesthesia and medications (dose mg/kg). Floxin otic solution (3 drops BID) was administered postoperatively. All patients were examined at 1, 4, and 8 weeks postoperatively. The rate of nasal complications and postoperative otorrhea was calculated. **Results:** There was no statistical difference in age, gender, race or weight between the two groups ( $p>0.05$ ). The laser adenoidectomy group had a statistically significant decrease in the incidence of postoperative otorrhea ( $p<0.05$ ). The procedure time for the laser adenoidectomy was statistically shorter than the traditional adenoidectomy technique ( $p<0.05$ ). There was no difference in nasal complications. **Conclusions:** Laser adenoidectomy with PET placement for COME can be safely performed, has a lower incidence of otorrhea, and may have an advantage over traditional adenoidectomy with curettage. A theory for the difference will be presented.

### **9:46 - 9:51 Q&A**

### **9:51 - 10:20 Break with Exhibitors/View Posters**

### **10:25 - 11:40 PANEL: COMMUNICATING EFFECTIVELY WITH PEDIATRICIANS TO ACHIEVE OPTIMUM OTOLARYNGOLOGIC CARE FOR CHILDREN**

**Moderators:** Kenneth M. Grundfast, MD\*, Boston, MA

Christopher J. Hartnick, MD\*, Boston, MA

**Panelists:** Joseph Haddad Jr., MD\*, New York, NY

Margaretha L. Casselbrant, MD PhD\*, Pittsburgh, PA

Blake C. Papsin, MD\*, Toronto, ON

Jay Paul Willging, MD\*, Cincinnati, OH

11:45 *Adjourn*

1:30 - 5:00 *“Otology Icons of the 20th Century: Addressing Unresolved Issues”  
Islands AB*

6:30 *Margaritaville Beach Party - Tiki Beach  
Children’s Parties - Location TBN*

**CONCURRENT SESSION II - HEAD & NECK - Islands CD**

8:00 - 8:05 **Announcements by Vice Presidents**  
Richard J. Wiet, MD\*, Chicago, IL, and Peter S. Roland, MD\*, Dallas, TX

**MODERATORS**

Lanny G. Close, MD\*, New York NY  
David W. Eisele, MD\*, San Francisco, CA

8:05 - 8:13 **MIDDLE SECTION RESIDENT RESEARCH AWARD WINNER - 1st Place**  
**JOSEPH H. OGURA RESIDENT RESEARCH AWARD**  
**Post-Allograft Donor and Recipient Dendritic Cell Trafficking in the Rat Larynx**  
**Aaron D. Friedman, MD, Cleveland Clinic, Cleveland, OH**  
Dan Olivia, BS, Cleveland, OH  
Judith A. Drazba, PhD, Cleveland, OH  
Robert R. Lorenz, MD, Cleveland, OH  
Marshall Strome, MD MS\*, Cleveland, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the relative migration kinetics of donor versus recipient dendritic cells in a laryngeal allograft model.

**Objectives:** Dendritic cells (DC) are potent antigen presenting cells that instigate allograft rejection. Their migration kinetics vary depending on the type of organ transplanted. The timing of donor and recipient DC trafficking in laryngeal allografts is unknown. **Study Design:** Rat laryngeal allograft model. **Methods:** Lewis to Brown Norway rat laryngeal allografts and Brown Norway laryngeal isografts were performed without immunosuppression. Recipient animals were sacrificed at each of 7 postoperative time points. Total DC, as well as recipient and donor DC (in the allograft animals), were enumerated in situ in the airway mucosa using monoclonal antibodies, fluorescence immunohistochemistry, confocal microscopy, and image analysis software. **Results:** Following laryngeal transplantation, donor DC migrated out of the graft, reaching a nadir by 3—5 days; they were identified in recipient cervical lymph nodes from 12 hours to 5 days. Recipient DC infiltrated the laryngeal allograft, reaching a maximal density by day 7. Both allograft and isograft total DC populations diminished to approximately 10% of their initial densities in the first 3 days and then subsequently increased beyond their starting values. **Conclusions:** The paradigm of donor DC efflux and recipient DC influx has been confirmed in a rat laryngeal transplant model, and the allograft specific timing of these events has been elucidated. Similarities in total DC migration between allografts and isografts suggest that this phenomenon may not be driven entirely by major histocompatibility mismatch. Further understanding of trafficking may help with the goal of manipulating DC in order to induce allograft tolerance in the absence of generalized immunosuppression.

8:13 - 8:21 **SOUTHERN SECTION RESIDENT RESEARCH AWARD WINNER - 1st Place**  
**LESTER A. BROWN RESIDENT RESEARCH AWARD**  
**Percutaneous Tracheotomy: A Meta-Analysis**  
**Eric R. Oliver, MD, University of South Carolina School of Medicine, Charleston, SC**  
Mikki A. Gist, BS, Charleston, SC  
Marion Boyd Gillespie, MD MPH, Charleston, SC

**Educational Objective:** At the conclusion of this presentation, the participants will have a better understanding of the advantages and disadvantages of bedside percutaneous dilatational tracheotomy (PDT) versus standard open surgical tracheotomy performed at the bedside or in the operating room. Prior meta-analyses have resulted in conflicting conclusions about complication rates and procedural risks and benefits. This study offers an updated review that incorporates the newer percutaneous single dilation technique.

**Objectives:** 1) Further delineate the differences in short- and long-term complication rates between bedside PDT, open bedside, and operating room open tracheotomy; 2) compare procedure times between percutaneous and open techniques; 3) evaluate differences in cost between the techniques; and 4) identify the limitations of the prospective controlled trials. **Study Design:** Meta-analysis using the Mantel-Haenszel Fixed Effects Model; selected studies include prospective clinical trials comparing open tracheotomy to PDT from 1999 to present. **Methods:** Two independent searches using percutaneous tracheotomy, percutaneous tracheostomy and literature cross referencing. Mortality, early complications, late complications, procedure time, and cost data were compared by calculating odds ratios (OR) with 95% confidence intervals (CI). **Results:** Thirteen studies were identified (1150 patients) satisfying the search criteria. Differences in mortality were not statistically significant. A trend toward increased early complications was identified with PDT [OR: 1.16(95% CI 0.79-1.70)] but was not statistically significant. Late complications occurred less after PDT [OR: 0.51 (95% CI 0.18-1.44)] but the decrease was not statistically significant. PDT takes 50% less time to perform [OR: 0.51(95% CI 0.48-0.54)]. PDT costs 60% less than open tracheotomy performed in the operating room. **Conclusions:** Percutaneous tracheotomy is an excellent option in the appropriately selected patient. Potential advantages of PDT include decreased procedure time, ease of performance, and decreased cost. Complication rates between open and percutaneous techniques are similar. However, better long-term data on complication rates could help define the true procedure of choice.

**8:21 - 8:29 EASTERN SECTION RESIDENT RESEARCH AWARD WINNER - 2nd Place**  
**Racial Differences in Stage and Survival in Head and Neck Squamous Cell Carcinoma**  
*Anthony C. Nichols, MD, Harvard Medical School, Boston, MA*  
Neil Bhattacharyya, MD\*, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss how blacks tend to present with later stage squamous cell carcinoma than Caucasians and that survival differences persist after controlling for stage and treatment.

**Objectives:** Characterize survival differences between blacks and Caucasians with head and neck squamous cell carcinoma (SCCA). **Study Design:** Retrospective analysis of stage at presentation and survival data from the Surveillance, Epidemiology and End Results cancer database. **Methods:** Cases of oral tongue and glottic SCCA in blacks or Caucasians were extracted from the Surveillance, Epidemiology and End Results (SEER) database (years 1988-2002). For each primary site, TNM staging was imputed and staging distributions were compared between races. For each black patient, a randomly selected Caucasian control was matched for age at diagnosis, sex, stage, surgical treatment and radiation. Kaplan-Meier survival comparisons for both overall and disease specific survival were then conducted for the matched pairs. **Results:** 1919 cases of tongue carcinoma (151 black; 1768 Caucasian) were extracted. Blacks had a significantly elevated T stage ( $p=0.001$ ) and N stage ( $p=0.002$ ) at primary presentation. 4578 cases of glottic carcinoma (625 black; 3953 Caucasian) were extracted. Blacks again presented with significantly elevated T-stage ( $p<0.001$ ) and N-stage ( $p<0.001$ ) compared to Caucasians. For 43 matched pairs with tongue carcinoma, mean overall survival for blacks was 66.1 months versus 74.8 months for matched Caucasian controls ( $p=0.502$ , log-rank test). Disease specific survival was 91.1 months for blacks versus 109.6 months for Caucasians ( $p=0.168$ ). For 401 matched pairs with glottic carcinoma, mean overall survival for blacks was 96.6 months versus 114.5 months for Caucasian controls ( $p<0.001$ ). Similarly the mean disease specific survival was 149.4 months for black patients versus 167.1 months for Caucasians ( $p<0.001$ ). **Conclusions:** Controlling for stage and treatment, blacks demonstrate poorer overall and disease specific survival with SCCA, implying other intrinsic or extrinsic factors influencing survival.

**8:29 - 8:37 Assessing the Impact of [18F]-2-Fluorodeoxyglucose-PET/CT on Head and Neck Cancer Staging and Management in Previously Untreated Patients**  
Alfred J. Fleming Jr., MD, Columbus, OH  
Stephen P. Smith Jr., MD, Latham, OH  
Christopher M. Paul, BA, Columbus, OH  
Brett T. Daly, Columbus, OH  
Amit Agrawal, MD, Columbus, OH  
David E. Schuller, MD\*, Columbus, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain how PET/CT technology may be applied to patients diagnosed with head and neck cancer. The audience should also be able to discuss how PET/CT is an emerging and exciting new modality in the diagnosis and treatment of patients with head and neck cancer. The results of this study should be added to the growing body of evidence to support PET/CT research and potentially improve head and neck cancer patient care and outcomes.

**Objectives:** The role of fused modality [18F]-2-fluorodeoxyglucose positron emission tomography (PET/CT) in diagnosing and accurately staging patients with primary, metastatic and recurrent head and neck cancer is evolving and the clinical implications need to be further defined. A few retrospective studies have been performed, but adequate sample sizes are lacking, as the number of head and neck cancer patients is relatively small. This study evaluates the positive predictive value (PPV) of PET/CT on previously untreated

head and neck cancer patients at a single tertiary care institution. **Study Design:** Retrospective cohort outcomes study at a tertiary comprehensive cancer center. **Methods:** IRB exemption #4 (45 CFR 46.101(b)(4)) criteria was applied for and accepted by the office of responsible research practices at our institution. The authors identified 270 consecutive PET/CT exams between March 2005 and January 2006 for head and neck cancer ordered by two head and neck oncologists at our institution. PET/CT exams were read by one of three neuroradiologists at our institution. Diagnostic upstaging, treatment management changes, true positives, true negatives, and positive predictive values were determined from subset analysis of 144 patients who had never received treatment for their head and neck cancer. Second primary lesions were detected in 14 patients using this modality. The statistics were verified with surgical specimen analysis by histopathologists at our university. **Results:** PET/CT was true positive in 119 of 144 patients (83%) with a positive predictive value of 86%. PET/CT had false positive results in 18 of 144 (13%) of patients. 13 of 765 dissected lymph nodes harbored metastases. Histopathology revealed nodal metastases in 9 of 36 neck sides and 9 of 142 nodal levels. PET/CT was true positive in 6 nodal levels (6 neck sides), false negative in three levels (3 neck sides), true negative in 127 levels (23 neck sides), and false positive in 6 levels (4 neck sides). True positive and false positive nodes exhibited similar standardized uptake values ( $4.8 \pm 1.1$  vs.  $4.2 \pm 1.0$ ;  $P > 0.05$ ). Sensitivity and specificity were 67% and 85% on the basis of neck sides and 67% and 95% on the basis of number of nodal levels, respectively. PET/CT detected second primary lesions in 14 patients, nine of whom had the lesion confirmed with histopathology. Six of nine patients (67%) had true positive results with a positive predictive value of 75%. There were two patients (22%) with false positive second primary lesions. **Conclusions:** The great benefit of this diagnostic modality resides in the 83% of patients with true positive findings, some of which led to appropriate upstaging of locoregional disease as well as identification of second primary malignancies. Using PET/CT in patients with previously untreated head and neck cancer does remarkably alter treatment protocols. The modality has a PPV of 87% in our study but still has a concerning number of false positives with the current SUV standard of 2.5. The false positive findings however in our series did not contribute significant additional morbidity in this population. There is not yet enough evidence to designate PET/CT as the standard of care imaging modality in previously untreated patients, and therefore our management decisions should not yet rely on PET/CT alone.

### **8:37 - 8:45 Differential Capture of Serum Proteins for Expression Profiling and Biomarker Discovery in Pre- and Post-Treatment Head and Neck Cancer Samples**

Gary L. Freed, MD, Norfolk, VA  
Lisa H. Cazares, MS, Norfolk, VA  
Scott A. Scraff, MD, Cincinnati, OH  
Richard R. Drake, PhD, Norfolk, VA  
Jeffrey T. Wadsworth, MD, Norfolk, VA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand a novel modality to identify serum markers for head and neck SCCA.

**Objectives:** Our goal is to develop proteomic based approaches to the detection and utilization of protein biomarkers for improvement in diagnosis, prognosis and tailoring of treatment for HNSCC. We have previously demonstrated that protein expression profiling of serum can identify multiple protein biomarker events that can serve as molecular fingerprints for the assessment of HNSCC. **Study Design:** Crossover. **Methods:** An HNSCC cohort of 60 sera samples consisting of healthy normals, pretreatment and 6-12 month post-treatment samples (n=20 per group) were used for analysis with an automated matrix assisted laser desorption/ionization time of flight (MALDI-TOF) mass spectrometer. Magnetic chemical affinity beads and glycoprotein binding lectins were used to differentially capture serum proteins prior to MALDI-TOF analysis. The resulting spectra were analyzed using postprocessing software. **Results:** In the working mass range of 1000-10,000 m/z, about 200 peaks were resolved for ionic bead capture approaches. The number of peaks per spectra in the glycoprotein capture with lectins varied. For spectra generated from weak cation bead capture, a k-nearest neighbor genetic algorithm was able to correctly classify 94% normal from pretreatment HNSCC samples, 80% of pretreatment from post-treatment samples, and 87% of normal from post-treatment samples. These peptides were then analyzed by MALDI-TOF/TOF MS for sequence identification. **Conclusions:** This initial study using new high resolution MALDI-TOF mass spectrometry coupled with bead fractionation is suitable for automated protein profiling and has the capability to simultaneously identify potential biomarker proteins for HNSCC. Using this we anticipate generating biomarker panels for use in more accurate prediction of prognosis and treatment efficacies for HNSCC.

### **8:45 - 8:50 Q&A**

#### **MODERATORS**

**Dennis H. Kraus, MD\*, New York, NY**  
**Soly Baredes, MD\*, Newark, NJ**

### **8:50 - 8:58 Perioperative Immunonutrition in Head and Neck Cancer: A Feasibility Study**

Douglas M. Sorensen, MD, Tacoma, WA  
Mary M. McCarthy, RN, Tacoma, WA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare outcomes regarding surgical complications, immunologic function, and nutritional status in head and neck cancer patients receiving immune enhanced formula versus standard formula.

**Objectives:** The aim of this study is to establish the feasibility of providing perioperative IMN support to HNCA patients in a regional referral center. Recent studies have demonstrated that perioperative IMN support results in enhanced cell mediated immunity, decreased infectious complications, and shortened postoperative hospital stay. Secondary aims will examine nutritional, immunologic, and wound healing outcomes. **Study Design:** Prospective, randomized, double blinded clinical trial. **Methods:** Twelve patients with HNCA received either an IMN formula (Impact Recover®/ Impact Glutamine®; TG) or a standard stress formula (Isosource 1.5®; CG) for a period of 7 days pre- and postoperatively. Nutritional outcomes, albumin and prealbumin, were measured at baseline and 4 later time points. Immunologic outcomes were measured by DTH skin testing, and TLC and lymphocyte subset counts at 5 time points. Wound healing was assessed using the ASEPSIS scoring tool and infectious complications were documented. **Results:** Perioperative nutrition support was favorably accepted by patients and staff. Subjects did not vary in demographics at baseline except for c-reactive protein (CRP) levels; BMI (M=22; SD=3.8), % weight loss (M =9.1; SD=9.3), nutritional risk (M=2.27; SD=.65), and CRP (TG 6.87 + 8.3 vs CG 39.5 + 13.8, p = .02). Based on diary entries the majority of patients consumed >75% of their preoperative nutritional supplement. CD56 (Natural Killer cells) demonstrated a more rapid return to baseline on POD 1 in the TG (p=.02). Wounds in the TG had less serous drainage and erythema on POD 3 (p=.05), POD 5 (p<.0001), and POD 6 (p=.01). Hospital LOS was considerably longer (TG M=5.7, CG M=14.7; p=0.04) in the CG; feeding issues postoperatively may have contributed to this outcome. **Conclusions:** This pilot study provided crucial information regarding preoperative interventions, timing of biomarkers, and measurement of outcomes that can be used for planning a larger, multisite, RCT of perioperative immunonutrition for any surgical population vulnerable to nutritional and immunologic compromise.

#### **8:58 - 9:06 Management of Salvage Laryngectomy Defects Following Organ Preservation Failure**

Kirk P. Withrow, MD, Birmingham, AL  
Eben L. Rosenthal, MD\*, Birmingham, AL  
Christine G. Gourin, MD\*, Augusta, GA  
Jeffrey S. Magnuson, MD, Birmingham, AL  
David J. Terris, MD\*, Augusta, GA  
William W. Carroll, MD, Birmingham, AL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the benefits of utilizing non-irradiated, vascularized tissue in the reconstruction of salvage laryngectomy defects.

**Objectives:** Salvage laryngectomy to treat organ preservation failures results in significantly higher local wound complications. Even in the absence of extralaryngeal disease, primary closure of laryngeal defects results in protracted wound care problems. We hypothesize that even if sufficient mucosa is present to close the defect primarily, introduction of previously untreated vascularized tissue to close the wound may improve outcomes. **Study Design:** Retrospective case control study. **Methods:** Patients undergoing salvage surgery for laryngeal squamous cell carcinoma 2000-2006 at two tertiary care centers were considered for this study. Patients requiring laryngopharyngectomy or with pharyngeal involvement were excluded. There were 37 patients who underwent salvage laryngectomy and met the study criteria: 17 patients underwent free flap reconstruction (16 radial forearm flaps and 1 rectus flap) and 20 patients underwent primary closure. The median follow-up was 12 months with a range of 4—60 months. Previous treatment consisted of chemoradiation for 41% of the reconstruction group and 35% of the primary closure group; the remainder was treated with primary radiation alone. **Results:** The free flap reconstruction group had a significantly lower rate of fistula (18%) formation compared to the primary closure group (50%; p = .04). The development of a fistula in either group resulted in a prolonged hospital stay (mean 19 days versus 7 days) and additional procedures. There was also a slightly lower rate of stricture formation (18% versus 25%) and feeding tube dependence (23% versus 45%) in the free flap reconstruction group. **Conclusions:** Planned reconstruction of post-treatment laryngeal defects with vascularized tissue is associated with a lower complication rate and may improve long-term outcomes and reduce costs.

#### **9:06 - 9:14 Incidence of Atelectasis After Rectus Free Tissue Transfer With Acellular Dermis or Surgical Mesh Reconstruction of the Abdominal Wall Defect**

Jamie O. Lo, MD, Portland, OR  
Stephen M. Weber, MD, Portland, OR  
Marc A. Gosselin, MD, Portland, OR  
Peter E. Andersen, MD, Portland, OR  
Neil D. Gross, MD, Portland, OR  
Mark K. Wax, MD, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the postoperative incidence and management of atelectasis in patients undergoing free rectus abdominus flaps.

**Objectives:** Atelectasis is a postoperative complication frequently encountered in head and neck surgery. We have previously published on the high incidence of atelectasis associated with harvest of the rectus free flap. In an attempt to reduce this, we began reconstructing the abdominal wall fascia with commercially available acellular dermis or surgical mesh. We expected that reduced abdominal wall tightness and associated abdominal pain would result in a decreased incidence of postoperative atelectasis. To our knowledge this issue has not been previously examined. **Study Design:** Retrospective chart review of patients who underwent rectus free tissue transfer between July 2002 and February 2006 at an academic, tertiary referral center. **Methods:** Forty-seven consecutive patients underwent rectus free tissue transfer during the study period. Thirty-two patients who underwent reinforcement of their abdominal defect and had adequate pre- and postoperative imaging studies were included in the final analysis. Patients were followed and electronic hospital records were reviewed. **Results:** There were 18 male and 14 female patients, average age of 60.5 (range, 22-86 years). Skin flaps ranged from 20-216 cm<sup>2</sup> (average, 91.2 cm<sup>2</sup>). Reinforcement was performed with acellular dermis (25) and mesh (7). Atelectasis was detected in 29 (90.6%) patients. Minor atelectasis in 16 patients and major atelectasis in 13 patients. There was no difference between small skin flaps (minor 8, major 8) when compared to larger flaps (minor 6, major 7). Operative times between groups and perioperative morbidity were the same. Comparison to previous data of un-reinforced patients yielded no differences between groups. **Conclusions:** The incidence of radiographic postoperative atelectasis in patients undergoing rectus free flap harvest is high. The use of acellular dermis or mesh to reconstruct the abdominal wall does not appear to reduce the incidence of radiographic atelectasis.

#### **9:14 - 9:22 Etiology of Late Free Flap Failures Occurring After Hospital Discharge**

Mark K. Wax, MD, Portland, OR  
Shrinath A. Nadig, MD, Portland, OR  
Eben L. Rosenthal, MD\*, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss late failure of a free flap and the incidence of local recurrence.

**Objectives:** Failure of free flaps most commonly occurs in the immediate postoperative period and is associated with failure of the microvascular anastomosis. Rarely do flaps fail in the late postoperative period. It is not well understood why free flaps can fail after 7 postoperative days. We undertook a case review series to assess possible causes of late free flap failure. **Study Design:** Retrospective chart review at 2 tertiary referral centers. **Methods:** Retrospective chart review at 2 tertiary referral centers. **Results:** A total of eleven patients with late graft failures were identified in the study population of 1331 free flaps (<1%). There were 6 radial forearm fasciocutaneous flaps, 2 rectus myocutaneous flaps, 2 fibulas, and 1 latissimus dorsi myocutaneous flap that underwent complete failure. There was one fibula osteocutaneous flap that underwent loss of the skin paddle. The time to necrosis was a mean of 34 days overall, ( range 7-90). Infection was responsible in 2 patients postoperatively, pressure on the pedicle in 4 patients and local tumor recurrence in 5 patients. Tumor recurrence was noted at the time necrotic flap debridement in 4 of nine patients or within 8 weeks in 2 patients. **Conclusions:** Although late free flap failure is rare, local factors such as infection and pressure on the pedicle can contribute. This complication should initiate an evaluation for local tumor recurrence.

#### **9:22 - 9:30 Lateral Temporal Bone Resection for the Treatment of Malignant Cancers Adjacent to or Invading Into the Temporal Bone**

Hung H. Dang, MD, Oklahoma City, OK  
Jesus E. Medina, MD\*, Oklahoma City, OK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) discuss the usual signs and symptoms of cancers affecting the external ear canal, the parotid gland, and the pinna; 2) compare the types of temporal bone resections; 3) recall the indications for temporal bone resection; and 4) discuss the prognostic factors for these cancers.

**Objectives:** To evaluate the efficacy of lateral temporal bone resection (LTBR) in controlling malignant tumors of the periauricular region adjacent to or invading into the temporal bone. **Study Design:** Retrospective chart review. **Methods:** A retrospective review of all LTBRs performed at a tertiary academic center from July 1990 to July 2004. **Results:** Fifty-two patients were included for analysis with 43 males and 9 females ranging from 30 to 91 years of age. Squamous cell carcinoma (SCC), basal cell carcinoma (BCC), and parotid carcinomas accounted for 50%, 25%, and 23.1% of the cases respectively. There were 1 melanoma and 1 metastatic nasopharyngeal carcinoma. Preexisting facial nerve dysfunction was present in 15 patients (28.8%). Thirty-five (67%) patients had had prior treatment including combined surgery and radiotherapy in 14 patients, surgery alone in 19 patients, and radiotherapy alone in 2 patients. There were five type I resections, eleven type II resections, twenty-four type III resections, six type IV resections, and four subtotal resections. At the time of last followup 29 patients were alive without disease, 13 patients died of their disease, and 10 died of other causes. Overall disease free survival is 53.8% at 2 years and 19.2% at 5 years. The respective 2 year and 5 year survival rates were 46% and 19% for SCC vs. 67% and 17% for BCC vs. 50% and 17% for parotid carcinomas. **Conclusions:** LTBRs can be used to treat

selected advanced and recurrent malignant tumors of the external ear, periauricular skin, and parotid with low morbidity and a high probability of local regional control.

**9:30 - 9:35 Q&A**

**9:35 - 10:05 Break with Exhibitors/View Posters**

#### **MODERATORS**

**Patrick J. Gullane, MD\*, Toronto, ON**

**Brian B. Burkey, MD, Nashville, TN**

#### **10:05 - 10:13 Return of Vocal Cord Movement: An Independent Predictor of Response to Nonsurgical**

##### **Management of Laryngeal Cancers**

Kenny Ekene Iloabachie, MD, Shreveport, LA

Cherie-Ann O. Nathan, MD\*, Shreveport, LA

Fred L. Ampil, MD, Shreveport, LA

Matthew L. Morgan, MEdCCC-SLP, Shreveport, LA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize T2B/T3 laryngeal cancer patients who are at an increased risk for treatment failure after laryngeal conservation therapy.

**Objectives:** To evaluate vocal cord function after treatment for T2b/T3 laryngeal carcinoma as an independent prognostic factor for locoregional recurrence. **Study Design:** A retrospective review of patients with T2b and T3 laryngeal lesions without distant metastasis treated with primary radiation with or without chemotherapy between 2000 and 2005 was conducted. **Methods:** Only those patients obtained from the tumor registry with pre- and post-treatment videostroboscopy were included. Patients' charts were reviewed for local and regional recurrence after treatment. The Fisher exact test was used to determine significant association between recurrence and a possible risk factor. **Results:** 14 patients met the inclusion criterion. Five patients had T2b lesions and nine patients had T3 lesions. 60% of patients with T2b and 75% of patients with T3 lesions had return of vocal cord function after treatment. 4/14 patients did not have return of vocal cord function and of these 100% had locoregional recurrence of disease. Of the 10 patients that had return of vocal cord movement none of the patients recurred. The proportion of recurrence was significantly higher for those whose vocal function did not return compared to the patients whose vocal function returned (100% vs. 0%,  $p=0.002$ ). **Conclusions:** The immobile vocal cord is associated with a worse prognosis and hence factored into the AJCC staging for laryngeal tumors. We show that vocal cord mobility is an independent prognostic factor of recurrence even after treatment and can predict treatment failure in T2b and T3 lesions of the larynx.

#### **10:13 - 10:21 A Multi-Institutional Trial of Sentinel Node Biopsy in Patients With T1 and T2N0 Oral Cavity**

##### **Cancer: Final Results**

Francisco J. Civantos, MD\*, Miami, FL

Robert Zitsch, MD, Columbia, MO

David Schuller, MD\*, Columbus, OH

Russell Smith, MD, Iowa City, Iowa

Jeffrey Myers, MD, Houston, TX

Wendell Yarbrough, MD\*, Nashville, TN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to assess the potential utility and limitations of this procedure in the regional nodal staging of patients with oral cavity cancer. Data obtained from this study will define the accuracy of sentinel node biopsy for OCSCC with stratification by site, stage, and surgical experience, and determine the direction of further study.

**Objectives:** Originally pioneered for melanoma, sentinel lymph node (SN) biopsy involves nuclear imaging and gamma probe guided surgical staging of the lymphatics. The validity of using sentinel node biopsy for T1 or T2 oral cavity squamous cell carcinoma using a cooperative group trial was tested by correlation of sentinel node status with the status of nodes within the remainder of the neck dissection. **Study Design:** Phase II pathologic validation trial. **Methods:** This study represents the results of an American College of Surgeons Oncology Group trial a 3 year effort involving 33 institutions and 65 surgeons. Surgeons were categorized as moderately experienced or novice surgeons. One hundred and sixty-one patients were enrolled with clinically invasive oral cancers, stage T1 and T2, N0; excluding minimally invasive lesions and lesions under 6 mm in size. Strict imaging criteria were used in order to exclude sub-clinical gross disease. Patients then underwent injection of the lesion with technetium 99 sulfur colloid, followed by nuclear imaging, narrow exposure sentinel lymphadenectomy, and subsequent formal neck dissection. Novice surgeons were trained through observation and a course, while more experienced surgeons submitted a case list. All surgeons watched an instructional video. The major endpoint for this trial is the negative predictive value (NPV) of SLN biopsy which is defined as the proportion of patients, with negative SN,

who also have no positive nonsentinel nodes on pathologic evaluation of the neck dissection specimen. **Results:** Interim analysis based on routine pathologic analysis of the SN(s) in 131 eligible patients revealed that of 100 gamma probe guided SN biopsies which were found to be pathologically and clinically node negative, 91 patients were found to have no other pathologically positive nodes in the remainder of the neck dissection specimen corresponding to a NPV of 0.91 (91%). Using a strict definition of the sentinel node 103 had negative SN and 91 of those had no positive nonsentinel nodes. This corresponds to a NPV of 0.88 (95% CI=0.81,0.94). Of the 103 SN negative patients 25 had primary tumors arising in the floor of mouth tumors while 77 patients had tumors which arose from other oral cavity sites corresponding to a NPV of 0.80 and 0.91 respectively. Final results of fine sectioning and immunohistochemistry for cytokeratin will be available by the time of this presentation. **Conclusions:** Previously presented interim analysis of a large, prospective multi-institutional clinical trial of sentinel node mapping for T1 and T2N0 oral cavity cancers shows that this procedure has a negative predictive value of 91%, and that the pathologic status of the sentinel node correlates with that of the neck dissection in 88% after routine H&E pathologic analysis. Additional data including more patients and further evaluation of the SN by step sectioning and immunohistochemical evaluation will now be presented and should provide additional insights into the potential utility and limitations of this procedure in the regional nodal staging of patients with oral cavity cancer. Data obtained from this study will define the accuracy of sentinel node biopsy for OCSCC with stratification by site, stage, and surgical experience, and determine the direction of further study.

### 10:21 - 10:29 Correlation of Intraoperative Parathyroid Hormone Levels With Parathyroid Gland Size

William H. Moretz III, MD, Augusta, GA  
Tammara L. Watts, MD PhD, Augusta, GA  
Frank W. Virgin Jr., MD, Birmingham, AL  
Chin Edward, MD, Augusta, GA  
Christine G. Gourin, MD\*, Augusta, GA  
David J. Terris, MD\*, Augusta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the relationship of intraoperative parathyroid hormone levels (iPTH) with parathyroid adenoma weight and volume in patients with primary hyperparathyroidism.

**Objectives:** To study the relationship of intraoperative parathyroid hormone levels (iPTH) with parathyroid adenoma weight and volume in patients with primary hyperparathyroidism. **Study Design:** A retrospective evaluation of consecutive patients undergoing minimally invasive parathyroidectomy with iPTH measurement was performed. **Methods:** Data collected include preoperative serum calcium, ionized calcium, and serum PTH levels, iPTH levels at baseline, 5 minutes, and 10 minutes, and parathyroid adenoma weight. Adenoma volume was calculated using an equation for the volume of a spheroid object. **Results:** Thirty patients underwent minimally invasive parathyroidectomy with iPTH measurement for a single parathyroid adenoma between March 2004 and January 2006. There were 8 men and 22 women, with a mean age of 59.3 (range 26-92) years. A significant correlation between preoperative serum calcium and ionized calcium levels and parathyroid adenoma weight was identified ( $p=0.0008$  and  $p=0.03$ , respectively). A significant correlation was also shown between baseline iPTH measurements and parathyroid adenoma volume ( $p=0.03$ ). There was no correlation between baseline iPTH levels and parathyroid adenoma weight. There was a significant correlation between parathyroid adenoma weight and percentage decrease of iPTH levels at 10 minutes compared to baseline ( $p=0.04$ ). **Conclusions:** Preoperative serum calcium and baseline iPTH levels may be useful in predicting parathyroid adenoma weight and volume, respectively. Adenoma weight may relate to the percentage decrease of iPTH levels at the 10 minute post-parathyroidectomy interval.

### 10:29 - 10:37 Emerging Trends in the Performance of Parathyroid Surgery

David J. Terris, MD\*, Augusta, GA  
Nan C. Chen, BS, Augusta, GA (Presenter)  
Christine G. Gourin, MD\*, Augusta, GA  
Edward C. Chin, MD, Augusta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the changing patterns of practice in parathyroid surgery.

**Objectives:** The management of hyperparathyroidism has evolved rapidly in the past decade with the introduction of intraoperative parathyroid hormone testing, radioguided surgery and endoscopic surgery. Not surprisingly, there is a corresponding movement toward specialization of surgeons providing increasingly sophisticated treatments for head and neck endocrine disorders. We sought to identify trends in the disciplines performing parathyroid surgery. **Study Design:** Nonrandomized, controlled comparison of surgical caseloads and publication volumes. **Methods:** Two metrics designed to reflect the proportion of parathyroidectomies being performed by otolaryngologist-head and neck surgeons (OHNS) and general surgeons (GS) were chosen: the operative case logs of graduates from American training programs in OHNS and GS from 1996 through 2005 and the number of scientific articles published relating to parathyroid surgery during two timeframes (1991-1995 and 2001-2005). **Results:** There was a gradual increase in the mean number of parathyroid surgeries performed by GS residents from 6 in 1996 to a peak of 9.2 in 2004; this volume has begun to decline (to 8.5 in 2005). During the same timeframe, the mean number of parathyroidectomies performed by OHNS residents rose sharply and steadily

from 2 in 1996 to 10.9 in 2005. The number of American GS parathyroid publications from 1991 to 1995 was 41, compared with 108 in the period 2001 to 2005 (a 130% increase). During the same timeframe, the number of American OHNS parathyroid articles increased from 1 to 27. The relative proportion of parathyroid publications authored by American otolaryngologists rose from 2.4% to 20.0% (P = .006). **Conclusions:** Increasingly, OHNS are the primary surgeons in parathyroid operations as indicated by two surrogate metrics. Graduating chief residents in otolaryngology now perform more parathyroid procedures than chief residents in general surgery, and a growing proportion of parathyroid publications are being authored by otolaryngologists.

### **10:37 - 10:45 Cosmetic Thyroid Surgery: Defining the Essential Principles**

David J. Terris, MD\*, Augusta, GA  
Melanie W. Seybt, MD, Augusta, GA (Presenter)  
Edward A. Chin, MD PhD, Augusta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the important principles in achieving an optimal cosmetic result when performing thyroidectomy.

**Objectives:** Minimally invasive thyroid surgery is rapidly becoming a common approach in busy endocrine surgery practices. The surgical concepts necessarily include a number of principles found within the realm of plastic surgery. **Study Design:** Prospective, non-randomized analysis of a consecutive series of thyroid surgical patients. **Methods:** All patients who underwent thyroid surgery in the department of otolaryngology at a university medical center were prospectively evaluated. Recommendations for endoscopic thyroidectomy, minimally invasive nonendoscopic thyroidectomy (MINET) or conventional thyroid surgery were based on patient and disease factors as previously described. Specific factors contributing to improved cosmetic outcomes were investigated. **Results:** 248 patients underwent thyroidectomy between 9/03 and 6/06. There were 50 males and 198 females with a mean age of  $44.9 \pm 14.6$  years. 51 patients (20.6%) had thyroidectomy using an endoscopic technique (Group A); 120 patients (48.4%) had a MINET (Group B); the remaining 77 patients (31.0%) underwent conventional thyroidectomy (Group C). Incision lengths were  $24.3 \pm 5.9$  mm in Group A,  $46.4 \pm 9.9$  mm in Group B, and  $92.4 \pm 22.3$  mm in Group C. The factors that contributed most to an optimal cosmetic result were: marking the patient sitting up prior to surgery, resecting skin edges during closure, avoidance of subplatysmal flap elevation, and use of Dermabond. **Conclusions:** Achieving an optimal cosmetic result when performing thyroid surgery is easiest when one applies a number of principles including elements normally associated with plastic surgery.

### **10:45 - 10:50 Q&A**

### **10:50 - 12:00 PANEL: IMAGING IN HEAD AND NECK SURGERY: WHAT'S NEW AND WHAT WORKS**

**Moderator:** Lanny G. Close, MD\*, New York, NY  
**Panelists:** James L. Netterville, MD\*, Nashville, TN  
Lisa Orloff, MD, San Francisco, CA  
Russell Smith, MD, Iowa City, IA

**12:00** *Adjourn*

**1:30 - 5:00** *"Otology Icons of the 20th Century: Addressing Unresolved Issues"*  
*Islands AB*

**6:30** *Margaritaville Beach Party - Tiki Beach*  
*Children's Parties - Location TBN*

## **SUNDAY, FEBRUARY 18, 2007**

**7:00 - 12:00** *Registration - Island E Foyer*

**7:00 - 12:00** *Speaker Ready Room - Key West*

**7:00 - 7:50** *Business Meeting (Members Only)*  
*Middle Section Members - Caxambus 1*  
*Eastern Section Members - Caxambus 2*

**7:00 - 7:50** *Continental Breakfast - Islands Foyer*

8:00 - 11:00 *Spouse Hospitality - Captiva*

8:00 - 12:00 *Rhinology & Sinus Scientific Session - Islands A-D*

12:00 *Adjourn*

**RHINOLOGY & SINUS SCIENTIFIC SESSION -  
Islands A-D**

**8:00 - 8:10** **Announcements by Vice Presidents**  
**Recognition of Poster Award winners**  
**Introduction of Vice Presidents-Elect:**  
*Lanny G. Close, MD\*, New York, NY*  
*Eastern Section*  
*P. Ashley Wackym, MD\*, Milwaukee, WI*  
*Middle Section*  
*Paul A. Levine, MD\*, Charlottesville, VA*  
*Southern Section*  
*Sigsbee W. Duck, MD\*, Gillette, WY*  
*Western Section*

**MODERATORS**

**Hassan H. Ramadan, MD\*, Morgantown, WV**  
**Steven D. Schaefer, MD\*, New York, NY**

**8:10 - 8:18** **Isolation of a Common Respiratory Viral Pathogen in Nasal Polyps Using Polymerase Chain Reaction**  
Aaron N. Pearlman, MD, New York, NY  
Richard A. Lebowitz, MD, New York, NY  
Joseph Jacobs, MD\*, New York, NY  
Lesley A. Rabach, BS, New York, NY  
Anil K. Lalwani, MD\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the use of molecular techniques in isolating viruses. Also, participants should be able to discuss the microbial flora present in the paranasal sinuses of patients with nasal polyps.

**Objectives:** To determine the presence or absence of adenovirus in the sinus mucosa of patients with chronic sinusitis and nasal polyps versus those with only chronic sinusitis and to determine whether adenovirus is present alone or are in combination with other microorganisms. **Study Design:** Prospective, cross-sectional study with a two group design. **Methods:** The study population was categorized intraoperatively into two groups based on the presence or absence of nasal polyps. Using ethmoid bulla mucosa, DNA extraction was performed. PCR was performed using primers specific for adenovirus. Bacterial and fungal cultures were performed as per standard microbiology laboratory techniques. **Results:** Forty-two patients were enrolled in the study, 18 had nasal polyps. Adenoviral DNA was isolated in zero of the 42 specimens. In reference to culture results, no significant difference between the two groups was observed concerning monomicrobial versus polymicrobial growth. The most commonly isolated organism, coagulase negative staphylococcus, was present in 33 patients. It was present in 95% of the controls versus 61% of the nasal polyp group. One positive fungal culture (*Bipolaris*) was isolated in the nasal polyp group. **Conclusions:** Adenovirus was not present in the mucosa of patients with chronic rhinosinusitis with or without nasal polyps. Only one organism was isolated in the majority of bacterial cultures. *Staphylococcus epidermidis* (coagulase negative) was the most commonly isolated organism in both the control and nasal polyp groups. There is a trend for a decreased incidence of *staphylococcus epidermidis* and an increased incidence of *staphylococcus aureus* in the nasal polyp group.

**8:18 - 8:26** **Surfactant Protein B Detection and Gene Expression in Chronic Rhinosinusitis**  
Bradford A. Woodworth, MD, Charleston, SC  
Rachel A. Wood, BS, Charleston, SC  
Danforth A. Newton, PhD, Charleston, SC  
John E. Baatz, PhD, Charleston, SC  
Rodney J. Schlosser, MD, Charleston, SC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the potential role of SP-B in chronic rhinosinusitis.

**Objectives:** Surfactant protein B (SP-B) is a hydrophobic protein secreted within pulmonary surfactant that facilitates the absorption of surface active lipids to the air liquid interface of the alveoli and increases alveolar stability. SP-B may also have anti-inflammatory properties. It is implicated in decreasing the pulmonary inflammatory response to bacterial lipopolysaccharide. However, the expression and function of SP-B in the sinonasal cavities has not been elucidated. Our objective was to detect the presence of SP-B and measure alterations in various forms of Th1 and Th2-type inflammatory chronic rhinosinusitis (CRS). **Study Design:** Basic science. **Methods:** Sinus mucosal biopsies were performed in patients with allergic fungal rhinosinusitis (AFRS), nonatopic CRS with nasal polyposis (NP), cystic fibrosis (CF), and normal controls. SP-B mRNA was measured in diseased states and normal controls using quantitative polymerase chain reaction. Immunoblot analysis for SP-B was also performed. **Results:** CF (n=4) showed significantly increased levels of SP-B (169-fold) mRNA ( $p = 0.004$ ) when compared to controls (n=5). CRS with NP (n=5) and AFRS (n=7) also demonstrated elevated levels of SP-B (14-fold and 4-fold, respectively) when compared to the control group. However, these elevations in CRS with NP and AFRS were not statistically significant. Immunoblot analysis confirmed the presence of the translated product. **Conclusions:** This is the first study to detect SP-B in the human sinus. In addition SP-B is upregulated in various forms of CRS but is significantly elevated in the Th-1 mediated inflammation of cystic fibrosis CRS.

### **8:26 - 8:34 Bacterial Eosinophilic Chronic Rhinosinusitis—A New Clinical Entity?**

Berrylin J. Ferguson, MD\*, Pittsburgh, PA  
William A. Wood, MD, Pittsburgh, PA (Presenter)  
Raja R. Seethala, MD, Pittsburgh, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the potentially new clinico-pathologic entity of bacterial eosinophilic chronic rhinosinusitis (bacterial ECRS) and compare this to other previously described sub-categories of ECRS. Participants should be able to recognize the histologic presentation of this entity and also be able to discuss the possible relevance of this clinico-pathologic description to bacterial superantigen induced ECRS (SAI-ECRS).

**Objectives:** We have recently observed a previously unreported histopathologic entity—bacteria in eosinophilic mucin rhinosinusitis (EMRS). When specifically assessed bacteria in EMRS is common. Our objective is to analyze this frequency, with and without accompanying fungal presence, and to correlate this with comorbidities such as aspirin intolerance, asthma, and culture results. Eosinophilic chronic rhinosinusitis (ECRS) is provisionally divided into four possibly overlapping etiologies: superantigen induced ECRS (SAI-ECRS), allergic fungal sinusitis (AFS), nonallergic fungal ECRS (NAF-ECRS), and aspirin exacerbated ECRS (AE-ECRS). **Study Design:** A retrospective pathologic review of patients having “allergic mucus” or a similar term, under the care of the senior author, correlated with clinical and laboratory data. **Methods:** Many initial pathology reports did not comment on the presence of bacteria within the mucus and are re-reviewed for this study along with demographic, allergic, and immunologic characteristics. **Results:** Of 60 “allergic mucus” specimens from 34 consecutive patients between 2003 and 2006, 15 had AFS with bacterial presence not commented upon; 27 had absent fungi by Grocott stain with bacteria not commented upon; 10 had absent fungi with bacterial presence noted; 7 had both fungi and bacteria present; and 1 had fungi with no bacteria. **Conclusions:** Our findings may represent the histopathologic picture of SAI-ECRS, or a previously unreported form of AFS in which bacteria and fungi synergistically promote the host eosinophilic and mucinous reaction or a different (new) etiologic subcategory. Based on our findings the role of bacteria in EMRS deserves further study.

### **8:34 - 8:42 Correlation of Tissue Eosinophilia to Peripheral Eosinophilia and SNOT 20 Scores in Chronic Rhinosinusitis**

Adam M. Becker, MD, Augusta, GA  
Stilianos E. Kountakis, MD PhD\*, Augusta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate further understanding of the relationship between eosinophilia and chronic rhinosinusitis.

**Objectives:** To correlate tissue eosinophilia (TE) with peripheral eosinophilia (PE) and sinonasal outcomes test (SNOT) 20 scores in chronic rhinosinusitis (CRS) patients undergoing functional endoscopic sinus surgery (FESS). **Study Design:** Prospective data analysis of CRS patients undergoing FESS. **Methods:** Data was collected prospectively in CRS patients (diagnosed according to Rhinosinusitis Task Force criteria) undergoing FESS. Tissue and peripheral eosinophilia levels were quantitated and SNOT 20 scores were reviewed. Patients were divided into two groups, those with  $< 5$  eosinophils/high powered field (hpf) and those with  $> 5$  eosinophils/hpf. Data analysis was performed using Student’s T-test. **Results:** 76 patients with CRS were enrolled (48 females and 28 males). TE levels were available in 69 patients. Of these PE levels were available in 35 patients, 13 of which had  $< 5$  eosinophils/hpf and 22 of which had  $> 5$  eosinophils/hpf. Mean PE levels were 208 in patients with low TE and 381 in patients with high TE ( $p = 0.03$ ).

Of the 69 patients with TE data SNOT 20 scores were available in 55. 21 patients had < 5 eosinophils/hpf and 34 had > 5 eosinophils/hpf. Mean SNOT 20 scores were 26 in patients with low TE and 28 in patients with high TE respectively (p = 0.46). **Conclusions:** Patients with tissue eosinophil levels > 5/hpf had significantly higher circulating eosinophils, suggesting the presence of systemic mediators of eosinophil recruitment. Tissue eosinophilia does not appear to have an impact on preoperative symptom scores.

#### **8:42 - 8:50 Prospective Study on the Effects of Smoking on Surgical Outcomes in Patients With Chronic Rhinosinusitis**

Subinoy Das, MD, Augusta, GA  
Adam M. Becker, MD, Augusta, GA  
Stilianos E. Kountakis, MD PhD\*, Augusta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the significant benefits of endoscopic sinus surgery in smokers and nonsmokers with chronic sinusitis and discuss the significant greater reduction in clinical severity in smokers when compared to nonsmokers in a population of patients prospectively studied at a tertiary referral center.

**Objectives:** Although the benefits of endoscopic sinus surgery for patients with chronic rhinosinusitis are well documented, there are conflicting reports and little data evaluating the benefits of sinus surgery to ongoing smokers. The purpose of this study was to prospectively compare the benefit of endoscopic sinus surgery to smokers and nonsmokers using a clinically validated symptom severity index (SNOT-20). **Study Design:** Prospective clinical trial. **Methods:** 235 patients were prospectively enrolled at a single tertiary academic center. Preoperative SNOT-20 scores and comprehensive demographic data were obtained. All patients underwent endoscopic sinus surgery under the supervision of the senior author. Postoperative SNOT-20 scores were obtained at 3 month, 6 month, and yearly intervals. **Results:** Preoperative SNOT-20 scores in 50 smokers (mean: 27.8) and 185 nonsmokers (mean: 26.2) were statistically similar. Both smokers and nonsmokers achieved a highly significant reduction in SNOT-20 scores at short-term followup evaluations (p < .0005). Smokers achieved a greater reduction in SNOT-20 scores (mean difference: 22.1) at short-term followup compared to nonsmokers (mean difference: 16.1). This result was statistically significant (p<.044). **Conclusions:** This study confirms that smokers and nonsmokers achieve a highly significant short-term benefit from endoscopic sinus surgery using a clinically validated symptom severity scale in a prospective study. Interestingly smokers achieved a greater short-term benefit than nonsmokers. This study calls into question the notion that current smokers are poorer candidates for endoscopic sinus surgery. Further prospective studies to confirm these results and provide long-term analysis should be performed.

#### **8:50 - 8:55 Q&A**

#### **MODERATORS**

Stilianos E. Kountakis, MD\*, Augusta, GA  
Robert H. Maisel, MD\*, Minneapolis, MN

#### **8:55 - 9:03 Endoscopic Ligation of the Anterior Ethmoid Artery**

Steven D. Pletcher, MD, San Francisco, CA  
Ralph Metson, MD\*, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe an endoscopic, transnasal approach to ligation of the anterior ethmoid artery.

**Objectives:** To describe a transnasal endoscopic approach for ligation of the anterior ethmoid artery (AEA) for the treatment of refractory epistaxis. **Study Design:** Prospective case series. **Methods:** The authors' experience with three patients who underwent endoscopic AEA ligation for intractable epistaxis is presented. The operative technique is highlighted. **Results:** All patients had endoscopic examination suggestive of an anterior source for their epistaxis and failed anterior-posterior nasal packing. In each case, endoscopic instrumentation was used through a transnasal approach to identify and ligate the AEA with a surgical clip. Concomitant endoscopic sphenopalatine artery ligation was performed in all cases. There were no intraoperative or postoperative complications. Epistaxis was successfully controlled in all patients with no further bleeding for a mean follow-up of 5.3 months (range 5.0-5.5 months). **Conclusions:** This is the first report to describe a reliable technique for ligation of the anterior ethmoid artery through an endoscopic transnasal approach. The role of this procedure in the treatment of patients with epistaxis remains in evolution.

#### **9:03 - 9:11 Algorithm for Reconstruction Following Endoscopic Skull Base Surgery**

Abtin Tabae, MD, New York, NY  
Vijay K. Anand, MD\*, New York, NY  
Jerry W. Lin, MD, New York, NY  
Theodore H. Schwartz, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the technique, outcomes and limitations of reconstruction following endoscopic skull base surgery.

**Objectives:** The expanding role of endoscopic skull base surgery necessitates a thorough understanding of the indications, techniques and limitations of various approaches to reconstruction. The heterogeneous nature of skull base lesions requires an individualized approach to achieve a watertight separation between the intracranial and sinonasal cavities to avoid postoperative cerebrospinal fluid leak (CSF). The technique and outcomes of endoscopic skull base reconstruction remains incompletely described in the literature. **Study Design:** Retrospective chart review of 102 endoscopic skull base procedures performed at tertiary care medical center. **Methods:** Patients undergoing endoscopic skull base surgery underwent various reconstructive techniques based on tumor location, defect size, and volume of intraoperative cerebrospinal fluid leak. A retrospective chart review was performed to determine the overall efficacy of reconstruction and identify risk factors for postoperative CSF leak. **Results:** The diagnosis in the 102 patients in this series included pituitary tumor (59%), encephalocele (12%) craniopharyngioma (8%), and meningioma (8%). Based on an algorithmic approach, successful reconstruction was initially achieved in 93 patients (91%). Nine patients (9%) experienced postoperative CSF leak all of which resolved with lumbar drainage alone. Correlation between postoperative CSF leak and study variables revealed statistically significant larger tumors in patients with postoperative CSF leak when compared to patients without CSF leak (3.3 cm vs. 2.2 cm,  $p=0.05$ ). **Conclusions:** The algorithm for reconstruction following endoscopic surgery presented in this study is associated with excellent overall efficacy. A further understanding of risk factors for postoperative CSF leak is imperative to achieve optimal results.

### 9:11 - 9:19 **Complications Following the Endoscopic Modified Lothrop Procedure: Review of 80 Cases**

Mobeen A. Shirazi, MD, Maywood, IL

James A. Stankiewicz, MD, Maywood, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to determine that the endoscopic modified Lothrop procedure is safe and effective in treatment of recalcitrant frontal sinus disease. We analyze our experience and report on management of revision cases and perioperative complications.

**Objectives:** We performed a systematic review of 80 cases in which an entirely endoscopic modified Lothrop procedure was performed. We studied the safety, efficacy, need for revision surgery, and complication rate following an endoscopic modified Lothrop procedure. **Study Design:** Retrospective chart analysis. **Methods:** A retrospective chart review and patient survey of 80 patients seen at our institution from 1995-2004 was performed. Main outcomes measured were need for revision surgery, improvement in symptoms of headache/pressure, recurrent infection, and need for osteoplastic flap (OPF), and cerebrospinal fluid (CSF) leak rate. **Results:** The most common indications for the procedure were recalcitrant frontal sinusitis and/or mucocele formation. Symptomatic clinical improvement was noted in 95% of patients. The frontal recess and floor of the frontal sinus were the most common areas of persistent disease. CSF leak rate was 1.3% (1/80) and was managed successfully at the time of the original surgery without any long-term sequelae. Thirteen percent (10 patients) required revision surgery. Four patients (5%) required revision with an OPF. **Conclusions:** Endoscopic modified Lothrop procedure is a safe and effective surgical option for patients with recalcitrant frontal sinus disease. Both complication and revision rates were low.

### 9:19 - 9:27 **Role of Revision Surgery on Outcomes of Endoscopic Sinus Surgery**

Jamie L. Robinson, MD MS, Portland, OR

Susan E. Griest, MPH, Portland, OR

Kenneth E. James, PhD, Portland, OR

Timothy L. Smith, MD MPH\*, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the role of revision status on endoscopic and QOL outcomes of endoscopic sinus surgery.

**Objectives:** 1) To examine the impact of revision surgery status on endoscopic and quality of life (QOL) outcomes after endoscopic sinus surgery (ESS); 2) to compare these results to patients undergoing primary ESS; and 3) to evaluate whether or not other risk factors and/or comorbidities influence this relationship. **Study Design:** Prospective observational study with an internal comparison group. **Methods:** A prospective cohort of patients with chronic rhinosinusitis who presented for endoscopic sinus surgery (ESS) was conducted. Preoperative CT, pre- and postoperative endoscopy and two validated disease specific QOL instruments, the Rhinosinusitis Disability Index (RSDI) and Chronic Sinusitis Survey (CSS), were collected. Differences in the proportions of patients who improved were analyzed using Pearson's chi-square. The relationship between revision surgery status and each of the outcomes were analyzed using multiple logistic regression models. **Results:** In patients without polyps RESS patients were 3.88 times more likely to improve on endoscopy scores than primary ESS patients (95% C.I. 1.70, 8.83;  $p=0.001$ ). In nasal polyp patients there was no difference by revision status (OR 0.48; 95% C.I. 0.15, 1.59;  $p=0.23$ ). The odds of improving on the RSDI (OR 0.51, 95% C.I. 0.25, 1.04,  $p=0.065$ ) and CSS (OR 0.98, 95% C.I. 0.51, 1.89,  $p=0.950$ ) were not significantly different for RESS patients as compared to primary ESS patients after adjusting for other preoperative factors. **Conclusions:** Both revision and primary ESS patients improved after ESS with regard to endoscopy scores and two QOL instruments.

## 9:27 - 9:35 **The Role of Perioperative Antibiotics in Endoscopic Skull Base Surgery**

Seth M. Brown, MD MBA, New York, NY  
Abtin Tabae, MD, New York, NY  
Theodore H. Schwartz, MD, New York, NY  
Vijay K. Anand, MD\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the role of perioperative antibiotics in endoscopic skull base surgery and understand that low infectious rates can be obtained with short courses of single agent perioperative antibiotics. This is in comparison to recent studies that have suggested that open skull base surgery may require broad spectrum antibiotics for extended periods of time.

**Objectives:** The indications and duration of perioperative antibiotics in endoscopic skull base surgery remains incompletely defined and poorly understood. The potential risks of intracranial contamination from the sinonasal cavity at the time of tumor removal and placement of reconstructive grafts must be weighed against the costs, spread of resistance, and side effects of excessive antibiotic use in the perioperative period. **Study Design:** Review of a prospective skull base database at an academic medical center. **Methods:** Ninety patients that underwent endoscopic skull base surgery with 24-48 hours of intravenous perioperative antibiotics were reviewed, and infectious complications were compared to historical controls. All patients received single agent antibiotic therapy determined by the patient's history of allergies to medications, consisting of cefazolin (87%), vancomycin (10%), and clindamycin (3%). **Results:** There were no cases of intracranial infections or meningitis in the series. Additional antibiotics were subsequently required during the hospital stay for urinary tract infection (2 patients), sinusitis (2 patients), lumbar drain prophylaxis (2 patients), postoperative fever (1 patient), and aspiration pneumonia (1 patient). Ninety-one percent of patients did not require additional antibiotics. The diagnoses in this series included pituitary tumor (64%), craniopharyngioma (9%), encephalocele (9%) and meningioma (8%). A variety of autologous, synthetic grafts, hemostatic agents, and tissue sealants were placed through the nasal cavity for reconstruction. **Conclusions:** Despite the direct contamination of the intracranial cavity in endoscopic skull base procedures, the majority of patients did not experience infectious complications following a brief course of a single agent perioperative antibiotic.

9:35 - 9:40 *Q&A*

9:40 - 10:00 *Break*

## 10:00 - 11:10 **PANEL: BALLOON SINUPLASTY**

**Moderators:** Ralph B. Metson, MD\*, Boston, MA  
Robert C. Kern, MD\*, Chicago, IL

**Panelists:** Jack A. Coleman, MD, Murfreesboro, TN  
Michael Setzen, MD, Manhasset, NY  
Raymond L. Weiss, MD, Ocean Springs, MS

### **MODERATORS**

Robert C. Kern, MD\*, Chicago, IL  
Roy Casiano, MD\*, Miami, FL

## 11:10 - 11:18 **Vidian Canal as a Landmark to the Petrous Internal Carotid Artery During Expanded Endonasal Approaches to the Skull Base**

Allan D. Vescan, MD, Pittsburgh, PA  
Carl H. Snyderman, MD, Pittsburgh, PA  
Barton F. Branstetter IV, MD, Pittsburgh, PA  
Amin B. Kassam, MD, Pittsburgh, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the endonasal relationships of the vidian (pterygoid) canal to the petrous carotid artery and other important endonasal landmarks.

**Objectives:** The purpose of this study is to describe the anatomy and relationships of the vidian (pterygoid) canal to known endonasal and skull base landmarks. This will allow the endoscopic skull base surgeon to safely approach the anterior genu of the petrous carotid artery during expanded endonasal approaches to the skull base. **Study Design:** The study is a prospective cohort study. **Methods:** Axial, coronal and sagittal computed tomography scans of the paranasal sinuses and skull base were examined. Individuals with known skull base pathology were excluded. Measurements included the length and angle of the vidian canal, the relationship of the vidian canal to the anterior genu of the petrous carotid artery, and the pneumatization pattern of the sphenoid sinus as it pertains to the foramen rotundum.

dum and the vidian canal. Additionally the relationship of the vidian canal to the sphenopalatine foramen and base of the medial pterygoid plate was assessed. **Results:** The degree of lateral pneumatization of the sphenoid sinus is highly variable. We have developed a novel grading system to describe the pneumatization pattern of the sphenoid sinus. The lateral pneumatization pattern has an impact on the relationships of the vidian canal and foramen rotundum. The vidian canal has a consistent relationship to the anterior genu of the carotid artery but does not provide a limit for the medial plane of the petrous carotid artery. **Conclusions:** The vidian canal is a useful but imperfect landmark for localization of the petrous internal carotid artery. Its relationship to the anterior genu provides guidance during drilling of bone in endoscopic skull base surgery. Knowledge of these landmarks minimizes the risk of carotid artery injury.

### **11:18 - 11:26 New Staging System for Sinonasal Inverted Papilloma in the Endoscopic Era**

Steven B. Cannady, MD, Cleveland, OH  
Pete S. Batra, MD, Cleveland, OH  
Nathan B. Sautter, MD, Cleveland, OH  
Hwan Jung Roh, MD, Cleveland, OH  
Martin J. Citardi, MD, Cleveland, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate understanding of the current state of the art for surgical treatment of inverted papilloma. Discuss the staging systems that have been applied to nasal inverted papilloma and contrast them to the proposed system in this paper.

**Objectives:** Advanced endoscopic techniques have emerged as the preferred treatment modality for sinonasal inverted papilloma (IP), but a widely accepted staging system has not yet been developed. This study aims to develop an IP staging system that offers prognostic information for IP managed with the endoscopic approach as the primary surgical modality. **Study Design:** A systematic review of the English language literature (1985-2006). **Methods:** From the literature, 445 patients with IP treated by endoscopic resection were identified in 14 reports. Only patients with known IP sites and outcomes were included. **Results:** Patients were categorized into 3 groups based upon recurrence rates (RR): Group A (IP confined to the nasal cavity, ethmoid sinus and medial maxillary sinus), 3.0% RR (n=234); Group B (IP with lateral maxillary sinus, sphenoid sinus and/or frontal sinus involvement); 19.8% RR (n=177); and Group C (IP with extrasinus extension); 35.3% RR (n=34). Pearson's chi-square test showed statistically significant differences for all pair wise comparisons of RR for each group (p<0.05). Mean followup was 39.8 months. **Conclusions:** This new staging system for IP provides information about prognosis (as operationally defined by recurrence rates) for IP managed by advanced endoscopic techniques. In contrast, other staging systems for IP reflect surgeon's judgment rather than outcomes data. This new classification for IP provides objective data for preoperative planning and patient counseling.

### **11:26 - 11:34 The Use of Fibrin Glue for Fixation of Acellular Human Dermal Allograft in Septal Perforation**

#### **Repair**

James R. Parry, DO, Syracuse, NY  
Timothy J. Minton, MD, Syracuse, NY  
Douglas H. Halliday, MD PhD, Syracuse, NY

**Educational Objective:** At the end of this presentation, the participants should understand the benefits of using fibrin glue compared to traditional suturing techniques in securing acellular human dermal allograft in septal perforation repair.

**Objectives:** Acellular human dermal allograft used as an interpositional graft between mucoperichondrial flaps has been shown to be effective in the repair of septal perforations. The material is typically sutured to the septum but this can be technically difficult. We describe a technique in which fibrin glue is used to secure acellular human dermal allograft for septal perforation repair. **Study Design:** Retrospective case series. **Methods:** Three consecutive patients with preexisting septal perforations underwent septal repair using fibrin glue to secure the interpositional acellular human dermal allograft. One cubic centimeter of fibrin glue was applied to both sides of the interpositional graft. The graft was placed between the mucoperichondrial flaps and compressed for five minutes to allow for fixation. **Results:** The use of fibrin glue compared to conventional suturing decreased the length of the procedure by approximately 30 minutes. At the three month postoperative examination all three patients were found to have successful outcomes. **Conclusions:** The use of fibrin glue for fixation of the acellular human dermal allograft in septal perforation repair is technically less difficult, reduces the length of the procedure, and we believe it reduces graft migration when compared to conventional suturing techniques. By decreasing operative time use of fibrin glue for fixation is potentially more cost effective than traditional suturing techniques.

### **11:34 - 11:42 Sinonasal Lymphomas: The Experience of Two Institutions**

Abby C. Meyer, MD, Minneapolis, MN  
Jennifer L. Long, MD PhD, Los Angeles, CA  
Stefan E. Pambuccian, MD, Minneapolis, MN  
Robert H. Maisel, MD\*, Minneapolis, MN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to: 1) demonstrate knowledge of the WHO classification of lymphoid neoplasias; 2) discuss the common features of extranodal non-Hodgkin's lymphoma and where they typically present within the head and neck; and 3) explain the clinical features of sinonasal lymphoma, including presentation, diagnosis, management, and prognosis.

**Objectives:** Since a large proportion of lymphomas present with involvement of lymphoid tissues of the head and neck, we reviewed our experiences with head and neck lymphoma in a county hospital and an academic center setting. Our main objective was to describe the disease course of patients with extranodal presentations of non-Hodgkin's lymphoma, in particular sinonasal lymphoma. **Study Design:** A search through the computerized databases of our two institutions identified all cases of lymphoma presenting in the head and neck over five years. **Methods:** We reviewed the pathology and the patients' charts and extracted data regarding presentation, mode of diagnosis, ancillary studies, WHO classification, treatment, and outcome. **Results:** 117 cases of head and neck lymphoma were identified; thirty-four of the 117 cases (29%) were located in extranodal sites. Of these 12 (35%) were located in Waldeyer's ring and 6 (18%) were in the sinonasal tract. Sinonasal lymphomas are unusual with case reports dominating the otolaryngology literature. **Conclusions:** Otolaryngologists are often among the first physicians to encounter a patient with a lymphoma presenting in the head and neck. Although uncommon it is important to keep lymphoma in the differential diagnosis when evaluating abnormalities of the sinonasal tract. A high index of suspicion and an appropriate workup facilitates the prompt diagnosis and management of the patient.

*11:42 - 11:47 Q&A*

*11:50 Adjourn*

## **POSTERS**

### **GENERAL, PEDIATRICS AND PLASTICS-AESTHETICS**

#### **1. Treatment of Orbital Contracture Using the Radial Forearm Free Flap**

Brian T. Andrews, MD, Iowa City, IA  
Russell B. Smith, MD, Iowa City, IA  
Keith D. Carter, MD, Iowa City, IA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the pathology of orbital contracture and the use of the radial forearm free flap as a treatment option.

**Objectives:** Orbital contracture is a severe cicatricial process resulting in progressive scarring and socket contracture in the enucleated orbit. Treatment involves the expansion of the socket with mucous membrane grafts but the progressive nature of this condition is often recalcitrant to multiple procedures. The radial forearm free flap is a suitable reconstructive option in such patients. **Study Design:** A retrospective chart review was performed. **Methods:** A chart review was performed to obtain patient demographics, etiology of enucleation, prior surgical procedures, operative notes, and short- and long-term followup results. **Results:** Two patients with orbital contracture after enucleation were identified. One patient underwent seven augmentation procedures (4 dermal fat grafts and 3 mucosal membrane grafts) prior to free flap reconstruction, and the second patient underwent one prior dermal fat graft procedure. Both patients underwent successful radial forearm free flap reconstruction without complication. Long-term follow demonstrates a well formed orbit without contracture two and three years after free flap reconstruction respectively. **Conclusions:** Orbital contracture is a rare condition but is often difficult to manage. The radial forearm free flap is a suitable option when mucosal membrane or dermal fat grafts fail to augment the contracted socket.

#### **2. Cutaneous Mucormycosis: Special Considerations for the Head and Neck**

Jenny L. Cross, MD, Morgantown, WV  
Mark A. Armeni, MD, Morgantown, WV(Presenter)  
Maximo K. Llaudes, MD, Morgantown, WV

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the manifestations of the disease course of cutaneous mucormycosis (CM), understand the diagnostic workup and special considerations for resection, reconstruction and treatment in the head and neck.

**Objectives:** Cutaneous mucormycosis is a rare condition of the immunocompromised patient. It most commonly manifests in the extremities. Rarely it is found in the head and neck region. This area presents complex treatment dilemmas due to the probability of great disfigurement. The author relates a case of cutaneous mucormycosis chronicling the special treatment considerations for the head and neck due to its cosmetic importance. **Study Design:** Case report. **Methods:** A review of the literature in cutaneous mucormycosis

diagnosis and treatment is presented as well as the experience at our institution. **Results:** We describe a case of a 53 year old gentleman with cutaneous mucormycosis of the left oral commissure/mandible area. The initial consult, frozen section diagnosis and surgical resection as well as intraoperative considerations are described. The subsequent treatment as well as the progressive plastic reconstruction is detailed. **Conclusions:** Cutaneous mucormycosis is an entity with which otolaryngologists must be familiar because only an early diagnosis can provide an opportunity to overcome the high rates of morbidity and mortality with which it is associated. Its prognosis is more favorable often because it arises in conspicuous locations which facilitate diagnosis and treatment. Treatment involves a combined approach. Head and neck reconstruction can be complicated secondary to location and consideration for patient's treatment plan.

### 3. Simultaneous Superficial Musculoaponeurotic System Flap Interposition and Fat Graft During Parotidectomy

Joseph M. Curry, MD, Philadelphia, PA  
Kyle W. Fischer, MD, Philadelphia, PA  
Ryan N. Heffelfinger, MD, Philadelphia, PA  
William M. Keane, MD\*, Philadelphia, PA  
Edmund A. Pribitkin, MD\*, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the functional and cosmetic outcomes and complications occurring with the superficial musculoaponeurotic system (SMAS) interposition and fat graft technique used for reconstruction during parotidectomy.

**Objectives:** To evaluate the use of a rhytidectomy incision, SMAS flap interposition and fat graft for the maintenance of facial symmetry, overall patient satisfaction, and the prevention of symptomatic Frey's syndrome. **Study Design:** Retrospective cohort study. **Methods:** Forty-three patients who underwent parotidectomy for benign disease using a rhytidectomy incision with SMAS flap and fat graft reconstruction were surveyed via telephone. **Results:** Two of 43 patients reported a mild degree of facial asymmetry, while 41 reported facial symmetry, cosmetic satisfaction, and feeling that the surgical defect was not noted by others. Two patients did complain of mild facial sweating when eating but did not feel that their symptoms were significant enough to seek treatment. Two sialoceles occurred and resolved after initial needle aspiration. One abscess occurred in a patient with diabetes mellitus and resolved without sequelae. The average length of followup from surgery was 35 months. **Conclusions:** The use of a rhytidectomy incision and simultaneous fat graft with SMAS interposition for patients requiring parotidectomy for benign disease results in a high degree of patient satisfaction and a low incidence of clinically evident Frey's syndrome.

### 4. Giant Cell Tumor: A Rare Tumor of the Mandible in a Child

Jean P. Font, MD, Galveston, TX  
Seckin O. Ulualp, MD, Galveston, TX  
Patrick Adegboyega, MD, Galveston, TX  
Leonard Swischuk, MD, Galveston, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize a rare tumor of the mandible in a child.

**Objectives:** Giant cell tumor (GCT) is a primary bone tumor commonly involving the long bones in the third to fourth decade. Head and neck region is a rare location for GCT. The aim of the present study was to describe clinical, radiologic and histological evaluation of a GCT in a rare location at an uncommon age. **Study Design:** Case review. **Methods:** Chart of an 11 year old boy referred to a tertiary care pediatric hospital was reviewed to obtain data on presentation, relevant history and physical examination, diagnostic studies, and management. **Results:** The child presented with a four month history of mandible mass gradually increased in size. There was no history of trauma, infection, bleeding, pain, fever, weight loss, and night sweats. The physical examination revealed a 1.5 cm x 1 cm, nontender, firm, purple colored mass located at the right 2nd premolar tooth. Calcium, alkaline phosphatase, and parathyroid hormone were within normal limits. Computerized tomography showed a soft tissue nodule adjacent to the right 2nd premolar with effacement of the cortex surrounding the tooth. The patient underwent excision of the mass. No deformity of the 2nd premolar tooth was appreciated. Histologic analysis of the mass was reported as giant cell tumor. At the 1 month followup visit the surgical site healed well with normal appearing 2nd premolar tooth. **Conclusions:** Despite the low prevalence of giant cell tumor in head and neck region and in children giant cell tumor should be included in the differential diagnosis of mandible mass in children.

### 5. Salvage Reconstruction of an Osteoradionecrosis Defect of the Orbit

David M. Gleinser, BS, San Antonio, TX  
Elizabeth M. Hueman, MD, San Antonio, TX  
G. Richard Holt, MD MSE MPH\*, San Antonio, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the salvage reconstruction of a left naso-orbital osteoradionecrosis defect with emphasis on the utilization of a paramedian forehead flap.

**Objectives:** To plan a successful salvage reconstruction of a left medial naso-orbital defect following radical surgery for a recurrent inverting papilloma with focal areas of verrucous and squamous cell carcinoma and the subsequent osteoradionecrosis where all previous reconstruction attempts had failed. **Study Design:** Case study. **Methods:** Case study. **Results:** Successful reconstruction of a left naso-orbital osteoradionecrosis defect utilizing a paramedian forehead flap. **Conclusions:** In a high risk patient with a long history of smoking and vascular disease reconstruction options are limited for midfacial defects. Following the failure of local and microvascular free flaps, a vascularized paramedian forehead flap was successfully utilized to reconstruct the recalcitrant defect. An algorithm for salvage reconstruction will be presented.

## 6. Transnasal Foreign Body Penetrating Into Cavernous Sinus: Evaluation and Management in the Pediatric Population

Daniel R. Gold, MD, Providence, RI  
Sharon E. Gibson, MD, Providence, RI

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify and manage intracranial penetration of nasal foreign bodies in the pediatric population.

**Objectives:** Foreign bodies penetrating through the nasal cavity into the cranial vault are uncommon. There are few reported cases of the evaluation and management of resultant vascular involvement occurring in the pediatric population. This study reviews the available evaluation and treatment algorithms. **Study Design:** Retrospective case review. **Methods:** Case report and literature review. **Results:** An eighteen month old female presented to the emergency room with a sharp wooden foreign body firmly lodged in the nasal cavity. Preliminary imaging revealed the object to be penetrating through the anterior cranial base with its tip resting in the cavernous venous sinus. Preoperative angiography demonstrated proximity to, but no injury of, the intracavernous segment of the internal carotid artery. In consultation with the neurosurgical service an open anterior fossa approach was deemed too hazardous to be safely executed secondary to the contracted operative field in this anatomic region. Consequently, an endoscopic assisted removal was performed in the operating room. Minimal intraoperative blood loss occurred following aggressive nasal packing. Postprocedure observation in the pediatric intensive care unit demonstrated no postinjury hemorrhage or neurological complications. Nasal packing was removed at ten days postprocedure. No neurological sequelae were noted at six week followup. **Conclusions:** Nasal foreign bodies penetrating into the cranial cavity may result in life threatening vascular injuries. These issues are especially complex in the difficult anatomic and emotional treatment of a pediatric patient. A high index of suspicion followed by early recognition and radiographic evaluation is necessary to guide the safe treatment and discharge of these injuries.

## 7. Mantle Cell Lymphoma Initially Presenting in the Hard Palate: A Case Report

Gregory A. Grillone, MD, Boston, MA  
Geoffrey M. Schwartz, BA, Boston, MA  
Nancy T. Andrea, MD, Boston, MA

**Educational Objective:** At the conclusion of this presentation the participants should be able to recognize the rare presentation of mantle cell lymphoma in the hard palate, be able to discuss the differential diagnosis of hard palate masses and work to establish a series of patients with mantle cell lymphoma for study.

**Objectives:** This study will examine mantle cell lymphoma presenting initially in the hard palate. Study objectives are to broaden awareness in the otolaryngologic community of the many possible head and neck presentations of mantle cell lymphoma and to identify the potential clinical, prognostic and therapeutic implications of this presentation. **Study Design:** The study will include a presentation of the case scenario, a discussion of the differential diagnosis of such hard palate lesions and a discussion of the most current literature on the clinical, therapeutic and prognostic implications of various presentations of mantle cell lymphoma. **Methods:** The study will begin with a case presentation. The researchers will consult hematology-oncology and perform an extensive literature review to achieve study objectives. **Results:** This is the second reported case of mantle cell lymphoma occurring in the hard palate. Both patients had disseminated, stage IV disease at the time of presentation but lacked any systemic symptoms. The diagnosis is tissue based and any concerning mass in the hard palate warrants biopsy. The determination of useful clinical prognostic factors in mantle cell lymphoma is difficult given its rarity and short median survival. Mantle cell lymphoma involving the gastrointestinal tract is common, whereas involvement of the hard palate is rare. Extranodal head and neck mantle cell lymphoma most frequently involves the salivary glands. **Conclusions:** The clinical, prognostic and therapeutic implications of mantle cell lymphoma involving the hard palate remain unknown. Hard palate involvement may be an early indicator of extensive disease and warrants immediate attention. Greater awareness in the otolaryngologic community will allow further study of the implications of mantle cell lymphoma in the hard palate.

## 8. Progressive Transformation of Germinal Centers: A Case Report and Literature Review

Jason M. Guillot, MD, Jackson, MS  
James R. Jordan, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to define the diagnosis of progressive transformation of germinal centers, to discuss the implications of that diagnosis, and to provide recommendations for further clinical management.

**Objectives:** To discuss the diagnosis of progressive transformation of germinal centers in the context of pediatric cervical lymphadenopathy. To educate the audience on the significance and implications of that diagnosis. To assist the clinician with substantiating his or her recommendations for further management through a review of the current literature. **Study Design:** Case report and literature review. **Methods:** We present an 11 year old girl with a persistent, unilateral neck mass and radiologically identified bilateral cervical lymphadenopathy. **Results:** The patient underwent excisional lymph node biopsy. Subsequent formal pathologic review revealed the presence of progressive transformation of germinal centers. **Conclusions:** Progressive transformation of germinal centers is a rare, but significant cause of cervical lymphadenopathy. Because of its documented association with lymphoid malignancy, most commonly the nodular form of lymphocyte predominant Hodgkin's disease, such patients warrant close follow-up with a low threshold for repeat excisional lymph node biopsy should lymphadenopathy persist or return.

## 9. Pediatric Isolated Cervical Actinomycosis—A Case Presentation and Literature Review

Jared R. Inman, MD, Loma Linda, CA  
Mark R. Rowe, MD, Loma Linda, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) explain different treatment plans for actinomycosis as compared to mycobacterial infections; 2) discuss long-term management options, both surgically and medically; and 3) demonstrate an understanding of how to rule out other potential sites of infection.

**Objectives:** Present a case of a 9 year old child with isolated cervical adenopathy devoid of any other sites of infection. Explain workup and potential medical and surgical therapy available to actinomycosis infections. **Study Design:** A retrospective chart review with a study of related literature to help the practitioner not only know how to recognize but treat this unusual infection. **Methods:** A single patient case investigation and presentation. **Results:** A 9 year old child underwent workup for what was initially felt to be lymphoma. Fine needle aspiration biopsy was inconclusive and otolaryngology was called for open biopsy. The final biopsy was actinomycosis. The patient recovered well from the procedure and was treated with 12 months of penicillin by the infectious disease physicians. 2 years later and the patient continues to be free from any recurrence. **Conclusions:** Isolated afebrile neck masses in children can be confusing. Differentiating from potential infectious etiologies and neoplasm usually requires an open biopsy. We discuss the very unusual case of isolated cervical actinomycosis and the medical and surgical management. Approaching these patients with an open mind and a willingness to work with specialists in infectious disease will help in a more rapid diagnosis and treatment plan.

## 10. Treatment of Linear Scleroderma “En Coup de Sabre” With AlloDerm Tissue Matrix

Jon M. Robitschek, MD, Honolulu, HI  
David C. Wang, PhD, Miami, FL  
Joseph Shvidler, MD, Honolulu, HI  
Daniel J. Hall, MD, Honolulu, HI

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the use of AlloDerm tissue matrix implant as a novel treatment for linear scleroderma, “en coup de sabre”, and understand the possible complications, benefits, and alternatives of such treatment.

**Objectives:** 1) Learn the use of AlloDerm tissue matrix implant as a novel treatment for linear scleroderma: “en coup de sabre”; and 2) understand the possible complications, benefits, and alternatives of using AlloDerm tissue matrix in the treatment of “en coup de sabre”. **Study Design:** Case presentation. **Methods:** A case report with clinical and photographic findings is presented along with review of the literature. **Results:** A 53 year old female presented with a 25 year history of a slowly progressing depressed linear forehead furrow, extending from the hairline to the patient's upper eyelid with localized alopecia and skin atrophy. Her past medical history was significant for intermittent migraine headaches and chronic fatigue. The diagnosis of linear scleroderma was established via tissue biopsy and rheumatology consultation with normal laboratory values including a negative antinuclear antibody screen. Initial treatments with botulinum toxin injections provided moderate cosmetic improvement however failed to fully address the forehead furrow. The patient subsequently underwent alloplastic implantation with AlloDerm tissue matrix which yielded marked improvements in the contour and symmetry of the forehead. **Conclusions:** Multiple treatment modalities exist for linear scleroderma ranging from autologous fat grafting to porous polyethylene implantation. We present a novel case of employing AlloDerm tissue matrix and offer it as a successful treatment option for soft tissue augmentation in patients with linear scleroderma.

## 11. **Mycobacterium Bovis—An Unusual Etiology to Isolated Cervical Adenitis in a Young Child**

Mark R. Rowe, MD, Loma Linda, CA  
Brian D. Boynton, MD, Loma Linda, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) understand how to manage children with possible M. Bovis adenitis; 2) explain the comanagement with medical and surgical therapies; 3) know how to recognize potential mycobacterial infections and workup for possible bovis etiology; 4) understand the health care provider's responsibility to notify patient contacts; and 5) understand the usefulness of fine needle aspiration for potential mycobacterial infections.

**Objectives:** Present an unusual case of mycobacterial adenitis and review the literature on appropriate management styles. Review the health care provider's responsibility to the community in notification of infectious potential. **Study Design:** Study design includes a retrospective chart review of a young child presenting with unresolving cervical adenitis. **Methods:** After documenting patient data a review of the literature was performed to gather information on this unusual infection and its management. **Results:** After a fine needle aspiration was indeterminate and common mycobacterial medications were unsuccessful, this patient underwent a selective neck dissection to remove all infected nodes. **Conclusions:** FNA potentially increases time to correct diagnosis and may make patient followup difficult. M. bovis, while rare, should be treated in similar fashion to atypical mycobacteria infection with excision surgical treatment. M. bovis as a cause of isolated cervical adenitis is quite rare and this report will help with updating management.

## 12. **Chondrolaryngoplasty (“Tracheal Shaving”) Under General Anesthesia Using Flexible Fiberoptic Laryngoscopy and Laryngeal Mask Airway**

Jeffrey H. Spiegel, MD, Boston, MA  
Gerardo Rodriguez, MD, Boston, MA (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the indications for chondrolaryngoplasty and understand the rationale for using laryngoscopy through a laryngeal mask airway for maximum patient safety during this procedure.

**Objectives:** To review the safety of chondrolaryngoplasty using flexible fiberoptic laryngoscopy through laryngeal mask airway (LMA) along with translaryngeal marking of the anterior commissure. **Study Design:** Retrospective case review. **Methods:** 21 chondrolaryngoplasties were performed by a single surgeon over a 16 month period. The surgical technique, indications, and unique approach to safety involving laryngoscopy through an LMA are reviewed. **Results:** All patients reported normal voices postoperatively with significant aesthetic improvement in their neck. The fiberoptic examination through LMA with marking of the anterior commissure resulted in only one complication, temporary laryngospasm, which was rapidly corrected. **Conclusions:** Fiberoptic visualization of the anterior commissure through an LMA under general anesthesia is a safe technique for chondrolaryngoplasty.

## 13. **Ear Stapling for Weight Loss**

Jeffrey H. Spiegel, MD, Boston, MA  
Leslie K. Winter, MD, Boston, MA (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss intelligently the current trend by acupuncturists to place staples within the conchal bowl for appetite suppression.

**Objectives:** To increase awareness of the current trend by acupuncturists to place staples within the conchal bowl for appetite suppression. **Study Design:** Case report and literature review. **Methods:** We review the case of a patient who presented with pain resulting from a surgical staple which had been placed into her left conchal bowl. “Ear stapling” literature is reviewed. **Results:** Acupuncturists maintain that pressure points near the tragus may suppress appetite. This is thought to be due to inhibition of the auricular branch of the vagus nerve resulting in vagal stimulation of gastric smooth muscle producing the sensation of satiety. Individuals seeking weight loss will have acupuncture done to the ear, however, recently some acupuncture practitioners have taken to placing long lasting metal staples in the ear to provide more constant appetite suppression. The risks to the auricular cartilage from this newly common technique are reviewed. **Conclusions:** Ear stapling is an increasingly common technique used by acupuncturists for weight loss. Otolaryngologists must be aware of this trend so they can be prepared to manage the possible complications and so that they can speak to the risks of the technique to their patients and for their community.

## 14. **Midline Attenuation of the Frontalis Muscle - An Anatomic Study and Discussion of Clinical Relevance**

Jeffrey H. Spiegel, MD, Boston, MA  
Ryan C. Goerig, BS, Boston, MA (Presenter)  
Todd Hoagland, PhD, Boston, MA  
Rebecca Luffler, BS, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the origin, insertion, activity, and significantly the amount and location of any midline attenuation of the frontalis muscle. Attendees will understand the clinical significance of this midline attenuation for facial plastic surgery procedures.

**Objectives:** To determine the location and amount of midline attenuation of the frontalis muscle and determine clinical landmarks for cosmetic surgery procedures including botulinum toxin injection. **Study Design:** An anatomic dissection of male and female preserved human cadavers. **Methods:** The foreheads of male and female cadavers were dissected to determine the location and extent of midline attenuation of the frontalis muscle. Averages for each gender are determined. **Results:** Frontalis muscle attenuation and its location relevant to external landmarks is presented. **Conclusions:** As some guides recommend treatments for the frontalis muscle that extend even to the midline of the forehead, we have performed an anatomic dissection of human cadavers to identify means for predicting the location of the midline attenuation.

#### **15. Day Float: An Alternative to the Night Float Coverage System for Residency Programs**

Amar C. Suryadevara, MD, Syracuse, NY  
Hootan Zandifar, MD, Syracuse, NY  
Marci Guyer, Syracuse, NY  
Robert M. Kellman, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the structure of a day float coverage system and see how it can be an alternative to night float for some residency programs.

**Objectives:** The Accreditation Council for Graduate Medical Education (ACGME) has mandated an 80 hour work week that has resulted in changes to many residency programs. In otolaryngology most programs have switched to either home call or night float systems. Our department covers all maxillofacial trauma and backup airway call, and this has made it difficult to employ a home call system. Instead of a night float coverage system our program implemented a day float coverage system. This allows for our residents to participate in a 24 hour call period. After call and sign out, the resident goes home; however, their clinical duties are covered by the day float resident. **Study Design:** A brief review of the literature pertaining to call coverage systems followed by a description of our day float system. Residents who have participated in a combination of night float, day float, or both systems were then surveyed regarding their experiences and/or perceptions. **Methods:** A nine question survey was handed out to our otolaryngology residents, and their responses were recorded and averaged. **Results:** The averaged responses strongly favor the day float to night float coverage system regardless of the level of training and systems the residents have participated in. **Conclusions:** The day float coverage system is favored by our program and has worked well. It allows for a more attending-like 24 hour period of call, continuity of care, attendance of educational activities, more time with family, and no prolonged void of clinical activities.

#### **16. Arteriovenous Malformation as a Cause of Intranasal Obstruction in an Infant**

Steven T. Wright, MD, Galveston, TX  
Seckin O. Ulualp, MD, Galveston, TX (Presenter)  
Patrick Adegboyega, MD, Galveston, TX  
Jean P. Font, MD, Galveston, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss causes of intranasal obstruction in an infant.

**Objectives:** Otolaryngologists are commonly asked to evaluate nasal obstruction in children. The aim of the present study was to describe clinical, radiologic, and histological features of an arteriovenous malformation as a rare cause of intranasal obstruction in an infant. **Study Design:** Case review. **Methods:** Chart of a male infant, 6 months of age, referred to a tertiary care pediatric hospital for assessment of nasal obstruction was reviewed. Data included relevant history and physical examination, diagnostic workup, and management. **Results:** The child has been having difficulty breathing thru the nose since the first day of life. Parents noticed that he has noisy breathing due to nasal obstruction, and the use of topical decongestant and saline did not relieve his nasal obstruction. As the child's breathing difficulty progressed, he became a mouth breather. At the time of presentation left nasal passage was obstructed by a mass located at the anterior portion of the inferior turbinate. CT images documented an irregular enhancing mass arising from the lateral aspect of the nasal cavity at the level of the left nasal bone and extending anteroinferiorly where the left naris was obstructed. Subsequently the mass showed homogenous enhancement with no intracranial abnormality in MR imaging. Upon resection of the mass thru intranasal approach histologic evaluation was reported as arteriovenous malformation. At 9 month followup the surgical site was healed with no evidence of mass lesion. **Conclusions:** Arteriovenous malformation, although uncommon, should be considered in the differential diagnosis of nasal obstruction in infants.

### **SINUS-RHINOLOGY, LARYNGOLOGY-BRONCHESOPHAGOLOGY**

## 17. Use of Mitomycin C in Prevention of Tracheal Cicatrix and Effect Subsequent Tracheal Resection

W. J. Azeredo, MD, Syracuse, NY

Jack M. Hsu, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to assess effects of mitomycin C on wound healing after tracheal resection.

**Objectives:** To determine whether prior treatment of stenotic tracheal segment interferes with healing after subsequent tracheal resection. To determine the extent that mitomycin C treatment effects the surrounding untreated tissue. **Study Design:** Retrospective chart review and literature search. **Methods:** Retrospective review of five patients with tracheal stenosis who underwent tracheal dilation with mitomycin C treatment. One patient required a subsequent tracheal resection. The histopathology of the trachea from this case was compared to a resected trachea from a non-mitomycin treated patient. **Results:** In this case series, mitomycin C treatment after ablation of tracheal stenosis resulted in significant reduction in cicatrix formation in a majority of patients. In the one treatment failure, prior mitomycin treatment did not appear to have any effect on subsequent wound healing post-tracheal resection. **Conclusions:** The use of mitomycin C can prevent the reformation of tracheal cicatrix in light of the results presented here. Its use does not preclude effective wound healing if subsequent tracheal resection is undertaken.

## 18. Atypical Presentation of Metastatic Melanoma of the Larynx

Naveen D. Bhandarkar, MD, Chicago, IL

H. Steven Sims, MD, Chicago, IL (Presenter)

Benjamin C. Johnson, MD, Chicago, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain rationale for aggressive investigation of laryngeal symptoms in patients with history of metastatic melanoma and describe treatment options.

**Objectives:** To present a rare case of metastatic melanoma to the larynx, review the literature, and propose methods to improve functional outcome. **Study Design:** Case report and review of literature. **Methods:** A 72 year old male presented with chief complaint of shortness of breath but also had mental status changes which initiated alternate workup initially. The patient had a history of malignant melanoma excised from the left arm 5 years prior to presentation. Two months following presentation, flexible bronchoscopy was performed to evaluate pulmonary findings. During passage the patient was found to have a pedunculated supraglottic pigmented lesion. When questioned later, the patient admitted to 8 months of vocal disturbance prior to admission. **Results:** Microdirect laryngoscopy revealed a 2 cm dark brown-purple well circumscribed pedunculated lesion that arose from the mucosa comprising the right false vocal fold and created a partial airway obstruction anteriorly. Excision was performed with carbon dioxide laser with intent of palliation and restoration of voice given the patient's disseminated disease status. The patient exhibited symptomatic improvement within 2 days following excision and avoided with no morbidity of more aggressive therapy. Histology confirmed metastatic melanoma. **Conclusions:** We recommend aggressive investigation of symptoms related to the larynx in patients with a history of malignant melanoma. Early detection and treatment is preferred to optimize functional outcome.

## 19. Connexin Genes 26 and 30 Mutation in Patients With Chronic Rhinosinusitis

Nicolas Y. Bu-saba, MD, Boston, MA

Michael J. Cunningham, MD, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the potential role of connexin gene mutations in mucociliary clearance dysfunction and the pathogenesis of chronic rhinosinusitis.

**Objectives:** Connexin genes play a role in cell to cell signaling. Mutations in these genes may potentially lead to mucociliary clearance dysfunction predisposing to chronic rhinosinusitis (CRS). The objective of this study is to determine the prevalence of connexin genes 26 and 30 mutations in patients with chronic rhinosinusitis. **Study Design:** Prospective case series. **Methods:** This is a prospective case series of 25 consecutive patients (6 children and 19 adults) who were diagnosed with chronic rhinosinusitis without nasal polyposis at a single tertiary care facility over a 3 month period. Patients with known mucociliary clearance dysfunction or cystic fibrosis were excluded. DNA from buccal swabs was sequenced for connexin genes 26 and 30. Data collected included age, gender, duration of disease and age at onset, history of otitis media, history of sensorineural hearing loss, and family history of CRS and/or hearing loss. **Results:** There were no detected mutations in connexin 30 gene in our study population. Two patients (8%), one male and one female, had mutations in connexin gene 26, but the two mutations were different. One of the patients with a connexin 26 mutation had a positive family history for CRS but no hearing loss or ear disease. Both patients were adult (> 18 years old). **Conclusions:** Connexin genes 26 and 30 mutations are rare in patients with CRS. Mutations in these connexin genes do not seem to play a role in the pathogenesis of CRS.

## 20. Congenital Arhinia—The Bosma Syndrome

Nathan P. Christensen, MD, Rochester, NY  
James A. Hadley, MD, Rochester, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the features of arhinia and the Bosma syndrome and be able to describe different methods of management that have been reported in the literature.

**Objectives:** 1) Describe the features and diagnosis of Bosma arhinia microphthalmia syndrome; 2) outline different reported algorithms with regard to immediate diet and airway management; and 3) discuss reported surgical reconstruction of the midface. **Study Design:** Case report and literature review. **Methods:** Case report and literature review. **Results:** Not applicable. **Conclusions:** Congenital arhinia is a very rare phenomenon. To date only 31 cases have been described in the world literature. The syndrome of Bosma arhinia microphthalmia is associated not only with arhinia, but with a host of other abnormalities. Management of certain key issues of this condition is of preeminent concern to the physician and family. These include airway and diet management, midface reconstruction, and social issues. This interesting case will be presented as well as a description of current management.

## 21. Coblation of the Canine Vocal Fold

Venu Divi, MD, Detroit, MI  
Michael S. Benninger, MD\*, Detroit, MI  
Allison M. Dobbie, BS, Detroit, MI  
Matti Kiupel, BS DVM VMD PhD, East Lansing, MI

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the histologic findings of initial injury and the subsequent healing associated with application of coblation to the canine vocal fold.

**Objectives:** This is the first study performed to determine the effects of coblation and the subsequent healing on the canine vocal fold. **Study Design:** A canine animal model was used. **Methods:** 4 canines had coblation of the left vocal fold. Stroboscopic evaluations were performed prior to the animals being sacrificed at 0, 4, 7, and 28 days. The larynges were then harvested and sent for histologic examination. The tissue was stained for inflammatory cells (H&E, Geimsa, CD79a, CD18, and CD3), collagen (trichrome), elastin (silver), and hyaluronic acid (alcian blue). **Results:** Examination of the vocal fold demonstrated an injury limited to the lamina propria, sparing the underlying muscle. Injury is noted to extend along the basement membrane lateral to the crater of injury. Neutrophils and macrophages are noted in the first 7 days of healing though no lymphocytes were noted during any stage of tissue repair. Re-epithelialization was begun by POD #4 and was completed by POD#7. Collagen was noted to be disorganized and bundled particularly in the periphery of the wound. Elastin fibers were initially broken and thinned after initial injury and demonstrated disorganized bundling and accumulation at the periphery of the wound over the first 7 days. Blinded stroboscopic evaluation demonstrated symmetric vocal fold vibration by POD #7. **Conclusions:** Coblation is a method of removing tissue from the upper aerodigestive tract which demonstrates injury limited to the lamina propria. Healing appears comparable with other forms of vocal fold injury. Further clinical studies are warranted to determine the use of coblation in removal of laryngeal lesions.

## 22. Transcutaneous Injection Laryngoplasty With Calcium Hydroxylapatite for Glottic Incompetence Dysphonia Due to Unilateral Vocal Fold Paralysis: Comparison With Cymetra Injection Laryngoplasty and Type I Thyroplasty

Murtaza T. Ghadiali, MD, Miami, FL  
Debbie E. Joseph, BS, Miami, FL  
Donna S. Lundy, PhD, Miami, FL  
Roy R. Casiano, MD PhD\*, Miami, FL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the use of calcium hydroxylapatite in the management of unilateral vocal fold paralysis and compare the results obtained with this technique to those obtained with type I thyroplasty and Cymetra vocal fold augmentation.

**Objectives:** To evaluate and compare the results of transcutaneous calcium hydroxylapatite (CaHA) injection laryngoplasty versus results with Cymetra injection and type I thyroplasty in patients with glottic incompetence dysphonia due to unilateral vocal fold paralysis. **Study Design:** Retrospective chart review at a tertiary referral center. **Methods:** Eight patients treated with CaHA vocal fold augmentation between 2004 and 2005 were included. Two control groups of individuals, age and sex matched that had previously undergone type I thyroplasty and Cymetra vocal fold augmentation were also included. Specific voice outcome parameters including glottic closure, maximal phonation time and the Voice Handicap Index (VHI) were measured and compared across all three groups both preoperatively and 1 month after surgical intervention. **Results:** Significant improvement in all three parameters including glottal closure ( $p=0.0008$ ), maximal phonation time ( $p=0.02$ ), and VHI ( $p=0.0008$ ) was noted after CaHA injection 1 month postoperatively. Data obtained with CaHA injection was comparable to both control groups, type I thyroplasty and Cymetra injection laryngoplasty. Furthermore the results obtained with CaHA were not significantly different ( $p>0.05$ ) when compared to the two control groups.

**Conclusions:** Transcutaneous injection laryngoplasty with calcium hydroxylapatite is a valuable tool for effective vocal fold augmentation in patients with glottic incompetence dysphonia secondary to unilateral vocal fold paralysis, especially when compared to other therapeutic modalities including type I thyroplasty and Cymetra augmentation. Long-term effectiveness of this therapy needs to be examined in future studies.

### 23. **Diagnosis and Treatment of Candida as a Cause of Invasive Fungal Sinusitis**

Parul Goyal, MD, Syracuse, NY  
Man-Kit Leung, MD, Stanford, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the pathogens commonly responsible for invasive fungal sinusitis, describe the criteria for the diagnosis of invasive fungal sinusitis, and describe the treatments available to treat invasive fungal sinusitis.

**Objectives:** Invasive fungal sinusitis is a life threatening process seen most commonly in immunocompromised patients. A variety of fungal pathogens can be responsible for the disease process, with aspergillus and mucor species being the most commonly implicated organisms. Candida species are part of the normal flora in humans, but can also lead to invasive fungal sinusitis. **Study Design:** Case report. **Methods:** Records of a patient with invasive fungal sinusitis were reviewed. **Results:** Candida was identified as the causative organism in a patient with invasive fungal sinusitis based on detailed examination of histology and culture data. The patient was treated with a combination of surgical debridement and antifungal medications, but the disease followed a rapidly progressive course. **Conclusions:** Accurate identification of the causative organisms in patients with invasive fungal sinusitis is important in determining prognosis and treatment. Because candida species are part of the normal human flora, it can be difficult to determine whether they are pathogenic organisms in cases of invasive fungal sinusitis. Knowledge of fungal morphology and growth patterns are important in making an accurate diagnosis. Characteristics of candida on histologic examination include the presence of two cell bifurcations and globose appearing cells. These characteristics, in conjunction with culture data, provide the basis for identification of candida as a cause of invasive fungal sinusitis. Candida invasive fungal sinusitis can follow a fulminant course, and treatment may require aggressive surgical debridement and appropriate antifungal therapy. Candida should not be ignored as a possible pathologic organism in cases of invasive fungal sinusitis.

### 24. **Invasive Sinonasal Mucormycosis: Case Reports of Rare Chronic Presentation and Review of Literature**

Hosai N. Hesham, MD, Washington, DC  
Stanley Chia, MD, Washington, DC  
Ziad Deeb, MD\*, Washington, DC

**Educational Objective:** At the conclusion of this presentation, the participants should understand the presentation, diagnosis, and currently accepted treatment modalities of both acute and chronic sinonasal mucormycosis.

**Objectives:** Mucormycosis primarily affects diabetics and immunocompromised individuals. It is known best for its acute presentation often progressing rapidly to orbital or intracranial invasion. Chronic mucormycosis, however, is an extremely rare presentation of this disease process. We present two cases of chronic sinonasal mucormycosis with successful surgical and medical treatment. New insight in pathophysiology and adjuvant therapy will also be presented. **Study Design:** Case reports and review of literature. **Methods:** Case reports of two patients with chronic mucormycosis are presented. Patient 1 presented with a one month history of hard palate and gingival erosion and complete necrosis of the maxilla extending to the skull base. Patient 2 presented with a three week history of proptosis and abscesses of the pterygopalatine fossa and masticator space. Intraoperative biopsies were consistent with mucormycosis. Both patients were treated successfully with aggressive surgical debridement and intravenous amphotericin. **Results:** Chronic invasive mucormycosis is an extremely rare presentation of a typically acute and fulminant process. Mucormycosis most commonly presents in a host with a compromised immune system. Neutropenia or dysfunctional phagocytes lead to increased risk of infection. Hyperglycemia, acidosis, steroids, and elevated serum iron inhibit phagocyte function. Aggressive surgical debridement and antifungal therapy are mainstays of therapy. Hyperbaric oxygen and cytokine therapy can also be considered. The role of iron in inhibiting phagocyte function suggests the possibility of utilizing effective iron chelators as adjunctive therapy. **Conclusions:** Invasive mucormycosis on rare occasions can present as an indolent disease process. The key to treatment is early diagnosis, surgical debridement, and intravenous antifungals.

### 25. **Superolateral Subperiosteal Abscess of Orbit**

Xinyan Huang, MD PhD, Springfield, IL  
Robert E. Finch, MD, Springfield, IL  
Stuart R. Farris, MD, Springfield, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand that frontal sinusitis can result in a superolaterally located orbital subperiosteal abscess and be aware that a different operative approach is required.

**Objectives:** Orbital complications of sinusitis generally occur as a consequence of ethmoid and/or maxillary sinusitis. We report a case of subperiosteal abscess in the superolateral orbital wall complicating frontal sinusitis. **Study Design:** Case report. **Methods:** A case report with literature review. **Results:** A 45 year old male presented with a one week history of progressive right eye pain and swelling two weeks after septoplasty and inferior turbinates reduction at an outline hospital. Clinical exam revealed right eye proptosis with inframedial deviation, upper eyelid ptosis, decreased vision, and intact extraocular motility. CT showed right pansinusitis and right superolateral orbital subperiosteal abscess. An anterior orbitotomy and endoscopic frontal sinuotomy with trephination were performed. Right superolateral orbital subperiosteal abscess was confirmed, and a bony defect in the orbital roof coincident with the frontal sinus floor was identified. Right vision and proptosis were fully recovered during postoperative period. There was no recurrence at six month followup. **Conclusions:** Frontal sinusitis which generally occurs in the setting of pansinusitis can result in a superolaterally located orbital subperiosteal abscess. This is presumably due to disease extension through congenital bony dehiscence in the frontal sinus floor and from septation of the frontal sinus which loculates the abscess laterally. Clinicians should be aware of this variation of orbital subperiosteal abscess as a different operative approach is required, and surgical attention to the frontal sinus is recommended.

## 26. Outcomes of Office Pulse Dye Laser Treatment for Benign Laryngeal Lesions

Chandra M. Ivey, MD, New York, NY  
Peak Woo, MD\*, New York, NY  
Stanley M. Shapshay, MD\*, Albany, NY  
Minoru Iida, MD, New York, NY  
Kenneth W. Altman, MD PhD\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the efficacy of in-office pulse dye laser for treatment of benign laryngeal lesions.

**Objectives:** Pulse dye laser (PDL) has been used for cutaneous vascular lesions due to the selective angiolytic effects at 577-595nm wavelengths. PDL has been used in otolaryngology to treat laryngeal papilloma, dysplasia, and granuloma. This study analyzes whether there is differential efficacy with PDL treatment of laryngeal polyp, papilloma, keratosis, and scar. **Study Design:** Retrospective case series review of 40 consecutive patients treated with PDL from 1/06-7/06. **Methods:** In-office PDL treatment were performed using a 585nm laser (450us pulse duration, 0.75-1.0J, spot size of 1-10mm). Lesions were analyzed based on type (polyp/papilloma/keratosis/scar), size (large/small), color (red/white), and total power of treatment (joules x pulse#). ANOVA and unpaired t-test were used ( $p \leq 0.05$ ) for analysis of these factors versus treatment response ( $>50\%/<50\%$  resolution). We hypothesize 1) PDL is more effective at treating red lesions; and 2) small lesions are more effectively treated. **Results:** Thirty-three cases with followup were analyzed [polyp (11), papilloma (9), keratosis (9), scar (4)]. Power ranged from 24-147J (mean 65J). Smaller lesions showed greater improvement than larger lesions ( $p=0.043$ ). While there was no statistical significance for total red versus white lesions ( $p=0.67$ ), small polyps were most likely to improve after PDL treatment in contrast to larger papillomatous lesions ( $p=0.003$ ). Keratosis also failed to show complete lesion resolution. There were no noted complications related to laser treatment. **Conclusions:** PDL seems most beneficial for small vascular polyps but can be safely used on many laryngeal lesions. Office use of PDL for photoangiolytic effect is an effective treatment alternative over microlaryngoscopy for small vascular lesions of the vocal folds.

## 27. Efficacy of a Portable, Audible Only EMG Device in the Treatment of Spasmodic Dysphonia

Benjamin T. Jeffcoat, MD, Jackson, MS  
John M. Schweinfurth, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss available options for EMG guidance of therapeutic neuromuscular injection.

**Objectives:** To determine the efficacy of a portable, audible only EMG device in the treatment of spasmodic dysphonia (SD). **Study Design:** Prospective, cohort study. **Methods:** Patients with at least a one year history of consistent treatment for adductor SD were consecutively enrolled. All injections were performed by the senior author using a portable, audible only EMG monitor (Accuguide, Xomed, Jacksonville, FL). A "missed" injection was defined as a lack of subjective or objective change in voice quality within the 2 weeks following injection. **Results:** A total of 38 patients were treated with intramuscular botulinum toxin injection under EMG guidance over the study period. Thirteen patients met our inclusion criteria and underwent multiple injections using EMG guidance. Out of a total of 85 injections, there were 9 "missed" injections for a "miss rate" of 10.5%. One patient was noted to have 3 missed injections, all on the same side. Excluding this patient, the rate fell to 8.3%. **Conclusions:** The use of a portable, audible only EMG monitoring device provides an acceptably low "miss rate" for botulinum toxin injection in adductor SD. This technique is more economical and more easily adapted by the practitioner who does not have access to the EMG monitoring services of a neurologist.

## 28. An Unusual Presentation of Unilateral Nasal Obstruction in an Adult

Arjun S. Joshi, MD, Washington, DC  
Neil S. Tanna, MD, Washington, DC  
Douglas R. Sidell, BS, Washington, DC  
Valerie A. Asher, MD, Silver Spring, MD

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the manifestations of acquired choanal atresia in adulthood and discuss appropriate treatment options for this rare condition.

**Objectives:** Choanal atresia or choanal stenosis is a congenital anomaly which most commonly manifests during infancy. When found in adults, it is usually associated with a prior history of radiation therapy to the nasopharynx or surgical trauma. Our objective is to discuss an unusual occurrence of choanal atresia in an adult patient without a history of prior risk factors. After this presentation, the participant should be able to recognize when further workup for affected patients is necessary. **Study Design:** A retrospective chart review of one patient with acquired choanal atresia followed by a discussion of recent literature. **Methods:** This case report discusses our management of an otherwise healthy adult female with complete unilateral nasal obstruction of several years duration who was subsequently diagnosed with choanal atresia. **Results:** An otherwise healthy 55 year old female with unilateral nasal obstruction of several years duration had been unsuccessfully treated with antibiotics for a presumptive diagnosis of chronic sinusitis. The patient's nasal breathing before symptom onset was reportedly normal. The patient is a good historian and denied any prior radiation exposure, nasal surgery, or chronic inflammatory disorders. After presenting to our clinic nasal endoscopy revealed complete choanal atresia on the right side with moderate stenosis of the left choana. The patient was subsequently taken to the operating room for transnasal endoscopic repair with a successful outcome. To the best of our knowledge this is the first case of idiopathic acquired choanal atresia reported in the literature. **Conclusions:** Choanal atresia is a rare benign congenital anomaly that typically presents during infancy. It is occasionally found in adults who have undergone radiation, nasal surgery, or in those who have chronic inflammatory disorders. The diagnosis should be suspected if patients fail to improve after medical therapy for nasal obstruction and endoscopic examination should be performed. Surgical treatment is generally curative.

## 29. Lymphangioma of the Hypopharynx Previously Misdiagnosed as Gastroesophageal Reflux Disease

Arjun S. Joshi, MD, Washington, DC  
Neil S. Tanna, MD, Washington, DC  
Steven A. Bielamowicz, MD\*, Washington, DC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the manifestations of laryngeal lymphangiomas and be able to discuss appropriate treatment options for affected patients.

**Objectives:** Lymphangiomas are rare benign congenital lymphatic malformations that typically present during childhood and rarely involve the larynx. After this presentation the participant should be able to recognize when further workup for affected patients is necessary and discuss the various treatment options for laryngeal lymphangiomas. **Study Design:** Retrospective chart review of one patient followed by a discussion of the literature. **Methods:** We present a case report and discuss our management of an otherwise healthy adult female with globus and intermittent dysphagia for several months who was subsequently diagnosed with a hypopharyngeal lymphangioma. **Results:** An otherwise healthy adult female with globus and intermittent dysphagia for several months had been unsuccessfully treated with a longstanding diagnosis of gastroesophageal reflux. She diagnosed with a hypopharyngeal lymphangioma, and underwent surgical resection. The patient's symptoms resolved after a brief hospitalization, and followup has been promising, without evidence of recurrence. To the best of our knowledge, this is the second case of hypopharyngeal lymphangioma ever reported in the literature, and the first case reported in an adult in North America. **Conclusions:** Lymphangiomas are rare benign congenital lymphatic malformations that typically present during childhood and rarely involve the larynx. They can present with common symptoms which may lead to misdiagnosis as in this case. They should be suspected if patients fail to improve after medical therapy, and especially if patients' symptoms worsen while on medication. Surgical excision is usually the only viable option for lesions in this anatomic location.

## 30. Coregistered Positron Emission Tomography and Computed Tomography (PET/CT) Evaluation of Sinonasal Inverted Papilloma

Julian Kertsman, BS, Newark, NJ  
Erik G. Cohen, MD, Newark, NJ (Presenter)  
Soly Baredes, MD\*, Newark, NJ  
Lionel S. Zuckier, MD, Newark, NJ  
Yiyan Liu, MD, Newark, NJ  
Nasrin V. Ghesani, MD, Newark, NJ

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the potential application of PET/CT to the evaluation of patients with sinonasal inverted papilloma.

**Objectives:** The extent of sinonasal inverted papilloma may be difficult to determine by conventional imaging. CT and MRI often cannot differentiate tumor from scar tissue and mucosal thickening. The objective of this study is to describe coregistered 18-FDG positron emission tomography and computed tomography (PET/CT) findings in patients with sinonasal inverted papilloma. This represents the first report of PET or PET/CT used for evaluation of sinonasal papilloma. **Study Design:** Retrospective consecutive case series. **Methods:** Patients with biopsy proven sinonasal inverted papilloma without evidence of malignant transformation were identified. Patients who underwent PET/CT scan prior to definitive treatment were included. Medical records, PET/CT scans, and pathology findings were reviewed. PET/CT scans were evaluated in blinded fashion. Nuclear medicine physician interpretation and standardized uptake value (SUV) were determined. **Results:** Four patients were identified who had biopsy proven sinonasal inverted papilloma who underwent PET/CT prior to definitive treatment. Three patients had newly diagnosed disease and one patient had recurrent disease. All 4 patients had positive PET/CT scans. Two scans revealed extremely intense radiotracer uptake with mean SUV of 40 and 14 and maximum SUV of 43 and 17 respectively. Two scans revealed moderate radiotracer uptake with mean SUV of 2.2 and 3.3 and maximum SUV of 3.5 and 4.6 respectively. **Conclusions:** PET/CT scan may be useful in the evaluation and followup of patients with sinonasal inverted papilloma. Radiotracer uptake is demonstrated in a series of tumors which may be extremely intense in some cases.

### 31. Management of Thyroplasty Failures With Revision Medialization Laryngoplasty and Arytenoid Adduction

J. Michael King, MD, San Antonio, TX  
C. Blake Simpson, MD, San Antonio, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the common causes of framework surgery failures and options for managing them.

**Objectives:** Evaluate the cause of framework surgery failures requiring surgical revision, determine their management, and report the voice outcomes of revision medialization laryngoplasty (ML) and/or arytenoid adduction (AA). **Study Design:** Retrospective cohort. **Methods:** Retrospective chart review of all revision ML +/- AA performed by the senior author at a single institution in the last ten years. Patients' subjective voice outcomes as well as pre- and postoperative VHI 30/VHI 10 outcomes were obtained. Charts were further reviewed to include type of material/method of original framework surgery, reason for failure, and subsequent management of each case. **Results:** A total of 21/142 patients underwent 23 revision ML +/- AA surgeries. A 10% revision rate (12/116 cases) was noted by the senior author, and the remaining 9 patients were referrals from other physicians. Most revisions were explained by under- and over-medialization: 5/23 and 4/23, respectively. Other reasons for failure include implant shifting/migrating (3/23) and persistent posterior VF gap (3/23). Seventeen of 21 patients (81%) reported improvement in their voice after revision. Only 9/23 (39%) revisions required AA while 12/23 (52%) required revising the cartilage window or reshaping the implant. Two of 23 (7%) revisions needed contralateral ML and 2/23(7%) required removal of the AA suture or implant. **Conclusions:** ML revision rates (10%) at our institution are similar to previous reports. Although AA is frequently required in revision framework surgery, a wide variety of surgical errors associated with ML can be corrected by reshaping the implant and adjusting the window position that may obviate the need for AA.

### 32. Diagnosis and Management of a Misplaced NG Tube Into the Pulmonary Pleura

Jamie O. Lo, MD, Portland, OR  
Vivian A. Wu, MD, Portland, OR  
Douglas A. Reh, MD, Portland, OR  
Shrinath A. Nadig, MD, Portland, OR  
Mark K. Wax, MD, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the management of NG tube placement complications and the proper method of determining correct placement.

**Objectives:** A significant number of patients receiving surgery for disorders of the head and neck will receive Dobbhoff tube, or NG tube, placement. This placement may be for the short-term, to get them over a critical illness, or for the long-term when the patient will require nutritional supplement for an extended period of time. These feeding tubes may be placed in the operating room under an anesthetic or at the bedside in a regular hospital setting. Many methods of monitoring the correct placement of the feeding tube have been described. Recently, our institution has seen three cases of feeding tubes placed in to the lungs or pleural space, including one on the otolaryngology service. **Study Design:** Case series. **Methods:** Retrospective review of a case series and review of the literature. **Results:** We will use this patient's presentation and subsequent hospital course to demonstrate a paradigm for ascertaining correct placement of feeding tubes. **Conclusions:** While the most common complications of nasogastric tube placement are related to the long-term effects of feeding, nausea, etc., placement in the lungs or in the pleural space has been recognized in less than 1%. This sequelae of an unrecognized misplaced feeding tube leak are pneumonitis, pneumonia, and pleural effusions with possibility of empyema. Current management of the misplaced tube, should feedings be put in to the lungs or pleural space, will be described.

### 33. Unsedated Flexible Fiberoptic Bronchoscopy in the Resident Clinic: Technique and Patient Satisfaction

Luc G. Morris, MD, New York, NY  
Milan R. Amin, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants will understand a simple technique for tracheobronchoscopy using topical anesthesia in an awake patient, the technique's indications and limitations, and patient preferences concerning this procedure.

**Objectives:** To describe a safe and simple technique for office bronchoscopy which does not require sedation or specialized instrumentation, and to evaluate patient satisfaction with this technique. **Study Design:** In selected patients unsedated flexible fiberoptic bronchoscopy was performed by otolaryngology residents in clinic. Patient satisfaction was assessed using a short questionnaire. **Methods:** A technique for comfortable, unsedated endoscopy of the tracheobronchial tree is described. Required instruments are a standard flexible fiberoptic laryngoscope, a video system, a red rubber catheter, and 4% lidocaine. Transcricothyroid lidocaine injection was added in a minority of cases. This technique was assessed in the resident clinic with a patient questionnaire focusing on patient discomfort with the topicalization and endoscopy as well as relative preference for alternatives such as sedated endoscopy or CT imaging. **Results:** All patients tolerated the procedure well under topical anesthesia, and none required nerve blocks or sedation. Patients rated their discomfort as minimal, and all indicated they preferred this procedure to either sedation or a CT scan as alternatives. **Conclusions:** This technique is quickly taught and easily performed in the resident clinic. It is safe and requires no special instruments. Patients are generally satisfied with the procedure and prefer it to alternative methods of airway evaluation.

### 34. **WITHDRAWN**

#### **Vidian Nerve Schwannoma: Endoscopic Transnasal Removal**

Patrick D. Munson, MD, Rochester, MN  
Jan L. Kasperbauer, MD\*, Rochester, MN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate understanding of radiologic findings of a vidian nerve schwannoma and explain the surgical steps for endoscopic removal of this mass. They should be able to discuss the incidence and management of head and neck schwannomas.

**Objectives:** To describe the removal of a vidian nerve schwannoma endoscopically, to review schwannomas of the head and neck. **Study Design:** Retrospective case review of the endoscopic transnasal removal of a left vidian nerve schwannoma in a single patient. **Methods:** The history, physical, preoperative imaging, surgical, pathologic, and postoperative findings of the patient are reviewed. Schwannomas of the head and neck are discussed. **Results:** A 53 year old man presented with a one year history of intermittent, treatment resistant headache. Physical exam was nonspecific with neither facial nerve deficit nor sensory deficits in cranial nerve V distribution. Nasal endoscopy was unremarkable. Head CT scan revealed a 3 cm ovoid soft tissue mass centered at the pterygopalatine fossa and the expected location of the vidian canal. MRI confirmed a well circumscribed soft tissue mass with no significant vascularity consistent with schwannoma. The patient underwent image guided endoscopic transnasal surgery for tumor biopsy and removal. The mass was found within the pterygopalatine fossa and frozen section suggested schwannoma of the vidian nerve. The mass was exenterated piecemeal from the fossa. Permanent pathology confirmed schwannoma with diffuse expression of S-100. The only postoperative complaint was diminished lacrimation effectively treated with artificial tears. **Conclusions:** This is the believed to be the second documented case of a vidian nerve schwannoma and the first to be removed via the endoscopic transnasal route. Schwannomas may originate from any peripheral, cranial, or autonomic nerve.

### 35. **Long-Term Followup Analysis of the Superior Rhinotomy Approach for the Resection of Bilateral Ethmoid Tumors With Intracranial Extension**

Sabina Omerhodzic, MD, New York, NY  
Benjamin Malkin, MD, Astoria, NY (Presenter)  
Guy Lin, MD, New York, NY  
William Lawson, MD\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate a full understanding of the indications, technical details, and complications associated with the superior rhinotomy approach.

**Objectives:** To determine the locoregional control rate and short- and long-term complications associated with the superior rhinotomy approach for resection of bilateral ethmoid sinus tumors with intracranial extension. **Study Design:** Our retrospective study analyzes 17 consecutive patients who were evaluated and operated in our institution between 1989 and 2005. All patients underwent a superior rhinotomy with craniofacial resection for bilateral ethmoid tumors with intracranial invasion. **Methods:** The medical records of 17 consecutive patients who underwent superior rhinotomy for resection of bilateral ethmoid tumors were reviewed retrospectively to determine locoregional control and complications associated with this approach. **Results:** Postoperative complications were broken down into 3 categories: intracranial, orbital and nasofacial. Oncologic locoregional control rates are comparable to alternative open cranio-

facial approaches. In this series of patients there were no permanent neurologic sequelae, loss of vision, or deaths resulting from this operation. Patients reported satisfactory long-term cosmetic results. **Conclusions:** The superior rhinotomy approach offers a wide and safe exposure for en block craniofacial resection of bilateral ethmoid sinus tumors with cribriform plate infiltration.

### **36. The Perils of Tracheal Resection for Subglottic Stenosis Associated With Wegener's Granulomatosis**

Frederick C. Roediger, MD, San Francisco, CA

Mark S. Courey, MD\*, San Francisco, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the importance of Wegener's granulomatosis in the differential diagnosis of subglottic stenosis, understand safe management of this condition, and critically evaluate the role of tracheal resection.

**Objectives:** To examine the clinical histories of Wegener's granulomatosis patients with narrowed upper airways, review treatment options, and discuss complications of open surgical intervention. **Study Design:** Case series review. **Methods:** The clinical courses of two patients with subglottic stenosis secondary to Wegener's granulomatosis who previously underwent tracheal resection are presented. Endoscopic images of the postresection larynges and operative findings for one patient who underwent microdirect subglottoscopy are analyzed. Voice and respiratory outcomes are described. **Results:** Both patients had approximately three year histories of dyspnea on exertion before undergoing tracheal resection at an outside hospital. Operative findings described subglottic involvement, yet partial cricoid resection was not undertaken by the outside physician. Recurrent symptoms developed in three months and one year, respectively, with subglottic narrowing to 50% of its normal contour in both patients on our initial evaluation. One patient had improved breathing following microdirect subglottoscopy with laser radial incisions and dilation, while the other expired one month after her first visit from an acute mucous plugging event. **Conclusions:** Wegener's granulomatosis can present with subglottic stenosis, in isolation or with active systemic disease. Tracheal resection confers a significant risk and does not address the primary area of the airway involved by the disease process. Safer and more efficacious treatment methods exist to manage the airway manifestations of this challenging disease.

### **37. Aspiration of a Capsule Endoscope and Description of Retrieval Technique**

Ali Sepehr, MD, Orange, CA

William B. Armstrong, MD\*, Orange, CA

Gregory C. Albers, MD, Orange, CA

David E. Vokes, MD, Orange, CA

Amir M. Karam, MD, Orange, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the otolaryngologic complication of capsule endoscope aspiration and its rapid definitive diagnosis and management.

**Objectives:** The objective of this project is to introduce the possible complication of capsule endoscope aspiration to the specialty of otolaryngology, identify risk factors, and recommend methods for diagnosis and management of this complication. **Study Design:** This is a descriptive study including a case report with review of the literature. **Methods:** A case of capsule endoscope aspiration is described. A Pubmed and Medline literature search was performed using the terms "capsule", "endoscope", and "aspiration". In addition, the bibliography sections of the articles found were used to identify additional articles. **Results:** There were only three reports of capsule endoscope aspiration and none in otolaryngology literature. In two of the three the patient was able to cough up the capsule. In the third the capsule had to be removed. In our patient the capsule had to be removed. The images from the capsule made the definitive diagnosis, and the capsule was removed in the operating room using a retrieval basket. **Conclusions:** Advanced age, poor general condition with dehydration or myopathy, dysphagia, poor dentition, alcohol or drug use, and neurologic disease are risk factors for capsule endoscope aspiration. One must have a high level of suspicion for aspiration in a patient with coughing, the sensation of the capsule being "stuck in the throat," or any persistent symptom localizing to the larynx, pharynx, or esophagus. Downloading video from the capsule endoscope is a novel, easy, rapid, and direct method of localizing its position. Due to its large size and smooth surface an expandable basket is helpful in its retrieval.

### **38. Type I Posterior Glottic Stenosis Secondary to Ossified and Dense Fibrous Bands: A Report of Two Cases**

Peter E. Seymour, MD, Philadelphia, PA

Joseph R. Spiegel, MD, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate an understanding of posterior glottic stenosis (PGS) and its management with special attention to mature, type I PGS due to dense fibrous and ossified interarytenoid bands.

**Objectives:** To review posterior glottic stenosis and describe the successful, minimally invasive management of two cases of dense

fibrous and ossified interarytenoid bands. **Study Design:** Chart review. **Methods:** Illustrative case report and literature review. **Results:** Posterior glottic stenosis (PGS) is a potential complication of prolonged endotracheal intubation. Additional confounding variables include traumatic intubations, multiple intubations/extubations, larger diameter endotracheal tubes, and local infections. PGS is classified into four types. Type I describes an interarytenoid band between the vocal folds that is anterior and isolated from the posterior interarytenoid mucosa. Type I PGS can be managed with open or endolaryngeal procedures. We present two cases of mature type I PGS identified in adults presenting with complaints of persistent dyspnea and dysphonia following prolonged intubations. One case revealed type I PGS secondary to a dense fibrous band. The second case was due to an ossified interarytenoid band. Both cases were treated successfully with endolaryngeal procedures. The first case was treated with sharp surgical excision while the second patient underwent CO2 laser excision of the calcified band and application of mitomycin C. Both patients have experienced a return to their premorbid condition. **Conclusions:** Type I posterior glottic stenosis can develop from prolonged intubation. Mature interarytenoid bands can be comprised of dense fibrous tissue or, very rarely, calcified tissue. We believe this to be the first reported case of a calcified type I PGS. These lesions can be managed successfully via an endolaryngeal approach without the need for prolonged endotracheal intubation, tracheotomy, or laryngeal stent.

### 39. Complete Bronchial Stricture and Associated Airway Management Challenges

Taha Z. Shipchandler, MD, Cleveland, OH

Paul R. Krakovitz, MD, Cleveland, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize signs of bronchial stricture/atresia and discuss the possible airway management strategies.

**Objectives:** The purpose of this report is to demonstrate a unique case of severe bronchial stricture and discuss the associated diagnostic and airway management challenges. **Study Design:** Case report. **Methods:** Literature review. **Results:** A 15 year old male with a history of renal transplantation 1 year prior presented with a ten day history of progressive cough and shortness of breath necessitating ventilator support. CXR and computed tomography (CT) showed complete whiteout of the left lung with some areas of hyperinflation of the left upper lobe. Subsequent flexible and rigid bronchoscopy noted a narrowed left mainstem bronchus with no evidence of an intact lumen. After failed attempts at medical treatment and dilation, the patient underwent a left pneumonectomy. He was ultimately discharged home in good condition. Bronchial strictures are rare phenomenon with oftentimes unclear etiologies. Atresia of bronchi is even rarer, usually occurring in young males, and may go undiagnosed for 30 years until clinical symptoms occur. Treatment of narrowed segments may involve medical treatment of infectious agents, stent placement, dilation and sleeve resection. Treatment of atresia or severe stricture may necessitate resection of lung distal to the affected region. **Conclusions:** Bronchial strictures and atresias may go undiagnosed for years before pulmonary symptoms occur. CT and bronchoscopy with biopsies represent the mainstays of diagnosis. Regional lung hyperinflation and peribronchial translucency may hint at bronchial atresia. Treatment paradigms vary from dilation and stent placement to resection of the affected areas. In the absence of a clear etiology for lung whiteout, severe bronchial stricture or atresia should be considered as a possibility.

### 40. Pleomorphic Hyalinizing Angiectatic Tumor of the Maxillary Sinus

Mobeen A. Shirazi, MD, Maywood, IL

Rita Schuman, MD, Maywood, IL

James A. Stankiewicz, MD, Maywood, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to determine the pathological features and endoscopic surgical management of pleomorphic hyalinizing angiectatic tumor (PHAT) and be able to review the differential diagnosis of unilateral nasal sinus opacification.

**Objectives:** Pleomorphic hyalinizing angiectatic tumor (PHAT) is a very rare, low grade malignancy occurring predominantly in the subcutaneous tissue of the lower limbs of adults. The authors describe the first reported case of PHAT in the sinonasal cavity. Pathological features and endoscopic surgical management are discussed along with a review of the differential diagnosis of unilateral nasal sinus opacification. **Study Design:** Case report, literature review. **Methods:** Clinical presentation: A 51 year old male presented with intermittent left sided epistaxis and nasal obstruction. Computed tomography (CT) revealed complete opacification of the left maxillary sinus without any bony erosion. Flexible endoscopy confirmed a polypoid, nonfriable lesion emanating from the left maxillary sinus. Endoscopic biopsy yielded a diagnosis of PHAT. **Results:** Intervention: Following a negative chest x-ray, the patient underwent an endoscopic medial maxillectomy with complete tumor resection. The final pathological diagnosis was PHAT. Short postoperative followup showed no evidence of tumor on endoscopic exam. **Conclusions:** PHAT is a very rare tumor and, to our knowledge, has never been reported in the sinonasal cavity. This case demonstrates the presenting symptoms, immunohistochemical characteristics, and endoscopic surgical management of this unique tumor.

### 41. Cost Effective Diagnosis of Ingested Foreign Bodies

Mark G. Shrime, MD, New York, NY

Paul E. Johnson, MD, New York, NY (Presenter)  
Michael G. Stewart, MD MPH\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the limitations of radiologic and operative diagnostic techniques for the diagnosis of ingested foreign bodies and compare their cost effectiveness.

**Objectives:** To compare the cost effectiveness of plain film radiography, computed tomography (CT), and endoscopy as initial diagnostic modalities in adult patients complaining of retained ingested foreign bodies. **Study Design:** Deterministic cost effectiveness analysis using a decision tree model. **Methods:** A systematic literature review was conducted to determine key statistics for the analysis such as prevalence of disease, prevalence of complications, and the sensitivity and specificity of each diagnostic modality. Costs were estimated using 2006 Medicare reimbursement for hospital and professional fees. The analysis was then conducted using decision analysis software to evaluate each diagnostic strategy. After identifying initial results, we also performed sensitivity and threshold analysis to assess the strength of the recommendations. **Results:** We reviewed 316 abstracts, identified 16 pertinent studies that included a total of 7,088 patients with possible foreign bodies, and extracted key statistics from those papers. Decision analysis showed that CT scanning as an initial diagnostic strategy proved more cost effective than plain film or operative endoscopy. The incremental cost of immediate endoscopy for every additional correctly diagnosed patient was \$5,238. Plain radiography was more costly and less effective, even with the addition of confirmatory CT scanning after a negative plain film. Sensitivity and threshold analyses demonstrated that these results are robust. **Conclusions:** Patients presenting with a complaint of a retained ingested foreign body are most cost effectively managed with CT scan, after history and physical. Immediate endoscopy may be considered if CT is not available, although it adds significant cost. Plain films are dominated by these two diagnostic strategies.

#### 42. Special Airway Concerns in Patients With Mucopolysaccharidoses

H. Steven Sims, MD, Chicago, IL  
James J. Kempiners, MD, Fort Thomas, KY

**Educational Objective:** At the conclusion of this presentation, the participants should feel better equipped to handle the airway in these rare and interesting patients. We will explain the underlying pathology as it relates to airway management and discuss strategies to aid the clinician in making insightful, appropriate decisions.

**Objectives:** The mucopolysaccharidoses are comprised of hereditary disorders joined by errant degradation of mucopolysaccharides. The relatively infrequent opportunity to care for these patients is evidenced by a fairly small number of case reports and anecdotal information. Though lifespan is increasing, onset of respiratory pathology or involvement remains portentous. We present two cases that punctuate the need for insightful decision making while managing the airway for these patients. **Study Design:** Case report on two patients with lysosomal storage disease and consequent airway embarrassment. **Methods:** Chart review and review of literature. **Results:** One patient with Morquio's Syndrome was successfully managed with a tracheostomy using a Bivona, flexible, adjustable tracheostomy tube. The other patient's airway was managed with a Bivona flexible tube, but he succumbed to progressive airway involvement typical of Hunter's Syndrome. **Conclusions:** Our ability to sustain patients with glycogen storage disorders has increased. However, airway involvement requires thoughtful decision making and anticipation of outcomes.

#### 43. Oncocytic Laryngeal Cyst Involving the Paraglottic Space, Literature Review and Surgical Management

Ameet S. Singh, MD, Rochester, NY  
Michael C. Haben, MD, Rochester, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the pathophysiology, clinical presentation, and surgical management of oncocytic laryngeal cysts.

**Objectives:** To report a case of a recurrent large oncocytic laryngeal cyst involving the paraglottic space and surgical management using endoscopic partial paraglottectomy. **Study Design:** Case report and review of literature. **Methods:** Case report and review of literature. **Results:** A 66 year old female smoker (40 pack year) with progressive hoarseness and airway obstruction was diagnosed with a large left supraglottic mass involving the left aryepiglottic fold extending through the thyrohyoid membrane. A biopsy of the mass was performed and interpreted as Warthin's tumor (papillary cystadenoma lymphomatosum) of the larynx. The patient underwent an endoscopic partial left supraglottic horizontal laryngectomy. Two years later the patient returned with worsening hoarseness and was noted to have recurrent left supraglottic mass involving the left false vocal fold and ventricle. Patient underwent an endoscopic partial antero-lateral-vertical supraglottic laryngectomy. Histopathological examination revealed cystic oncocytic metaplasia consistent with an oncocytic laryngeal cyst. A 6, 12 and 18 month followup examination revealed an improvement in voice quality, complete extirpation of the tumor, and no evidence of recurrence. **Conclusions:** Oncocytic laryngeal cysts are unusual lesions which have a distinct epidemiology, pathophysiology, clinical presentation, and recurrence pattern when compared to other laryngeal cysts. Aggressive surgical management using endoscopic technique may help reduce recurrence rates.

#### 44. Anterior Laryngotracheoplasty in the Treatment of Subglottic Stenosis

Jamie D. Sisk, MD, Jackson, MS

John M. Schweinfurth, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the treatment of tracheal stenosis with subglottic involvement in adults particularly when anterior tracheal wall collapse is a cause as seen in percutaneous tracheostomy.

**Objectives:** To evaluate the success of anterior laryngotracheoplasty (LTP) using septal cartilage grafts in adult patients with subglottic tracheal stenosis involving the cricoid. **Study Design:** A prospective case series of adult patients undergoing LTP for tracheal stenosis. **Methods:** Adult patients presenting with tracheal stenosis underwent computed tomography and direct laryngoscopy for evaluation of stenosis. Patients with subglottic involvement underwent LTP with septal cartilage grafts. Approximately 3 X 1.5 cm septal cartilage graft was obtained. The trachea was skeletonized from the tracheostomy site to the hyoid bone. A vertical anterior incision was made from the stoma to the inferior edge of the thyroid cartilage and the fibrosis was removed with sharp dissection. A flexible silastic T-tube stent was placed and the septal cartilage graft used to reconstruct the anterior tracheal wall overlying the stent. Stents were removed in 3 months and capping trials begun with a standard tracheostomy tube followed by decannulation in 2-4 weeks. **Results:** Five adult patients have undergone LTP as described. All patients have been successfully decannulated. Tracheal stenosis was secondary to percutaneous tracheostomy in three patients. One patient developed stenosis secondary to treatment for recurrent respiratory papillomatosis and one patient secondary to prolonged intubation. **Conclusions:** The ideal treatment for tracheal stenosis is tracheal resection with direct anastomosis. When the stenosis involves the cricoid, however, surgical repair is more challenging and results less reliable. Anterior LTP is a safe and simpler method for treatment of tracheal stenosis with cricoid involvement and is particularly effective when stenosis is caused by anterior tracheal wall collapse from percutaneous tracheostomy.

#### 45. Treatment of the Allergic Response to Aspergillus Antigen in a Murine Model

William C. Spanos, MD, Iowa City, IA

Siew Shuen Chao, MD, Singapore

Scott M. Graham, MD, Iowa City, IA

John H. Lee, MD, Iowa City, IA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the efficacy of treatment modalities presented in this murine model of aspergillus mediated allergic rhinitis.

**Objectives:** Allergic rhinitis has been associated with fungal allergens including aspergillus antigens. Marked eosinophilia has been observed in clinical specimens with recruitment of eosinophils in response to antigen binding to IgE. We analyzed the allergic response in the context of treatment in a murine model of aspergillus antigen allergic rhinitis. **Study Design:** Experimental animal model. **Methods:** Balb/c mice were sensitized and subsequently challenged with aspergillus antigen. Treatment during the challenge with systemic dexamethasone, oral montelukast, or nasal fluticasone was performed. The mice were sacrificed and processed for histology. A fluorescent stain was used to quantify eosinophils. An ELISA was used to quantify the total serum IgE levels. **Results:** Balb/c mice sensitized and challenged with aspergillus antigen had higher numbers of eosinophils per mm<sup>2</sup> as compared to mice challenged with PBS (p<.001). A three fold decrease in eosinophils per mm<sup>2</sup> was observed for dexamethasone, fluticasone, and montelukast compared to no treatment (p<.001); however no significant difference was noted among treatment groups. Serum IgE levels were decreased 25% by treatment with systemic dexamethasone (p<.05) compared to aspergillus alone. Fluticasone and montelukast did not decrease IgE levels compared to the aspergillus control. **Conclusions:** Systemic corticosteroids, intranasal steroids, and oral leukotriene inhibitors appear to decrease the intranasal eosinophil burden with similar efficacy in this murine model of aspergillus allergic rhinitis. However modulation of the serum IgE level was only seen with systemic corticosteroids.

#### 46. Voice Related Quality of Life Index Improvement After Bilateral PCA Muscle Botulinum Toxin Injections

Benjamin C. Stong, MD, Atlanta, GA

Michael M. Johns III, MD, Atlanta, GA (Presenter)

Adam M. Klein, MD, Atlanta, GA

Edie R. Hapner, PhD, Atlanta, GA

Justin C. Wise, PhD, Atlanta, GA

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

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the success of botulinum toxin injections for abductor spasmodic dysphonia in relation to the voice related quality of life index before and after injection.

**Objectives:** Abductor spasmodic dysphonia (AbSD) treatment with botulinum toxin (BT) injections has been reported to be variably successful. Simultaneous bilateral PCA BT injections have been demonstrated to be safe. This study aims to review an objective vocal

outcome measure, the voice related quality of life index (VRQOL), before and after PCA BT. **Study Design:** Prospective study. **Methods:** The VRQOL was measured just before injection and then 3 to 6 weeks postinjection in a tertiary academic clinic over a 16 month period for 37 consecutive simultaneous bilateral PCA BT injections. **Results:** Fourteen patients (9 females and 5 males) underwent 37 injections for isolated AbSD. The average age was 47 (range 27 to 64). The average interval between VRQOL scores was 36 days (range 21 to 42). A related samples t-test was performed on first (n=14) and second (n=9) visit injection subgroups with significant improvement for each injection, p=.001 and p=.006, respectively. Effect size, calculated for both groups using a Cohen's d was 4.57 and 3.61 for the first and second groups respectively (large effect greater than 0.8). Overall 33 out of 37 injections (89%) resulted in improvement from the pre- to postinjection VRQOL. The mean improvement from pre- to postinjection was 19.8 (range -5 to 53). No significant complications occurred. **Conclusions:** Simultaneous bilateral PCA BT injections result in a statistically significant improvement in pre- and postinjection VRQOL index scores in the majority of AbSD patients.

#### 47. **Endoscopic Orbital Decompression in Graves' Ophthalmopathy**

Richard D. Wemer, MD, Kansas City, KS  
Larry A. Hoover, MD\*, Kansas City, KS  
Thomas J. Whittaker, JD MD, Kansas City, KS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the usefulness of modern endoscopic techniques for orbital decompression in Graves' Ophthalmopathy.

**Objectives:** The objective of this paper is to demonstrate the improved efficacy of modern endoscopic techniques for orbital decompression back to the critical area of the orbital apex where muscle hypertrophy constricts the optic nerve blood supply resulting in nerve edema back into the sphenoid bony canal. In a prior study angled self-irrigating diamond burrs with axis of rotation immediately adjacent to the burr and image guidance were not available (only drills with long 60-90mm shafts and axis of rotation far from the site of decompression causing drill tip perturbation limiting precise decompression were then available). **Study Design:** We compared the current series of 9 patients and 11 eyes with our series of ten years ago. Pre- and postoperative Hertel scores, visual acuity, visual fields, diplopia, and retinal exams were obtained. **Methods:** Orbital decompression was achieved by a transnasal/transethmoid endoscopic removal of the medial orbital wall and a sublabial/transmaxillary approach for inferior orbital floor decompression. Decompression was carried back past the orbital apex into the sphenoid sinus to include the bony canal of the optic nerve thru the lateral wall of the sphenoid sinus. **Results:** In all cases visual acuity improved some dramatically. On average the patient's Hertel score improved 4.8mm. Most impressively with marked and rapidly progressive visual loss aggressive decompression resulted in rapid and dramatic improvement. **Conclusions:** Advances in endoscopic instrumentation now allow precise decompression of the optic nerve in the problem orbital apex and bony canal of the sphenoid sinus lateral wall.

#### 48. **Atypical Guillain Barre Syndrome Presenting With Unilateral Cranial Nerve Palsies**

Nwanmegha O. Young, MD, New York, NY  
Andrew Blitzer, MD DDS\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the clinical syndrome of atypical GBS.

**Objectives:** Guillain Barre syndrome (GBS) is the most common cause of acute flaccid paralysis worldwide. GBS classically presents as a rapidly progressing ascending paralysis. In addition to the classic presentation of GBS there are other GBS subtypes and variants. The otolaryngologic manifestations include cranial nerve palsies which have been infrequently described in the literature. Therefore we illuminate the disorder with a description of a challenging patient presentation of atypical GBS. **Study Design:** Case report. **Methods:** A patient presented with a sudden onset of imbalance and later developed dysphagia, dysarthria and left facial paralysis. His clinical presentation, physical and laboratory examination findings, and course of illness will be discussed. **Results:** The patient was worked up extensively and had a variety of tests including multiple MRIs and CAT scans and a CSF puncture. All tests were negative. Fiberoptic exam revealed paralyzed left cord. He was then referred for left TVC augmentation. EMG and FEEST were performed. EMG revealed no volitional activity on the left side with fibrillations. FEEST demonstrated no sensation with max simulation on left side. The right side was normal. The LTVC was augmented. He was referred to neurology for further evaluation and was ultimately diagnosed with atypical GBS. **Conclusions:** This is the first case of atypical GBS presenting with unilaterally primarily in the head and neck region. Prompt recognition of atypical GBS is critical because it can progress to generalized GBS which has a 15% mortality rate.

## **OTOLOGY**

#### 49. **WITHDRAWN**

##### **Temporal Bone CT Facilitates Surgery for Chronic Ear Disease**

Wayne E. Berryhill, MD, Oklahoma City, OK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the benefits that CT scans contribute to chronic ear surgery.

**Objectives:** The objective of this study was to evaluate the usefulness of routine temporal bone computerized tomography scans in the performance chronic ear disease surgery. **Study Design:** Retrospective review. **Methods:** Preoperative records, audiograms, CT scans, operative procedure notes, and followup records were reviewed. Preprocedure impressions of the proposed operative procedure were compared to the actual procedure performed. Accuracy of CT evaluation was compared to the findings at the time of surgery. **Results:** CT scans from 153 patients were evaluated. Of these patients there were 59 primary cholesteatoma patients and 5 congenital cholesteatoma patients. 38 patients underwent tympanoplasty with the remaining 115 undergoing tympanoplasty/mastoidectomy/atticotomy or canal wall down mastoidectomy. The results of the CT scan evaluation alone were found to have changed the proposed procedure 34% of the time. The most common reasons for procedural change were possible facial nerve dehiscence, which resulted in attended facial nerve monitoring, and an increase in atticotomy and decreased mastoidectomy, as well as facial recess performance. CT failed to visualize fine cholesteatoma lining not filled with debris, giving the false impression uninvolved with cholesteatoma. The need for canal wall down mastoid was accurately gauged 88% of the time. **Conclusions:** CT of the temporal bone is extremely useful in helping patients visualize and understand the proposed surgical procedure as well as the critical areas which may lead to more aggressive procedures. CT was also useful in changing the procedure for the safety of the facial nerve and allowing the use of less invasive mastoid procedures.

## 50. Sound Transmission Characteristics of a Silicone Prosthetic Ear

Alexander G. Bien, MD, Omaha, NE  
Trish E. Morrow, AuD, Omaha, NE  
Gordon K. Mahanna, DDS, Omaha, NE  
Rhonda J. Ward, MS CCC-A, Omaha, NE  
Gary F. Moore, MD\*, Omaha, NE

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the importance of the external ear in sound transmission and compare the ability of threshold versus suprathreshold stimuli to accurately reflect daily hearing conditions.

**Objectives:** The external ear plays an important role in sound transmission. Our goal was to determine, in a patient with a prosthetic ear, whether there was a correlation between subjective reporting of a decreased ability to hear with the prosthesis in place and objective threshold testing. **Study Design:** The patient's subjective report of poorer hearing with a silicone ear prosthesis in place was discovered through history taking. This subjective reporting of hearing in everyday situations was compared to objective pure tone audiometric threshold levels. **Methods:** Audiologic thresholds were obtained from 250-8000 Hz in sound field at 0, 45, 90, and 180 degrees azimuth, both with the prosthetic ear in place and removed. A purely descriptive analysis was performed on the data collected. **Results:** The only result consistent with the patient's subjective complaints was at 4000 Hz, where his thresholds were consistently better with the prosthesis off as opposed to the prosthesis in place. **Conclusions:** The patient's subjective reporting of his hearing in everyday situations did not correlate with objective audiometric testing. This discrepancy between subjective reporting by the patient and objective testing could be due to the reverberation characteristics of the prosthetic ear at threshold versus suprathreshold levels. Future testing could test suprathreshold speech discrimination tasks that more accurately reflect daily auditory demands. Further testing on similar subjects may delineate a similar phenomenon at 4000 Hz suggesting an inherent attenuating effect of the silicone prosthetic ear at this frequency range.

## 51. Objective Evidence of Resolution of Balance Dysfunction Following Posterior Fossa Decompression With Duraplasty for Pediatric Chiari Type I Malformation: A First Case Report

Esa A. Bloedon, MD, Wilmington, DE  
Robert C. O'Reilly, MD, Wilmington, DE  
Jeffrey W. Campbell, MD, Wilmington, DE  
John D. Henley, PhD, Wilmington, DE  
Freeman Miller, MD, Wilmington, DE  
Thierry G. Morlet, PhD, Wilmington, DE

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize the otolaryngologic symptoms related to patients with Chiari Type I malformations and have an understanding of the instruments used to objectively measure improvement in vestibular symptoms.

**Objectives:** To review results of objective evidence of vestibular and balance improvement after posterior fossa decompression with duraplasty for pediatric Chiari Type I malformation. We discuss the vestibular symptoms related to Chiari Type I malformations in the pediatric population, the treatment options, and a first report of complete objective balance testing, including a unique test of dynamic

balance function developed in our laboratory showing interval improvement of vestibular and balance function after posterior fossa/foramen magnum decompression. **Study Design:** Case report. **Methods:** A patient presenting with disequilibrium and nystagmus underwent posterior fossa/foramen magnum decompression with duraplasty for Chiari Type I malformation. Complete vestibular testing including video electronystagmography, sinusoidal harmonic rotational acceleration testing, computerized dynamic platform posturography and a unique test of dynamic balance/gait analysis were measured at 8 days and 6 months postoperatively to confirm interval vestibular and balance improvement. **Results:** Vestibular testing at postoperative day 8 was consistent with persistent and severe central vestibular dysfunction. Repeat testing at 6 months revealed dramatic interval improvement of vestibular and balance function. **Conclusions:** This is the first case in the literature to show that posterior fossa decompression with duraplasty for pediatric Chiari Type I malformation affords a dramatic objective improvement in static and dynamic vestibular and balance function. Vestibular testing may be useful in the preoperative assessment of patients with Chiari Type I malformation and in objectively measuring interval improvement following surgical management.

## 52. Differential Lipid Raft Localization of erbB2 in Vestibular Schwannoma Cells and Schwann Cells

Kevin D. Brown, MD PhD, Iowa City, IA

Marlan R. Hansen, MD, Iowa City, IA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the functional importance of lipid rafts in cell signaling. They should also be able to discuss the tumorigenic implications of constitutive erbB2 lipid raft localization in schwannomas.

**Objectives:** To evaluate differential lipid raft localization of the growth factor receptor erbB2 in Schwann cell (SC) and vestibular schwannoma (VS) cells. **Study Design:** Lipid raft and nonlipid raft cell fractions were probed for erbB2 in fresh VS tissue and fresh peripheral nerve (proliferating or quiescent SC). Co-localization studies were also performed to evaluate erbB2 localization. **Methods:** Fresh VS tissue or rat peripheral nerve (proximal or distal to a crush injury) was isolated into TX-100 soluble (non-raft) and SDS soluble fractions (lipid raft fraction). Extracts were separated and blotted against erbB2 and phospho-erbB2. Separately, VS cells were probed with erbB2 and cholera toxin B (a raft marker) to evaluate co-localization. **Results:** We demonstrate constitutive raft localization of erbB2 in VS cells, and phosphorylation of erbB2 in that fraction. We also demonstrate inducible lipid raft localization of erbB2 in rat peripheral nerve distal to a crush injury (proliferating segment). Furthermore, erbB2 is phosphorylated in raft fractions of the distal proliferating segment. Co-localization studies on VS cells in culture demonstrates co-localization of erbB2 with lipid rafts. **Conclusions:** These data demonstrate erbB2 is constitutively localized to lipid rafts in VS in both whole tissue and cell culture. ErbB2 is also inducibly localized to rafts in denervated sciatic nerve (undergoing SC proliferation) suggesting a critical role for erbB2 in Schwann cell proliferation. ErbB2 is phosphorylated in raft fractions, and phosphorylated erbB2 activates downstream signaling cascades which ultimately promote proliferation. Constitutive lipid raft localization and phosphorylation in VS cells may in part explain the unrestricted growth potential of VS cells.

## 53. Osteoma of the Internal Auditory Canal: A Case Report and Literature Review

Mark J. Burstein, MD, Albany, NY

Steven M. Parnes, MD\*, Albany, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the presentation and management options for osteoma of the internal auditory canal.

**Objectives:** Osteoma of the internal auditory canal is a rare lesion with variable vestibular and audiologic presentations. Due to the sparsity of available case reports and series, the natural history and indications for surgical management of this lesion are not clearly defined. We report a case which will add to the body of literature pertaining to the presentation and surgical management of osteoma of the IAC and review previously reported cases for comparison. **Study Design:** Case report and literature review. **Methods:** A case of a thirty-eight year old woman who underwent resection of a right internal auditory canal osteoma is presented. Her clinical presentation, audiologic and radiologic findings, surgical management, and clinical outcome are discussed. A review of the literature pertaining to this unusual lesion is also presented. **Results:** Workup of this patient who presented with right sided peripheral vertigo revealed an osteoma of the internal auditory canal. The patient underwent surgical resection via a retrosigmoid craniotomy. Her initial postoperative course was remarkable for a transient and incomplete facial weakness, which has resolved, and for a right sided sensorineural hearing loss, which continues to improve. However, the patient reports a subjective improvement in her vestibular symptoms and is now satisfied with the procedure. **Conclusions:** Surgical management of osteoma of the internal auditory canal may be indicated in symptomatic cases or in instances where the lesion fails to stabilize in size. However surgeons and patients must weigh the potential benefits against risks such as transient injury to the seventh and eighth cranial nerves.

## 54. Resident Friendly Approach to Stapedectomy

Vinaya K. Chakradeo, MD, Shreveport, LA

Gale Gardner, MD, Shreveport, LA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to review the different techniques used to perform stapedectomy and to discuss the standardized approach to help the residents to develop a higher degree of skill necessary for this procedure.

**Objectives:** 1) To evaluate how to train residents to perform safe and effective stapes surgery; and 2) to design a standardized approach using a combination of different techniques to maximize results and safety in all elements of the operation. **Study Design:** Literature and case review in a tertiary otologic referral center. **Methods:** Stapes surgery is considered a high risk otologic surgery. In most training programs, limited cases are available for learning. We reviewed the results of stapedectomy procedures performed by the residents in the past five years in the department of otolaryngology/head and neck surgery at our institution. Comparison of pre- and postoperative hearing results (pure tone averages of 500, 1000, and 2000 Hz) from 36 cases revealed closure of airborne gap to within 10 dB in 44 percent of the procedures. We decided to study the techniques of the most outstanding stapes surgeons in the English literature to determine the different techniques used by each for the basic steps of the operation. We propose using a combination of their techniques to create a standardized approach for successful stapes surgery. **Results:** The detailed analysis of all these different articles led us to determine the steps that are most suitable for use by residents. **Conclusions:** We propose that using our recommended approach would reduce the variables and allow residents to develop a higher degree of skill necessary for this procedure. We therefore plan to implement this approach and study the results prospectively.

### 55. Sound Transmission Through the Middle Ear in Live Human Subjects

Vinaya K. Chakradeo, MD, Shreveport, LA  
Elizabeth S. Olson, PhD, New York, NY  
Jose N. Fayad, MD\*, Los Angeles, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the mechanics of sound transmission through the human middle ear and compare it with studies done in temporal bones and gerbils.

**Objectives:** To test the following two hypotheses: 1) the middle ear is not responsible for the high frequency limit of hearing in human beings; and 2) at frequencies above approximately 800 Hz, the middle ear does not operate as a leveraging system but as a mechanical waveguide. **Study Design:** Prospective, nonrandomized experimental investigation in live human subjects undergoing cochlear implantation. **Methods:** We measured the scala vestibuli pressure intraoperatively in live human subjects undergoing cochlear implantation by using a pressure sensor. A micromanipulator and an ear speculum holder were used for positioning the sensor. A speaker delivering a tone of approximately 80 dB SPL was coupled to the ear canal during the experiment. We delivered frequencies up to 40 kHz to test the first hypothesis. **Results:** We have successfully performed the experiment in two subjects. The difference between the scala vestibuli and ear canal pressure was calculated to determine the delay of sound transmission through the middle ear. A delay of approximately 110 microsec was found that supports the “wave” mechanism of sound transmission through the middle ear. Our first hypothesis was not supported by this data because the response peaked at ~ 1 kHz and was greatly reduced at higher frequencies. **Conclusions:** The results obtained were similar to temporal bone measurements. The transmission delay proves that the middle ear does not operate as a lever. Further studies are needed to understand transmission of sound through the middle ear in human beings.

### 56. Rate of Postoperative Complications After BAHA Implantation

Sean M. Demars, MD, Tacoma, WA  
Carlos R. Esquivel, MD, San Antonio, TX  
Douglas D. Backous, MD\*, Seattle, WA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the rates of the most common complications after BAHA and various management options.

**Objectives:** To evaluate the rate of implant loss (either voluntary or due to failure) and skin reactions in patients receiving bone anchored hearing aid (BAHA) systems. **Study Design:** Retrospective chart review of all patients receiving a BAHA at either of the two tertiary referral centers included in the study. **Methods:** 84 patients receiving a BAHA from 1999 to 2005 were evaluated regarding the timing and nature of any abutment loss, as well as the number, timing, and types of revisions required for abutment maintenance. Patients were also assessed for any differing rates of loss or revision with respect to age, gender, size of abutment, use of dermatome, area of skin grafted, staging of placement, type of suture used, tobacco usage, prior otologic surgery, or diabetes. **Results:** 25 of 84 (29.8%) patients required at least one revision of the abutment site with 12 (14.3%) having more than two revisions for a total of 37 procedures. The most commonly performed revision was excision of tissue overgrowth (40.5%). Gender was the only significant variable for necessity of a revision (male 46.9% vs. female 19.2%). Nine patients had loss of an abutment, two of which were elective. Only size of abutment was predictive of increased failure with 3mm (37.5%) being greater than 4mm (7.0%). Average followup was 32.4 months, with 6.1 months until the first revision and 5.4 months until abutment loss. **Conclusions:** BAHA remains a useful alternative to conventional hearing amplification but does require prolonged surveillance and occasional maintenance for successful use.

## 57. **Diagnosis, Pathology, and Management of Spontaneous CSF Leakage of the Temporal Bone**

Hamid R. Djalilian, MD, Orange, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand how to diagnose and treat spontaneous CSF leakage originating in the temporal bone.

**Objectives:** To evaluate the various presentation and different treatment options for spontaneous cerebrospinal fluid (CSF) leakage originating in the temporal bone. **Study Design:** Retrospective case review. **Methods:** Ten patients diagnosed with spontaneous CSF leakage over a 3 year period were included in the study. The age ranged between 57 and 84. Presenting symptoms included serous otitis media (50%), persistent otorrhea after tympanostomy tube placement (30%), and recurrent meningitis (20%). Preoperative diagnosis was made using imaging studies. Given CSF leaks originating in the temporal bone tend to be slow, adequate specimen for beta 2 transferrin studies could not be obtained or was negative. The diagnosis was substantiated by observation of tegmen dehiscence and dural herniation intraoperatively. Treatment was eustachian tube plugging (10%), mastoidectomy with obliteration with fat (40%), or middle fossa approach with extradural (40%), or intradural (10%) repair. **Results:** Successful treatment was obtained in 8 of the 9 patients undergoing repair of the dehiscent tegmen. The only failure was a patient with a posterior fossa source for the leakage. Pathologic confirmation of the existence of brain and aggressive arachnoid granulation in the mastoid was obtained in some patients and will be demonstrated. **Conclusions:** Diagnosis of spontaneous CSF leakage from the temporal bone is complex given beta 2 transferrin testing is not reliable due to the scant amount of fluid available. CT and MR imaging is the key to the diagnosis. This disease is probably more common than previously thought. The treatment of the disorder must be tailored to the patient's age, medical status, and the extent of tegmen dehiscence.

## 58. **Lytic Lesions of the Temporal Bone With Sensorineural Hearing Losses: A Comparative CAT Scan and Histopathological Study**

Jose N. Fayad, MD\*, Los Angeles, CA

Fred H. Linthicum Jr., MD\*, Los Angeles, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to make a differential diagnosis of three osteolytic lesions of the temporal bone.

**Objectives:** Review the computerized axial tomographic (CAT) scan and histopathological characteristics of three osteolytic temporal bone lesions that cause sensorineural hearing losses. **Study Design:** CAT scan and histopathological evaluation of temporal bones from patients' advanced otosclerosis, Paget's disease, and syphilis. **Methods:** CAT scans and histopathological images of the characteristic findings of the three diseases were selected for comparison. **Results:** Images of advanced otosclerosis and syphilis, in contrast to Paget's disease, appear similar. The histopathology is quite different. **Conclusions:** CAT images of advanced otosclerosis and syphilis are similar and need to be differentiated with other clinical studies while Paget's lesions are characteristic.

## 59. **Sublingual Teratoid Cyst**

Aylon Y. Glaser, MD, Newark, NJ

Neena Mirani, 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 features, embryology, and presentation of a sublingual teratoid cyst as well as its workup and clinical management.

**Objectives:** To describe a case of a sublingual teratoid cyst, including clinical presentation, differential diagnosis, imaging, and pathological findings. **Study Design:** Report of a case of sublingual teratoid cyst. **Methods:** The clinical presentation, management, and outcomes were reviewed. **Results:** A 3 day old infant was seen on consultation for evaluation of a sublingual mass. Imaging revealed a sublingual cystic mass consistent with a lymphangioma. Although there was some concern that this mass may be interfering with feeding, the patient seemed to be doing well with a bottle and gaining weight appropriately. Therefore the patient was observed over three months. The patient underwent excision of the mass at four months of age. Pathologic examination of the specimen revealed elements of ectoderm, mesoderm, and endoderm. A diagnosis of teratoid cyst was made. **Conclusions:** There are only four other reported cases of teratoid cysts of the tongue. These cysts have the potential to affect speech and swallowing ability. If large they may compromise the airway. The definitive treatment is complete surgical excision.

## 60. **Computed Tomography and the Assessment of Titanium Middle Ear Prosthesis Position**

Nathan W. Hales, MD, Oklahoma City, OK

Scott L. Knappenburger, MD, Oklahoma City, OK

Wayne E. Berryhill, MD, Oklahoma City, OK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the use of computed tomography (CT) in the evaluation of middle ear prosthesis position.

**Objectives:** The objective of this study was to evaluate the use of computed tomography (CT) to assess the position of middle ear prosthesis in patients with a history of prior ossicular chain reconstruction (OCR) that later present with vertigo or hearing loss. **Study Design:** Anatomical cadaveric dissection. **Methods:** OCR was performed on five fixed cadaveric temporal bones and compared with postprocedure CT scans. Placement of the prosthesis within the oval window or atop the stapes was confirmed after imaging by further anatomical dissection. **Results:** Postprocedure CT correctly confirmed prosthesis position and placement within the oval window or atop the stapes in all specimens. Limited scatter from the prosthesis was demonstrated on each of the respective CT scans. A limited number of studies are available to support computed tomography as the imaging study of choice in patients with vertigo or hearing loss with a history of prior OCR. **Conclusions:** CT is an accurate and useful imaging modality in the assessment of titanium middle ear prosthesis position in the evaluation of patients with a history of prior OCR that present with vertigo or hearing loss.

## 61. Osteotome Technique for Removal of Symptomatic Ear Canal Exostoses

Douglas G. Hetzler, MD\*, Santa Cruz, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the technique and benefits of using osteotomes via a transcanal approach to remove symptomatic ear canal exostoses.

**Objectives:** This study was undertaken to assess a transcanal osteotome technique for removing symptomatic ear canal exostoses. Outcomes measures included healing rates and the rate of complications. **Study Design:** Prospective study in a private practice. **Methods:** A straight 1mm osteotome and a curved 1mm osteotome were used via a transcanal approach to incrementally remove obstructive ear canal exostoses. If anterior or superior bone growths were closely approximating the tympanic membrane, they were partially removed with a 1.5mm cylindrical end- and side-cutting burr. Healing rates were monitored with weekly postoperative visits. **Results:** 221 ears (140 patients) were consecutively treated with this technique. Healing was achieved at 2-8 weeks (ave. 3.50), with 90% healed by 4 weeks. There were 4 mobilizations of a segment of anterior canal wall; 3 exposures of the periosteum anterior to the anterior bony wall; one tear of the tympanic membrane requiring a tympanoplasty; 18 anterior and 11 posterior pinpoint tympanic membrane tears which healed spontaneously; 3 instances of sensorineural hearing decrease; 3 cases of new tinnitus; 1 instance of positioning vertigo; and 4 cases of fungal otitis externa within 8 weeks of surgery. There were no instances of laceration of the tympanic membrane by an osteotome, no facial nerve injuries, no soft tissue stenoses of the ear canals and no skin grafting of an ear canal. **Conclusions:** The described technique of using osteotomes transcanal for removal of symptomatic obstructive ear canal exostoses was effective and safe and promoted rapid healing.

## 62. Does Packing the Eustachian Tube Impact CSF Rhinorrhea Rates in Translabyrinthine Vestibular Schwannoma Resections?

Abraham Jacob, MD, Columbus, OH

Jared S. Bortman, MD, Seattle, WA

Lawrence Robinson, MD, Chicago, IL

Edward E. Dodson, MD, Columbus, OH

D. Bradley Welling, MD PhD\*, Columbus, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss overall CSF leak rates for translabyrinthine (TL), middle cranial fossa (MCF), and retrosigmoid/suboccipital (SO) approaches to vestibular schwannomas and determine whether packing the eustachian tube impacts the incidence of CSF rhinorrhea after TL resections.

**Objectives:** To determine whether packing the eustachian tube (ET) in translabyrinthine (TL) vestibular schwannoma (VS) resections impacts CSF rhinorrhea rates and to calculate overall CSF leak rates for TL, middle cranial fossa (MCF), and retrosigmoid/suboccipital (SO) approaches for VS. **Study Design:** Retrospective. **Methods:** Chart review. **Results:** Three hundred fifty-nine VS resections were reviewed in 356 patients ranging from 10 to 86 years (mean 50.5) of age. Two hundred thirty-one TL, 70 MCF, 53 SO, and 5 combined TL/SO procedures were analyzed. Total CSF leak rates (incisional, otorrhea, and rhinorrhea) were 14.2% for TL, 11.4% for MCF, and 13.2% for SO approaches. In the 148 TL patients having their incus removed, aditus enlarged, eustachian tube (ET) packed, and middle ear filled with muscle, 12 developed CSF rhinorrhea (8.1%). In those who had their middle ears packed with muscle but did not have their ET packed, aditus enlarged or incus removed, 5.9% (3 of 51 patients) developed CSF rhinorrhea. Proplast, used in 121 patients for ET packing, was the most effective eustachian tube packing material with a CSF rhinorrhea rate of 5.8%. However, this material extruded from the ET in 4 of 121 patients (3.3%) and presented as delayed infectious otorrhea. **Conclusions:** CSF leak rates were similar in patients undergoing TL, SO, and MCF approaches. CSF rhinorrhea was not decreased by ET packing. Patients whose eustachian tubes are packed with Proplast are at risk for extrusion and otorrhea years beyond their initial VS resection.

**63. Nerve of Origin, Tumor Size, Hearing Preservation, and Facial Nerve Outcomes in 359 Vestibular Schwannoma Resections at a Tertiary Care Academic Center**

Abraham Jacob, MD, Columbus, OH  
Lawrence Robinson, MD, Chicago, IL  
Jared S. Bortman, MD, Seattle, WA  
Edward E. Dodson, MD, Columbus, OH  
D. Bradley Welling, MD PhD\*, Columbus, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify the most common nerve of origin for vestibular schwannomas, compare hearing preservation rates and facial nerve outcomes in superior versus inferior vestibular nerve tumors, and discuss the impact of tumor size on hearing preservation.

**Objectives:** To determine nerve of origin, tumor size, hearing preservation rates, and facial nerve outcomes in patients undergoing translabyrinthine (TL), middle cranial fossa (MCF), and retrosigmoid/suboccipital (SO) approaches to vestibular schwannomas (VS). **Study Design:** Retrospective. **Methods:** Chart review. **Results:** Two hundred thirty-one TL, 70 MCF, 53 SO, and 5 combined TL/SO procedures for VS were analyzed from 356 patients. The inferior vestibular nerve (IVN) was the nerve of origin in 84 of 359 cases (23.3%) and the superior vestibular nerve (SVN) in 36 patients (10%). In 239 of 359 cases (66.6%), the nerve of origin was not identified. Functional hearing (< 50dB PTA and > 50% speech discrimination) was preserved in 10 of 15 patients (75%) with SVN tumors and 7 of 25 patients (28%) with IVN tumors. Facial nerve outcomes were House-Brackmann (HB) grade I-III in 69 of 72 patients (96%) with IVN tumors and 35 of 35 patients (100%) with SVN tumors. Looking at tumor size vs. hearing, hearing was preserved in 22 of 49 patients (45%) with < 1 cm tumors and 4 of 20 patients (20%) of patients with 1-1.5 cm tumors. Overall, HB I-III facial nerve outcomes were achieved in 96% of SO, 95% of MCF, and 87% of TL procedures. **Conclusions:** IVN tumors were twice as common as SVN tumors. Nerve of origin did not affect facial nerve outcomes but did impact hearing preservation. Patients with tumors < 1 cm had the best chance for hearing preservation. Overall facial nerve preservation was excellent with >90% achieving HB 1-3 function at final followup.

**64. Spinal Myxopapillary Ependymoma Metastatic to Bilateral Internal Auditory Canals**

Kris R. Jatana, MD, Columbus, OH  
Abraham Jacob, MD, Columbus, OH  
H. W. Sloan, MD, Columbus, OH  
Abhik Ray-Chaudury, MD, Columbus, OH  
D. B. Welling, MD PhD\*, Columbus, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the clinical presentation, radiographic features, and histopathology of metastatic ependymoma to the internal auditory canals (IACs) as well as the diagnostic criteria for neurofibromatosis type 2 (NF-2).

**Objectives:** To report the first case of spinal myxopapillary ependymoma metastatic to both IACs and its implications for diagnosing NF-2. **Study Design:** Case report and review of literature. **Methods:** A detailed clinical history, pre-/postoperative MR imaging, intra-operative photographs, and histopathology from a patient with bilateral IAC lesions is presented, and the diagnostic criteria for NF-2 are reviewed. **Results:** A 14 year old male with normal hearing and a previous history of spinal myxopapillary ependymoma presented to our institution with bilaterally enhancing IAC lesions on postcontrast T1 weighted MRI. The diagnosis of NF-2 with bilateral vestibular schwannomas (VS) was entertained. However, close examination of T2 weighted MRI demonstrated the masses to be isointense to and indistinguishable from CSF. This raised the possibility of other, more unusual IAC lesions. The patient underwent sequential suboccipital craniotomies, and both IAC masses were found to be myxopapillary ependymomas. **Conclusions:** This is the first reported case of bilateral IAC ependymomas. While VS accounts for the majority of T1 weighted postcontrast enhancing IAC lesions, other uncommon lesions may present in a similar manner. Both T1 and T2 weighted MRI may be necessary to distinguish VS from some unusual IAC lesions like metastatic ependymoma. This distinction has implications for patient prognosis and clinical surveillance.

**65. Nitinol End Effector for the Soundtec Implantable Hearing Aid**

Glenn W. Knox, MD\*, Jacksonville, FL  
Jack J.V.D. Hough, MD\*, Oklahoma City, OK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain how implantable hearing aids are designed, discuss technical problems in their clinical use, and compare methods to attach the effector to the stapes.

**Objectives:** To assess the efficacy of the shape memory alloy Nitinol as an end effector for the Soundtec semi-implantable hearing aid. **Study Design:** Prospective laboratory study. **Methods:** In previous patient testing of the Soundtec device, after separating the incul-

ostapedial joint, a magnet encased in a titanium canister with a ring was introduced onto the stapes neck. Gelfoam or adipose tissue was used to stabilize the magnet. It has been noted that the ring attaching the titanium canister to the stapes neck becomes unstable in a minority of cases interfering with sound quality. In the present study, the identical surgical procedure using temporal bones in the laboratory were used with nitinol as the attachment ring. **Results:** The shape memory and super-elastic properties of nitinol are of great potential benefit in attaching the titanium canister to the stapes. Nitinol conforms to the natural shape of the stapes neck. The super-elastic properties of the nitinol prevent loosening of the titanium canister. **Conclusions:** Previous in vivo studies revealed that magnet instability and noise were the most frequent complaints and necessitated anchoring the magnet with fat. The solution to this problem may be using nitinol in the attachment ring. The in vitro results with the nitinol ring suggest that in vivo testing with the nitinol ring attachment are warranted.

## 66. The Incidence of Tinnitus in an Adult Cochlear Implant Population as it Relates to Patient Perception and Device Characteristics

Pamela T. Kruger, AuD, Dallas, TX  
Peter S. Roland, MD\*, Dallas, TX (Presenter)  
Angela G. Shoup, PhD, Dallas, TX  
Christine E. Powell, MA, Dallas, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the prevalence of tinnitus in a postoperative adult cochlear implant population and relate that to such variables as programming strategy and unilaterally versus bilaterally implanted patients.

**Objectives:** The objective of this study is to evaluate the incidence of tinnitus in our adult cochlear implant program population. A secondary objective is to evaluate responses from a subset of the adult CI patient population to a tinnitus questionnaire. **Study Design:** A retrospective review of previously implanted adult patients in a university clinic setting will be presented. In addition, responses from a subset of these patients to a tinnitus questionnaire will be included. **Methods:** A retrospective chart review conducted of all adult patients implanted in our cochlear implant program. These adult patients will be provided with a questionnaire about tinnitus for completion. **Results:** To date approximately 200 adults have received cochlear implants at our clinic from Cochlear Corporation, Advanced Bionics and Med-El. From the chart review, information about pre- and postoperative tinnitus will be provided and related to etiology of deafness, duration of deafness prior to implantation, side of implantation (unilateral/bilateral), type of technology, processing strategy, and speech perception scores. In addition to aggregate information, case studies of three patients will be included. **Conclusions:** The literature indicates that in most instances tinnitus is reduced postimplantation in patients implanted unilaterally. Limited information is available about the impact of bilateral implantation, type of technology, processing strategy and prevalence of tinnitus. The large patient population reviewed will provide insight into these variables.

## 67. EASTERN SECTION RESIDENT RESEARCH AWARD WINNER - Honorable Mention Refining the Transcanal Acute Otitis Media Model in the Chinchilla

*Scott L. Lee, MD, Albany Medical College, Albany, NY*  
Jing-Ren Zhang, PhD, Albany, NY  
Yueyun Ma, PhD, Albany, NY  
Jun Yang, Albany, NY  
Steven M. Silver, MD, Albany, NY

**Educational Objective:** At the conclusion of this presentation, the participants should demonstrate an understanding of the transcanal middle ear inoculation and lavage techniques, discuss the limitations of such approaches, and recognize the implications of the observed bacterial migration patterns.

**Objectives:** Chinchilla laniger is a rodent commonly employed for otologic experimentation because of its hypertrophied bulla, low incidence of natural otitis media, and the lack of streptococcus pneumoniae carriage in the external auditory canal, nasopharynx, and oropharynx. We report a transcanal inoculation and lavage technique of the chinchilla middle ear, viable bacterial recovery from the middle ear, nasopharynx, and blood, as well as assess the status of the contralateral middle ear. **Study Design:** Prospective, nonrandomized animal trial. **Methods:** Six C. laniger left ears were inoculated with  $10^3$ - $10^4$  CFU of wild-type S. pneumoniae through a transcanal tympanotomy. Three days later, a tympanotomy was performed in both ears of all six animals, lavaged with phosphate buffered saline, and cultured. Nasopharyngeal and blood cultures were also obtained at necropsy. **Results:** S. pneumoniae was recovered from five of six left ears (83%), three of six right ears (50%), six of six nasopharyngeal cultures (100%), and one of six blood cultures (17%). **Conclusions:** Inoculation and lavage via a transcanal tympanotomy are simple, direct, and atraumatic techniques for inducing acute otitis media (AOM) and recovering viable bacteria in the chinchilla model. In contrast to the transbulla approach, bulla disruption is not necessary and avoids possible contaminants from the skin flora. The isolation of S. pneumoniae in the contralateral ear suggests bacterial migration via the eustachian tube. This should raise concern to the use of the contralateral ear as an independent control in AOM models.

## 68. Spontaneous CSF Otorrhea and Obesity

Adam J. LeVay, MD, New Haven, CT

John F. Kveton, MD, New Haven, CT

**Educational Objective:** At the conclusion of this presentation, the participants should be able to appreciate the association between spontaneous CSF otorrhea and increased body mass index (BMI) in adults.

**Objectives:** To review patients who presented with spontaneous CSF otorrhea in search of common patient features and comorbidities and to develop a hypothesis related to its etiology. **Study Design:** A retrospective review was conducted of inpatients with the diagnosis of CSF otorrhea presenting during a fifteen year period to a tertiary care medical center. **Methods:** Patient records were reviewed and the following data were extracted: age, sex, height, weight, past medical/surgical history, laterality of otorrhea, findings at operation, and methods of repair. Otorrhea was considered spontaneous in the absence of trauma, recent otologic surgery, and infection. **Results:** Of the 19 adult patients identified 11 patients presented with CSF otorrhea that was spontaneous in nature. There were 8 men and 4 women in this group. The average BMI among these patients was  $35.5 \pm 9.5$  which was higher than the average in the non-spontaneous group,  $29.2 \pm 4.6$  ( $p=0.05$ ). Diagnoses of obstructive sleep apnea were also more common in the spontaneous group ( $n=2$ ) compared to the non-spontaneous group ( $n=0$ ). At operation 10 of the bony defects were repaired with hydroxyapatite cement and one was repaired with a fat graft. All patients had satisfactory results. **Conclusions:** In this series patients with spontaneous CSF otorrhea were more likely to be severely and morbidly obese than patients with non-spontaneous otorrhea. The role of obstructive sleep apnea and obesity in the pathophysiology of spontaneous CSF leaks warrants further investigation.

## 69. Development of Evaluation Tools for Resident Surgical Proficiency

Sam J. Marzo, MD, Maywood, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the importance of the accurate evaluation of resident surgical performance, describe ways to measure surgical performance, and discuss the important role of feedback in resident surgical training.

**Objectives:** The objective of this presentation is to describe the development, use, and application of a tool to measure resident performance in a busy otolaryngological training program. **Study Design:** Prospective. **Methods:** A one page questionnaire was used weekly during random otological surgical cases during a four month period on two residents. The tool measured the ACGME competencies of patient care, medical knowledge, professionalism, and interpersonal and communication skills. Results were tabulated and analyzed. **Results:** By quantifying scores in the four domains of patient care, medical knowledge, professionalism, and communication skills, the resident surgical performance tool allowed measurement of the ACGME competencies critical for resident education. The tool showed residents the areas needing improvement and was used during the semiannual resident performance evaluation. **Conclusions:** Accurately measuring resident surgical performance and providing timely feedback is critical. This tool is one method that is easy to use, applies to various surgical cases, and allows the program director to accurately track and quantify resident performance.

## 70. MIDDLE SECTION RESIDENT RESEARCH AWARD WINNER - 3rd Place

### DEAN M. LIERLE RESIDENT RESEARCH AWARD

### Enhanced Survival of Bone Marrow Derived Pluripotent Stem Cells in an Animal Model of Auditory Neuropathy

*Akihiro Joseph Matsuoka, MD PhD, Indiana University School of Medicine, Indianapolis, IN*

Takako Kondo, PhD, Indianapolis, IN

Eri Hashino, PhD, Indianapolis, IN

Richard T. Miyamoto, MD\*, Indianapolis, IN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain how bone marrow stem cell research is being applied to regenerate the spiral ganglion neurons. Also the advantages of using bone marrow stem cell for regenerating the spiral ganglion neurons will be discussed and will be compared with other type of stem cells such as embryonic stem cells.

**Objectives:** The loss of spiral ganglion neurons (SGNs) is one of the major causes for profound sensorineural hearing loss. Stem cell replacement therapy has the potential to treat or cure those who suffer from an array of illnesses and degenerative neurological disorders including sensorineural deafness. However little is known about the potentials of bone marrow derived stem cells (MSCs) and their ability to take on properties of SGNs. The main purpose of this study is to elucidate the survival of mouse MSCs transplanted into the ouabain treated gerbil cochlea. **Study Design:** Thirty-two Mongolian gerbils at the age of 3-4 month old were used as recipients and four TgN (ACTbEGFP) mice (Green fluorescence positive) at the age of 6 weeks old were used as donors. **Methods:** Under anesthesia the animals received an intraperilymphatic transplantation of GFP positive undifferentiated MSCs by two different ways of injection.

tion, scala tympani injection and modiolar injection. Seven days after the transplantation the survival of MSCs was evaluated by microscopic examination of frozen sections cut through the cochleae of the recipient animals. The number of profile was counted on the five most modilar sections. One way ANOVA was used for statistical analysis. **Results:** Our finding indicated that undifferentiated MSCs were able to survive in the modiolus both in the control cochlea and the ouabain treated cochlea. The average number of profiles found in the modiolus was greater in the ouabain treated cochlea than the one in the control, and this difference is statistically significant ( $p < 0.05$ ) with one way ANOVA and ad hoc Tukey-Kramer's test. With scala tympani injection there was no profile found in the modiolus either in the control or ouabain treated cochlea indicating that transplanted MSCs may need to be directly injected into the modiolus to be able to replace injured SGNs. **Conclusions:** Our results suggested that modiolar injection of MSCs seemed to be essential for MSCs to be able to survive in the modiolus of Mongolian gerbil. Also degenerative environment caused by ouabain helped MSCs facilitate the survival in the modiolar region.

## 71. Large Asymptomatic Pneumocephalus Developing Years After Middle Cranial Fossa Surgery—A Case Report

Ilka C. Naumann, MD, Indianapolis, IN  
Richard T. Miyamoto, MD\*, Indianapolis, IN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize a pneumocephalus as a rare but serious complication of a neurosurgical or neurotologic procedure and be aware of a potential chronic course with lack of typical signs and symptoms.

**Objectives:** Most otogenic pneumocephali develop in an acute or subacute fashion, presenting with focal neurological symptoms, headache or signs of meningitis secondary to translocation of bacteria into the cavity. Chronic pneumocephalus or pneumocele of otogenic origin is extremely rare and commonly unsuspected as described in the presented patient. **Study Design:** Case report. **Methods:** We describe a patient with a supra-auricular soft tissue swelling as the only presenting symptom of a large chronic epidural pneumocele with extension into the extracranial subcutaneous tissues. It presented several years after surgical resection of a meningioma that involved the temporal bone. **Results:** The patient underwent a successful evacuation of the extradural air and repair of the defect via transmastoidal approach and did not show a recurrence at 1 year postoperatively. **Conclusions:** Whereas acute pneumocephalus has been well characterized in the literature, typically seen postoperatively after neurosurgical and neurotologic procedures, a chronic pneumocele developing several years after surgery is highly unusual.

## 72. Screening Patients With Sensorineural Hearing Loss for Vestibular Schwannoma Using a Bayesian Classifier

S. A. Reza Nouraei, MBBChir, London, UK  
Quentin J. M. Huys, MA, London, UK  
Paul Chatrath, FRCS, London, UK  
James Powles, FRCS, London, UK  
Jonny P. Harcourt, FRCS, London, UK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to better appreciate the scope and benefits of applying neural network technologies to aid otolaryngological diagnosis. In particular, this paper presents an improved method of selecting/screening patients with audiovestibular symptom for MR imaging, which is based on Bayesian machine learning.

**Objectives:** Selecting patients with asymmetrical sensorineural hearing loss for further investigation continues to pose clinical and medicolegal challenges given the disparity between the number of symptomatic patients and the low incidence of vestibular schwannoma (VS) as the underlying cause. We developed and validated a diagnostic model using Gaussian process ordinal regression, a generalization of neural networks, for detecting vestibular schwannomas from clinical and audiological data, and compared its performance with existing audiological screening protocols. **Study Design:** Validation studies. **Methods:** Clinical and audiometric data from 129 MR-proven VS+, and as many VS patients were obtained. A Gaussian process ordinal regression classifier (GPORC) was trained and cross-validated to classify cases as VS+ or VS-, and its diagnostic performance was assessed using receiver operator characteristic plots. **Results:** It proved possible with GPORC to pre-select sensitivity and specificity with an area under the curve of 0.8025. At 95% sensitivity GPORC had a specificity of 56%, 30% better than audiological protocols with closest sensitivities. Protocols had fixed sensitivities ranging from 82-97% and specificities between 15% and 61%. **Conclusions:** The GPORC model developed increased the flexibility and specificity of the screening process for VS when applied to a large historical sample of matched patients with and without vestibular schwannoma. If applied prospectively and clinically, for instance via an internet based freeware, it could reduce the number of "normal" MR scans by as much as 30% without reducing the sensitivity of detecting true cases. Performance of the system can be further improved through incorporating additional data domains into the decision making process.

## 73. Adult Bilateral Cochlear Implant Outcomes

Christine E. Powell, MA CCC-A, Dallas, TX

Peter S. Roland, MD\*, Dallas, TX (Presenter)  
Angela G. Shoup, PhD CCC-A, Dallas, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare and discuss the quantitative and qualitative improvements indicated by bilateral cochlear implantation in adults.

**Objectives:** To evaluate bilateral benefit of cochlear implants in adults. **Study Design:** A retrospective chart review was conducted of adult patient performance with bilateral cochlear implants. **Methods:** Test results obtained monaurally and binaurally pre- and post-implantation will be presented. Procedures used to evaluate speech perception included HINT, CNC, CUNY, and BKB lists presented in quiet and in noise. In addition, pre- and post-implant questionnaires exploring perceived benefit (APHAB, LOCATE, Cochlear Questionnaire, Med EL Questionnaire) were completed. **Results:** This review details the performance of 17 adults who received Nucleus (N=9), Med El (N=7), and Advanced Bionics (N=1) devices. 13 of the patients were implanted simultaneously and 4 sequentially. Both quantitative performance as measured by speech perception tasks and qualitative information obtained from questionnaires will be discussed. In addition to the cumulative data a case presentation of a sequential candidate with greater than 5 years between the first and second implantation will be discussed. **Conclusions:** The quantitative and qualitative information reviewed indicated improved outcomes with binaural stimulation.

#### 74. Contemporary Revision Stapedectomy: A Case Series and Literature Review

Jeffrey C. Rastatter, MD, Columbus, OH  
Abraham Jacob, MD, Columbus, OH  
Nicholas A. Fettman, MD, Columbus, OH  
Andrew S. Kalan, Columbus, OH  
Raul J. Lopez, BS, Columbus, OH  
D. Bradley Welling, MD PhD\*, Columbus, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the present day safety and efficacy of revision stapedectomy.

**Objectives:** To analyze the safety, efficacy, and functional outcomes of revision stapedectomy within the past decade. **Study Design:** Retrospective case series between 2001-2005 at a single tertiary referral center and a literature review spanning 1995-2005. **Methods:** All charts from patients undergoing revision stapedectomy/stapedotomy between 2001-2005 were reviewed. Clinical and audiometric data were evaluated. Pure tone air conduction average (PTA:AC) and pure tone bone conduction average (PTA:BC) thresholds were calculated using 0.5, 1, 2, and 3 kHz. The primary functional outcome measures were postoperative PTA:AC, air bone gap (ABG), and sensorineural hearing loss (SNHL). The scientific literature on revision stapedectomy between 1995-2005 was also reviewed. **Results:** Seventeen patients from 15 to 69 years of age (mean 47 years) underwent revision stapedectomy between 2001-2005 at our institution. Their mean preoperative PTA:AC was 53 dB (SD 14.4 dB, range 28-86 dB) and ABG was 31 dB (SD 12.2 dB, range 7-51 dB). Postoperatively, the mean PTA:AC was 30 dB (SD 10.2 dB, range 14-48 dB) and ABG was 10 dB (SD 6.7 dB, range 0-27 dB). 15 of 17 patients had improved hearing. Two patients had mild postoperative SNHL. Twenty-seven case series between 1995-2005 were reviewed. This literature found a mean postoperative ABG of 14 dB, SNHL rate of 3% and an anacusis rate of 1%. **Conclusions:** Contemporary revision stapedectomy is a safe and efficacious procedure in adults.

#### 75. The Impact of the Size of Auditory Nerve at Base of Cochlea on Cochlear Implantation Outcome

Shari D. Reitzen, MD, New York, NY  
Edwin W. Wang, MD, New York, NY  
Annette O. Nusbaum, MD, New York, NY  
Noel L. Cohen, MD\*, New York, NY  
Susan B. Waltzman, PhD, New York, NY  
Anil K. Lalwani, MD\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the size of the auditory nerve and its impact on cochlear implantation outcomes.

**Objectives:** Recent demonstration of a direct relationship between the size of the auditory nerve as it enters the base of the cochlea and the severity of sensorineural hearing loss (SNHL) suggests that deaf individuals with narrower width/smaller auditory nerve may have poorer outcomes following cochlear implantation. The purpose of this study was to evaluate if the width of the entry zone of auditory nerve into the cochlea correlates with success of cochlear implantation. **Study Design:** Retrospective review/tertiary referral center. **Methods:** Forty-seven adult/pediatric cochlear implant recipients with profound SNHL and forty-eight normal hearing control patients were studied. The width of the entry zone of the auditory nerve into the base of the cochlea was measured on thin section temporal bone CT. A battery of auditory and speech perception tests were performed preoperatively and at six months to four years postimplantation.

**Results:** The auditory nerve was significantly narrower in patients with profound SNHL as compared to controls. However all subjects showed significant improvement in speech recognition postoperatively. Performance did not correlate with the width of the entry zone of the auditory nerve in patients with cochlear implants. **Conclusions:** While the width of the entry zone of the auditory nerve into the cochlea is narrower in SNHL patients, it does not portend a poor outcome following cochlear implantation.

#### 76. **The Effect on Hearing of Synergistic Exposure to Loud Noise and Kerosene**

Yisgav Shapira, MD, Miami, FL  
Michal Zilberberg, MOcH, Tel Hashomer, Israel  
Jona Kronenberg, MD, Tel Hashomer, Israel  
Joseph Attias, DSc, Petah Tiqva, Israel

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the definitions of noise induced hearing loss, the influence of organic solvents on hearing and discuss the combined effect of synergistic exposure to both.

**Objectives:** The purpose of this study was to examine the synergistic effect of exposure to jet plane noise and JP-8 jet fuel on the hearing of soldiers in the air force. **Study Design:** Occupational epidemiological study. **Methods:** We examined 167 soldiers in the different air force bases. Each soldier went through a complete otologic neurotologic physical examination and filled a questionnaire. Two audiometries performed at least 6 months apart were compared. The study groups were “exposed to noise”, “exposed to jet fuel”, “exposed to both” and “exposed to none”. **Results:** We found a significant correlation between exposure to jet fuel and a 4 kHz dip. There was no significant correlation between exposure to noise or synergistic exposure to noise and jet fuel and hearing loss. **Conclusions:** In our study loud noise, as defined by NIOSH, did not cause hearing loss and did not add to the minor effect of exposure to kerosene on hearing.

#### 77. **High Resolution Thin Cut Computed Tomographic (HRCT) Scan of the Temporal Bone: A Cost Versus Benefit Analysis**

Joseph R. Smolarz, MD, Houston, TX  
Gale G. Gardner, MD, Shreveport, LA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to determine whether a high resolution thin cut CT of the temporal bone should be ordered after a temporal bone fracture.

**Objectives:** To evaluate whether thin cut high resolution (HRCT) scan of the temporal bone is indicated after a fracture is found on 5mm cut CT scan of the head. **Study Design:** Retrospective review. **Methods:** CPT codes were used to find 92 patients with temporal bone fracture in the years 2002 to 2006 to analyze the changes in management after HRCT scan. **Results:** 17 patients had a CSF leak and each patient had resolution of symptoms with CSF precautions and bed rest. Of the 18 patients with facial nerve paralysis, one underwent repair with graft and one underwent facial nerve decompression. All facial nerve paralysis were found on physical exam and treatment was not changed by HRCT temporal bone, though helpful in surgical planning. Seven patients did have a small subarachnoid hemorrhage close to the fracture sight. **Conclusions:** HRCT scan of the temporal bone should be performed when clinical criteria such as facial nerve paralysis warrant its use or for surgical planning. From an otolaryngic standpoint, this study does not change the management of a noncomplicated temporal bone fracture. The physician must remember that small subarachnoid hemorrhages can be missed on 5 mm cut CT scan of the head. A low threshold to obtain HRCT should be implemented as the standard of care.

#### 78. **Cystic Lymphangioma of the Middle Ear**

Neil Tanna, MD, Washington, DC  
Arjun S. Joshi, MD, Washington, DC (Presenter)  
Douglas Sidell, BS, Washington, DC  
David A. Schessel, MD PhD, Washington, DC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the clinical, radiologic, histopathologic features, developmental etiology and management of cystic lymphangioma of the middle ear.

**Objectives:** To review the clinical, radiologic, and histopathologic features of cystic lymphangioma of the middle ear, and to discuss the developmental etiology and management of such a lesion. **Study Design:** Presentation of an unusual location for the development of a cystic lymphangioma with emphasis on etiology, clinical implications and current treatment. **Methods:** Case report and review of the literature. **Results:** A 10 year old female presented with progressive ear discomfort, headaches, and a pulsatile sound in her right ear. Physical examination revealed a mass involving the medial surface of the tympanic membrane. T2 weighted MRI demonstrated a hyperintense lesion in the anterior-superior middle ear cavity without evidence of vascular abnormalities. The mass was surgically excised and the postoperative course was without complications. **Conclusions:** When considering the differential for a middle ear mass the diagnosis of cystic lymphangioma should not be ignored. The etiology of such a lesion has been demonstrated to arise from abnor-

malities in growth factors which contribute to the tightly regulated process of lymphangiogenesis. When these lymphatic malformations develop in the middle ear, they can be diagnosed presumptively by virtue of magnetic resonance imaging in combination with a detailed physical examination. The treatment of choice for lymphangiomas located in the middle ear is surgical excision. Definitive diagnosis of the lesion is then made by identifying specific histopathologic characteristics. Although rare and histologically benign middle ear lymphangiomas may produce significant patient discomfort and ultimately a conductive hearing loss. Therefore remain an important consideration for the astute clinician.

### 79. Position of Transtympanic Electrode: Manubrium Is Poor Guide

N. Wendell Todd, MD MPH\*, Atlanta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to describe the variability of transtympanic electrode positioning using the manubrium as guidepost.

**Objectives:** Though a transtympanic electrode is commonly used (e.g., for electrocochleography and electrically evoked auditory brainstem response), the variability of responses among normal subjects is wide. The manubrium is the typical guidepost for electrode placement. This study addresses the hypothesis that electrode position relative to the round window niche is tightly localized. **Study Design:** Postmortem anatomic dissection of 41 bequeathed adult crania (82 temporal bones). **Methods:** Drill marks were made on the medial wall of the mesotympanum from two manubrium based positions: 1.5-2 mm posterior to the umbo and halfway between umbo and annulus posterior-inferior. **Results:** Distances to lip of round window niche ranged 0.8-3.5 mm and 1.8-4.5 mm for the two electrode sites, respectively. The posteriorly determined site was uniformly onto the promontory, but the posterior-inferior site was into hypotympanic trabeculations in 81% of ears and into the jugular plate in 6%. Distances from the electrode sites to round window niche were not obviously associated with either mastoid size or orientation of manubrium in the head. **Conclusions:** The location of a transtympanic positioned electrode using the manubrium as guidepost is not accurately predictable relative the round window niche.

### 80. Post-Traumatic Cholesteatoma of the Infratemporal Fossa: A Case Report and Literature Review

Rachelle E. Wareham, MD, Loma Linda, CA

John Y. Kim, MD, Loma Linda, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the uncommon presentation of post-traumatic cholesteatoma and its surgical management.

**Objectives:** Cholesteatomas existing beyond the usual confines of the middle ear and mastoid, such as in the paranasal sinuses or beyond the skull base, are relatively uncommon. We provide a literature review, a case presentation of post-traumatic infratemporal fossa cholesteatoma and discussion of surgical treatment. **Study Design:** Case report. **Methods:** Our case is an adult female, evaluated at a tertiary referral center and surgically treated for an extensive post-traumatic cholesteatoma that invaded the infratemporal fossa and maxillary sinus. Clinical presentation, imaging studies, operative findings, surgical management and postoperative results are included. **Results:** A review of English literature over the past century found few articles related to large cholesteatomas of the infratemporal fossa. Surgical access for exteriorization of our patient's cholesteatoma was obtained through an endoscopic maxillary sinus approach. **Conclusions:** Acquired cholesteatomas involving intracranial regions are uncommon but may occur following temporal bone trauma. To our knowledge, while some reports exist involving cholesteatoma in the middle or posterior cranial fossa, very little is said about the infratemporal fossa. Reports advocate complete excision or exteriorization as surgical management; our patient was successfully treated by exteriorization.

### 81. Modified Fisch Approach for Hearing Preservation (Canal Wall Replacement)

Richard J. Wiet, MD\*, Chicago, IL

Philip D. Littlefield, MD, Chicago, IL (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participant should understand how to remove and replace the external auditory canal during the infratemporal type A approach to the skull base.

**Objectives:** The postauricular infratemporal approach (Fisch A) provides excellent exposure to jugular foramen and surrounding skull base but concedes a maximum conductive hearing loss due to overclosure of the ear. It is possible to remove the external auditory canal and reattach it with hydroxyapatite bone cement in some operative procedures. We investigated the feasibility of this during skull base cases where it is necessary to remove the external auditory canal for wide exposure. **Study Design:** Retrospective review. **Methods:** All cases where ear canal reconstruction followed tumor removal were identified. Surgical outcome, complications, and hearing results were reviewed. **Results:** Two patients were identified. Both had postauricular infratemporal fossa exposures for benign tumors. One had a glomus jugulare while the other had an aggressive pleomorphic adenoma that invaded the fallopian canal and the jugular bulb. There were no major complications. Meticulous postoperative care was necessary to assure proper healing. Both currently have intact ear canals and tympanic membranes. **Conclusions:** Our preliminary results show that it is possible to reconstruct the conductive hear-

ing mechanism following this approach to the skull base without compromising the exposure or risking major complications. This eliminates a major drawback to approaches to this region.

## **HEAD AND NECK**

### **82. Retrospective Institutional Review of Otorhinolaryngological Manifestations of Mucous Membrane Pemphigoid**

Eran E. Alon, MD, Rochester, MN  
Oren Friedman, MD, Rochester, MN  
Michael Camilleri, MD, Rochester, MN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the various otorhinolaryngological manifestations, diagnosis and management of mucous membrane pemphigoid.

**Objectives:** To review mucous membrane pemphigoid as it pertains to the upper aerodigestive tract. **Study Design:** Retrospective chart review of patients with mucous membrane pemphigoid with otorhinolaryngological manifestations in the last 20 years in a single institution. **Methods:** Retrospective chart review. **Results:** According to the First International Consensus on Mucous Membrane Pemphigoid (MMP), MMP describes a heterogeneous group of chronic, inflammatory, mucous membrane dominated, subepithelial blistering diseases that manifest a varying constellation of oral, ocular, skin, genital, nasopharyngeal, esophageal, and laryngeal lesions. We have reviewed all cases of MMP that have been seen at our institution in the past 20 years. We report on the upper aerodigestive manifestations of this disorder focusing on the initial presentation, diagnostic and management trends which have evolved over time as well as outcome. **Conclusions:** MMP is an uncommon autoimmune disorder that may present with a wide spectrum of head and neck manifestations. It is essential that the otolaryngologist be familiar with its presenting features, diagnostic challenges, and treatment options. This work highlights our experience with MMP in an attempt to draw attention to this unusual disorder.

### **83. Postlaryngectomy Fistula Closure Using the Vacuum Assisted Closure (V.A.C.)**

Brian T. Andrews, MD, Iowa City, IA  
Henry T. Hoffman, MD\*, Iowa City, IA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the application of using the vacuum assisted closure (V.A.C.) system to close postlaryngectomy fistulas.

**Objectives:** Postlaryngectomy fistulas have a reported incidence of 3% to 65% and are a challenging complication to manage. The vacuum assisted closure (V.A.C.) system is a topical negative pressure dressing that has been used extensively to manage a multitude of complicated wounds including facilitating enterocutaneous fistula closure. We hypothesize that the V.A.C. system is a feasible treatment option for closing postlaryngectomy fistulas. **Study Design:** A retrospective chart review was performed. **Methods:** A subject with a recurrent T2N0 squamous cell cancer who failed a previous partial laryngectomy underwent a total laryngectomy. On postop day #13, a salivary fistula was suspected on clinical exam. A barium swallow study confirmed this diagnosis. Under local anesthesia the laryngectomy incision was opened 2 cm to bluntly drain the fluid collection, the V.A.C. system was applied at the neck skin. **Results:** The V.A.C. system was removed after 72 hours when the outputs suggested the fistula tract was closed. Inspection of the wound revealed no fistula remnant. A repeat barium swallow study was performed and no fistula was detected. Oral intake was resumed without further sequelae. **Conclusions:** The V.A.C. system is a feasible treatment option for postlaryngectomy fistulas and may facilitate quick fistula closure in select clinical situations.

### **84. The Utility of a Nonoperative Workup for Head and Neck Cancer**

William P. Innis, MD, Burlington, MA  
Jennifer G. Andrus, MD, Burlington, MA  
Timothy D. Anderson, MD, Burlington, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the advantages of transnasal esophagoscopy (TNE) over traditional rigid esophagoscopy in the workup of head and neck cancer, as well as the role TNE can play with flexible nasopharyngolaryngoscopy (FNPL) and computed tomography (CT) in the nonoperative staging of head and neck cancer. Elements of management participants will be able to consider include time from first presentation to initial diagnosis and to treatment, cost, procedure duration, and patient tolerance of procedures, among others.

**Objectives:** Transnasal esophagoscopy (TNE) is playing an increasing role in the management of head and neck cancer (HNC) patients. Prompt, cost effective diagnosis and treatment of HNC is imperative. We illustrate the utility of a nonoperative workup of HNC using TNE, highlighting the efficiency and economy of this approach. **Study Design:** Retrospective chart review. **Methods:** Ten patients who underwent a nonoperative workup of HNC were compared to ten matched historical controls. Nonoperative evaluation included his-

tory and physical examination (H&P), flexible nasopharyngolaryngoscopy (FNPL), TNE, in-office biopsy, laboratory evaluation, and contrast CT of the neck and chest. Historical workup included H&P, FNPL if indicated, laboratory evaluation, contrast CT of the neck and chest, biopsy, and panendoscopy under general anesthesia. For both patient groups, we assessed physical, endoscopic, and biopsy findings, cost of evaluation, time from initial visit to time of diagnosis, and time to definitive treatment. **Results:** Final diagnosis, physical, endoscopic, and biopsy findings, cost of evaluation, time from initial visit to diagnosis and to definitive treatment are delineated and compared for each group. **Conclusions:** Some patients with HNC may be diagnosed and staged via a nonoperative workup including TNE. These patients can begin treatment in a timely manner, as biopsy and flexible endoscopy can be scheduled in the office without waiting for operative time and testing. This management strategy warrants further investigation, including prospective studies comparing the accuracy of diagnosis and staging of HNC via nonoperative vs. operative methods, and assessments of patient opinions regarding nonoperative workup of HNC.

## 85. Pathologic Outcomes of Planned Neck Dissection After Chemoradiation for Advanced Carcinoma of the Head and Neck

Keith A. Casper, MD, Cincinnati, OH  
Michael J. Wolfe, MD, Cincinnati, OH  
Lee A. Zimmer, MD PhD, Cincinnati, OH  
Keith M. Wilson, MD, Cincinnati, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the role of neck dissection after chemoradiation for advanced head and neck cancer.

**Objectives:** Treatment protocols utilizing chemoradiation for primary treatment of advanced squamous cell carcinoma of the head and neck have become increasingly utilized. Controversy remains regarding the appropriate surgical management and treatment algorithm for nodal disease following definitive chemoradiation. The aim of this study was to evaluate the rate of residual viable nodal disease after chemoradiation. **Study Design:** Retrospective review. **Methods:** Charts were reviewed of twenty-three patients with advanced squamous cell carcinoma of the head and neck treated with chemoradiation and planned neck dissection. Patient characteristics, tumor staging, treatment regimen as well as clinical, radiographic and pathologic response to treatment were recorded. Clinical and radiographic response to therapy was divided into complete response, partial response, no response and progressive disease. **Results:** 34 neck dissections were performed among the 23 patients (11 bilateral). Pathologic evaluation demonstrated viable cancer in 10 of 23 patients (43.4%). The distribution of residual disease was 0/1 N1; 6/17 N2 (35.2%); 4/5 N3 (80%). Further division of N2 disease reveals 0/3 N2a; 4/8 N2b (50%); 2/6 N2c (30%). Seven patients had a complete radiographic response; 14 had a partial response; and 2 had no response. 2/7 complete radiographic responders had persistent pathologic disease (28.5%); 6/14 partial responders (42.8%); 2/2 patients with no response had persistent nodal disease (100%). **Conclusions:** A significant percentage of patients treated with definitive chemoradiation, regardless of clinical response, will have residual pathologic nodal disease. Neck dissection should be considered for all N2b, N2c and N3 disease.

## 86. Are Airbags Protective for Maxillofacial Injuries?

Eugene H. Chang, MD, Iowa City, IA  
Peter W. Cho, MD, Iowa City, IA  
Ginger J. Yang, PhD MPH, Iowa City, IA  
Kent C. Choi, MD, Iowa City, IA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to: 1) appreciate the social and economic costs of motor vehicle accidents (MVAs); 2) understand the mechanism of maxillofacial injuries in MVAs; and 3) compare the effect of seatbelts and airbags in reducing maxillofacial injury.

**Objectives:** To determine the efficacy of seatbelts and airbags in reducing maxillofacial injury in MVAs. **Study Design:** We performed a retrospective chart review of 1,447 patients with significant facial injuries (Abbreviated Injury Scale (AIS)  $\geq$  2), who were drivers or front seat passengers involved in a MVC and admitted to a level I university trauma service from 2002 to 2005. **Methods:** Data was collected regarding frequencies of maxillofacial fracture, type of fracture, and those requiring operative intervention. Risk of facial fracture and the odds of fatality were chosen as outcome variables. Data was analyzed using a logistic regression model that controlled for age and the effect of secondary protective devices. **Results:** The 1,447 subjects were classified into four groups, +SB+AB (18%), +SB-AB (46%), -SB+AB (3%), -SB-AB use (33%). The frequency of significant facial trauma was 8%. Among the injured patients, 52% required operative intervention. Seatbelt use significantly reduced risk in maxillofacial injury (62%), fatality (67%), need for surgery (74%), and decrease average LOS (2 of 9 days) ( $p < .0001$ ). Airbag use appeared to have a protective effect against facial trauma when used with seatbelts (10%, 95% CI 0.59-2.03), but caused more maxillofacial fractures as well as a higher operative rate when used alone (7%, 95% CI 0.40-2.87). **Conclusions:** Seatbelts do save lives as well as reduce maxillofacial injuries. Airbags may increase the risk of maxillofacial injury, especially when used as the sole safety device. Further studies incorporating vehicle speed, collision data, and driver/passenger position are warranted.

## 87. The Transoral Approach to the Removal of Retropharyngeal Lymph Nodes in Well Differentiated Thyroid Cancer

James I. Cohen, MD PhD, Portland, OR  
Domi Le, BSc, Portland, OR (Presenter)  
Kathryn Schuff, MD, Portland, OR  
Mary Samuels, MD, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the diagnosis of, indications for and technical aspects of transoral removal of retropharyngeal lymph nodes containing metastatic well differentiated thyroid cancer.

**Objectives:** While involvement of the retropharyngeal lymph nodes (RPLN) by well differentiated thyroid cancer is relatively uncommon, surgical management of disease in this location can be problematic. Traditional extirpative dissection to disease in this location (usually squamous cell carcinoma) involves a transcervical approach as a superio-medial extension of a neck dissection done as part of the surgical approach to the primary disease. However the proximity of the RPLN to the posterior oropharyngeal mucosa and the well circumscribed noninvasive nature of thyroid cancer metastases (without extracapsular spread) make a more direct transoral approach to their removal technically feasible and oncologically sound. The purpose of this report is to describe the method of diagnosis, the surgical technique of transoral removal and the results with its application in 5 patients. **Study Design:** Retrospective case series. **Methods:** Retrospective chart review. **Results:** Transoral removal of RPLN was performed on 6 occasions in 5 patients. There was one immediate postoperative hematoma which was evacuated without sequela. All patients resumed an oral diet immediately and had no clinical sequela in terms of speech or swallowing. There were no problems with healing or velopharyngeal incompetence. No patient has/had residual radioactive iodine uptake in the retropharyngeal location or clinical/radiographic evidence of recurrence with a median followup of 39 months. **Conclusions:** For well circumscribed noninvasive disease in the RPLN as seen in well differentiated thyroid cancer, removal can be accomplished by a relatively straightforward low morbidity transoral approach.

## 88. Alcohol Consumption Alters Concentration of Carotenoids in Oral Cavity Tissues as Measured by Raman Spectroscopy

Jason A. Diaz, MD, Salt Lake City, UT  
Prمود K. Sharma, MD, Salt Lake City, UT  
Robert W. McClane, MS, Salt Lake City, UT  
Brandon G. Bentz, MD, Salt Lake City, UT

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the role that carotenoids may play in tumorigenesis and understand how lifestyle factors may affect levels.

**Objectives:** Carotenoids are antioxidants that have been hypothesized to protect against the development of various cancers. We used Raman spectroscopy to measure and compare intraoral tissue carotenoid levels in an effort to further define their role in tumorigenesis of the head and neck. **Study Design:** IRB approved, prospective, cross sectional study. **Methods:** Participants completed a questionnaire designed to gather demographic data and identify behavioral patterns. A Raman instrument was used to measure carotenoid concentrations in the buccal mucosa, anterior floor of mouth, oral tongue, and soft palate. Statistical analyses were performed to identify variables affecting tissue levels. **Results:** The study population consisted of 51 subjects 30 (59%) of which were male. The mean age was  $46.9 \pm 18.9$  years. 15 of the 51 (29%) participants were found to have a head and neck squamous cell carcinomas or premalignant lesions. Alcohol users had a significantly higher level of tissue carotenoids in the tongue ( $p=0.03$ ), floor of mouth ( $p=0.05$ ), and palate ( $p=0.02$ ) than those who did not drink. There was a trend toward decreased carotenoid levels in the tongue when cancer or a premalignant lesion was present. Smokers with these lesions had lower levels of carotenoids in the palate than those without signs of disease. **Conclusions:** Variation in carotenoid levels between sites may represent unique methods of metabolism or may reflect differences in tissue composition. Higher concentrations found in subjects who drank alcohol suggest that carotenoids behave differently within these individuals. Lower carotenoid levels found in patients with cancer are consistent with current literature regarding their role as antioxidants.

## 89. Metastatic Insular Thyroid Carcinoma in the Pediatric Patient

Kimberly A. Donnellan, MD, Jackson, MS  
Richard O. Wein, MD, Jackson, MS  
Jeffrey D. Carron, MD, Jackson, MS  
Stephen A. Bigler, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss insular thyroid carcinoma with respect to diagnosis and management.

**Objectives:** The clinical history of a pediatric patient with metastatic insular thyroid carcinoma will be reviewed. Previously reported cases will be examined to allow for comparison of prognosis. **Study Design:** Case report and limited review of the literature on the topic of pediatric insular thyroid carcinoma will be presented. **Methods:** A four year old female with the complaint of chronic cough, progressive shortness of breath and weight loss for two months underwent cervical lymph node biopsy. The biopsy revealed metastatic thyroid carcinoma. Preoperative imaging was suspicious for miliary metastatic spread to the lungs. **Results:** Surgical intervention included total thyroidectomy with bilateral paratracheal and modified radical neck dissections. The right internal jugular vein and recurrent laryngeal nerve were sacrificed at the time of surgery due to gross tumor invasion. Final pathology revealed the insular variant of papillary thyroid carcinoma with bilateral regional metastasis. Postoperatively the patient underwent I-131 treatment. **Conclusions:** Pediatric metastatic insular thyroid carcinoma is an uncommon form of thyroid malignancy requiring aggressive surgical treatment and adjuvant radioactive iodine. Miliary metastatic spread to the lungs raises concern for post-treatment pulmonary fibrosis which should be monitored for closely.

## 90. Papillary Thyroid Carcinoma and Familial Adenomatous Polyposis of the Colon

Kimberly A. Donnellan, MD, Jackson, MS

Richard O. Wein, MD, Jackson, MS

Stephen A. Bigler, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be familiar with the association of the cribriform-morular variant of papillary thyroid carcinoma to familial adenomatous polyposis of the colon.

**Objectives:** To raise the awareness of the association of the cribriform-morular variant of papillary thyroid carcinoma to familial adenomatous polyposis of the colon. **Study Design:** Case report and limited review of the literature on the topic of papillary thyroid carcinoma and familial adenomatous polyposis and its genetic associations. **Methods:** A patient with multiple prior surgeries for colonic polyps, abdominal perineal resection for colorectal cancer, and wedge resection for metastatic adenocarcinoma (consistent with rectal primary) presented with a thyroid mass. Fine needle aspiration demonstrated papillary thyroid carcinoma. **Results:** The patient underwent total thyroidectomy. Pathology revealed the cribriform-morular variant of papillary carcinoma that has been reported in patients with familial adenomatous polyposis. **Conclusions:** Cribriform-morular variant of papillary thyroid carcinoma is an uncommon diagnosis known to be associated with familial adenomatous polyposis. Although the incidence is rare this diagnosis should raise the clinician's suspicions to recommend both colorectal screening and genetic counseling for family members.

## 91. Langerhans Cell Histiocytosis of the Thyroid Gland

Tarik Y. Farrag, MD, Baltimore, MD

Ralph P. Tufano, MD, Baltimore, MD

**Educational Objective:** At the conclusion of this presentation, the participants should be able to be aware of this rare disease of the thyroid gland, to be included in the differential diagnosis of thyroid enlargement, and to have guidance in its diagnosis and management.

**Objectives:** A case is reported in which Langerhans cell histiocytosis was found in the thyroid gland. Although thyroid gland is frequently affected with multiple common diseases, a search of the English language literature suggests this is a rarely reported disease in the thyroid gland. **Study Design:** Case report and literature review. **Methods:** The records of a patient with Langerhans cell histiocytosis in the thyroid gland were reviewed. The presentation, other organs/systems affection, imaging, and histo-pathologic findings are presented and the implications of these discussed. The differential diagnoses and the role of multidisciplinary team cooperation are explained and discussed. The surgical approach, intraoperative findings, and different treatment methods are discussed. **Results:** A 31 year old woman presented with an enlarged, diffusely firm, nontender, nonmobile, and not particularly nodular thyroid gland with mild compressive symptoms. She had an intermittent skin papules and one episode of a gingival ulceration. Ultrasound showed an enlarged, hypoechoic thyroid with dimensions of 36 x 20 x 16 mm on the right and 36 x 16 x 17 mm on the left. No distinct nodules were noted with normal thyroid function tests. Laboratory testing for autoimmune abnormalities of the thyroid was negative for antithyroid peroxidase, antiparietal cell, and antismooth muscle cell antibodies. She tested positive for serum antithyroglobulin antibodies. A CT scan demonstrated abnormal low attenuation of her thyroid gland without any distinct nodules or masses. A fine needle aspiration and core biopsy confirmed the diagnosis of LCH. Dissection was technically challenging due to the firm and nonmobile lobes. Densely adherent strap musculature was encountered bilaterally, and the rare presence of a nonrecurrent laryngeal nerve was noted on the right. Histologically thyroid parenchyma was largely obliterated by a diffuse infiltrate of mononuclear spindled to epithelioid histiocytes cells with few residual thyroid follicles. These histiocytes have moderate to abundant pale to eosinophilic cytoplasm and some have prominent nuclear grooves and indentation/clefts, consistent with Langerhans cells. Plasma cells and lymphocytes were sparsely dispersed. Immunohistochemistry shows that these histiocytes are positive for S100 and rare lesional histiocytes are also positive for CD1a. Eosinophils are not readily identified in this lesion. **Conclusions:** Langerhans cell histiocytosis in the thyroid gland is rarely reported, frequently mistaken with other thyroid diseases, and with controversy over its management. This disease should be always considered

in the differential diagnoses of nodular or diffuse thyroid gland enlargement, and multidisciplinary team cooperation is important for its diagnosis and management.

## 92. Synovial Cell Sarcoma of the Infratemporal Fossa

Tarik Y. Farrag, MD, Baltimore, MD  
Victor R. Lai, MA, Baltimore, MD  
Kofi D. Boahene, MD, Baltimore, MD  
Ralph P. Tufano, MD, Baltimore, MD

**Educational Objective:** At the conclusion of this presentation, the participants should be able to be aware of this first reported case of synovial cell sarcoma developing in the infratemporal fossa which brings to light the rare disease with an additional location reported herein in the head and neck region.

**Objectives:** A case is reported in which synovial cell sarcoma was found in the infratemporal fossa. A search of the English language literature suggests this is the first reported case of a synovial cell sarcoma developing in the infratemporal fossa. **Study Design:** Case report and literature review. **Methods:** The records of a patient with synovial cell sarcoma developing in the infratemporal fossa were reviewed. The presentation, imaging, and histo-pathologic findings are presented and the implications of these discussed. The differential diagnoses are explained and discussed. The surgical approach, intraoperative findings, the reconstructive techniques and different treatment methods are discussed. **Results:** A 46 year old white female with a longstanding history of migraines presented with a one month history of having “pins and needles” on the left side of her head. On exam, sensory testing in the trigeminal nerve distribution revealed a deficit along the left side of V3. MRI revealed a 4.7 x 3.4 cm mass within the left infratemporal fossa region. It appeared to cause some bony erosion of the lateral aspect of the pterygoid plate as well as the posterolateral wall of the left maxillary sinus. There were some bony remodeling of the left mandibular ramus and condylar neck on the left side. Fine needle aspiration revealed spindle cell neoplasm. Biopsy, via left endoscopic maxillary antrostomy, revealed synovial cell sarcoma. Upfront surgery was performed and the lesion was extensive and filling the superior and inferior aspects of the infratemporal fossa, tracking along the maxillary roots, V1 and V2 nerves. Bicornal flap preauricular approach to infratemporal fossa and midline skull base was performed, with transorbital zygomatic and mandibular osteotomy. Transparotid (parotidectomy) approach with identification and mobilization of the facial nerve was then used for excision of the tumor in the infratemporal fossa en-bloc. Reconstruction of the resected left temporomandibular joint with a mandibular sling was performed; together with replacement and plating of osteotomized orbitozygomatic complex utilizing Synthes craniofacial titanium plates. Facial nerve monitoring was performed throughout the procedure. Final pathology reports confirmed the diagnosis. The patient had postoperative chemotherapy and radiation. **Conclusions:** This is the first reported case of synovial cell sarcoma developing in the infratemporal fossa which brings to light the rare disease with an additional location reported in the head and neck region.

## 93. Effect of Comorbidity on Post-Treatment Quality of Life Scores in Patients With Head and Neck Squamous Cell Carcinoma

Christine G. Gourin, MD\*, Augusta, GA  
Brian Boyce, MS, Augusta, GA (Presenter)  
Robert H. Podolsky, PhD, Augusta, GA  
Creighton C. Vaught, MD, Augusta, GA  
David J. Terris, MD\*, Augusta, GA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the effect of comorbidity on quality of life and the limitations of measuring QOL in patients with advanced comorbidity.

**Objectives:** We hypothesized that advanced comorbidity is associated with a diminished ability to compensate for the effects of HNSCC treatment and sought to determine if comorbidity influenced 1 year post-treatment QOL. **Study Design:** Nonrandomized, retrospective patient analysis. **Methods:** The medical records of HNSCC patients who participated in QOL analysis over a 28 month period were reviewed. Patients with a history of prior treatment for HNSCC, unresectable or distant metastatic disease were excluded. The University of Washington (UW) QOL questionnaire, Performance Status Scale (PSS), and Karnofsky score were used to measure QOL. Comorbidity was graded using the Modified Medical Comorbidity Index. **Results:** One hundred twenty-five patients participated in longitudinal QOL analysis. The majority of patients (74%) presented with advanced stage (III/IV) disease; advanced comorbidity was present in 29%. One year QOL scores were available for 68 patients. Pretreatment and post-treatment groups did not differ with respect to patient and tumor demographics, stage, treatment or comorbidity. Treatment and disease status were not associated with differences in QOL. Advanced comorbidity was associated with significantly decreased PSS eating in public scores; advanced stage disease was associated with significantly decreased UW chewing scores ( $p < 0.05$ ). Patients with advanced comorbidity and advanced stage disease had poorer 1 year survival (66%) than patients with advanced comorbidity and early stage disease (75%) or patients with low comorbidity regardless of TNM stage (80-100%). **Conclusions:** Long-term analysis of QOL is limited in patients with advanced comorbidity and advanced stage disease due to increased mortality. The combination of comorbidity and disease stage appears to have

utility as an independent prognostic factor in patients with HNSCC.

#### 94. Spontaneous Supraglottic Hematoma Mimicking Advanced Supraglottic Carcinoma

Adam T. Graff, MD, San Antonio, TX  
C. Blake Simpson, MD, San Antonio, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the process of spontaneous supraglottic hematoma causing airway obstruction and compare the initial clinical manifestation of a patient with spontaneous supraglottic hematoma obstructing the airway versus other, more common causes of airway obstruction including advanced supraglottic cancer and infectious processes.

**Objectives:** Upper aerodigestive tract hematoma formation, while a relatively infrequent cause of airway obstruction, may be suspected in the setting of trauma or in the anticoagulated patient. The spontaneous hematoma, however, is a more rare and therefore more sinister entity, manifesting itself clinically in such a way that the surgeon may initially favor a malignant or infectious process as the underlying etiology. We present what we believe to be the first case of spontaneous supraglottic hematoma resulting in acute airway obstruction published in the English language literature. **Study Design:** Case report. **Methods:** We report a 52 year old gentleman who presented with a spontaneous supraglottic, hemilaryngeal hematoma that mimicked the clinical manifestations of advanced supraglottic cancer. Initial presenting symptoms, physical examination findings, laboratory and pathologic results, radiographic and endoscopic findings, and operative results are discussed. **Results:** The patient underwent awake tracheostomy, direct laryngoscopy, bronchoscopy and esophagoscopy with biopsies that revealed clotted blood consistent with hematoma. He had an uncomplicated postoperative course, remaining in hospital for seven days. **Conclusions:** Spontaneous supraglottic hematoma, while rare, should be included among the differential diagnosis of a patient presenting with an acute airway obstruction. A careful history and physical examination will enable the astute clinician to differentiate between this entity and more quotidian causes of airway obstruction. Early recognition of spontaneous supraglottic hematoma formation will facilitate the selection of the appropriate treatment regimen.

#### 95. Hard Palate Necrosis After Sphenopalatine Artery Embolization

Joel Guss, MD, Philadelphia, PA  
Marc Cohen, MD, Philadelphia, PA  
Duane A. Sewell, MD, Philadelphia, PA  
Natasha Mirza, MD, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be aware that soft tissue necrosis is a rare but serious complication of sphenopalatine artery embolization and that strategies including early removal of posterior packing may be able to prevent it.

**Objectives:** Percutaneous angiography and embolization of the sphenopalatine artery is an effective and safe method of treating posterior epistaxis that is refractory to conservative management. Soft tissue necrosis is a rare complication of embolization owing to the extensive collateral blood supply of the head and neck. **Study Design:** A retrospective review of a single case. **Methods:** We reviewed the case records of a patient who developed necrosis of the mucosa overlying the ipsilateral hard palate after undergoing sphenopalatine embolization for refractory posterior epistaxis. **Results:** Analysis of the medical record demonstrated that the patient had a nasopharyngeal balloon pack and bilateral nasal tampons placed prior to embolization and that this packing was kept in place for two days following embolization. **Conclusions:** While embolization of the sphenopalatine artery occludes the primary blood supply to the ipsilateral hard palate (the greater palatine artery), soft tissue necrosis is rare secondary to extensive collateral blood supply. In the setting of tight nasopharyngeal and nasal packing, though, collateral blood supply from the soft palate and incisive foramen may be compromised, creating a situation where necrosis can occur. Nasal and nasopharyngeal packing should be removed as soon as safely possible after embolization to prevent this serious complication.

#### 96. Clival Hepatocellular Carcinoma Metastasis: Case Report and Review of the Literature

Hosai N. Hesham, MD, Washington, DC  
Mathew Werger, BA, Washington, DC  
Nazaneen Grant, MD, Washington, DC  
Kenneth Newkirk, MD, Washington, DC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to appreciate that hepatocellular carcinoma metastasis to the head and neck is a rare occurrence. However, it should be considered in the differential diagnosis of head and neck lesions in populations with the appropriate risk factors.

**Objectives:** Hepatocellular carcinoma is a cancer with rapidly increasing prevalence. We present the case of a 53 year old male with known HCC who presented with dysphagia and dysarthria. MRI demonstrated a large clival mass which immunohistochemistry con-

firmed as hepatocellular in origin. With the current epidemic of hepatitis C and improved treatment options, one can expect an increased prevalence of HCC with distant metastases. **Study Design:** Case report and review of literature. **Methods:** Case report and review of literature. **Results:** Skull base and sinus metastases of HCC are rare events with little documentation in the literature. In the ten reported cases of metastatic HCC in the sinonasal tract, epistaxis was the most frequent presenting symptom. Patients with skull base tumors were less consistent and presented with a variety of symptoms including extraocular muscle disturbance, and as in this case, neck pain, dysarthria, and dysphagia. The dysphagia and palatal deficits in this patient are consistent with invasion of the tumor into the jugular foramen causing compression of the vagus and glossopharyngeal nerves. Dysarthria and tongue deviation to the side of the lesion are understandable given the proximity of the jugular foramen to the hypoglossal canal and the size of the clival lesion. **Conclusions:** Hepatocellular carcinoma metastatic to the skull base is a rare presentation but should be suspected in any patient with a known history of primary HCC. Clinical examination, radiographic studies of the skull base, and immunohistochemically positive pathology help to establish the diagnosis. Treatment is usually supportive and nonsurgical.

#### 97. **The NCDB Hospital Comparison Benchmark Reports: Head and Neck Cancer**

Henry T. Hoffman, MD\*, Iowa City, IA  
Russell B. Smith, MD, Iowa City, IA  
Daniel E. Kennedy, MD, Lexington, KY  
Corey J. Langer, MD, Philadelphia, PA  
Neal W. Wilkinson, MD, Iowa City, IA  
Randall S. Weber, MD\*, Houston, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify current trends in the management of head and neck cancer and to incorporate use of the NCDB Hospital Comparison Benchmark Reports in the function of their cancer center.

**Objectives:** Review of the management of head and neck cancer and of the utility of the American College of Surgeons National Cancer Data Base (NCDB) Benchmark Reports. **Study Design:** Nonrandomized retrospective review of the computerized NCDB Hospital Comparison Benchmark Reports. **Methods:** Commission on Cancer (CoC) Datalinks system was accessed at <https://Web.facs.org/datalinks> to download relevant information. **Results:** Among laryngeal cancers diagnosed in 2003 (N=10,140) irradiation was the most common treatment overall (33.4%), for stage I (49.2%) and for stage II 51.6%). Chemoradiation was most common for stage III (33.6%) and stage IV (26.2%). Surgery remained the most common initial treatment for floor of mouth cancer from 2000 (47.6%) to 2003 (48.3%). The most common treatment of tonsil cancer changed from surgery with irradiation in 2000 (23.1%) to chemoradiation in 2003 (27.0%). From 2000 to 2003 chemoradiation (32%) was the most common initial treatment of stage IV tonsil cancer both from the statewide report (13 hospitals, N=150) and from a single cancer center in the state (1 hospital, N=81). During this same period among community cancer programs in the U.S. (430 hospitals, N=931), 27.1% of stage IV tonsil cancers were treated with chemoradiation compared to 32.3% among teaching/research hospitals (307 hospitals, N=3,643). **Conclusions:** The NCDB Hospital Comparison Benchmark Reports are useful in tracking demographics and management of cancer. Continued improvements will likely provide clinicians with more detailed analyses of cancer management at their individual institutions to compare to national data.

#### 98. **Herpes Zoster Isolated to the Vagus Nerve Causing Conchal Vesicles, Posterior External Auditory Canal Vesicles, Ipsilateral Palatal Paresis, Ipsilateral Vocal Cord Paresis, and Ipsilateral Arytenoid Vesicles**

Kevin G. Hueman, MD, Lackland AFB, TX  
Joseph A. Brennan, MD, Lackland AFB, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the pathophysiology of the varicella zoster virus and explain the craniocervical extensions of the vagal nerve.

**Objectives:** To educate clinicians in the pathophysiology of herpes zoster involving the tenth cranial nerve. **Study Design:** Case report. **Methods:** A fifty-one year old female with five days of progressively worsening dysphagia, dysphonia, and left sided otalgia and odynophagia presented to the emergency department. Physical exam revealed left auricular conchal vesicles, posterior external auditory canal vesicles, tympanic membrane erythema, ipsilateral palatal paresis, ipsilateral vocal cord paresis, and ipsilateral arytenoid vesicles. **Results:** A CT of the neck with IV contrast revealed fat stranding of the left posterior external auditory canal and left sided cervical lymphadenopathy. Direct immunofluorescence assay of vesicle scrapings confirmed the diagnosis of herpes zoster. MRI of the course of the tenth cranial nerve revealed no masses or enhancement. The patient was given IV acyclovir and IV Decadron every eight hours. Her symptoms improved after twenty-four hours of therapy: she was able to tolerate a full liquid diet, her voice grew stronger, and her ear and throat pain improved. On day two of treatment intravenous Decadron was transitioned to an oral Medrol dose pack. On day five of treatment intravenous acyclovir was transitioned to oral valacyclovir 1000 mg TID for five days for a total antiviral treatment course of ten days. Her dysphagia completely resolved three weeks later. At a three month followup she was asymptomatic and physical exam revealed normal tympanic membranes and external ears, normal palatal motion, mobile vocal cords, and normal laryngeal mucosa. **Conclusions:** This is the first known reported case of isolated vagal herpes zoster with this extensive con-

stellation of symptoms.

### 99. **Incidence of Deep Venous Thrombosis (DVT) and Pulmonary Embolism (PE) in Otolaryngologic Surgical Patients**

William P. Innis, MD, Burlington, MA

Timothy D. Anderson, MD, Burlington, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss risk factors in the development of DVT/PE in surgical and medical patients and identify patients at greatest risk of developing DVT/PE in their practices.

**Objectives:** Occurrence of DVT and PE are increasingly recognized as major perioperative risks with significant potential morbidity and mortality. Clear differences in degree of risk exist between specialties and types of surgical procedures. The level of risk for development of DVT and PE are relatively well established in many specialties, including orthopedic, vascular, gynecologic, urologic and general surgery. No data exist that delineate the risk in otolaryngologic surgical procedures and patients. **Study Design:** 5 year retrospective review of incidence of recognized DVTs and PEs in a tertiary care otolaryngologic practice. **Methods:** Computer based search of discharge diagnosis of PE or DVT in otolaryngologic patients from 2000 to 2005. All surgical procedures were reviewed for these years and were segregated into ambulatory versus inpatient procedures and malignant versus nonmalignant diagnoses. **Results:** 6 DVTs were identified, 5 with a diagnosed malignancy. One resulted in a PE. 1540 inpatient surgeries and 4582 outpatient surgeries were performed. 824 of these procedures were for malignancies (542 inpatient). The incidence of DVT was 0.1%. The incidence in patients with malignancy was 0.6%. **Conclusions:** Otolaryngology should be considered to be a specialty with low DVT risk. Standard prophylaxis with subcutaneous heparin and pneumatic devices is probably sufficient for most otolaryngologic patients.

### 100. **Monophasic Synovial Sarcoma of the Lateral Pharyngeal Wall: A Case Report and Review of the Literature**

Seth J. Isaacs, MD, Syracuse, NY

Timothy J. Minton, MD, Syracuse, NY

Jack M. Hsu, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the diagnostic difficulties in cases of synovial sarcoma and how immunohistochemistry can aid in differentiating the subtypes.

**Objectives:** Synovial sarcoma is a rare malignant mesenchymal neoplasm that accounts for approximately 10% of all soft tissue sarcomas. These tumors are most often found in the lower limbs but can also infrequently be found in the head and neck. When these neoplasms are encountered in the head and neck, immunohistochemical analysis is crucial for the diagnosis and differentiation of the biphasic and monophasic variants as the prognosis differs between the two. **Study Design:** Case report and review of the literature. **Methods:** Records of a patient with monophasic synovial sarcoma of the lateral pharyngeal wall were reviewed. A literature search was performed to review the diagnosis and treatment of these rare neoplasms. **Results:** A case of hypopharyngeal poorly differentiated synovial sarcoma was treated via partial pharyngectomy. Diagnosis was made using a combination of immunohistochemistry and electron microscopy. The patient underwent postoperative radiation therapy and has had no evidence of recurrence. **Conclusions:** Synovial sarcoma of the head and neck is an extremely rare entity. Histopathologically the monophasic variant is described by either epithelial or fusiform patterns. However a rounded cell morphology exists creating further diagnostic dilemmas. Immunohistochemical investigations and electron microscopy are crucial for the proper tissue diagnosis. Differentiation between these subtypes is important for determining prognosis and outcome.

### 101. **Prevertebral Abscess—A New Otolaryngology Diagnosis**

Scharukh M. Jalisi, MD, Boston, MA

Vartan Mardirossian, MD, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the wide clinical presentations of a prevertebral/epidural abscess. The participants will be able to demonstrate a high understanding in prompt diagnosis of a patient with prevertebral abscess presenting with less common symptoms of dysphagia and fever. Participants will learn that dysphagia and odynophagia may be the sentinel symptom of this devastating disease process. To demonstrate understanding of the deep fascial layers of the neck.

**Objectives:** To discuss the first otolaryngologic manifestation of spinal epidural abscess in the literature, its clinical course, diagnosis, treatment and outcome. **Study Design:** Retrospective chart review from 2004-2006 at a tertiary medical center. **Methods:** Retrospective review of medical records, presenting symptoms of the patients, physical examination, imaging studies, surgical intervention and final outcome. A literature search on MEDLINE and Pubmed was performed spanning the last 10 years and no reports were found in the otolaryngology literature. **Results:** Three prevertebral abscess patients were identified. One patient had spinal epidural abscess with result-

ant impending spinal shock. Two patients had prevertebral abscess. All patients had timely otolaryngologic diagnosis of these infections which resulted in surgical intervention and resolution of the patients' symptoms and neurologic sequelae. **Conclusions:** Otolaryngologists should have a high index of suspicion of prevertebral abscess in a patient who presents with fever, dysphagia and neck pain. This is especially important because otolaryngologists can be the first physicians to diagnose this highly morbid disease process. Undiagnosed prevertebral and epidural abscesses uniformly cause catastrophic neurologic sequelae. Treatment includes incision and drainage of the abscess followed by aggressive antibiotic therapy. In this paper we have presented the first report in the otolaryngology literature of a spinal epidural abscess presenting as dysphagia and fever.

### 102. Sarcoidosis Masquerading as Carotid Body Tumor

Scharukh M. Jalisi, MD, Boston, MA  
Leslie K. Winter, MD, Boston, MA (Presenter)  
Rebecca S. Stone, MD, Boston, MA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) demonstrate the differential diagnosis of a carotid body/parapharyngeal tumor; 2) demonstrate understanding of the surgical approach to carotid body tumors; 3) demonstrate the understanding of the necessary workup of a carotid body/artery tumor; and 4) understand that inflammatory and granulomatous diseases can mimic a neoplasm on the carotid artery.

**Objectives:** To present the diagnosis and management of the first recorded case of sarcoidosis involving the carotid artery and presenting as a carotid body tumor. **Study Design:** Retrospective case review. **Methods:** Diagnosis and management of the first case of sarcoidosis involving the carotid artery in a circumferential manner at a tertiary care center. The approach to the parapharyngeal space and carotid artery are performed for tissue diagnosis. **Results:** Sarcoidosis is a heterogeneous disease process which may affect multisystem organs and have an unpredictable course. Multiple treatments are currently utilized today though none offer definitive cure. The most recent studies suggest tetracycline antibiotics are an effective treatment modality. This lends support to the hypothesis of an infectious etiology for sarcoid, despite the absence of microorganisms in culture. Despite this recent data there exist many other studies which support other etiologies for the disease process. Review of the current and past literature reveals a paucity of information regarding vascular sarcoid. There is no other report in the literature of a circumferential lesion involving the common carotid artery. Tissue diagnosis was obtained and then medical therapy was initiated on the patient. **Conclusions:** Sarcoidosis involving the carotid artery or other major vascular structures has been an unknown entity. Diagnosis and treatment should follow a logical protocol with presurgical planning depending on the particular vascular structure involved. Untreated there is always a risk of hemodynamic compression of the great vessels with resultant morbid neurologic sequelae.

### 103. Skip Metastases From Bronchogenic Adenocarcinoma to the Palatine Tonsil

Scharukh M. Jalisi, MD, Boston, MA  
Leslie K. Winter, MD, Boston, MA (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) demonstrate that bronchial adenocarcinoma can present as a metastatic lesion in the head and neck without presence of nodal disease in the neck; 2) understand that metastases of adenocarcinoma can occur from the lungs to the palatine tonsil as compared to the usual metastasis from oropharynx to lung; and 3) demonstrate understanding of the manifestations and management of metastatic neoplasms to the palatine tonsil.

**Objectives:** To present the incidence, diagnosis and management of metastatic bronchial neoplasms to the palatine tonsils. **Study Design:** Case report. **Methods:** Retrospective review of the care of a patient with metastatic bronchial adenocarcinoma to the palatine tonsil. **Results:** Patient with rapidly growing palatine tonsil mass that was diagnosed as metastatic adenocarcinoma from the lung. He was treated with chemotherapy and external beam radiation. **Conclusions:** Metastatic neoplasms to the palatine tonsil is a rare finding with less than 100 reported cases in the literature to date. While primary tonsil squamous cell cancer is a common pathologic finding in an otolaryngologic practice, it is unusual to find a lesion in the oropharynx that has metastasized from the lung without nodal disease in the neck. This finding often portends poor prognosis with average survival less than a year from presentation. Surgical excision is not indicated in this setting. It is essential for an otolaryngologist to understand that adenocarcinoma of the oropharynx in the absence of cervical nodal disease may be a sign of metastasis from an unknown primary pulmonary neoplasm.

### 104. An Evaluation of Locally Aggressive Differentiated Thyroid Cancer (LADTC) Among the Underserved Population

Gina D. Jefferson, MD, Los Angeles, CA  
Janette Brunken, MD, Colton, CA  
Sofia Avitia, MD, Los Angeles, CA  
Jimmy J. Brown, DDS MD\*, Los Angeles, CA

**Educational Objective:** At the conclusion of this presentation the participants should be able to 1) realize the difference in prevalence of locally aggressive well differentiated thyroid carcinoma in the underserved population in comparison to the general population; 2) be able to identify predisposing characteristics for locally aggressive well differentiated thyroid carcinoma; and 3) consider additional therapeutic intervention for this subset of patients for the improvement in outcomes.

**Objectives:** The purpose of this study is to determine the prevalence of LADTC among an underserved African American/Latino patient population and the characteristics that predispose to the outcomes of LADTC in this group. **Study Design:** Retrospective analysis. **Methods:** A retrospective chart review of patients' medical records was performed to identify those diagnosed with well differentiated thyroid cancer between January 1, 1989, and December 31, 2003. The data extracted included the following variables: age, race, gender, immigrant status, marital status, presenting symptoms, physical findings, imaging features, tumor characteristics, treatment modalities, intraoperative findings, comorbidities, previous history of neck radiation, previous surgical history and illnesses, number of followup visits/treatments, complications of therapy, complications of disease, recurrence(s) and death. Statistical analysis was performed to determine incidence of local recurrence, distant metastasis and time of death. These results were then compared to the general population. **Results:** Seventy-nine charts were gleaned for patients with documented well differentiated thyroid cancer. Twelve were identified with manifestations of locally aggressive features intraoperatively. The prevalence of LADTC among this patient group was determined to be 15%. A majority of patients in this group (nine patients) had no recurrence over the time period of the study. The most common structure to be invaded was the anterior neck muscles (66.7%). **Conclusions:** The prevalence of LADTC in this underserved population constituting predominantly Latino and African American patients was higher than the general population (15% versus 7-10%). The long-term outcomes for LADTC patients are considered to be worse than those of the well differentiated tumors without local invasion. We hope that knowledge of the prevalence and characteristics of patients with LADTC will contribute to their improved outcomes.

#### 105. Comparison of Acellular Dermis to Split Thickness Skin Grafting for Oral Cavity Resurfacing

Jeffrey B. Jorgensen, MD, Kansas City, KS  
Douglas A. Girod, MD, Kansas City, KS  
Terance T. Tsue, MD, Kansas City, KS  
Kevin J. Sykes, MPH, Kansas City, KS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the use of acellular dermis and split thickness skin grafting for oral cavity resurfacing.

**Objectives:** Outcome comparison of patients receiving acellular dermis (AlloDerm, AD) and split thickness skin grafting (STSG) for oral cavity resurfacing. **Study Design:** Prospective cohort study. **Methods:** Data was collected from 27 patients (16 AD, 11 STSG) during their postoperative followup from clinic charts, a patient interview, and a quality of life survey (EORTC-QLQ-C30, H&N35). Length of followup ranged from 3 to 72 months (mean=20.8 months, SD=20). The study population was 56% female with most subjects being white (93%). Age ranged from 24 to 86 years (mean=56.2 years; SD=13.2). Survey scores were compared using the Mann-Whitney test with SAS 9.1 (Cary, NC, 2002-2003). **Results:** Subjective measure of contracture had a mean score of 1.4 in both groups (SD=0.7 in AD, SD=0.5 in STSG). There were three instances of graft failure (11%) - all from the AD group. Among the two study groups no statistically significant difference was observed for overall quality of life (p=0.11). However within the functional scales AD patients reported a higher level of social functioning (p=0.03). In addition among the symptom scales significant improvements were found in reports of problems with smell and taste (p=0.02), eating (p=0.005), and opening the mouth (p=0.04) in the AD group. **Conclusions:** The use of acellular dermis grafting resulted in equal or better quality of life scores despite higher rates of graft failure. For this reason we feel that acellular dermis should be considered as an alternative to STSG when selecting grafting material for oral cavity resurfacing.

#### 106. **WITHDRAWN**

##### **Inverted Papillomas: Our Ten Year Review**

Barry S. Kang, MD, Tampa, FL  
Vesna J. Vrcel, MD, Tampa, FL  
Yash J. Patil, MD, Tampa, FL  
Thomas V. McCaffrey, MD PhD\*, Tampa, FL  
Tapan A. Padhya, MD, Tampa, FL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to 1) evaluate our experience in treating patients diagnosed with inverting papillomas; 2) review the current literature and compare our study population with that of others; 3) evaluate the tumors removed based on site, size, associated malignancy, and other characteristics; 4) serotype the papilloma virus in our population (if it exists); and 5) investigate for markers associated with malignant transformation.

**Objectives:** 1) To evaluate our experiences in treating patients diagnosed with inverting papillomas over the past ten years; 2) to review

the current literature and compare our study and patient population with what others have reported; 3) to evaluate the tumors removed on site, size, associated malignancy and other characteristics; 4) to serotype, if present, the papilloma virus association in our patient population; and 5) to investigate for markers associated with malignant transformation. **Study Design:** Retrospective chart review. **Methods:** Retrospective chart review of consecutive patients treated at a university based, tertiary academic center over a ten year period. Patients included in the study were treated for inverted papillomas of the nasal cavity or paranasal sinuses between 1996 and 2006. Demographic patient information and tumor characteristics including site, size, orbital involvement, and malignant transformation were compiled. **Results:** Initial screening resulted in almost 25% of patients with malignant transformation. The majority of patients in our study were men, and they were more often associated with malignant transformation compared to women. The maxillary sinus was the most common site of origin for both men and women. **Conclusions:** Inverted papillomas are among the most common benign tumors of the nasal cavity and paranasal sinuses, after osteomas and hemangiomas. Preliminary screening yielded limitations with a retrospective design and small sample population. Our initial data revealed a malignant transformation potential comparable to that of other studies reported in the literature.

#### 107. Lingual Thyroid Ca With Nodal Metastasis

Thomas L. Kennedy, MD\*, Danville, PA  
Waldemar Riefkohl, MD, Danville, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss carcinoma of the lingual thyroid and its management.

**Objectives:** To discuss the management of cervical metastasis and treatment options and surgical management of lingual thyroid carcinoma with cervical metastasis. **Study Design:** Lingual thyroid is relatively uncommon, and carcinoma of the lingual thyroid is extremely rare with only thirty cases reported. The author reports a case in a young female who initially presented with a cervical neck mass found to represent metastatic papillary ca. Further workup revealed the patient's only thyroid at the tongue base and the site of the primary tumor. Management of lingual thyroid ca and review of the literature is discussed. **Methods:** A case report and review of the literature of carcinoma of the lingual thyroid. **Results:** A young female presented with a left neck mass found to represent metastatic papillary carcinoma. A review of the neck CT revealed only lingual thyroid tissue. Bilateral selective neck dissections with removal of the tongue base lesion confirmed the diagnosis of lingual thyroid carcinoma with multiple left cervical lymph node metastasis. **Conclusions:** A case of papillary carcinoma of the base of the tongue with cervical metastasis is reported. Treatment is best managed with surgical excision of all thyroid tissue followed by radioactive iodine. Surgical approaches to the tongue base need to be considered based on the size of the lingual primary and the need to address lymph node metastasis. This is the second reported case in the literature of lingual thyroid ca presenting with cervical nodal metastasis.

#### 108. Primary Squamous Cell Carcinoma of Stensen's Duct

Theresa B. Kim, MD, San Francisco, CA  
Harvey Z. Klein, MD, San Francisco, CA  
Christine M. Glastonbury, 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 recognize primary squamous cell carcinoma of Stensen's duct presenting as parotid swelling.

**Objectives:** To describe an unusual case of primary squamous cell carcinoma of Stensen's duct. **Study Design:** Case report. **Methods:** Chart review and review of the literature. **Results:** Primary malignant tumors involving Stensen's duct are rare neoplasms with less than 30 cases reported in the literature. Most of these tumors represent mucoepidermoid carcinoma, squamous cell carcinoma, or adenocarcinoma, although cases of other rare tumors have been reported. We report a case of primary squamous cell carcinoma arising from Stensen's duct in an immunocompromised patient. A 47 year old man with HIV presented with intermittent right parotid swelling. Physical examination revealed a firm linear swelling in the right parotid gland suggestive of obstruction and dilation of Stensen's duct. His symptoms persisted despite duct dilation and conservative measures. On followup examination a buccal mass emanating from Stensen's duct was noted. A transoral biopsy revealed carcinoma and an MRI revealed an abnormally enlarged right parotid duct with intrinsic high T2 signal. An ultrasound guided FNA of the linear parotid swelling confirmed the mass to be tumor rather than a dilated duct. Surgical resection was performed and final pathological diagnosis was primary squamous cell carcinoma confined to Stensen's duct. The patient received postoperative external beam radiation therapy and remains disease free with greater than one year of followup. **Conclusions:** Primary squamous cell carcinoma of Stensen's duct is a rare entity that may mimic benign obstructive parotid disease. FNA and MRI are useful in the assessment of disease extent.

#### 109. A Reclassification of Temporal Bone Fractures and Its Association With Facial Nerve Injury

Midori Kubo, BS, Seattle, WA  
Timothy M. McCulloch, MD, Seattle, WA (Presenter)

Mark E. Whipple, MD, Seattle, WA  
Wendy A. Cohen, MD, Seattle, WA  
Yoshimi Anzai, MD, Seattle, WA  
Pyong Kim, MD, Seattle, WA  
Molly Raske, MD, Seattle, WA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the traditional classification of temporal bone fractures with a newer classification system based on the anatomic structures within the temporal bone. In addition they should be able to discuss the differences in predictive value with facial nerve injury seen with the two systems.

**Objectives:** Historic methods of classifying temporal bone fractures poorly correlate with clinical findings. We hypothesize that a modern computerized tomography centered classification system focused on the anatomic structures within the temporal bone will best predict facial nerve injuries. **Study Design:** A retrospective chart review has identified 207 patients with temporal bone fractures meeting inclusion criteria. **Methods:** Complete staging and outcomes data is currently available on 115 fractures (99 patients). CT scans were reviewed and fractures were classified by our proposed system based on medial extent and structure involvement (Groups A-lateral and canal, B-middle ear cleft, C-facial nerve course and D-otic capsule) and by the traditional system (longitudinal, transverse, mixed). Fractures were grouped according to the classification schemes and correlated with clinical reports of facial nerve dysfunction. **Results:** 16 of the 115 fractures had associated facial nerve weakness or paralysis. Using the new classification scheme, facial nerve injury was present as follows: Group A fractures—0/20, Group B—5/55 (9%), Group C—6/31 (19%), Group D—5/9 (56%). Using the traditional classification system facial nerve dysfunction was present as follows: 11/72 (13%) of longitudinal fractures, 4/21 (19%) of transverse fractures, 3/22 (14%) of mixed fractures. **Conclusions:** When compared to the traditional classification system for temporal bone fractures, these results demonstrate that the new system appears to have a higher predictive value with facial nerve function. This simple system can help physicians triage patients and predict those patients at risk for facial nerve injury.

#### 110. The Utility of Lip Biopsy in the Diagnosis and Treatment of Sjogren's Syndrome

Alexander J. Langerman, MD, Chicago, IL  
Elizabeth A. Blair, MD, Chicago, IL  
Nadera J. Sweiss, MD, Chicago, IL  
Jerome B. Taxy, MD, Chicago, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the potential error inherent in lip biopsy interpretation and critically evaluate a patient's need for the diagnostic procedure.

**Objectives:** Sjogren's Syndrome (SS) is an autoimmune disease involving primarily the salivary and lacrimal glands ("sicca" symptoms) with systemic features including joint and nervous system involvement. In patients with a questionable diagnosis of SS but severe systemic symptoms, a lip biopsy is often performed to firmly establish the diagnosis of SS. It is not clear, however, the consistency with which current grading systems are applied and the utility of those biopsies in guiding treatment decisions. **Study Design:** Retrospective review of clinical and pathologic data. **Methods:** Clinical data from 48 patients referred to the otolaryngology-head and neck surgery service for lip biopsy were reviewed. Archival pathologic specimens were scored using the currently accepted grading system ("focus score", FS). **Results:** The FS system was incorrectly applied during initial interpretation of 46% (n=22) of specimens. This resulted in 5 (10%) pathologic misdiagnoses and 16 (34%) non-diagnoses. Upon reinterpreting the specimens with consistent application of FS system 58% (n=28) of the biopsies were definitely positive and 35% (n=17) were negative. Neither positive serology nor the presence of sicca symptoms predicted a positive biopsy (LR=0.95 and 0.96, respectively). Lip biopsy guided treatment in at least 65% (n=31) of patients but was ignored in the presence of other clinical findings in 17% (n=8) of patients. **Conclusions:** Consistent application of the focus score is essential in avoiding incorrect diagnosis and aiding clinical decisions. However not all patients undergoing lip biopsy will derive diagnostic benefit from the procedure. In this series clinical symptoms and serology did not predict positive lip biopsy.

#### 111. Unusual Delayed Presentation of a Penetrating Nail Gun Injury Through the Infratemporal Fossa

Alice D. Lee, MD, Orange, CA  
Young S. Oh, MD, Anaheim, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the mechanisms of tissue damage from nail gun injury to the head and neck, usual patient presentation, methods of patient evaluation and treatment, and potential complications from injury.

**Objectives:** Published reports of nail gun injury to the head and neck are uncommon. We describe an unusual delayed presentation of a nail gun injury through the infratemporal fossa and review of the literature. **Study Design:** Case report and literature review. **Methods:** We report a case of a 55 year old patient who was diagnosed two weeks after a nail gun injury was sustained while working at a construction site. The patient initially presented to urgent care on the day of injury and was noted to have a puncture wound in the

sublabial area which was sutured. The patient returned two weeks later with complaints of a slight but persistent localized headache. He had no other complaints or deficits on exam. CT of the head was significant for a 9 cm nail traversing the right infratemporal fossa with intracranial extension. He was referred to neurosurgery then sent to our department for evaluation. **Results:** Given the patient's complaint and the possibility of intracranial infection, surgery was recommended for foreign body removal. The patient was sent for preoperative CT angiography. A preauricular infratemporal fossa approach was used to identify the head of the nail. The nail was removed intact without subsequent intracranial bleeding, CSF leak or intracranial infection. **Conclusions:** Nail gun missiles to the head and neck are uncommon, dramatic, but often nonfatal due to their relative low velocity. Patients are usually diagnosed at the time of injury, evaluated with CT and angiography, and treated with surgery. We describe a patient with an unusual delayed presentation.

## 112. Infratemporal Fossa Abscess: Complication of Dental Injection

Douglas D. Leventhal, MD, Philadelphia, PA

David N. Schwartz, MD, Voorhees, NJ

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain and discuss the anatomy of the infratemporal fossa and its relationship to surrounding structures. Participants should be able to diagnose an infratemporal fossa abscess in an expeditious manner based upon signs and symptoms. They should understand the rationale for prompt treatment and be familiar with an intraoral approach to the infratemporal fossa.

**Objectives:** To present a case of an infratemporal fossa abscess treated at our institution and review the anatomy, etiology, clinical features, and management of this rare condition. **Study Design:** Retrospective chart review. **Methods:** Illustrative case report and literature review generated by PubMed citation search. **Results:** The infratemporal fossa is a relatively rare anatomic site for abscess formation. Infections in this space have been found following maxillary sinusitis, maxillary sinus fracture, temporomandibular arthroscopy, dental infection, and tooth extraction. The few cases that have been described were reported in the dental and oral and maxillofacial literature with rare discussion in otolaryngology journals. Anatomically the infratemporal fossa contains important neurovascular structures and directly communicates with the orbit and skull base. Therefore infection may spread to these areas leading to rapid clinical deterioration. A 39 year old female presented to our institution with severe facial swelling and trismus. These symptoms occurred after having a dental filling that required multiple needle sticks and a nerve block to achieve adequate anesthesia. A computed tomography scan showed a 3.8 cm infratemporal fossa abscess and the patient subsequently underwent intraoral incision and drainage. Postoperative followup showed continuing improvement. **Conclusions:** Infratemporal fossa abscess is an uncommon condition that is scantily described in the literature. Although rare it is imperative to recognize the possibility of this clinical entity following any dental procedure. Prompt diagnosis and treatment is of utmost importance to prevent dissemination of the infection.

## 113. Staged Temporal Scalp Flap for Upper Lip Reconstruction After Resection of an Invasive Microcystic Adnexal Carcinoma

Andrea F. Lewis, MD, Jackson, MS

Richard O. Wein, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate the role of a hair-bearing pedicled temporoparietal fascial flap in the reconstruction of total loss of the upper lip in a male patient.

**Objectives:** The purpose of this paper is to demonstrate the role of a hair-bearing pedicled temporoparietal fascial flap in the reconstruction of total loss of the upper lip in a male patient. **Study Design:** In a patient, with a history of multiple prior procedures requiring excision of an infiltrating microcystic adnexal carcinoma of the upper lip, a temporoparietal fasciocutaneous flap was harvested and used for reconstruction. **Methods:** The intraoral portion of the flap was reconstructed with a skin graft. The flap length was 14cm with a width of 3cm. The planned second stage takedown of the flap was performed four weeks later. **Results:** The patient recovered with no evidence of microstomia and minimal donor site alopecia. Nearly two years after his initial operation the patient has acceptable aesthetic and functional results. **Conclusions:** The pedicled temporoparietal scalp flap is a thin, highly vascular, versatile flap that is a viable option for the reconstruction of many head and neck sites. In male patients with extensive lip defects it is a relatively simple way to provide hair-bearing skin to the upper lip.

## 114. An Unusual Etiology of Obstructive Sleep Apnea

Fred Y. Lin, MD, New York, NY

Adam S. Jacobson, MD, New York, NY

Eric M. Genden, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize that obstructive sleep apnea (OSA) can be an unusual manifestation of an underlying head and neck lesion. By discussing our case series of head and neck masses which presented as OSA, we will highlight the importance of a thorough workup when evaluating patients with sleep disordered breathing.

**Objectives:** To highlight the importance of thorough workup when evaluating patients with sleep disordered breathing. **Study Design:** Retrospective chart review of all patients who presented with OSA to our institution between 1998 and 2006. **Methods:** A retrospective chart review was performed for 196 patients that presented with OSA. Eleven patients were identified to have a head and neck lesion impinging on the airway. These cases were reviewed for clinical presentation, diagnostic workup, findings on imaging and physical examination, location of head and neck tumor, treatment, and status of OSA symptoms after treatment. **Results:** Head and neck masses accounted for 5% (11/196) of patients presenting with OSA. In all cases patients presented with OSA confirmed on polysomnography or a history of witnessed sleep apnea. On diagnostic workup a variety of head and neck masses involving the tongue, pharynx, nasopharynx, and subglottic airway were identified. In all cases fiberoptic endoscopy was the most useful tool for initially identifying the obstructive masses of the upper airway. All 11 patients were treated for their underlying lesions with complete resolution of their OSA. **Conclusions:** OSA is a common diagnosis, however these unusual presentations of head and neck lesions as OSA highlight the importance of a thorough head and neck exam (including imaging, fiberoptic rhinolaryngoscopy, and nasal endoscopy) during the workup of sleep disordered breathing patients.

### 115. Brachial Plexus Neuropathy Resulting From a Massively Enlarged Papillary Thyroid Carcinoma

Jonathan D. Lipana, MD, New York, NY

Marita S. Teng, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss a rare complication of thyroid disease.

**Objectives:** Well known complications of thyroid enlargement and papillary carcinoma include compression or invasion of the trachea, esophagus, and/or vascular structures. Recurrent laryngeal nerve invasion by thyroid carcinoma is not uncommon, and phrenic nerve invasion has also been described. Preoperative dysfunction of a vocal cord, which often implies invasive carcinoma, may necessitate recurrent laryngeal nerve sacrifice and is therefore irreversible. We present an unusual case of reversible brachial plexus compression in a patient with massive thyroid enlargement and papillary carcinoma. **Study Design:** Our case report involves a 49 year old man who presented with progressive weakness of his right hand and a neck mass which had been slowly enlarging over seven years. Upon examination a large lower neck mass was noted and preoperative neurological evaluation revealed diffusely decreased strength to 3/5 in the right upper extremity consistent with a brachial plexus neuropathy. Imaging studies revealed massive substernal thyroid enlargement extending to the right mainstem bronchus and compressing the right brachial plexus in the lower neck. **Methods:** A MEDLINE search was performed from 1966-present with key terms including: thyroid, goiter, papillary, carcinoma, brachial plexus, neuropathy and plexopathy. **Results:** A review of the literature did not reveal any similar case reports. The patient underwent a total thyroidectomy via a transcervical incision combined with median sternotomy, and the mass was dissected free from the right brachial plexus. Pathology revealed papillary thyroid carcinoma. By three months postoperatively, the patient regained full strength of the right upper extremity and electromyography revealed normal amplitudes and nerve conduction velocities of the right median and ulnar nerves. **Conclusions:** Although rare, compressive brachial plexus neuropathy can be a reversible condition seen in patients with massive thyroid enlargement.

### 116. Dermatopathic Lymphadenitis Presenting as a Large Unilateral Neck Mass

David G. Lott, MD, Cleveland, OH

Robert R. Lorenz, MD, Cleveland, OH

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the disease process, accurately diagnose, and appropriately treat dermatopathic lymphadenitis when it presents as a neck mass.

**Objectives:** To report a rare case of dermatopathic lymphadenitis presenting as a neck mass. **Study Design:** Case report. **Methods:** Literature review. **Results:** A 34 year old man presented with an 8 by 6 cm mass in the right neck. Also noted were a cutaneous hyperpigmented plaque on the neck and grouped papules on the left wrist. A right selective neck dissection levels II - IV was performed. Microscopic examination revealed benign lymph nodes with follicular hyperplasia. The paracortical regions contained T-zone nodules with pigment, consistent with dermatopathic change. Dermatopathic lymphadenitis (DL) is associated with a benign pruritic skin disorder in 66—91% of cases. It is hypothesized that this is a nonspecific reactive change due to barrier disruption of dependent skin. The histologic and immunohistochemical features of DL demonstrate a lymph node paracortex that is expanded by pale staining phagocytic histiocytes, Langerhans cells, interdigitating reticulum cells and positive staining for S-100. DL can also be associated with mycosis fungoides, chronic lymphocytic leukemia, Sezary syndrome, and AIDS. Given this association and difficulty in diagnosis, a thorough investigation should be undertaken. FNA of the mass is the simplest means by which a diagnosis can be made but is not always accurate. Excisional lymph node biopsy is therefore the procedure of choice for definitive diagnosis and is considered the definitive treatment when DL is not associated with systemic disease. **Conclusions:** With early recognition and awareness of the potential relationship with severe life threatening illnesses, otolaryngologists can play a central role in ensuring satisfactory patient outcomes.

### 117. Erosive Benign Lymphoid Hyperplasia Mimicking Squamous Cell Carcinoma

Matthew J. Lutch, MD, Oakland, CA  
Deepak Gurushanthaiah, MD, Oakland, CA  
Raymond L. Hilsinger Jr., MD\*, Oakland, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss advanced benign lymphoid hyperplasia in the head and neck and how this entity can mimic malignancy on clinical and radiologic exam.

**Objectives:** Benign lymphoid hyperplasia (BLH) is a common head and neck finding in the HIV infected or AIDS population. Benign lymphoid adenotonsillar hyperplasia in Waldeyer's ring can be manifest clinically as a symptomatic entity that must be distinguished from malignancy. In its advanced form, BLH can manifest aggressively with erosion and distortion of surrounding structures. We discuss the presentation, unusual radiologic findings, diagnosis and treatment of advanced BLH. An awareness of BLH is necessary for clinicians in selecting appropriate diagnostic options. **Study Design:** Case report. **Methods:** Retrospective review. **Results:** Radiologic findings in advanced BLH can closely mimic malignancy. **Conclusions:** Though imaging characteristics of BLH are nearly always benign appearing, in its advanced form soft tissue proliferation, lymphadenopathy and bony erosion are evident. These findings necessitate a thorough workup to diagnose neoplasm from infectious or immunologic related causes.

#### 118. **Glaring Inconsistencies in Sentinel Lymph Node Biopsy: Experimental Analysis and Review of Literature**

Matthew J. Lutch, MD, Oakland, CA  
Barry M. Rasgon, MD, Oakland, CA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain how to perform sentinel node biopsy in a standard fashion, avoiding inconsistencies that are present in much of the literature.

**Objectives:** Sentinel lymph node biopsy (SLNB) is an important tool for staging melanomas of the head and neck. SLNB involves the intradermal injection of radioactive tracer around a neoplastic lesion followed by lymph node mapping and dissection to assess for micrometastatic disease. We wished to investigate whether or not the full amount of radioactive tracer in the syringe is injected out, and if not, how much tracer is retained after a complete injection. **Study Design:** Serial injections of unfiltered technetium-99 sulfur colloid were prepared at volumes of 0.2 and 0.3 ml. **Methods:** The amount of radioactivity in micro-Curies (uCi) in the syringe and needle was recorded before and after complete injection and statistically analyzed. **Results:** Significant portions of technetium were retained in the syringe and needle post-injection as recorded by collimator. In the low and high volume series, 31.2% and 27.0% of the radioactivity was retained. **Conclusions:** The description of technique and dosage used in SLNB varies widely from study to study and is poorly described. This may affect lymphatic mapping and results presented. Based on our data, we recommend documenting the amount of tracer in the syringe and needle before and after injection in order to standardize the technique of this procedure. A detailed step by step description should be documented in materials and methods sections so the actual amount injected into the patient can be accurately reported.

#### 119. **A Unique Case Report of an Infraorbital Myxoid Liposarcoma**

Kavita Malhotra, MD, Shreveport, LA  
Timothy S. Lian, MD, Shreveport, LA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate knowledge of the clinical presentation, histologic features, and management of primary myxoid liposarcoma of the skin.

**Objectives:** Liposarcoma is the second most common soft tissue sarcoma typically occurring in areas with abundant adipose tissues. The lack of abundance of such tissues makes involvement of the head and neck region rare. Less than 25 cases have been reported in the literature of primary liposarcoma of the skin. Because most cases occur in deep-seated tissues, the more commonly sited areas are in the scalp, neck, and cheek. We present a unique case of a myxoid liposarcoma in the periorbital region. **Study Design:** Case report. **Methods:** A 38 year old male presented with a mass under his left eye for about 3 months. The mass was slowly increasing in size with no associated weight loss, tenderness, or vision changes. The patient was scheduled for an excisional biopsy of the lesion. **Results:** The patient underwent a wide local excision of the area. His postoperative course was uneventful and on 6 month followup has no evidence of disease. Final pathology was consistent with a well differentiated myxoid liposarcoma and all margins were negative for tumor. **Conclusions:** Primary myxoid liposarcoma of the skin is exceedingly rare. The difficulty in diagnosing well differentiated liposarcoma is well documented often being made only after resection or upon recurrence. Although the infraorbital area in a young adult is not classically a site of abundant deep-seated soft tissues, our case highlights the importance of appropriate diagnosis with subsequent wide local excision for adequate treatment of this entity.

#### 120. **Endoscopic Transmaxillary Approach for Management of a Fifth Cranial Nerve Schwannoma of the Infratemporal Fossa**

Benjamin D. Malkin, MD, New York, NY

Chih-Kwang Sung, MD, New York, NY (Presenter)  
Benjamin R. Roman, BA, New York, NY  
Joshua B. Bederson, MD, New York, NY  
Eric M. Genden, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the surgical anatomy of the infratemporal fossa and compare different approaches to tumors in this area, specifically focusing on the use of the endoscopic transmaxillary approach.

**Objectives:** In this study, we report a case of an extracranial schwannoma of the mandibular division of the trigeminal nerve managed endoscopically. We discuss the endoscopic transmaxillary approach to the infratemporal fossa, reviewing the surgical perspective and anatomy and comparing this approach to other more commonly used open approaches. **Study Design:** This study is a case report and review of the relevant literature. **Methods:** The endoscopic transmaxillary approach was designed based on previously reported cadaveric studies on its use in accessing the infratemporal fossa (ITF). It consists of making a sublabial incision to access the maxilla, the anterior and posterior walls of which are then removed along with the lateral pterygoid plate using an endoscope for exposure. This allows complete visualization of the ITF for removal of the tumor. A literature search was performed using the PubMed search engine. **Results:** The patient is an 80 year old woman who became increasingly symptomatic with chronic suppurative otitis media from a 6.0cm schwannoma of the mandibular division of the trigeminal nerve. An endoscopic transmaxillary approach was used to completely excise the mass. The patient had no complications and was discharged from the hospital on postoperative day 2. A total of 7 other cases of schwannomas limited to the infratemporal fossa were identified in the English literature; all were removed by open approaches. **Conclusions:** Extracranial schwannomas of the ITF are uncommon. The endoscopic transmaxillary approach offers a minimally invasive approach for resection of these tumors with low morbidity and short recovery time.

## 121. The Cell Surface of the Oropharynx: A Comparison Between Smokers and Nonsmokers Using the Scanning Electron Microscope

Daniel J. Merenda, MD, Morgantown, WV  
Paul G. Van der sloot, MD, Morgantown, WV

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the mucosal surface of smokers and nonsmokers in terms of flora present and surface characteristics.

**Objectives:** To qualitatively compare the surface characteristics of the oropharynx mucosa of smokers with nonsmokers using the SEM. **Study Design:** Prospective, randomized and blinded study. **Methods:** Adult patients undergoing a routine tonsillectomy procedure will be the target group. At the time of surgery, a small portion of tissue will be collected from the oropharynx. This will be accomplished by using a special microbiopsy forcep. This will be placed in formalin and processed to be viewed under the SEM. B. For smoker group. Similar to A. Adult patients undergoing panendoscopy with biopsy. A small scraping of tissue from the oropharynx will be collected at the time of the scheduled surgery. This will be prepared and viewed under the SEM. **Results:** Smokers were found to have significantly less organisms per mm<sup>2</sup> when compared to the nonsmoker group. In addition, the organisms demonstrated characteristics of biofilm formation on the oropharyngeal mucosa. Also, the smoker group was noted to have a denuded cell surface, while the control group had a fibrinous coating over the cell surface. **Conclusions:** The scanning electron microscope is a useful tool to explore the surface of epithelial cells. This study has shown that there are definite differences in the cell surface of smokers compared to nonsmokers. Namely smokers tend to have less organisms present on their cell surface when compared to nonsmokers. In addition the organisms present on the surface of nonsmokers have characteristics of biofilm formation. Lastly nonsmokers tend to have a fibrinous coating over the cell surface. What, if any role, these findings have on the development of oropharyngeal squamous cell carcinoma in smokers is yet to be determined.

## 122. Prevalence and Usage Patterns of Complementary and Alternative Medicine Among Patients Treated for Head and Neck Cancers

Matthew C. Miller, MD, Philadelphia, PA  
Edmund A. Pribitkin, MD\*, Philadelphia, PA  
Tara DiFabio, RN, Philadelphia, PA  
William M. Keane, MD\*, Philadelphia, PA

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss complementary and alternative medicine (CAM) usage patterns among head and neck cancer patients. We hope to foster better understanding of patient desires and perceptions of CAM as it relates to the treatment of head and neck cancers.

**Objectives:** Complementary and alternative medicines (CAM) have enjoyed a surge in popularity in recent years, particularly among oncology patients. We sought to describe prevalence and patterns of CAM usage among head and neck cancer patients treated at an aca-

demic otolaryngology practice in the northeastern United States. **Study Design:** Anonymous survey of new and established patients. **Methods:** New and established patients were surveyed regarding CAM use during treatment for head and neck carcinomas during the calendar years 2005 and 2006. Responses included CAM modalities employed, perceived outcomes and adverse effects, sources of CAM and CAM related information, expenses, physician disclosure and perceived physician responses, as well as primary tumor site and demographic information. **Results:** 15.9% of patients surveyed were using CAM during treatment. 81% of these were herbals or supplements. Only 55% of respondents using CAM disclosed this to their physician during in-office encounters. Health food stores and the internet were the most frequent sources of CAM with the majority of patients spending at least \$25 weekly. The most frequently cited reason for CAM use was recommendations by family/friends as being potentially helpful. No adverse effects were reported. **Conclusions:** CAM usage, while not highly prevalent, is certainly present to a significant extent among head and neck cancer patients. Importantly those who choose to utilize CAM are most frequently employing modalities with biological activity that may potentially interact with conventional therapies. Disclosure of CAM usage is infrequent. Consequently otolaryngologists should regularly elicit this information in a highly specific fashion so that we may better serve our unique patient population.

### 123. Sclerosing Paraganglioma of the Subglottic Larynx

Timothy J. Minton, MD, Syracuse, NY  
James R. Parry, DO, Syracuse, NY  
Robert M. Kellman, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand that the sclerosing variant of paraganglioma exists and it can be misinterpreted as a malignant tumor.

**Objectives:** Paragangliomas of the larynx are uncommon, benign tumors arising from neuroectodermal crest derived paraganglia. Location in the subglottic larynx is exceedingly rare. The majority of paragangliomas display typical histological features. Sclerosing paraganglioma is an unusual variant exhibiting prominent sclerosis and fibrosis which can obscure the classic histopathological features and appear infiltrative. This variant has been found in various locations in the head and neck, but until now, its location in the subglottic larynx has not been reported. **Study Design:** This study presents a case review of a 50 year old female with sclerosing paraganglioma of the subglottis treated at our institution. **Methods:** The patient's records were reviewed for demographic, symptomatology, evaluation, and surgical management. A literature search was performed to review the diagnosis and treatment of these rare neoplasms. **Results:** Preoperative workup and tissue analysis was suggestive of a malignant neoplasm. Given these findings and the patient's frailty total laryngectomy with partial tracheal resection was opted over hemitracheolaryngectomy. The patient did very well postoperatively and has had no evidence of recurrence. **Conclusions:** Sclerosing paraganglioma of the head and neck is an extremely rare variant and this is the first case reported that involves the subglottis. The histopathological appearance of this lesion can make the diagnosis very difficult, and it is often interpreted as malignant. If paraganglioma is suspected, it is important to be aware that this variant exists and the clinical history along with histopathological and immunohistochemical analysis can aid in narrowing the differential diagnosis.

### 124. The Utility of Computed Tomography (CT) Surveillance for Recurrent Squamous Cell Carcinoma of the Head and Neck

Bruce A. Morgan, MD, Birmingham, AL  
J. Scott Magnuson, MD, Birmingham, AL  
Jessica G. Zarzour, BS, Birmingham, AL  
Joni B. Skipper, MD, Birmingham, AL  
Jennifer F. De Los Santos, MD, Birmingham, AL  
Sharon A. Spencer, MD, Birmingham, AL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand the benefits/limitations of CT and CE surveillance in the detection of local-regional recurrence of squamous cell carcinoma of the upper aerodigestive tract.

**Objectives:** To compare the accuracy of post-treatment computed tomography (CT) to clinical examination (CE) for detecting local-regional recurrence in patients with squamous cell carcinoma of the upper aerodigestive tract. **Study Design:** Retrospective cohort study. **Methods:** Review of medical records of patients with squamous cell carcinoma of the upper aerodigestive tract treated between 1997-2005 at a tertiary care institution. Eligible patients were identified using CPT/ICD-9 codes and clinical trial rosters. Inclusion criteria included patients treated with radiation, chemotherapy/radiation or surgery/radiation therapy. All received a post-treatment CT and were monitored by periodic CE with a minimum of one year followup. **Results:** One hundred twenty-three patients met the inclusion criteria. Local-regional recurrence confirmed by biopsy was 24%. Surveillance of local-regional recurrence by CE had greater sensitivity, specificity, positive predictive value and negative predictive value (89.3%, 98.9%, 96.2%, 96.9%, respectively) than CT (42.9%, 76.8%, 35.3%, 82%, respectively). Outcomes stratified by location of primary tumor or stage of cancer were not statistically significant. **Conclusions:** Clinical examination is an effective screening tool for detecting recurrent squamous cell carcinoma in the upper aerodigestive tract within one year after primary treatment. In this study, CE more accurately indicated the presence or absence of a recurrence than CT. Uncontrolled variables may have preferentially influenced CT outcomes. Further investigation is warranted

prior to excluding CT surveillance of local-regional recurrence of post-treatment upper aerodigestive squamous cell carcinoma.

**125. Total Gangrene of the Oral Tongue Following Intraaortic Balloon Pump Support in a Patient With Cardiogenic Shock**

Luc G. Morris, MD, New York, NY  
Arnold Komisar, MD\*, New York, NY  
Lisa A. Liberatore, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants will better understand gangrene of the tongue, its causes, and its management, as well as possible head and neck sequelae of intraaortic balloon pumps.

**Objectives:** Ischemic necrosis of the tongue is extremely rare having only been reported in several patients with giant cell arteritis. It has not been reported as a sequela of shock. We present a case of complete gangrene of the oral tongue in a patient who required intraaortic balloon pump support for cardiogenic shock. **Study Design:** Case report. **Methods:** Medical records, laboratory and vascular studies, and clinical photographs were reviewed. **Results:** A 79 year old woman required placement of an intraaortic balloon pump (IABP) for profound cardiogenic shock. Within two days the tip of the tongue showed signs of necrosis quickly progressing to complete necrosis and sloughing of the oral tongue. There was no evidence of giant cell arteritis or carotid vascular disease. The patient was managed expectantly with local wound care and did not require debridement. Recent cardiology literature indicates that the IABP does not effectively augment blood flow to the head and neck, because it is situated distal to the takeoffs of the carotid arteries from the central system. Accordingly patients requiring IABPs for shock are at increased risk of ischemia to the end organs of the head and neck including the tongue. **Conclusions:** We report the first case of tongue gangrene secondary to shock. Tongue gangrene may be managed with local wound care and debridement only if there is evidence of infection. Giant cell arteritis and vascular disease should be ruled out in these patients.

**126. SOUTHERN SECTION RESIDENT RESEARCH AWARD WINNER - 3rd Place Tie  
JAMES A. HARRILL RESIDENT RESEARCH AWARD  
Cost Effective Analysis of 18-FDG Positron Emission Tomography in the Detection of Recurrent Laryngeal Carcinoma**

*Thomas C. Mullis, MD, University of Mississippi Medical Center, Jackson, MS*  
Christine B. Franzese, MD, Jackson, MS

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the cost effectiveness of two strategies (FDG-PET and direct laryngoscopy with biopsy) for detecting recurrent laryngeal cancer in patients who have undergone primary radiotherapy.

**Objectives:** To compare the cost effectiveness of an initial FDG-PET versus an initial direct laryngoscopy with biopsy for the evaluation of suspected recurrent laryngeal cancer in patients who received primary radiotherapy for treatment. **Study Design:** Cost effective analysis. **Methods:** A decision tree model was constructed to model the two competing strategies and to compute the incremental cost effectiveness ratio (ICER) of the PET strategy. Multiple one way sensitivity analyses were conducted for all independent variables. Outcome measures included expected charges, number of intact larynges, and incremental charges per additional larynx preserved. **Results:** Compared to a direct laryngoscopy with biopsy strategy, a strategy which included an initial FDG-PET scan resulted in an increase in laryngeal preservation, but at an additional \$17,931 in charges for each additional preserved larynx. However, the sensitivity analysis suggests that for many values of the model parameters, the FDG-PET strategy becomes more cost effective than the direct laryngoscopy strategy. **Conclusions:** In the workup of suspected recurrent laryngeal cancer after definitive radiotherapy, direct laryngoscopy with biopsy as the initial diagnostic test is cost effective when compared to a strategy which includes an initial FDG-PET scan unless the payer is willing to pay an additional \$17,931 per additional preserved larynx.

**127. Metastatic Gastrinoma to the Parotid Gland**

Patrick D. Munson, MD, Rochester, MN  
Jan L. Kasperbauer, MD\*, Rochester, MN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate knowledge of the presentation of gastrinoma metastatic to the parotid gland. Additionally they should be able to discuss locally metastatic versus distantly metastatic lesions to the parotid, including differential diagnosis and management.

**Objectives:** To highlight the unique finding of metastatic gastrinoma of the parotid gland. To review the incidence and management of metastatic tumors of the parotid. **Study Design:** A retrospective case review of a single patient with gastrinoma metastatic to the parotid gland. **Methods:** The history, physical, preoperative imaging, surgical, pathologic, and postoperative findings of the patient are reviewed. Metastatic cancers to the parotid gland are discussed. **Results:** A 65 year old woman with multiple endocrine neoplasia-1

syndrome presented with a new onset right parotid mass. She had undergone partial pancreatectomy for gastrinoma nine years previously. Subsegmental liver resection for gastrinoma liver metastasis occurred 1 year prior to presentation. Physical exam revealed a firm, fixed, 4 cm right tail of parotid mass. Indium-111 Octreoscan demonstrated increased uptake in the parotid region of the right lateral neck. PET/CT confirmed this hypermetabolic mass. Fine needle aspiration (FNA) was nondiagnostic. The patient underwent right total parotidectomy and select level II neck dissection. Pathology was consistent with metastatic gastrinoma to the parotid with periparotid lymph node and facial nerve involvement. Multiple neck nodes were negative for malignancy. Postoperative adjuvant intensity modulated radiation therapy (IMRT) was administered. There was no evidence for recurrence 6 months postoperatively. **Conclusions:** This is believed to be the first reported case of gastrinoma metastatic to the parotid gland. Albeit uncommon, primary tumors distant from the head and neck can metastasize to the parotid gland and lymph nodes.

### 128. **An Analysis of Complications Following Surgical Treatment of Benign Parotid Disease**

S. A. Reza Nouraei, MBBChir, London, UK  
Yasmin Ismail, MRCS, Newcastle Upon Tyne, UK  
Mark S. Ferguson, MRCS, London, UK  
Neil R. McLean, FRCS, Adelaide, NSW  
Peter J. Thomson, FRCS, Newcastle Upon Tyne, UK  
Andrew R. Welch, FRCS, Newcastle Upon Tyne, UK

**Educational Objective:** At the conclusion of this presentation, the participants should be able to appreciate the various factors, those related to pathology, as well as variations in surgical practice, that influence the development of complications following surgical treatment of benign parotid disease.

**Objectives:** To study the incidence of, and risk factors for, developing complications following parotidectomy for benign disease, to improve preoperative patient counseling and surgical management. **Study Design:** Chart review. **Methods:** An 11 year retrospective review of 162 parotidectomies for benign disease, collecting and analyzing data about presentation, investigations, surgical treatment, postoperative facial nerve function, Frey's syndrome, and other surgical complications. **Results:** Mean age at presentation was 58 years. The most common pathology was benign pleomorphic adenoma (43%), followed by Warthin's tumor (30%) and chronic sialadenitis (22%). Sialadenitis was a significant risk factor for facial nerve palsy and increased the incidence of salivary fistulae. Parotid duct ligation increased the risk of nerve palsy in the distribution of zygomatic and buccal branches. Operations for Warthin's tumor were associated with an elevated risk of dysfunction of the cervical branch of the nerve. Half of patients had intraoperative facial nerve stimulation and this did not influence the likelihood of facial paresis. The recovery of facial nerve function showed a biphasic distribution with 90% of patients having normal function within 12 months followed by a slower recovery rate for up to two years. **Conclusions:** The incidence of postoperative complications was influenced by the pathology, with inflammatory lesions significantly increasing the risk of facial nerve dysfunction and other complications, but also by variations in surgical practice such as parotid duct ligation. Overall, the incidence of permanent facial paralysis was under 2%, but a temporary nerve palsy was common at 40%, with most patients regaining normal function within one year of the operation.

### 129. **Outcomes of Chemoradiation Therapy for Laryngeal Cancer With Vocal Cord Fixation**

Steven M. Olsen, BS, Portland, OR  
Daniel W. Yoon, MD, Omaha, NE  
Peter E. Andersen, MD, Portland, OR  
William M. Lydiatt, MD, Omaha, NE  
Neil D. Gross, MD, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the research and ask questions.

**Objectives:** To report the efficacy and morbidity of organ preservation therapy for patients with fixed cord laryngeal cancer. **Study Design:** A retrospective chart review. **Methods:** Tumor registry and departmental databases were searched and charts reviewed for patients with fixed cord laryngeal cancer diagnosed between 1980 and 2004. **Results:** Twenty-two cases of fixed cord lesions were identified with a mean followup of 62 months. Recurrent disease occurred in 27.3% of patients. Observed survival, disease specific survival, and laryngectomy free survival were 57.8, 77.0, and 54.5% at 5 years. Five patients required salvage laryngectomy. Chemoradiation therapy morbidity included tracheostomy requirement, enteral feeding requirement, severe mucositis, and neutropenia in 27.3, 22.7, 22.7, and 22.7% respectively. One patient died of neutropenic sepsis. **Conclusions:** This series provides unique insight into the long-term results of organ preservation therapy in fixed cord laryngeal cancer. Local control and survival were comparable to other reviews of organ preservation therapy. However our study demonstrated significant treatment related morbidity.

### 130. **Patient Compliance With Radiation Therapy for Advanced Head and Neck Cancer at a Tertiary Care County Hospital**

Urjeet A. Patel, MD, Chicago, IL  
Kunal H. Thakkar, MD, Chicago, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the variable compliance with radiation therapy that is seen when treating head and neck cancer patients in the public sector. Participants should be able to compare this population to the general population as well as the populations treated in various benchmark organ preservation studies.

**Objectives:** Combined chemotherapy and radiotherapy are routinely used to treat advanced stage head and neck squamous cell carcinoma (HNSCC). Patient compliance is often difficult given increased toxicities. Medically underserved or Objective: to evaluate compliance with radiation therapy for patients with advanced stage HNSCC at an urban tertiary care county hospital. **Study Design:** Retrospective chart review. **Methods:** Data was extracted from charts of 136 consecutive patients who were advised to undergo chemoradiotherapy for newly diagnosed HNSCC from 2004 to 2006. Demographic and tumor related information was collected as was patient compliance with radiation treatment. Total dose, length of treatment, and theoretical “loss of locoregional control” was calculated. Benchmark compliance data was obtained from select publications. **Results:** Of 136 patients, 55 did not begin treatment or transferred care elsewhere, leaving 81 study patients. 28 patients (35%) had unacceptable overall treatment courses. 48 patients (59%) received less than the effective dose of 65 Gy after accounting for missed treatment days. 51 patients (63%) had a greater than 10% calculated loss in locoregional control. Univariate and multivariate analysis yielded no predictive value of gender, ethnicity, node status, stage, or primary site on compliance. **Conclusions:** Compared to other institutions HNSCC patients in this setting are less likely to complete a prescribed therapeutic regimen. Patient and tumor characteristics measured in this study do not predict compliance. Organ preservation protocols require further evaluation in populations where compliance is suspect. Future research must examine interventions to improve compliance and assessment of its impact on survival.

### 131. Intraparotid Facial Nerve Schwannoma: Preoperative Assessment

Zara M. Patel, MD, New York, NY  
Jamie I. Chang, MD, New York, NY  
Adam S. Jacobson, MD, New York, NY  
Eric M. Genden, MD, New York, NY  
Peter M. Som, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to utilize radiographic characteristics and clinical signs to better distinguish between facial nerve schwannomas (FNS) and other intraparotid tumors, while recognizing that this is not always possible.

**Objectives:** To analyze radiographic characteristics of intraparotid FNS to better distinguish these neoplasms from other intraparotid tumors preoperatively. **Study Design:** Retrospective chart review. Preoperative imaging and intraoperative photography will be presented. **Methods:** Detailed review of history, physical examination, needle biopsy, preoperative imaging and intraoperative findings of four cases of intraparotid FNS. **Results:** All four patients presented with a longstanding parotid mass without pain, rapid growth, or facial weakness. In all cases MRI and CT imaging demonstrated a well circumscribed cystic mass with necrotic foci and the preoperative needle biopsy was “inconclusive” in all cases. Intraoperatively the main trunk of the facial nerve could be traced into a cystic mass wherein the nerve branches could not be dissected free. **Conclusions:** Intraparotid FNS are rare, with less than 70 cases documented in the literature. Irrespective of prior literature that suggests that a FNS may exhibit radiographic signs such as the “target sign” and growth along the facial nerve, we found that the clinical presentation, preoperative examination, needle biopsy and radiography did not establish a definitive preoperative diagnosis. In our cases the diagnosis was made intraoperatively.

### 132. Submental Hematoma After Antibiotic Use and Warfarin Therapy

Daniel I. Plosky, MD, New Haven, CT

**Educational Objective:** At the conclusion of this presentation, the participants should be able to apply knowledge of potential drug-drug interactions between warfarin and common antibiotics used in otolaryngology.

**Objectives:** To report a case of warfarin-amoxicillin/clavulanate interaction leading to submental hematoma. **Study Design:** Case report. **Methods:** A 52 year old male developed a rapidly enlarging submental hematoma two days after beginning a course of amoxicillin/clavulanate (AM/CL) therapy as treatment for a right submandibular gland sialadenitis. His medication history was notable for long-term warfarin therapy for a DVT 10 years prior. Examination revealed a muffled voice, floor of mouth fullness and ecchymosis with deflection of his tongue toward his palate. Fiberoptic laryngoscopy demonstrated an ecchymotic and edematous base of tongue with a retroflexed epiglottis. His international normalized ratio was elevated to 24 which was promptly reversed with vitamin K and fresh frozen plasma. His airway was secured via nasotracheal intubation. **Results:** Our report mimics a case of Ludwig’s angina as a result of an interaction between warfarin and AM/CL. Although the mechanism for this interaction is not fully known, it is suspected to be either pharmacokinetic (via metabolism in the cytochrome P450 system and preferential metabolism of clavulanate potassium in

the liver) or pharmacodynamic (via interference with the production of vitamin K-dependent clotting factors II, VI, IX, and X). **Conclusions:** This case report of prolonged bleeding time and airway compromise was likely related to his underlying salivary gland infection and the above described drug-drug interaction.

### 133. Cerebrospinal Fluid Leak After Anterior Cervical Disc Fusion (ACDF), An Unusual Cause of Dysphagia and Neck Mass

Madeleine R. Schaberg, MD, New York, NY

Peak Woo, MD\*, New York, NY

Stanley M. Shapshay, MD\*, New York, NY

Jason I. Altman, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss a rare cause of dysphagia after ACDF.

**Objectives:** Dysphagia after ACDF is a common complaint. It is most often transient and benign. We present two cases of dysphagia caused by a serious and rare complication of this surgery: cerebrospinal fluid leak into the neck. **Study Design:** A case series of two patients. **Methods:** Both patients underwent chart review, comprehensive history, physical exam, flexible nasolaryngoscopy, and radiographic imaging. A literature review of the MEDLINE database (1966-2006) using key words, dysphagia and anterior discectomy, was performed. **Results:** Our first case is a 67 year old man who reported continued dysphagia postoperatively. Physical exam revealed a boltable mass of the neck. Computed tomography (CT) of the neck demonstrated a fluid collection in the prevertebral space from C3-C7. Our second case is a 21 year old woman who reported continued dysphagia one month postoperatively. Physical exam revealed a neck mass and CT revealed a fluid collection extending from C5-T3. Both patients had resolution of symptoms following neurosurgical exploration and repair. **Conclusions:** CSF collection presenting as dysphagia and neck mass is an unusual complication after ACDF. It must be included in the differential diagnosis because both fine needle aspiration and incision and drainage are contraindicated. Treatment including lumbar drain or re-exploration is appropriate.

### 134. The Impact of an Onsite Cytopathologist on the Initiation of Therapy for Head and Neck Cancer Patients

Madeleine R. Schaberg, MD, New York, NY

Eric M. Genden, MD, New York, NY

Maixin Wu, MD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the impact of an onsite cytopathologist at a tertiary care head and neck cancer center.

**Objectives:** Fine needle aspiration (FNA) is an essential tool for rapid and accurate diagnosis of a neck mass. If performed and interpreted onsite by a cytopathologist initiation of therapy can be immediate. We assess the impact of an onsite cytopathologist at a tertiary care head and neck cancer center. **Study Design:** A retrospective chart review. **Methods:** We reviewed 36 consecutive patients that underwent evaluation of a neck mass using FNA. Twenty patients were evaluated by a cytopathologist who performed and interpreted the FNA at the cancer center during the initial consultation. Sixteen patients underwent a FNA by a surgeon wherein the slides were prepared and sent to cytopathology for interpretation. The charts were reviewed for diagnostic accuracy and the impact of the FNA on the timely initiation of therapy. **Results:** Twenty FNA's were performed by an onsite cytopathologist. In fourteen cases (70%) the cytopathologist was able to immediately render a diagnosis. Treatment was instituted an average of 5.3 days after initial consultation. Sixteen patients underwent a FNA by a surgeon. A diagnosis was achieved by FNA in 11 patients (73%), and the average time to the initiation of therapy was 12.2 days, significantly greater than the group evaluated by an onsite cytopathologist ( $P > 0.05$ ). **Conclusions:** A cytopathologist onsite at a head and neck cancer center can improve the delivery of care by significantly decreasing the time to diagnosis and initiation of definitive therapy.

### 135. Otolaryngologic Manifestations of Multiple Myeloma

Maulik B. Shah, MD, New Hyde Park, NY

David Myssiorek, MD\*, Long Island, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to discuss the various otolaryngologic manifestations and treatment of multiple myeloma.

**Objectives:** A 70 year old woman presented with dysphagia, mild stridor and a left sided neck mass for three weeks. The patient had a 15 lb weight loss over six months, hoarse voice for one month, and a history of multiple myeloma which had been treated with thalidomide and Zometa one year prior to this presentation. Flexible fiberoptic laryngoscopy revealed a large submucosal mass in the supraglottis occluding the left arytenoids, false and true vocal folds, including the left epiglottic edge. An FNA was significant for large atypical plasmacytoid cells consistent with multiple myeloma or plasmacytoma. The patient's stridor improved with conservative intra-

venous steroid treatment while the plasmacytoma was treated with radiotherapy. A repeat flexible fiberoptic laryngoscopy one week into radiotherapy revealed greater than 90% reduction in the size of the supraglottic mass. Extramedullary plasmacytoma converting to multiple myeloma has been reported in the past. An atypical plasmacytoma of the larynx following successful treatment of multiple myeloma is presented. The head and neck manifestations, diagnosis, and treatment of multiple myeloma are reviewed. **Study Design:** Case report/review. **Methods:** See above. **Results:** See above. **Conclusions:** See above.

### 136. **Oncolytic Vesicular Stomatitis Virus in the Treatment of Medullary Thyroid Carcinoma**

Edward J. Shin, MD, New York, NY  
Chih-Kwang Sung, MD, New York, NY (Presenter)  
Bryan Choi, MS, New York, NY  
Oliver Ebert, MD, New York, NY  
Eric M. Genden, MD, New York, NY  
Savio Woo, PhD, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate rVSV is an effective oncolytic agent against human and murine medullary thyroid carcinoma in vitro.

**Objectives:** Replication competent, vesicular stomatitis virus (VSV) has been demonstrated to be an effective oncolytic agent in a variety of malignant tumors. rVSV-F and rVSV-IL-12 have been demonstrated to have significant antitumor effects against squamous cell carcinoma in an orthotopic murine model. We investigate the efficacy of these oncolytic vectors in vitro against both human and murine medullary thyroid carcinoma. **Study Design:** In vitro testing of one human (TT) and one murine medullary thyroid carcinoma (MTC-M) cell lines treated by two different oncolytic rVSVs. **Methods:** Cells were monitored for cytopathic effects by bright field microscopy and cell viability was assessed via MTT assay. IL-12 expression by rVSV-IL-12 treated cells was determined by ELISA. Samples of cell culture supernatants at varying MOIs were assayed for viral RNA genome by real-time RT PCR. **Results:** Viral replication in vitro for both viruses peaked between 36 to 48 hours in both cell lines. Replication resulted in greater than 1,000 fold increase in viral titers over a 48 hour period. rVSV-F was highly cytotoxic in vitro at a concentration of one infectious viral particle per 1000 cancer cells (MOI 0.001) in both human and murine thyroid cell lines. rVSV-IL12 effectively produced IL-12(>5x10e5 pg/cc) even at low MOIs (.0001) at 48 hours. **Conclusions:** rVSV-F and rVSV-IL12 display efficient replication and oncolysis of both human and mouse medullary thyroid cancers in vitro and suggest that rVSV is a promising novel oncolytic virus in the treatment of medullary thyroid cancers.

### 137. **Head and Neck Squamous Cell Carcinoma: The T-Regulatory Cell as a Prognostic Indicator**

Mobeen A. Shirazi, MD, Maywood, IL  
Joseph M. Scianna, MD, Maywood, IL  
Phong T. Le, PhD, Maywood, IL  
Guy J. Petruzzelli, MD, Maywood, IL

**Educational Objective:** At the conclusion of this presentation, the participants should be able to understand that T-regulatory (Treg) cells are a useful marker for advanced stage head and neck squamous cell carcinoma (HNSCC), recurrent HNSCC and positive neck disease.

**Objectives:** In an effort to develop better strategies and treatments that can increase overall survival of patients with HNSCC, we studied the molecular mechanism that drives tumor cell differentiation and the state of immune response against tumor cells. Treg cells are known potent immune suppressors. We hypothesized that patients with more advanced HNSCC will have a relatively higher percentage of Treg cells in peripheral circulation, producing a relative immunocompromised state. **Study Design:** Basic science, laboratory study. **Methods:** Peripheral blood was collected from 58 patients with HNSCC. Lymphocytes were isolated and immunofluorescent staining and flow cytometric analysis was used to determine the absolute percentage of Treg cells. We also used indirect immunofluorescent staining to confirm the presence of Treg cells in HNSCC tumor specimen. **Results:** A positive correlation between Treg cell population and histopathologic tumor stage was found with  $r=0.40$ . Twenty-four of 58 patients had nodal disease identified. A statistically significant ( $p<0.05$ ) increase in Treg cell population percentage was found in patients with recurrent disease as well as those with nodal basin disease. In addition our immunofluorescent staining confirmed the strong presence of Treg cells in the actual HNSCC tumor specimen. **Conclusions:** Increased percentage of Treg cells are associated with an advanced stage HNSCC, recurrent HNSCC and positive neck disease. Understanding the mechanism of how the tumor is able to use the immunosuppressive activity of Treg cells to protect itself from an effective immune response will provide a new target for immunotherapy.

### 138. **In Vitro Characterization of an Antibody/CpG Oligonucleotide Conjugate for Tumor Targeted Immunotherapy of Melanoma**

Andrew G. Sikora, MD PhD, Houston, TX  
Josh Gregorio, MS JD, Houston, TX

Michel Gilliet, MD, Houston, TX  
Yanyan Lou, MD PhD, Houston, TX  
Patrick Hwu, MD, Houston, TX  
Willem W. Overwijk, PhD, Houston, TX

**Educational Objective:** At the conclusion of this presentation, the participants should be able to explain the importance of targeting immune response modifiers to tumors for cancer immunotherapy and compare antibody/CpG conjugate to other tumor targeted therapies.

**Objectives:** Immune response modifiers such as immunostimulatory CpG oligonucleotides are a promising approach to the treatment of melanoma and other human cancers. Unmethylated CpG oligonucleotides bind to toll like receptor 9 (TLR9) expressed on immune cells to stimulate cytokine production, maturation of antigen presenting dendritic cells, and T lymphocyte and natural killer cell mediated responses. While intratumoral injection of CpG oligonucleotides has been shown to cause immune mediated regression of a number of tumor types in mouse models, direct injection is impractical for widely metastatic disease. To overcome this obstacle to targeted immunotherapy we designed a tumor targeted CpG compound. **Study Design:** Preclinical laboratory study. **Methods:** Antibody/CpG conjugate was created by chemically linking CpG oligonucleotides to an antibody against ganglioside D-2 (GD-2) which is expressed on the surface of most human melanomas. The antibody/CpG conjugate was purified by chromatography and centrifugal filtration. Binding to a GD-2 expressing variant of the B16 murine melanoma line and ability of the conjugate to stimulate ex vivo cultured mouse dendritic cells were assayed by flow cytometry. **Results:** Direct intratumoral injection of the CpG oligonucleotide sequence alone inhibits growth of GD-2 expressing B16 melanoma in mice. In vitro assays demonstrate that the antibody/CpG conjugate binds specifically to GD-2 expressing, but not GD-2 negative tumor lines. Conjugate treatment of cultured murine dendritic cells stimulates upregulation of CD40 and CD86, markers of dendritic cell activation. **Conclusions:** Based on this in vitro validation of the antimelanoma antibody/CpG conjugate further experiments will examine its ability to home to melanoma and its therapeutic efficacy in vivo.

### 139. Use of Fibular Free Flaps in the Management of Chronic Osteomyelitis of the Mandible and a Review of the Current Literature

Cristian M. Slough, MD, Portland, OR  
Brian M. Woo, DDS MD, Portland, OR  
Brett A. Ueeck, DMD MD, Portland, OR  
Mark K. Wax, MD, Portland, OR

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate a knowledge of the current management options for osteomyelitis of the mandible, compare the treatment benefits and pitfalls of the use of fibular free flaps in the management of chronic osteomyelitis of the mandible, and discuss the criteria for their use in these patients.

**Objectives:** To investigate the use of fibular free flaps as an alternative and effective method in the management of chronic osteomyelitis of the mandible and review the current literature on the management options for the condition. **Study Design:** Prospective review of two cases of chronic osteomyelitis of the mandible managed with a fibular free flap. **Methods:** Previous treatment options and ultimate outcome were reviewed. Patient satisfaction and aesthetic result were examined. Followup to 6 months was achieved and radiographic studies conducted. Review of the current literature on the treatment of chronic osteomyelitis of the mandible and the use of free flaps in its management was also reviewed. **Results:** The two cases of chronic osteomyelitis of the mandible that had failed conservative management were cured with the use of a fibular free flap reconstruction. At six months both cases continued to be disease free and exhibited boney continuity radiographically. They also continued to be satisfied with their outcome not only from a disease prospective but also from an aesthetic point of view. One patient developed a submental abscess that resolved with incision and drainage. **Conclusions:** Microvascular reconstruction with a fibular flap is a treatment option in the armamentarium of the clinician when considering the management of osteomyelitis of the mandible. In the appropriate patient the free flap can be particularly effective in eradicating the infection quickly and effectively while giving the patient excellent reconstructive options for the future.

### 140. Limited Parotidectomy: The Role of Extracapsular Dissection in Parotid Gland Neoplasms

Sarah L. Smith, MD, New York, NY  
Arnold Komisar, MD DDS\*, New York, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare the available surgical techniques for parotid gland neoplasm removal and discuss the validity of extracapsular dissection technique in excision of these masses.

**Objectives:** Surgical techniques for parotid gland neoplasm removal have been shaped over the years by the importance of the gland's relationship with the facial nerve, histological behavior of parotid tumors and recurrence rates from specific techniques. Parotidectomy with facial nerve dissection has become the procedure of choice in removal of parotid gland neoplasms due to its low recurrence rate. However, these more comprehensive dissections can cause significant postoperative complications, some cosmetically devastating. We

propose that a more limited dissection yields a similar low recurrence rate but with less risk of complications. **Study Design:** Retrospective case series. **Methods:** A retrospective review of the clinical outcomes and pathology of 27 patients who underwent extracapsular dissection for parotid gland neoplasms. **Results:** All tumors were located in the superficial lobe of the parotid gland and size of the masse ranged from 4.0 to 1.0 cm (mean 2.4 cm) in diameter. Pathology of the parotid tumors consisted of 11 pleomorphic adenomas, 6 Warthin's tumors, 6 benign epithelial cysts, 1 sarcoid lesion, 2 lymphoid hyperplasia and 1 Kaposi's sarcoma. There were no cases of capsular rupture. There was no temporary or permanent facial paralysis and no incidence of Frey's syndrome. One patient developed a sialocele which was aspirated and resolved after 3 months. There were no recurrences with follow-up time between 6 years to 5 months (mean 41 months). **Conclusions:** We advocate extracapsular dissection for benign parotid neoplasms because of the acceptable recurrence rates with limited complications as compared to superficial parotidectomy.

#### 141. Otolgia Following Fibula Free Flap Mandibular Reconstruction

Jeffrey H. Spiegel, MD, Boston, MA

Joel V. Ferreira, MA, Boston, MA (Presenter)

**Educational Objective:** At the conclusion of this presentation, the participants should be able to diagnose an unusual cause of otalgia following mandible reconstruction. Otolgia due to malposition of mandible reconstruction hardware.

**Objectives:** To review an unusual cause of otalgia following mandible reconstruction with a fibula free flap. **Study Design:** Literature review and case presentation. **Methods:** The medical records and radiographic images used to diagnose otalgia due to malposition of mandible reconstruction hardware are presented. A literature review of other complications from mandible reconstruction that could cause otalgia is also provided. **Results:** A patient presented with otalgia one year after mandible reconstruction due to malposition of a mandible reconstruction titanium plate. Initial trismus resolved as the plate slowly eroded into the skull base. **Conclusions:** Mandible reconstruction plates need to be carefully positioned to allow for proper healing of the mandible, however, other considerations are critical as malposition can result in trismus, otalgia, and serious complications to the skull base.

#### 142. Bisphosphonate Osteochemonecrosis of the Mandible or Maxilla

Matthew R. Stumpe, MD, Memphis, TN

Jeremy P. Watkins, MD, Memphis, TN

Furhan Yunus, MD, Memphis, TN

Sandeep Samant, MD, Memphis, TN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to compare bisphosphonate therapy and its association with osteochemonecrosis. The participants should be able to recognize potential risk factors and treatment of bisphosphonate osteochemonecrosis of the mandible or maxilla.

**Objectives:** To present a retrospective review of patients treated with bisphosphonate therapy and incidence of osteochemonecrosis of the mandible or maxilla. **Study Design:** Retrospective chart review and review of the literature. **Methods:** We review 758 patient charts treated with intravenous pamidronate (Aredia©) or zoledronic acid (Zometa©), duration of treatment, and cumulative dose at one institution. 5 patients were treated for osteochemonecrosis of the mandible or maxilla. Comparison of bisphosphonate therapy, potential risk factors, and treatment modalities are described. **Results:** Review found an incidence of bisphosphonate therapy osteochemonecrosis of 5/758, 0.7%. Patients with osteochemonecrosis ranged in age from 58-71 years and 4/5 were male. Presenting symptoms in all patients included affected bony pain. Cumulative dose of pamidronate ranged from 540-1800mg and zoledronic acid of 56mg given in FDA approved dose and schedule. All patients presented with exposed bone. Previous dental work was observed in 3/5, similar to previously reported rates. The mandible was affected in 4/5. All patients were treated medically initially. One patient developed a pathological fracture of the effected mandible requiring external fixation for repair. One patient developed a submental abscess requiring incision and drainage. One patient required multiple debridements of necrotic bone followed by a segmental mandibulectomy. Two patients were successfully treated with medical therapy. **Conclusions:** Osteochemonecrosis of the mandible or maxilla is a recently recognized adverse side effect of bisphosphonate therapy with an incidence of 0.7%. Dental comorbidity is a significant factor that should be addressed prior to bisphosphonate therapy. The otolaryngologist should be aware of this clinical entity and the treatment options.

#### 143. Spontaneous Regression of a Carotid Body Tumor

Amar C. Suryadevara, MD, Syracuse, NY

Hootan Zandifar, MD, Syracuse, NY

Jack M. Hsu, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to know more about carotid body tumors.

**Objectives:** Carotid body paragangliomas are typically benign tumors that occur either sporadically or associated with familial syndromes. They classically present as asymptomatic slowly enlarging lateral neck masses. Although treatment has traditionally been sur-

gical, watchful waiting with serial imaging studies or radiation therapy are options in those who cannot tolerate surgery. Search of the literature has shown no spontaneous regression of these lesions. We describe an interesting case of a 59 year old gentleman who had spontaneous regression of a carotid body tumor over a 5 year period. **Study Design:** A brief review of the literature regarding the diagnosis and treatment of carotid body paragangliomas, followed by a case report. **Methods:** The hospital chart and imaging studies of the patient with a carotid body tumor were obtained and reviewed. **Results:** The patient was diagnosed with a carotid body tumor, measuring 8 X 7cm, at the age of 59. As he was severely mentally retarded, the decision to follow him closely with exam and imaging studies was made with his caretakers. Over the course of the next 5 years this lesion has regressed in size and is now not noticeable. **Conclusions:** Carotid body tumors are rare slow growing lesions which without treatment have never been shown to regress in size. Our patient is a unique example where this has occurred.

#### **144. Sinonasal Carcinoma After Irradiation for Medulloblastoma in a Patient With Nevoid Basal Cell Carcinoma Syndrome**

Neil Tanna, MD, Washington, DC  
Jordan L. Wallin, BA, Washington, DC (Presenter)  
Philip E. Zapanta, MD, Washington, DC  
Puja K. Puri, MD, Washington, DC  
Nader Sadeghi, MD, Washington, DC

**Educational Objective:** At the conclusion of this presentation, the participants should be able to identify the association between nevoid basal cell carcinoma syndrome and radiation induced tumors. Additionally, management of the latter should become clear. Additionally, current concepts in the management of these patients will be elucidated.

**Objectives:** The authors examine the genotype of nevoid basal cell carcinoma syndrome (NBCCS) and their propensity for radiation induced tumors. Additionally, the management of neoplasms in these tumor sensitive patients is reviewed. **Study Design:** We present a 19 year old male with NBCCS that presents with a sinonasal carcinoma, seventeen years after receiving craniospinal irradiation for treatment of medulloblastoma. **Methods:** Case report and review of the literature. **Results:** To our knowledge, this is the first report of a sinonasal tumor following irradiation in a patient with NBCCS. **Conclusions:** NBCCS is associated with multiple basal cell carcinomas, odontogenic cysts, craniofacial anomalies, and childhood medulloblastomas. The increased frequency of the latter often necessitates early irradiation. As such, NBCCS has been associated with irradiation induced neoplasms including meningiomas, sarcomas, and gliomas. NBCCS patients may also have a propensity to radiation induced sinonasal carcinomas.

#### **145. Atlanto-Axial Subluxation as a Complication of Adult Thyroid Surgery**

Konstantin G. Tarashansky, MD, Brooklyn, NY  
Krishnamurthi Sundaram, MD\*, Brooklyn, NY

**Educational Objective:** At the conclusion of this presentation, the participants should realize that atlanto-axial subluxation may occur as a sequel of an elective thyroid surgery, that some patients may be at higher risk for the disorder and may require appropriate preoperative counseling and preventative management.

**Objectives:** To report an atlanto-axial subluxation as a complication of the elective thyroid surgery in the adult population. To identify patient and procedure factors that can increase a risk of subluxation. Compare features of atlanto-axial subluxation in the adult population to those in pediatric patients based on clinical experience and current literature review. **Study Design:** Retrospective review and comparative analysis of the clinical data, review of the literature. **Methods:** Comprehensive review of series of clinical cases of atlanto-axial subluxation in young adults following elective thyroidectomy. Comparative analysis of patients and disease characteristics in the affected group and their correlation with the similar parameters in a 13 year old boy with Grisel's syndrome following adenoidectomy. Thorough review of multidisciplinary literature. **Results:** Despite traditional description of nontraumatic atlanto-axial subluxation (Grisel's syndrome) as a disease of children complicating common pediatric procedures, we repeatedly observed this disorder in the adult patients following uneventful thyroid surgery. Clinically and radiologically disease correlated with pediatric Grisel's syndrome, but lower degrees of vertebral displacement were detected. Several patients' features, such as young age, long neck, co-existent upper respiratory tract allergic conditions, and asthma were shared in the group and may play a predisposing role. **Conclusions:** Atlanto-axial subluxation should be considered as a potential complication of the adult thyroid surgery. Certain patient characteristics may be associated with ligament laxity and be predisposing to subluxation. High level of physician's awareness, appropriate patient counseling, and expectant preventive management should be exercised, especially in the patients with the predilecting factors.

#### **146. Chondroid Syringoma of the Face**

Konstantin G. Tarashansky, MD, Brooklyn, NY  
Richard W. Westreich, MD, Brooklyn, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to demonstrate knowledge of clinical,

histopathologic, and therapeutic characteristics of chondroid syringoma and consider chondroid syringoma in the differential diagnosis of cutaneous masses of the head and neck region.

**Objectives:** To emphasize that chondroid syringoma, a rare benign neoplasm of sudiferous skin glands, may present as an asymptomatic cystic or nodular lesion in the head and neck and impose significant diagnostic challenge, misdirecting a treatment approach. **Study Design:** Case study and comprehensive literature review. **Methods:** We present a case of a 57 year old man with asymptomatic, smooth cystic lesion of the upper lip evolving for over a year and clinically resembling sebaceous cyst. Diagnosis of chondroid syringoma was provided by the post-excisional histopathologic examination. Literature review revealed that nondistinctive clinical appearance of the tumor commonly impedes its preoperative identification confusing it with more common cutaneous lesions. **Results:** Chondroid syringoma is a benign mixed tumor of the cutaneous sudiferous glands, first described in 1859 by Billorth and known as mixed tumor of the skin. Histopathologic features are similar to pleomorphic adenoma of the salivary glands, but cases of malignant transformation with distant metastasis have been reported. Tumors are typically slow growing, painless, firm, nonulcerated, subcutaneous or intracutaneous with no pathognomonic appearance and usually confused with more common benign lesions of epidermal or mesenchymal origin. **Conclusions:** Chondroid syringoma is a benign tumor with a malignant transformation potential, which should be included in the differential diagnosis of cutaneous or subcutaneous slow growing solid masses in the head and neck region and treated with complete surgical excision.

#### 147. Effects of Neck Dissection Combined With Radiation and Chemotherapy on Shoulder Function

Jeremy P. Watkins, MD, Memphis, TN  
Sandeep Samant, MD, Memphis, TN  
Kevin Cleveland, MD, Memphis, TN  
Anthony Mascioli, MD, Memphis, TN  
Kathy King, RN, Memphis, TN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to appreciate effects of neck dissection on shoulder function even with accessory nerve preservation. The participants will also be able to compare effects of radiation and chemotherapy on shoulder function.

**Objectives:** To assess the impact of chemotherapy and radiotherapy on shoulder function in patients undergoing selective neck dissection. **Study Design:** Cross-sectional observational study. **Methods:** Patients with a history of undergoing a selective neck dissection, with or without radiotherapy or chemoradiation, were subjected to an evaluation of shoulder function using a modified Constant's Score, which included a subjective score of shoulder disability and an objective performance score of shoulder function. Patients were at least 6 months removed from treatment. Those with a regional flap reconstruction or residual disease were excluded from the study. Main outcome measures included total Constant's Score, including its subjective and objective components. **Results:** A total of 34 patients meeting above-mentioned criteria, in whom 42 neck dissections had been performed, were available for this study. Seven patients (10 shoulders) underwent neck dissection alone while 13 patients (17 shoulders) were treated with radiotherapy and 14 patients (15 shoulders) were treated with chemoradiation in combination with neck dissection. There was no statistical difference between the total Constant's Score in the surgery only, surgery with radiotherapy and surgery with chemoradiation groups [84, 71, 77 respectively ( $p=0.160$ ); mixed model analysis]. There also did not appear to be any statistical difference in the objective shoulder performance [52, 43, 48 respectively ( $p=0.192$ )] or the subjective score [32, 28, 29 respectively ( $p=0.373$ )] between the three groups. By contrast, there was a statistically significant difference in shoulder function between the operated and non-operated sides [mean Constant's Score of 76.85 in shoulders involved with neck dissection and 89.7 for shoulders not involved with neck dissection ( $p<0.001$ ); paired t-test]. **Conclusions:** There does not appear to be any statistically significant deleterious impact of chemoradiation or radiotherapy on shoulder function in the setting of selective neck dissection. The observed difference between the operated and non-operated sides suggests that even selective neck dissections, which preserve the spinal accessory nerve, can have a significant effect on shoulder function.

#### 148. Cervical Emphysema and Pneumomediastinum Secondary to Crack Cocaine Use: An Unusual Presentation of Laryngeal Cancer—Case Report and Meta-Analysis

Glenn B. Williams, MD, Memphis, TN  
Syamal D. Bhattacharya, MD, Memphis, TN  
Francisco M. Vieira, MD, Memphis, TN

**Educational Objective:** At the conclusion of this presentation, the participants should be able to recognize cervical emphysema as a complication of smoked cocaine abuse and potential presenting sign of laryngeal cancer. Also one will be able to discuss the mechanism of injury, treatment and outcome of cocaine related cervical/thoracic emphysema.

**Objectives:** To present the first reported case of laryngeal cancer with cervical emphysema as a presenting sign and reintroduce the otolaryngology community to cervical and thoracic emphysema secondary to cocaine abuse. **Study Design:** Case report and meta-analysis. **Methods:** Case report and review of literature. **Results:** There are no reports of laryngeal carcinoma presenting with

cervical/thoracic emphysema. A Pubmed review of the English medical literature to date was conducted, including our report there are 36 cases (29 males, 7 females) of cocaine related cervical and/or thoracic emphysema. Age ranges from 17-44 years of age, mean 21. Twenty-nine (83%) cases were secondary to smoked and six (17%) from intranasal “snorting”. Radiographic findings include pneumomediastinum (91%), cervical emphysema (77%), pneumothorax (23%) and pneumopericardium (11%). Presenting symptoms include chest pain (89%), dyspnea (43%), Hamman’s sign (43%), neck pain (29%), sore throat (14%), dysphagia (14%), hoarse/muffled voice (9%) after long sessions of cocaine abuse or soon after abbreviated session. To date the majority of cases have been successfully managed conservatively with supplemental oxygen, close inpatient observation and repeat radiologic studies. Our patient reported several month history of hoarseness in addition to significant tobacco use. At presentation, he was in respiratory distress after a prolonged smoking session and required tracheostomy placement emergently for a marginal airway. At the time of tracheostomy, direct laryngoscopy with biopsy was performed that showed a T3 squamous cell carcinoma. **Conclusions:** Cervical/thoracic emphysema is a rare complication of smoked cocaine typically treated conservatively with superior outcomes. To date there have been no reported cases of laryngeal cancer presenting in this manner. Guided by a detailed history and review of systems, patients who present with cervical/thoracic emphysema after cocaine use should be evaluated for laryngeal pathology by the otolaryngologist.

#### 149. **Laryngomalacia: A Potential Cause for Airway Obstruction After Thyroidectomy for Massive Goiter**

Byron P. Windham, 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 most common causes of post-thyroidectomy airway obstruction as well as the presentation and management of laryngomalacia induced by massive multinodular goiter.

**Objectives:** To present the first reported case of acute postoperative airway obstruction as a result of laryngomalacia secondary to massive multinodular goiter. We also review the most common causes of post-thyroidectomy airway obstruction as well as present our hypotheses as to the physiologic mechanism responsible for massive goiter induced laryngomalacia. **Study Design:** Case report. **Methods:** A 58 year old male presented with massive multinodular goiter and compressive symptoms. Preoperative flexible laryngoscopy revealed normal true vocal cord motion with some prominence of the arytenoids. He underwent total thyroidectomy with laryngeal nerve monitoring with no intraoperative complications. **Results:** After extubation the patient suffered respiratory distress and audible inspiratory stridor with inability to maintain appropriate oxygen saturations despite delivery of oxygen via nasal cannula. Awake flexible laryngoscopy revealed redundant arytenoid and aryepiglottic fold mucosa prolapsing into the glottis similar to laryngomalacia causing complete inspiratory obstruction. He was reintubated and subsequent direct laryngoscopy and supraglottoplasty were performed. After the procedure the patient was extubated without difficulty and experienced complete resolution of his symptoms. **Conclusions:** This is the first reported case of post-thyroidectomy acute airway obstruction as a result of laryngomalacia secondary to massive multinodular goiter. We hypothesize that this presentation is a result of direct mucosal expansion of the hypopharyngeal and upper esophageal mucosa from massive retropharyngeal goiter with subsequent prolapse into the upper airway after thyroidectomy. Soft tissue lymphedema from lymphatic outflow obstruction may also be a causative factor. Regardless of the etiology this problem should be managed with prompt airway control followed by supraglottoplasty.

#### 150. **Massive Maxillary Sinus Ossifying Fibroma Complicated by Repeated Positive Cocaine Toxicology**

Robert L. Witt, MD\*, Wilmington, DE

**Educational Objective:** At the conclusion of this presentation, the participants should be able to separate the overlapping and contradictory histopathological features of ossifying fibroma and fibrous dysplasia and better understand cocaine toxicology.

**Objectives:** This manuscript is a sentinel call to institutions that do not have a position statement regarding cocaine positive testing and the timing of head and neck surgery. It describes the clinical and pathological presentation that can make the differentiation between ossifying fibroma and fibrous dysplasia ambiguous. **Study Design:** Case report—community teaching hospital. **Methods:** A 39 year old patient with cocaine dependency presented with facial deformity, intranasal mass, and exophthalmus. CT demonstrated an 8x6 cm circumscribed maxillary sinus neoplasm. Repeated cocaine positive urine toxicology delayed treatment. The patient had positive cocaine urine testing the morning of surgery but was stable from a cardiovascular standpoint and was strictly observed for 8 hours in the hospital. **Results:** There is little in the otolaryngology literature to guide the surgeon regarding the timing of surgery in the cocaine positive patient. **Conclusions:** Clinical and imaging data help separate the overlapping and contradictory histopathological features of ossifying fibroma and fibrous dysplasia. In the hemodynamically stable patient who has been strictly observed for 8 hours and is properly consented, it may be reasonable in selected cases to proceed with elective head and neck oncological surgery with positive urine cocaine testing. Outcome studies are needed in this regard. Popular urine screening can remain positive long after cocaine is metabolically inactive and may not reflect the degree of intoxicification. The half life of the urine immunoassay for the inactive metabolite benzoylecgonine is 4-6 hours. The half life for cocaine is 1-1.5 hours with five half lives totaling 8 hours.

#### 151. **Spinal Accessory Nerve Monitoring With Clinical Outcome Measures: Selective Versus Modified Neck**

## Dissection

Robert L. Witt, MD\*, Wilmington, DE

**Educational Objective:** At the conclusion of this presentation, the participants should be able to determine if more current is required to stimulate the spinal accessory nerve comparing selective neck dissection with modified radical neck dissection and if there is any clinical correlation.

**Objectives:** To determine if a threshold increase in current is required to stimulate the spinal accessory nerve (SAN) comparing current on initial identification of the SAN and after completion of the dissection and prior to closure for selective neck dissection, zones 1, 2, 3 (SND), and modified radical dissection zones 1, 2, 3, 4, 5 (MRND) and compare clinical outcome measures for “shoulder syndrome” for SND and MRND. **Study Design:** Prospective study of 22 consecutive patients receiving SND or MRND by one surgeon at one institution. **Methods:** Electrophysiological recording of current on initial identification of the SAN was compared to the current recorded at the completion of the procedure and prior to closure for SND and MRND. Clinical correlation measured and compared parameters of “shoulder syndrome” (shrug, flexion, abduction, winging, and pain) for SND and MRND at 2 months. **Results:** 0 of 11 (0%) patients with SND and 3 of 11 (27%) patients with MRND had significant threshold increases (>0.4 mA) on completion of the dissection. 1 of 11 (9%) patients with SND and 3/11 (27%) with MRND had <90 degrees of shoulder abduction, scapular winging, and/or significant pain. **Conclusions:** SND results in less threshold shift compared to MRND. Electrophysiological integrity of the SAN does not completely correlate with clinical outcome measures for “shoulder syndrome” but the negative predictive value is >90%. SND is a less invasive procedure than MRND.

### 152. SOUTHERN SECTION RESIDENT RESEARCH AWARD WINNER - 3rd Place Tie

#### JAMES A. HARRILL RESIDENT RESEARCH AWARD

#### A Controlled Outcomes Study of Radiation Resistance in Spindle Cell Variant Squamous Cell Carcinoma of the Head and Neck

*Adam M. Zanation, MD, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC*

Victor Lai, BS, Chapel Hill, NC

Marion Couch, MD PhD, Chapel Hill, NC

William W. Shockley, MD, Chapel Hill, NC

Mark Weessler, MD, Chapel Hill, NC

Carol G. Shores, MD PhD, Chapel Hill, NC

**Educational Objective:** At the conclusion of this presentation, participants should be able to 1) define the outcomes differences between spindle cell variant (SCV) and non SCV squamous cell; and 2) understand why primary surgical treatment may pretend a better disease free survival chance than primary radiation treatment.

**Objectives:** The objectives of this study are to evaluate the clinical outcomes of spindle cell variant squamous carcinomas (SCVSCC) and to compare radiation response rates of SCVSCC to non-spindle cell SCC of the head and neck. **Study Design:** Case control outcomes study of 27 SCVSCC patients and 54 matched patients. **Methods:** Spindle cell skin cancers and any patient with prior HNSCC were excluded from analysis. Controls were matched for site of disease, stage, treatment and age. Comparison of disease free survival (DFS) and response to therapy was performed. Results were stratified for treatment type, radiation therapy and stage. **Results:** SCVSCC is associated with worse clinical outcomes than non-spindle cell SCC. The relative risk of recurrence with SCVSCC was 2.8 compared with match non-spindle cell controls. Curative surgical therapy as the initial treatment reduced this difference to a relative risk of 1.4. The analysis of initial response to radiation treatment showed SCVSCC was significantly radioresistant compared to matched controls ( $p < 0.05$ ). **Conclusions:** Spindle cell variant squamous carcinoma (SCVSCC) of the head and neck pretends an overall worse prognosis than non-spindle cell SCC. It is also relatively resistant to standard radiation therapy compared with non-spindle cell SCC.

### 153. Chronic Osteomyelitis of the Mandible Associated with Paget’s Disease

Hootan Zandifar, MD, Syracuse, NY

Amar C. Suryadevara, MD, Syracuse, NY

Robert M. Kellman, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to have more knowledge about treatment options for osteomyelitis of the mandible in association with Paget’s disease.

**Objectives:** Paget’s disease of the bone can be seen in up to 4% of patients over the age of forty. Involvement of the mandible is not uncommon. However osteomyelitis as a complication of Paget’s disease is rarely described. Only one case report was found that describes osteomyelitis of the mandible as a complication of Paget’s disease. We present another case of a 67 year old patient with chronic osteomyelitis of the mandible associated with Paget’s disease who was never treated with bisphosphonates or radiation. **Study Design:** Chart review case presentation. **Methods:** This is a chart review case presentation of a 67 year old patient who presented to

the clinic with chronic osteomyelitis of the mandible not responding to long-term antibiotic treatment. During a course of 6 years she underwent 5 debridements, long-term antibiotic therapy and hyperbaric therapy as well as continued treatment of her Paget's. She is now 2 years since her last surgery. **Results:** Her Paget's disease is in remission and she shows no evidence of recurring osteomyelitis. **Conclusions:** Osteomyelitis as a complication of Paget's disease is rare event and it is difficult to treat necessitating long-term antibiotics and multiple debridements.

#### 154. Unusual Presentation of Multiple Giant Cell Reparative Granulomas of the Mandible

Hootan Zandifar, MD, Syracuse, NY

Amar C. Suryadevara, MD, Syracuse, NY

Jack M. Hsu, MD, Syracuse, NY

**Educational Objective:** At the conclusion of this presentation, the participants should be able to have more information about giant cell granulomas of the mandible.

**Objectives:** Giant cell reparative granuloma (GCRG) of the mandible is a common benign entity that presents as a single interosseous lesion. It can vary from an asymptomatic slow growing mass to a locally destructive aggressive lesion. Pathological findings of the mandible associated with cherubism and hyperparathyroidism can mimic that of GCRG. However these diseases demonstrate multiple mandibular lesions as opposed to a single lesion seen in GCRG. We describe a case report of a 9 year old female with multiple mandibular lesions pathologically positive for GCRG who has no familial history of cherubism or any evidence of hyperparathyroidism. **Study Design:** Chart review case presentation. **Methods:** This is a chart review case presentation of a 9 year old patient who initially presented to the clinic after sustaining trauma to the left side of her face and developed persistent swelling and pain. Panorex and CT scan showed multiple cystic lesions of the mandibular ramus bilaterally. The largest cyst showed extension within the masseteric space. She underwent curettage and excisional biopsies of these lesions. The pathology is consistent with giant cell reparative granuloma. **Results:** She has been referred to our maxillofacial surgeon for further treatment. **Conclusions:** This is an unusual presentation of a patient with multiple giant cell reparative granulomas of the mandible. Although this is usually associated with cherubism or hyperparathyroidism, our patient has neither of these diseases.