

# SOUTHERN AND MIDDLE SECTION PROGRAMS

THURSDAY, JANUARY 8, 2004

Noon - Registration - North Wall  
8:00

3:00 - Speaker Ready Room - Key West  
8:00

6:30 - Welcome/President's Reception - Collier Hall  
8:00

FRIDAY, JANUARY 9, 2004

7:00 - Registration - North Wall  
12:30

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

7:00 - Southern Section Business Meeting (Members Only) - Caxambus I  
7:50

7:00 - Poster Viewing - Collier Hall  
12:30

6:30 - Poster Viewing - Collier Hal  
8:00

7:00 - Exhibit Hall Open - Collier Hall  
12:30

7:00 - Continental Breakfast with Exhibitors - Collier Hall  
7:50

8:00- Scientific Session - Salons A - D  
12:20

8:00 - Welcome and Introduction of Robert A. Jahrsdoerfer, MD\*, President  
Harold C. Pillsbury, MD\*, Chapel Hill, NC

8:05 - Presidential Address  
Robert A. Jahrsdoerfer, MD\*, Charlottesville, VA

8:15 - Introduction of Guests of Honor, Robert H. Ossoff, MD\*, Nashville, TN, and Sigsbee W. Duck, MD\*, Gillette, WY  
Harold C. Pillsbury, MD\*, Chapel Hill, NC

Presentation of Vice Presidential Citations, Amelia F. Drake, MD\*, William W. Shockley, MD\*, and Mark C. Weissler, MD\*, all of Chapel Hill, NC  
Harold C. Pillsbury, MD\*, Chapel Hill, NC

**MODERATORS: PAUL R. LAMBERT, MD\*, CHARLESTON, SC  
PETER S. ROLAND, MD\*, DALLAS, TX**

8:25 - Cochlear Implantation in Patients with Substantial Residual Hearing  
Robert D. Cullen, MD, Chapel Hill, NC  
Carol A. Higgins, MS, Chapel Hill, NC  
Harold C. Pillsbury, MD\*, Chapel Hill, NC  
Craig A. Buchman, MD, Chapel Hill, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the outcomes expected in patients receiving cochlear implantation with substantial residual hearing.

**OBJECTIVES:** Cochlear implantation is an effective means for providing auditory rehabilitation in adult patients with severe to profound sensorineural hearing loss. Recipients who have short durations of deafness demonstrate improved performance compared to patients with longer durations between deafness and implantation. The purpose of this study is to describe the outcomes of patients with significant residual hearing who have undergone cochlear implantation. **STUDY DESIGN:** Retrospective chart review of patients with substantial residual hearing who underwent cochlear implantation. **METHODS:** Chart reviews were completed on patients with sensorineural hearing loss and substantial residual hearing who underwent cochlear implantation. Preoperative and postoperative measures were reviewed with regard to audiologic performance as well as complications. **RESULTS:** The performance outcomes of patients who underwent cochlear implantation with substantial residual hearing will be described. The incidence of clinically evident vestibular symptoms will also be presented. **CONCLUSIONS:** Patients with significant residual hearing do very well after cochlear implantation. There is an initial decline in performance compared to preoperative performance. This decline is rapidly overcome and is eventually exceeded. Vestibular dysfunction may also occur in this patient population.

**8:33 Transduction of Anti-Apoptotic Genes to Prevent the Loss of Spiral Ganglion Neurons After Hair Cell Loss**

Michael P. Rodrigues, MD, Baltimore, MD  
Kim Baker, MD, Baltimore, MD  
Mark Praetorius, MD, Baltimore, MD  
Hinrich Staecker, MD, Baltimore, MD

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the use of a new viral vector to prevent apoptosis of spiral ganglion cells after hair cell loss.

**OBJECTIVES:** When either hair cells or central cochlear neurons are destroyed, trophic factors that support the auditory neurons are lost causing the auditory neurons to degenerate. A new herpes simplex viral vector (HSV ICP 10) has been used to transfect spiral ganglion neurons in mouse inner ear with an endogenous herpes gene ICP 10. This gene prevents apoptosis after the destruction of hair cells. **STUDY DESIGN:** This is a prospective study using a mouse model to study the effectiveness of a new herpes simplex viral vector (HSV ICP 10) in preventing apoptosis of spiral ganglion neurons after destruction of hair cells. **METHODS:** In an in vivo study, transduction of this new HSV ICP 10 into adult mice spiral ganglion cells, prevented the loss of these cells after all the auditory hair cells were destroyed by a round window injection of neomycin. **RESULTS:** Immunohistochemical staining for a marker protein on the vector revealed high uptake into the spiral ganglion cells as well as into vestibular neurons. A double label staining for neurons and viral vector marker protein showed a high level of expression of the vector in the auditory neurons of the spiral ganglion at 1 month post-transduction. Counts of auditory neurons demonstrated a 90% neuronal survival rate for treated animals versus untreated controls. Aminoglycoside only treated animals demonstrated (30%) neuronal survival after compared to untreated controls. **CONCLUSIONS:** This type of genetic therapy aimed at neuronal rescue can potentially be combined with electrical stimulation to increase the efficacy of cochlear implants.

**8:41 THIRD PRIZE - FRANCES LEJEUNE, SR., RESIDENT RESEARCH AWARD  
The Canalith Repositioning for Benign Positional Vertigo: A Meta-Analysis**

Bradford A. Woodworth, MD+, Charleston, SC  
M. Boyd Gillespie, MD, Charleston, SC  
Paul R. Lambert, MD\*, Charleston, SC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the magnitude of treatment effect of the canalith repositioning procedure over controls in the treatment of BPPV.

**OBJECTIVES:** To review the effectiveness of the canalith repositioning procedure (CRP) in the treatment of BPPV by a critical review of the literature and meta-analysis. **STUDY DESIGN:** Meta-analysis. **METHODS:** Studies eligible for inclusion were randomized, controlled trials of the canalith repositioning procedure (CRP) performed on clearly defined cases of BPPV. A total of nine studies meeting inclusion criteria were identified by two independent literature searches of Medline. Treatment and control groups were compared for symptom resolution and elimination of a positive Dix-Hallpike. **RESULTS:** Patients treated with the CRP were more likely to demonstrate symptom resolution (OR 4.6; 95% C.I. 2.8-7.6) and negative Dix-Hallpike (OR 5.2; 95% C.I., 3.0-8.8) at the time of first follow-up. The effect of the CRP for symptom improvement was strongest within the first month following treatment (OR 4.1; 95% C.I. 3.1-5.2) with some decline thereafter (OR 2.8; 95% C.I., 1.7-3.9). Conversely, the ability of CRP to produce a negative Dix-Hallpike strengthened between the first month following treatment (OR 3.0; 95% C.I., 1.8-4.0) and later follow-up times (OR 5.0; 95% C.I., 3.9-6.1). The Q value of the meta-analysis ( $p=0.50$ ) reveals relative homogeneity in the measured effect of CRP among the included studies. This indicates that the observed treatment effect is consistent and robust regardless of study design. **CONCLUSIONS:** The canalith repositioning procedure is more effective than control in resolving the vertigo and positive Dix-Hallpike associated with BPPV. Untreated patients may demonstrate symptom improvement with time, however, many will continue to have a positive Dix-Hallpike when examined. Resolution of vertigo in untreated patients is therefore most likely due to avoidance of provocative positions.

**8:49 Advantages of MRI Over CT in Preoperative Evaluation of Pediatric Cochlear Implant Candidates**

David A. Parry, MD+, Dallas, TX  
Peter S. Roland, MD\*, Dallas, TX  
Timothy T. Booth, MD, Dallas, TX

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain and compare the different information provided by a CT or MRI of the inner ear and discuss the strengths and weaknesses in relation to preoperative evaluation for cochlear implant candidates.

**OBJECTIVES:** To examine preoperative evaluation of pediatric cochlear implant candidates with MRI or CT, and to verify which study offers the most pertinent information. **STUDY DESIGN:** Retrospective chart review. **METHODS:** The charts of pediatric cochlear implant candidates were reviewed from 2000 to present. All patients who had a high resolution MRI of the temporal bone were included in the study. A total 61 patients' charts were reviewed. Thirty-one met inclusion criteria. A single pediatric neuroradiologist reviewed all films. Abnormalities noted on MRI were categorized into seven anatomic subgroups: cochlea, modiolus, vestibule, cochlear nerve, endolymphatic sac, endolymphatic duct, and central findings. CT scans were read out as normal or abnormal with respect to each category. Finally, the cases of patients with MRI scans and no associated CT scans were discussed with the radiologist who gave an opinion as to whether the anomalies would have been seen on CT. The senior author evaluated each patient in an outpatient setting. **RESULTS:** Of the 62 cochlea imaged the following abnormalities were encountered: 14% had abnormalities of the cochlear turns, 13% had abnormal signal in the modiolus, 16% had abnormal vestibulae, 14% had abnormal endolymphatic ducts and/or sacs, 6% had abnormalities of the cochlear nerves. Of the 31 patients, 29% had abnormalities of the brain. CT scans missed between 0 and 100% of the above-mentioned abnormalities. **CONCLUSIONS:** MRI detects more abnormalities than does CT in cochlear implant candidates. Moreover, the abnormalities better detected on MRI are more likely to influence the implantation process (i.e., nerve aplasia, cochlear duct obstruction). Consequently, MRI provides information pertinent to cochlear implantation otherwise missed by CT.

**8:57 Cochlear Implantation in the Anatomically Abnormal Temporal Bone**

Alessandro de Alarcon, MD, Charlottesville, VA  
George T. Hashisaki, MD, Charlottesville, VA  
Anne De Michele, PhD, Charlottesville, VA  
Roger A. Ruth, PhD, Charlottesville, VA  
John C. Mason, MD, Charlottesville, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss cochlear implantation in the anatomically abnormal temporal bone.

**OBJECTIVES:** Identify cochlear implant patients with abnormal temporal bone findings and the types of abnormalities. Analyze the complications and audiologic results in this subset of patients. **STUDY DESIGN:** Retrospective chart review of 226 patients implanted at an academic institution between 1984-2003. **METHODS:** Patient charts were reviewed for CT/MRI reports/findings, audiology data, demographic data, and complications. Audiology charts were reviewed to obtain SAT, SRT, pure tone averages (500 Hz, 1000 Hz, 2000Hz) at 1 month, 3 months, 6 months, 9 months, 1 year, and 1+ years, and/or sound field data. Results for each patient for this interval were averaged if patients had multiple data. **RESULTS:** 28 of the 226 patients had temporal bone abnormalities. Demographic data: age range at implant 1-79 years, mean 32. 11 males and 17 females. 13 Clarion and 15 Nucleus. 2 patients with perilymph gushers at time of implant. One oval window implant. 15/28 pts with post-implant SAT, range 5-40 dB, mean 24 dB. 20/28 pts with post-implant sound field testing range 5-75dB. Abnormalities: 10 otosclerosis, 3 Mondini, 7 enlarged vestibular aqueduct, 2 common cavity, 3 IAC

stenosis, 3 SCC abnormalities, 4 cochlear hypoplasia, 2 vestibular dysplasia, 1 temporal bone fracture, 1 stenotic vestibular aqueduct. 3 complications: 2 meningitis/cerebral abscess 9-24 months post implant. One implant extrusion. **CONCLUSIONS:** Anatomic abnormalities are not a contraindication to implantation, except cochlear nerve aplasia and cochlear aplasia. The majority of patients with temporal bone abnormalities can be implanted with good results.

**9:13 DISCUSSION - JOHN K. NIPARKO, MD\*, BALTIMORE, MD**

**MODERATORS: HAROLD C. PILLSBURY, MD\*, CHAPEL HILL, SC  
FRED J. STUCKER, MD\*, SHREVEPORT, LA**

**9:21 Otolaryngologic Presentations of Amyotrophic Lateral Sclerosis**

Anton Chen, MD+, Nashville, TN  
C. Gaelyn Garrett, MD\*, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify otolaryngologic signs and symptoms of amyotrophic lateral sclerosis.

**OBJECTIVES:** To determine the incidence of voice disturbance as a presenting symptom of amyotrophic lateral sclerosis (ALS) in an academic otolaryngology practice and to describe laryngologic features of ALS. **STUDY DESIGN:** Retrospective chart review. **METHODS:** The medical records of patients with voice disturbance at the voice center and ALS patients at the neurology movement disorders clinic were reviewed from January 1998 to March 2003. Symptoms, physical findings, videostroboscopic exam, and speech pathology assessments were recorded. **RESULTS:** 15 of 1759 (0.85%) patients with voice disturbance were later diagnosed with ALS. Of 220 ALS patients seen in neurology clinic, 44 (20%) presented with bulbar symptoms. 19 of these 44 (43%) bulbar ALS patients initially presented to an otolaryngologist. Dysarthria (93%), dysphagia (86%), and dysphonia (48%) were the most common symptoms while tongue fasciculation (64%), hyperreflexia (52%), and tongue atrophy (48%) were the most common exam findings. No significant difference was found between bulbar ALS patients with and without dysphonia. The diagnosis of ALS was initially missed in 8 of 19 (42%) ALS patients who presented to an otolaryngologist. **CONCLUSIONS:** Although otolaryngologists rarely encounter undiagnosed ALS patients, a significant portion of bulbar ALS patients are initially evaluated by otolaryngologists. These patients may remain undiagnosed after evaluation by primary care physicians, neurologists, and otolaryngologists. Vigilance for neuromuscular abnormalities on otolaryngologic exam is important in patients who present with dysarthria, dysphonia, or dysphagia.

**9:29 Pepsin Mediates Reflux-Related Laryngeal Damage by Decreasing Protective Carbonic Anhydrase III**

Nikki S. Johnston, PhD, Winston-Salem, NC  
John Knight, PhD, Winston-Salem, NC  
Peter W. Dettmar, PhD, Hull, UK  
Mark O. Lively, PhD, Winston-Salem, NC  
Jamie A. Koufman, MD\*, Winston-Salem, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify emerging theories on laryngeal defense mechanisms against reflux. Specifically, participants should be able to identify the association between increased pepsin and decreased CAIII. In addition, participants will appreciate the plausible role of CAIII depletion in laryngeal mucosa reflux damage vulnerability.

**OBJECTIVES:** To characterize the cellular response of laryngeal epithelium to laryngopharyngeal reflux (LPR) in patients with pH-documented LPR (with controls). **STUDY DESIGN:** Prospective cell biological investigation of laryngeal biopsies taken from 22 LPR patients and 12 (normal) controls using antibodies specific for human pepsin (produced in our laboratory) and CAIII. **METHODS:** Laryngeal biopsy specimens between two groups (i.e., LPR and controls) were statistically compared for the degree of pepsin. Further analyses investigated the correlation between pepsin, CAIII depletion, and pH testing data. Specimens were frozen in liquid nitrogen for Western analysis and fixed in formalin for Pepsin immunohistochemistry. **RESULTS:** Statistical analysis revealed that the degree of pepsin was significantly different between the two groups. Secondary analyses demonstrated that pepsin levels correlated with severity of CAIII depletion and pH testing data in individuals with LPR. **CONCLUSIONS:** Individuals with LPR demonstrated higher levels of pepsin in laryngeal mucosal biopsies than their controls. Increased pepsin was associated with CAIII depletion. Furthermore, given the correlation between severity of CAIII depletion and severity of LPR, it is highly plausible that CAIII depletion predisposes laryngeal mucosa to reflux-related inflammatory damage.

**9:37 Seldinger-Assisted Videotelescopic Intubation (SAVI): A Common Sense Approach to the Difficult Pediatric Airway**

Peter G. Michaelson, MD+, Lackland Air Force Base, TX  
Eric A. Mair, MD, San Antonio, TX

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate use of the Seldinger-Assisted Videotelescopic Intubation (SAVI) technique and explain its role in aiding in the intubation of the difficult pediatric airway.

**OBJECTIVES:** To describe the Seldinger-Assisted Videotelescopic Intubation (SAVI) technique, a newly-reported method for aiding in difficult pediatric intubations using common equipment available to the practicing otolaryngologist. **STUDY DESIGN:** Technique description with representative case series. **METHODS:** Detailed description of technique for utilizing a pediatric laryngoscope with video-assisted endotracheal tube (ETT) covered rigid bronchoscopy to assist in controlled intubation in difficult pediatric airways. Challenging clinical examples are presented from over a decade of experience with SAVI. **RESULTS:** In our practice, SAVI is vital in establishing a secure airway in the difficult-to-intubate child. After insertion of a laryngoscope, an appropriate sized endotracheal tube is delivered through the glottis under direct video-visualization from a rigid telescope using a variation of the well-established Seldinger technique. The telescope serves as the stable ETT stylet which also provides panoramic visualization. The ETT slides over the telescope to provide a secure airway directly visible to all in the operating room. Benefits of the SAVI technique to previously described video-assisted intubations with flexible or specially designed endoscope devices include markedly decreased cost, employment of previously existing endoscopy skills, the benefit of rigid delivery of the endotracheal tube as well as innate versatility to a multitude of clinical situations. **CONCLUSIONS:** The SAVI technique offers a practical clinical solution to the difficult pediatric airway. Although ultimately establishing the airway depends on the skills of the operator, the SAVI technique has saved multiple lives by employing common equipment through a common-sense approach.

**9:45 The Safety and Efficacy of Transcutaneous Electrical Stimulation in Treating Dysphagia: Updated Experience**

Peter C. Belafsky, MD PhD, La Jolla, CA  
Greg N. Postma, MD, Winston-Salem, NC (Presenter)  
Jan A. Speirs, MA, La Jolla, CA  
Susan G. Hiss, PhD, Winston-Salem, NC  
Carole A. Roth, PhD, La Jolla, CA

**EDUCATIONAL OBJECTIVE:** To report our preliminary experience with transcutaneous electrical stimulation in treating persons with dysphagia and aspiration.

**OBJECTIVES:** To critically evaluate the safety and efficacy of ES in treating persons with dysphagia and aspiration. **STUDY DESIGN:** Prospective, non-randomized observational study. **METHODS:** All persons undergoing ES between 3/01/03 and 7/30/03 were prospectively evaluated. The indications, safety and efficacy of ES were recorded into a clin-

ical database. Treatment success was gauged by diet upgrade and improvement in endoscopic or fluoroscopic swallow evaluation. **RESULTS:** Twenty individuals were followed. The mean age of the cohort was 70 (+/- 15) years. The etiology of dysphagia was stroke (9/20 or 45%), respiratory failure (4/20 or 20%), cricopharyngeal dysfunction (2/20 or 10%), head and neck cancer (3/20 or 15%), muscular dystrophy (1/20 or 5%), and steroid myopathy (1/20 or 5%). The treatment was well tolerated by all and there were no complications related to ES therapy. The mean number of treatments was 10 (+/- 6). Four patients underwent adjunctive dilation and one individual underwent an endoscopic cricopharyngeal myotomy during treatment. Seventy-five percent (15/20) were improved after ES therapy and had their diet upgraded. Forty-five percent (8/13) had no diet restrictions at the end of treatment. Seven persons are still undergoing ES therapy. **CONCLUSIONS:** Our preliminary experience suggests that transcutaneous ES is a safe and effective therapy for persons with dysphagia. Multiple treatments are often necessary and adjunctive dilation of the cricopharyngeal segment has been helpful.

#### **9:53 The Use of Pattern Generators with CO2 Lasers in Laryngeal Surgery**

Shashidhar Kusuma, MD, Nashville, TN  
Catherine G. Garrett, MD\*, Nashville, TN  
Lou Reinisch, PhD, Christ Church, Canterbury New Zealand  
Jonathan R. Workman, MD, Greenville, NC  
Mark S. Courey, MD\*, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand pattern generators, its features, indications, and use in laryngeal microsurgery.

**OBJECTIVES:** The CO2 laser has many potential advantages in otolaryngologic surgical procedures. Improvements have been made in laser technology to lessen unwanted thermal damage, improve efficiency, and potentially increase its applicability in laryngeal surgery. Most recently, pattern generators have been introduced to accomplish these goals. This study was undertaken to determine the precision and the thermal damage of incisions made on vocal folds with a prototype pattern generator attachment for the CO2 laser. **STUDY DESIGN:** Histologic studies of canine vocal folds after incisions were created with a prototype pattern generator attachment to the CO2 laser. **METHODS:** In vivo canine vocal folds were used to create CO2 laser incisions with a prototype pattern generator attachment set at various incisional depths. Histologic studies were conducted to determine the accuracy of the incisional depth, width, lateral thermal damage and the depth of thermal damage. **RESULTS:** Measured incisional depths closely approximated depth settings of 200um and 500um on the pattern generator. However, the incisions made at depth settings of 1000um and 2000um did not correlate with the measured incisional depths. There was an increase in the width of the laser wounds with increasing depth settings on the pattern generator. In addition, there was no correlation between the lateral thermal damage (p-value .27), and depth of thermal damage (p-value .40) with the depth settings on the pattern generator. **CONCLUSIONS:** The pattern generator can be used to create incisions that closely approximate the depth settings of 200um and 500um on a vocal fold. Incisions made at depth settings of 1000um and 2000um are not as precise.

#### **10:01 DISCUSSION - W. FRED MCGUIRT, MD\*, WINSTON-SALEM, NC**

#### **10:09 Break/Poster Presentations/Visit with Exhibitors - Collier Hall**

**MODERATORS: AMELIA F. DRAKE, MD\*, CHAPEL HILL, SC  
RICHARD L. MABRY, MD\*, DALLAS, TX**

#### **10:40 Transnasal Esophagoscopy (TNE) Update**

Gregory N. Postma, MD, Winston-Salem, NC  
Peter C. Belafsky, MD PhD, San Diego, CA  
Jacob T. Cohen, MD, Tel Aviv, Israel  
Kevin K. Bach, MD, San Diego, CA  
Jamie A. Koufman, MD\*, Winston-Salem, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the indications, techniques, and capabilities of TNE as well as recognize a wide array of esophageal abnormalities.

**OBJECTIVES:** Transnasal esophagoscopy (TNE) allows comprehensive, in-office, examination of the esophagus and airway without sedation. The endoscope has a working port for air insufflation, suction, flexible laser use, and biopsy. The objective of this presentation is to update the author's experience (indications, techniques, and results) using TNE. **STUDY DESIGN:** Retrospective chart and data base review. **METHODS:** Retrospective review of the records of seven hundred consecutive patients undergoing TNE. **RESULTS:** TNE was performed on seven hundred otolaryngology patients; the most common indications were: 1) screening examination of the esophagus in reflux and/or dysphagia patients (82%); 2) screening examination of the esophagus in head and neck cancer patients (8%); 3) biopsy of a lesion in the laryngopharynx, trachea, or esophagus (7%); and 4) tracheoscopy and bronchoscopy (3%). Twenty three procedures were aborted. Of the remaining 677 patients, significant findings were found in 50% (338/677). In decreasing order of frequency the findings were: esophagitis, hiatal hernia, Barrett's esophagus, esophageal candidiasis, carcinoma, stricture, abnormal esophageal motility, and patulous E-G junction. In addition, 42 patients underwent flexible laser therapy of various lesions including RRP, granulation tissue, granulomas, and laryngeal leukoplakia without complications. Other procedures performed included stricture dilation and secondary tracheoesophageal puncture. **CONCLUSIONS:** TNE is well tolerated by patients with topical anesthesia alone, and no sedation or significant patient preparation is needed. Its role in head and neck oncology and in-office surgical procedures continues to expand.

#### **10:48 Complications of Radiofrequency Tissue Reduction in the Soft Palate, Tongue Base, and Nasal Turbinates**

Jonathan M. Morgan, MD+, Tampa, FL  
Marion B. Ridley, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the complications of radiofrequency tissue reduction in the oropharynx and nasal cavity, as well as discuss the relative low major complication rate.

**OBJECTIVES:** This study examines complications of radiofrequency tissue reduction (RFTR) in the nose and oropharynx. **STUDY DESIGN:** A retrospective chart review. **METHODS:** 46 consecutive patients who underwent 87 total procedures: nasal turbinate reduction (n=10, 13 procedures), tongue base reduction (n=6, 12 total procedures), soft palate reduction (n=30, 62 procedures). Complications were defined as major or minor based upon the severity and/or duration of symptoms. Any significant complaint that persisted for greater than 5 days was considered major. **RESULTS:** Nasal turbinate reduction resulted in one complication (8%): a vasovagal response to the anesthetic injection. The major complication rate was 0%, and the minor complication rate was 8%. Tongue base reduction resulted in four complications (33%). The one (8%) minor complication was a small mucosal ulceration. The three major complications were severe pain, ulceration, and edema requiring hospitalization. The major complication rate was 25%, however all occurred in the same patient during three procedures. Soft palate reduction resulted in 12 complications (19%). These included odynophagia, otalgia, ulceration, uvular swelling, dysphagia, palatal perforation, and minor bleeding. The total major complication rate was 3%, including odynophagia that required narcotics > 5 days. **CONCLUSIONS:** RFTR is being used increasingly in the treatment of nasal obstruction, allergic rhinitis, snoring, sleep-disordered breathing, and obstructive sleep apnea. It has been reported as a simple procedure with limited morbidity. This is the largest review of RFTR complications reported. It indicates that while there is a higher frequency of minor complications, there are very few major complications.

**10:56 SECOND PRIZE - JAMES HARRILL RESIDENT RESEARCH AWARD**

**Cytokine Amplification by RSV Infection in Human Nasal Epithelial Cells**

Subinoy Das, MD+, Chapel Hill, NC  
William D. Leight, BS, Chapel Hill, NC  
Joshua B. Surowitz, BS, Chapel Hill, NC  
Raymond J. Pickles, PhD, Chapel Hill, NC  
Scott H. Randell, PhD, Chapel Hill, NC  
Craig A. Buchman, MD, Chapel Hill, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the cytokine induction on well-differentiated human nasal epithelial cells by Respiratory Syncytial Virus (RSV) infection alone and with subsequent TNF-alpha stimulation. Participants should also be able to discuss the priming of RSV infection on the innate immune response of human epithelial cells and its potential role in the pathogenesis of RSV-induced complications.

**OBJECTIVES:** Respiratory syncytial virus (RSV) is an important cause of upper respiratory infections and is known to play a causal role in the pathogenesis of rhinitis, sinusitis, acute otitis media, and pneumonia. RSV appears to prime the respiratory tract to secondary inciting events such as bacterial or antigen challenges. To study the pro-inflammatory priming effects of RSV infection, cytokine expression was measured in well-differentiated human nasal epithelial cells (WD-NE) following RSV infection alone or after subsequent TNF-alpha stimulation. **STUDY DESIGN:** In vitro investigation. **METHODS:** Human nasal epithelial cells were obtained from surgical specimens and allowed to differentiate in air-liquid interface cultures until ciliation and mucus production were evident. Two experimental paradigms were used. First, accumulation of cytokines in the media was measured by ELISA and real time RT-PCR following RSV infection alone. In the second set of experiments, cytokines were also measured after TNF-alpha stimulation in both RSV-infected and uninfected cultures. **RESULTS:** RSV infection of WD-NE resulted in significant accumulations of IL-8, IL-6, and RANTES when compared to controls. Real-time RT-PCR demonstrated significant increases in IL-8 gene expression following RSV infection when compared to controls. Secondary TNF-alpha stimulation following well-established (i.e., 72 hours) RSV infection induced marked increases in IL-8, IL-6, and RANTES when compared to both RSV infection alone and TNF-alpha stimulation alone. **CONCLUSIONS:** These findings suggest that RSV infection primes nasal epithelial cells to secondary proinflammatory challenge resulting in a hyperimmune response. RSV-induced priming of a hyperimmune response may be important in the pathogenesis of sinusitis, acute otitis media, and pneumonia.

**11:04 Endoscopic Management of CSF Rhinorrhea**

Kevin C. McMains, MD, Augusta, GA  
Charles W. Gross, MD\*, Charlottesville, VA  
Stilianos E. Kountakis, MD PhD, Augusta, GA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: review the etiology of CSF rhinorrhea; discuss the diagnostic techniques of CSF rhinorrhea; and discuss endoscopic techniques and surgical outcomes in the management of CSF rhinorrhea.

**OBJECTIVES:** Anterior skull base defects causing CSF rhinorrhea can be readily approached using endoscopic techniques when surgical repair is necessary. We present our data with endoscopic repair of CSF rhinorrhea with long-term follow-up. **STUDY DESIGN:** Retrospective data analysis. **METHODS:** Retrospective data analysis of patients that were diagnosed with anterior skull base CSF rhinorrhea and underwent endoscopic repair at a tertiary institution. The data were analyzed to determine the etiology of CSF leaks, diagnostic techniques, location of the leak, surgical techniques and outcomes. **RESULTS:** Ninety two patients were diagnosed with CSF rhinorrhea and underwent endoscopic repair over a 10 year period. Forty eight were males and 44 were females. The average age was 49 (range=6-81). Average follow-up was 25 months with range of 12 to 82 months. The etiology of CSF leak was prior endoscopic sinus surgery in 23 (25%) patients, idiopathic in 19 (21%), neurosurgery in 17 (18%), trauma in 18 (20%) and the presence of meningocele/encephalocele in 11 (12%) patients. The most common location of the defect was the sphenoid sinus (n=36, 39%), followed by the ethmoid roof (n=27, 29%) and the cribriform plate (n=24, 26%). Endoscopic repair was initially successful in 78 (87%) of patients. Seven additional patients underwent successful revision endoscopic repair with an overall success rate of 94% (n=85). No major complications were encountered. Five (6%) large skull base defects were eventually repaired by neurosurgery using open intracranial techniques. **CONCLUSIONS:** The intranasal endoscopic approach is an effective and safe technique in the surgical management of anterior skull base CSF rhinorrhea. Long-term success rate in our patient population was 94%.

**11:12 Endoscopic Management of Hypopharyngeal Stenosis Following Organ Sparing Therapy for Head and Neck Cancer**

Christopher A. Sullivan, MD, Boston, MA  
Michael T. Jaklitsch, MD, Boston, MA  
Robert I. Haddad, MD, Boston, MA  
Anand L. Mahadevan, MD, Boston, MA  
Marshall R. Posner, MD, Boston, MA  
Charles M. Norris, MD, Boston, MA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to evaluate and safely manage post-chemoradiation partial and complete hypopharyngeal stenoses using an innovative anterograde/retrograde endoscopic technique.

**OBJECTIVES:** The objective of this study was to evaluate the efficacy and safety of an endoscopic technique for the management of post-chemoradiation hypopharyngeal stenoses. **STUDY DESIGN:** Retrospective review. **METHODS:** Patients with post-chemoradiation hypopharyngeal stenoses were identified from an institutional head and neck cancer database. Patients who had undergone extirpative surgery and reconstruction were excluded. All patients underwent either anterograde dilatation (AD) or concomitant anterograde/retrograde dilatation (CARD). Chemoradiation records, clinic notes, operative reports, inpatient records, radiology reports and swallowing test data were reviewed. Removal of the g-tube was considered the endpoint of the study. **RESULTS:** Seventeen patients had post-cricoid stenoses identified by modified barium swallow and confirmed on endoscopy. Nine patients (53%) had partial stenoses and eight (47%) had complete stenoses. Nine partial stenosis patients underwent thirteen AD procedures. Eight complete stenosis patients underwent nine CARD procedures with esophageal stent placement and a total of thirty-six subsequent AD procedures. Fifteen patients (88%) were able to resume swallowing after dilatation. Twelve patients (71%) maintained their weight on an oral diet and had their gastric feeding tubes removed. Two patients (12%) failed to remain open after successful CARD and remained g-tube dependent. Two (12%) hypopharyngeal perforations were managed expectantly with intravenous antibiotics. **CONCLUSIONS:** Post-cricoid hypopharyngeal stenosis may be partial or complete following organ sparing chemoradiation for head and neck cancer. Using the CARD technique, successful rehabilitation of swallowing in complete post-chemoradiation hypopharyngeal stenoses can be achieved with a low incidence of complications.

**11:20 DISCUSSION - FREDERICK A. KUHN, MD\*, SAVANNAH, GA**

**MODERATORS: RONALD G. AMEDEE, MD\*, NEW ORLEANS, LA  
JAMES L. NETTERVILLE, MD\*, NASHVILLE, TN**

**11:28 FIRST PRIZE - G. SLAUGHTER FITZ-HUGH RESIDENT RESEARCH AWARD**

**Tarceva (Erlotinib, OSI-774) Inhibits Oral Cavity Carcinoma and Synergizes with Cisplatin and Ionizing Radiation in Vitro**

Raymond A. Hinerman, DDS MD+, Morgantown, WV

Weiyi Gao, MD, Morgantown, WV

Hassan H. Ramadan, MD, Morgantown, WV

Peilin Zhang, MD PhD, Morgantown, WV

**EDUCATIONAL OBJECTIVE:** The study demonstrated the effect of a new line of small organic molecule targeted to epidermal growth factor receptor tyrosine kinase activity on the oral cavity carcinoma cells in vitro, and compared the effects of the drug alone and in combination with conventional radiation and chemotherapy.

**OBJECTIVES:** Epidermal growth factor (EGF) plays important roles in growth and development of normal epidermis and numerous malignant tumors. EGF is a secreted protein and binds to heterodimeric receptor which possesses an intrinsic tyrosine phosphorylation activity. EGFR inhibitor has been shown to specifically inhibit the tumor growth for lung cancer, head and neck cancer, colon cancer and others. **STUDY DESIGN:** We investigated the potential role of the newly developed tyrosine kinase inhibitor Tarceva in treatment of oral cavity cancer in cell culture condition, and to see if there is any effect for the drug alone or in combination with conventional chemo and radiation therapy on the oral cavity squamous carcinoma. **METHODS:** We used in vitro cell culture model to evaluate the cytotoxicity effect of the drug alone or in combination with cisplatin or gamma radiation. We further used flow cytometry to see the inhibitory effect of the drug at the specific cell cycle. We evaluated the expression level of the specific cell cycle regulator CHK2 in response to the drugs. **RESULTS:** Tarceva, a specific organic inhibitor of epidermal growth factor receptor, showed a dose dependent inhibition of the growth of squamous carcinoma of the tongue (SCC-15) in the cytotoxic assays. The inhibition of SCC-15 by Tarceva appeared to be within the physiologically achievable concentration (low micromolar concentration). Tarceva effect on SCC-15 cells appears to be intra-S-phase inhibition as well as G2/M phase inhibition by flow cytometry study. Furthermore, Tarceva can inhibit the SCC-15 growth synergistically with cisplatin and radiation. **CONCLUSIONS:** These results represent promising preliminary data for further clinical trial of this kind of drugs as adjuvant therapy for squamous carcinoma of the oral cavity.

**11:36 Squamous Cell Carcinoma of the Subglottis**

Jimmy G. Garas, MD MBA, Winston Salem, NC

W. Fred McGuirt, MD\*, Winston-Salem, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate an increased awareness of subglottic carcinoma particularly in discussing the importance of full laryngological examination of patients with progressive obstructive respiratory symptoms and/or hoarseness.

**OBJECTIVES:** To examine and compare trends in diagnosis, treatment, and survival to other's experience with this uncommon entity. **STUDY DESIGN:** Patients were grouped according to treatment modality including surgery alone, surgery with radiotherapy, radiotherapy alone, or radiotherapy with surgical salvage. Symptoms at presentation, nodal disease, and three-year follow-up were obtained on all eligible patients. Patients were compared based on extent of disease and treatment modality. **METHODS:** This retrospective study reviewed 1098 patients treated for head and neck malignancy over the 25-year period between 1976 and 2001. Of these, 15 (1.4%) met the criteria of squamous cell carcinoma originating 5mm below the free margin of the vocal cord and above the lower border of the cricoid cartilage. **RESULTS:** This series had a preponderance (80%) of advanced staged (T3T4) lesions, a low 3-year survival rate (25%) and a slightly higher but not statistically significant cure rate for laryngectomy and post-op irradiation (40%), relative to surgery alone (33%), or radiation alone (20%). Hoarseness was an initial symptom in two-thirds of the patients but 40% had stridor and respiratory compromise on presentation to the otolaryngologist. A high rate of direct extension outside the larynx, involvement of paratracheal and mediastinal lymph nodes (33%), and lung metastases (46%) were seen. **CONCLUSIONS:** This study emphasizes that awareness of subglottic carcinoma and its appropriate evaluation is critical in the patient presenting with hoarseness and/or biphasic stridor. It also illustrates the importance of defining cervical extra-laryngeal direct extension paratracheal and mediastinal adenopathy as well as pulmonary metastasis when staging these primary lesions.

**11:44 Sentinel Lymph Node Biopsy for Melanoma: Fact, Fiction or Folly?**

Andrew H. C. Loy, MD, Charlottesville, VA

James F. Reibel, MD, Charlottesville, VA

Paul A. Levine, MD\*, Charlottesville, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the techniques of intraoperative lymphatic mapping and sentinel lymph node identification and avoid some of the potential pitfalls associated with the procedure.

**OBJECTIVES:** We report results of a trial of intraoperative lymphatic mapping and sentinel lymph node identification in patients with head and neck melanoma from a mid-sized academic center. We aim to show equal efficacy with results from larger cancer institutions and additionally discuss some of the potential problems and pitfalls of the technique to assist the practitioner in their avoidance. **STUDY DESIGN:** Retrospective review. **METHODS:** From April 1998 to June 2003, 33 patients, median age 58 (range 18-84) with cutaneous melanoma of the head and neck and clinically negative lymph nodes were enrolled. The mean Breslow thickness was 2.85mm (range 0.85 to 8.3mm) and median Clarks level was IV. Intraoperative lymphatic mapping and sentinel lymph node identification were performed using technetium Tc 99m-labeled sulphur colloid. After identification of the sentinel lymph nodes, sampling was performed and the patient received a therapeutic neck dissection if the sentinel nodes subsequently proved to have metastatic melanoma. **RESULTS:** Sentinel nodes were identified in 32 patients (97%); 66 sentinel nodes were identified in 50 nodal basins (mean 2.1 nodes per patient, range 1 to 4). 6 patients (19%) had tumor-positive sentinel nodes (3 intraparotid, 2 level 1, 1 level 2, 1 preauricular). The mean Breslow thickness in this group was 4.1mm (range 1.2-8.3mm), and they went on to have therapeutic neck dissection +/- parotidectomy. All subsequent specimens were negative for melanoma and all remain NED on follow-up. **CONCLUSIONS:** We will highlight management of potential problems that may arise during the procedure and avoidance strategies.

**11:52 Anatomical Distribution of Nasal Steroid Spray Versus Nebulized Nasal Steroid**

Monica Tadros, MD, Washington, DC

Natalie A. Earl, MD, Washington, DC

Ajay E. Chitkara, MD, Washington, DC

Miguel A. Acevedo, MD, Washington, DC

Mark V. Alexander, MD, Washington, DC

Suzette K. Mikula, MD, Washington, DC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to visualize the superior intranasal distribution of topical steroids when delivered via intranasal nebulization versus metered-dose spray. This presentation will demonstrate a marked superiority in superior nasal cavity and middle meatal distribution via nebulization.

**OBJECTIVES:** Previous studies concur that the intranasal metered-dose pump spray enables medication to be distributed only to the anterior and inferior portions of the nasal cavity. This investigation aims to show that unlike metered-dose steroid spray, intranasal nebulized steroid more effectively reaches the superior nasal cavity and middle me-

tus. **STUDY DESIGN:** Prospective, randomized, internally controlled study. **METHODS:** Sixteen adult patients were randomized to each undergo two prospective trials, group A underwent nebulization as the first trial, while group B underwent nasal spray initially. Twelve patients had virgin noses, while four patients had previous nasal surgery including septoplasty. Each patient served as an internal control by undergoing one trial each of a metered-dose dyed budesonide spray and a nebulized dyed budesonide on separate days. A minimum of 5 days separated each trial. Fiberoptic nasal endoscopy was performed at zero, 5, 10, and 15 minutes after administration of the intranasal pump spray or completion of 90 seconds of nebulization. The anatomical site and intensity of the blue dye was graded on a scale of 0-3, recorded manually and photo-documented. An additional eight post-septoplasty patients are being recruited for additional comparison. **RESULTS:** Results from the sixteen patients corroborate that metered-dose pump spray application does not reach the superior nasal cavity or middle meatus on primary application, nor does it redistribute into this area with mucociliary clearance. Eleven nebulization patients showed an average staining of 1.16 along the superior nasal septum, compared with seven spray patients who showed an average staining of 0.93. Nine nebulization patients showed an average staining of 1.15 at the superior portion of the middle turbinate, compared with 0 spray patients. Fourteen nebulization patients demonstrated an average staining of 0.70 in the middle meatus on at least one side, compared with 0 spray patients. Staining in the remaining nasal cavity was comparable between the two groups. Of note, 7 nebulization patients had an average staining of 1.3 in the larynx, compared with 0 spray patients. **CONCLUSIONS:** Intranasal application of topical steroid via a nebulized route of administration enables superior primary application of topical steroid medication when compared with intranasal metered-dose pump spray.

#### **12:00 Malignant Parotid Tumors: Presentation, Clinical/Pathologic Prognostic Factors and Treatment Outcomes**

Surjeet S. Pohar, MD, Syracuse, NY  
Hiram A. Gay, MD, Syracuse, NY  
Paula F. Rosenbaum, PhD, Syracuse, NY  
Darren F. Klish, MD, Kansas City, KS  
Jeffery A. Bogart, MD, Syracuse, NY  
Chung T. Chung, MD, Syracuse, NY

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to have a better understanding of the important clinical/pathologic factors relevant to the management of malignant parotid tumors.

**OBJECTIVES:** To determine optimal therapy for patients with malignant parotid tumors including roles of surgery and radiation therapy. To determine which clinical/pathologic factors are relevant to local control of the disease and long-term survival. **STUDY DESIGN:** Retrospective review. **METHODS:** This study was a retrospective chart review of 163 patients treated for malignant parotid tumors at two institutions. The median age at diagnosis was 60 years and 52% of patients were male. The most common histologic types were mucoepidermoid (23%), adenocarcinoma (21%), squamous cell (15%), adenoid cystic (15%), and acinic cell (12%). Staging by AJCC 5th ed. (1997) revealed Stage I (42%), Stage II (12%), Stage III (2%), and Stage IV (37%). Facial weakness at presentation was noted in 18%. Ninety-one patients were treated with surgical resection and radiation therapy (RT), 55 were treated with surgery alone and 13 were treated with radiation alone. The median follow-up was 5.1 years, with a range 0-37 years. Descriptive statistics were calculated as were Kaplan-Meier (KM) analyses to look for significant clinical/pathologic predictors of survival. Significance levels reported for KM analyses are from the Logrank test unless specifically noted. Additionally, Cox proportional hazard models were fitted to evaluate the simultaneous effects of multiple variables on survival and local control. **RESULTS:** Definitively treated patients (surgery +/- RT) had overall 5 and 10 year survivals of 59 and 42%, and 5 and 10 year cause-specific survivals of 61 and 48%. Loco-regional recurrence occurred in 38% of surgery only, 11% of surgery + RT and 15% of RT only patients (p=0.001, Pearson's Chi-square). There was no significant difference in overall survival between the two institutions. Clinical prognostic factors showing significant associations with both overall and disease-free (DF) survival in KM analyses included age >55 (p<0.001-both) and facial nerve palsy at presentation (p<0.02-both); pathologic factors associated with both overall and DF survival were high grade tumors (p<0.04-both) and perineural invasion (p<0.05-both). Gross facial nerve invasion was associated only with decreased overall survival (p=0.05) while metastatic nodal involvement lead to significantly decreased DF survival (the statistical tests showed mixed results for the association of positive nodes to overall survival; logrank=0.11, Breslow=0.01, Tarone-Ware=0.02). Cox proportional hazard model analysis revealed that age>55, facial weakness and higher stage were each significantly (p<.05) associated with a poorer overall 5 year survival. Age>55 and higher stage were each associated with a significantly lower 5 year cause specific and disease-free survival. Only age>55 was shown in Cox proportional hazard analysis to negatively impact on local control. **CONCLUSIONS:** This series confirms the value of the AJCC 5th ed. staging system in prognosticating outcome. Furthermore, age >55, facial nerve weakness, high grade, perineural invasion, gross facial nerve invasion, and metastatic nodal involvement were significant prognostic factors for overall and/or DF survival in KM analysis. However, in Cox proportional hazards multivariate analysis only age>55, facial weakness and stage were significant. The addition of radiation therapy to surgery, as found in other series, does not improve overall survival but does reduce loco-regional recurrence.

#### **12:08 DISCUSSION - PAUL A. LEVINE, MD\*, CHARLOTTESVILLE, VA**

#### **12:15 Introduction of Southern Section Vice President-Elect , Robert L. Baldwin, MD\*, Birmingham, AL** Harold C. Pillsbury, MD\*, Chapel Hill, NC

#### **1:00 Golf and Tennis Tournaments**

#### **6:30 - Meet the Authors Poster Reception - Collier Hall** **8:00 Exhibit Hall Open**

### **SATURDAY, JANUARY 10, 2004**

#### **7:00 - Registration - North Wall** **3:00**

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

#### **7:00 - Southern Section Business Meeting (Members Only) - Caxambus I** **7:50**

#### **7:00 - Middle Section Business Meeting (Members Only) - Caxambus II** **7:50**

#### **7:00 - Exhibit Hall Open - Collier Hall** **1:00**

#### **7:00 - Poster Viewing - Collier Hall** **1:00**

#### **7:00 - Continental Breakfast with Exhibitors - Collier Hall** **7:50**

7:55 - Scientific Sessions - Salons A - D  
3:00

7:55 **Welcome Remarks**

**Presentation of Vice Presidential Citations to Robin T. Cotton, MD\*, Cincinnati, OH, Michael E. Glasscock, MD, Austin, TX, Jack L. Gluckman, MD\*, Cincinnati, OH, and Harold C. Pillsbury, MD\*, Chapel Hill, NC**  
Myles L. Pensak, MD\*, Cincinnati, OH

**Introduction of Guest of Honor, John M. Tew, MD, Cincinnati, OH**  
Myles L. Pensak, MD\*, Cincinnati, OH

8:10 **KEYNOTE ADDRESS: BUILDING A DREAM...A NEUROSCIENCE CENTER**  
John M. Tew, MD, Cincinnati, OH

8:25 **Presentation of Middle Section Resident Awards**  
George L. Adams, MD\*, Minneapolis, MN, and Myles L. Pensak, MD\*, Cincinnati, OH

**MODERATORS: RICHARD T. MIYAMOTO, MD\*, INDIANAPOLIS, IN**  
**MICHAEL S. BENNINGER, MD\*, DETROIT, MI**

8:30 **Connexin 26 and Connexin 30 Mutations in Children with Non-Syndromic Hearing Loss**

Christy B. Erbe, BS, Milwaukee, WI  
Kevin C. Harris, MD, Milwaukee, WI  
Christina L. Runge-Samuelson, PhD, Milwaukee, WI  
Valerie A. Flanary, MD\*, Milwaukee, WI  
Phillip A. Wackym, MD\*, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: 1) understand the role of connexin 26 and connexin 30 gene mutations in congenital hearing loss; and 2) understand the relationship between the type connexin mutation and degree of hearing loss.

**OBJECTIVES:** Mutations in the connexin 26 (Cx26 or gap junction beta 2) gene are the leading cause of hereditary non-syndromic sensorineural hearing loss (NSHL) in Caucasians. We sequenced the Cx26 coding region of 68 children with NSHL to determine the frequency and type of Cx26 mutations in this population. We also screened for a common connexin 30 (Cx30 or gap junction beta 6) mutation (del (GJB6-D13S1830)). Children also underwent audiologic testing to determine whether any correlation exists between Cx26 mutations and severity of hearing loss. **STUDY DESIGN:** A total of 68 children with NSHL were screened for Cx26 and Cx30 mutations by PCR and direct sequencing. **METHODS:** Genomic DNA was amplified by PCR using primers that flank the entire Cx26 coding region. Screening for the 342 kb Cx30 deletion was performed using primers that amplified the break-point junction of the deletion. The amplicons were then sequenced in both directions and analyzed for mutations. Audiometric testing, including pure-tone audiometry and auditory evoked brainstem response, was also performed to determine the degree of hearing loss. **RESULTS:** 27 out of 68 children tested had mutations in Cx26 with 35delG being the most prevalent. Ten additional Cx26 mutations were detected including a novel compound heterozygote. Two children were heterozygous for the connexin 30 del (GJB6-D13S1830) mutation. **CONCLUSIONS:** Cx26 and Cx30 mutations were present in 41.2% of children tested in our population. Audiometric data supported previous studies demonstrating a greater degree of hearing loss in subjects who are homozygous for the 35delG mutation.

8:38 **FIRST PRIZE - PAUL HOLINGER RESIDENT RESEARCH AWARD**

**Cochlear Implantation in Adults with Prelingual Deafness: Clinical Results and Underlying Constraints That Affect Audiological Outcomes**  
Su W. Teoh, MD+, Indianapolis, IN  
David B. Pisoni, PhD, Bloomington, IN  
Richard T. Miyamoto, MD\*, Indianapolis, IN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the latest post-implant audiologic results of adult cochlear implant users with prelingual deafness and to explain the outcomes using known physiological and anatomical correlates along the auditory pathway.

**OBJECTIVES:** To examine the hypothesis that the newer generations of cochlear implants could provide considerable speech understanding to late-implanted prelingually deaf adult patients and to discuss the underlying physiological and anatomical constraints on audiological performance. **STUDY DESIGN:** Retrospective review. **METHODS:** Speech perception scores of 103 patients with long-term prelingual deafness obtained from the recent clinical trials were compared to other previously published results. In order to understand and explain the sources of the observed performance limitation and variability, we review the anatomical and physiological changes that take place in both the peripheral and central auditory pathways in response to prolonged congenital deafness and discuss how they are altered by chronic electrical stimulation. **RESULTS:** Unlike patients implanted in early childhood, the audiologic performance of most patients with long-term prelingual deafness rapidly approached asymptotic levels within a year after implantation. Beginning at three months post-implantation, statistically significant improvement was noted in their speech perception scores compared to their pre-implant levels. However, the average performance plateau achieved by this group of patients was significantly below the levels published for postlingual patients. **CONCLUSIONS:** A review and analysis of the currently available evidence suggests that the colonization of the auditory cortex by other sensory modalities is the main limiting factor in post-implantation performance, not the pathological degenerative changes of the auditory nerve, cochlear nucleus, or auditory midbrain. For patients with long-term prelingual deafness, educational programs stressing oral communication should be emphasized before (with hearing aids) and after cochlear implantation to reduce such colonization phenomenon.

8:46 **Endolymphatic Duct Violation During Retrosigmoid Dissection of the Internal Auditory Canal: A Human Temporal Bone Radiographic Study**

Cecille G. Mariano, MD+, Cleveland, OH  
Mark A. Vecchiotti, MD, Cleveland, OH  
Maroun T. Semaan, MD, Cleveland, OH  
Jonathan S. Lewin, MD, Cleveland, OH  
Cliff A. Megerian, MD, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the different hypothesis for delayed hearing loss after retrosigmoid dissection for removal of acoustic neuromas; explain the mechanism for endolymphatic duct injury and how injury relates to delayed hearing loss; and discuss preventative measures in avoiding hearing deterioration after retrosigmoid dissection of acoustic neuromas.

**OBJECTIVES:** Successful hearing preservation following acoustic neuroma resection is sometimes complicated by delayed hearing deterioration. The goal of this study was to investigate the hypothesis that internal auditory canal (IAC) drilling during retrosigmoid acoustic neuroma removal can result in endolymphatic duct (ELD) injury; a potential cause of delayed hearing loss following hearing preservation surgery. **STUDY DESIGN:** Temporal bone anatomic and radiographic study, literature review. **METHODS:**

Twenty-one human temporal bones were analyzed with high-resolution multislice computed tomography (HRMCT) and subjected to standard retrosigmoid IAC dissection with labyrinthine preservation and follow-up HRMCT for analyses of the ELD. A Medline search was performed of studies documenting hearing preservation outcomes after retrosigmoid dissection. **RESULTS:** Five of twenty-one (24%) bones were found to have violation of the endolymphatic duct despite preservation of labyrinthine structures. Historic data reveals that variations in inter-structure distances makes topographical landmarks unreliable for precise localization of underlying labyrinthine structures. In addition, animal studies have demonstrated that injury to the ELD may create endolymphatic hydrops. **CONCLUSIONS:** The endolymphatic duct is vulnerable to injury during IAC dissection even if labyrinthine structures at the lateral aspect of the IAC (vestibule and posterior semi-circular canal) are preserved. These findings may be helpful in explaining and potentially preventing some cases of long-term hearing deterioration possibly due to endolymphatic hydrops following ELD injury during acoustic tumor removal via the retrosigmoid approach. Careful preoperative review of imaging studies HRMCT is useful prior to retrosigmoid dissection given anatomic variations. Standardization of hearing results will assist in comparison of long-term outcomes.

## 8:54 DISCUSSION

### 9:00 Pathology of the Olfactory Epithelium: Smoking and Ethanol Exposure

Julia Vent, MD, Omaha, NE  
Alan M. Robinson, PhD, Chicago, IL  
Martha J. Gentry-Nielsen, PhD, Omaha, NE  
David B. Conley, MD, Chicago, IL  
Donald A. Leopold, MD\*, Omaha, NE  
Robert C. Kern, MD\*, Chicago, IL

**EDUCATIONAL OBJECTIVE:** This study demonstrates the toxic effects of tobacco smoke on olfactory epithelium. It shows the increased rate of apoptosis occurring in tissue exposed to this toxin. The role of caspase-3 in the apoptotic pathway active in this rat model of smoking injury is described and the possible pathophysiology of secondary olfactory dysfunction is discussed.

**OBJECTIVES:** To investigate the effects of ethanol and tobacco smoke on the olfactory epithelium using a rat model. The sense of smell is mediated by olfactory sensory neurons (OSNs) present within the nasal epithelium. OSNs are continuously replaced to assure normal olfaction into adult life. Disruption of the apoptosis-regeneration cycle has been associated with olfactory dysfunction. Smoking is associated with diminished olfactory function, however the pathophysiology is poorly understood. **STUDY DESIGN:** Animal model with two experimental and one control group. Immunohistochemical analysis of activated protein with positive and negative controls. **METHODS:** Rats were exposed to tobacco smoke (for 12 weeks), dietary ethanol (for the final 5 weeks), both or neither (control). Immunohistochemical analysis of the olfactory epithelium was performed using an antibody to caspase-3, the primary apoptotic effector enzyme in this system, indicating that a cell was prone to undergo apoptotic cell death. **RESULTS:** Control rats demonstrated a low baseline level of caspase-3 activity in the olfactory epithelium. In contrast, tobacco smoke exposure triggered a dramatic increase in the degree of OSN apoptosis that affected all stages of the neuronal lineage. **CONCLUSIONS:** These results suggest that smell loss in smokers is triggered by increased OSN death, which eventually overwhelms the regenerative capacity of the epithelium.

### 9:08 Endoscopic Management of Sinonasal Tumors

David M. Poetker, MD, Milwaukee, WI  
Robert J. Toohill, MD\*, Milwaukee, WI  
Todd A. Loehrl, MD, Milwaukee, WI  
Timothy L. Smith, MD MPH\*, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the use of primary endoscopic management of sinonasal tumors.

**OBJECTIVES:** To report our experience using endoscopic techniques for the surgical management of sinonasal tumors. **STUDY DESIGN:** A retrospective study. **METHODS:** A chart review of patients with sinonasal tumors was performed. All patients treated with primary endoscopic management, who received their first definitive operative procedure at our institution from January, 1993 through June, 2003 were included. **RESULTS:** Forty-three patients were identified, 27 male, 16 female. The mean age was 53.7 years, and the mean follow-up for all patients was 26 months. For benign tumors, 28 patients were identified with a mean age of 51.8 years and a mean follow-up of 16 months. The group included 18 patients with inverted papilloma, three with angiofibroma, two with meningioma, and five patients with assorted benign pathologies. The recurrence rate for this group was 3.57%. For malignant tumors, 15 patients were identified, with a mean age of 57.3 years, and a mean follow-up of 44.7 months. Five of the patients were diagnosed with squamous cell carcinoma, four with esthesioneuroblastoma, two with adenocarcinoma, and four with assorted malignancies. The recurrence rate for the malignant group was 13.95%. Endoscopic procedures were primarily used in all patients, however, due to tumor location, an adjuvant Caldwell-Luc approach and/or osteoplastic flap was performed in six patients, and an adjuvant craniotomy was performed in five additional patients. **CONCLUSIONS:** Endoscopic surgical excision of very selective sinonasal tumors has proven to be an effective therapeutic modality. In some cases, adjuvant external procedures may be required based on tumor location.

### 9:16 IgE to Staphylococcal and Streptococcal Enterotoxins in Patients with Chronic Sinusitis

Anju Tripathi, MD, Chicago, IL  
David B. Conley, MD, Chicago, IL  
Leslie C. Grammer, MD, Chicago, IL  
Robert C. Kern, MD\*, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to recognize the significance of staphylococcal and streptococcal specific IgE antibodies in the serum of patients with chronic sinusitis. This represents a novel finding that may contribute to the pathogenesis of chronic sinusitis.

**OBJECTIVES:** This study is designed to identify the presence of serum IgE to staphylococcal and streptococcal enterotoxins in patients with chronic sinusitis (CS). These enterotoxins have superantigen activity and have been implicated in other chronic inflammatory diseases such as asthma. **STUDY DESIGN:** Prospective analysis of 30 patients undergoing endoscopic sinus surgery by two of the authors. Controls were 7 atopic and 6 non-atopic individuals without CS. **METHODS:** IgE to staphylococcal enterotoxins A, B (SEA, SEB), and toxic shock syndrome toxin-1 (TSST-1) as well as streptococcal enterotoxins A and B were measured in the sera of 30 individuals with CS. This was compared to the controls without CS. In addition, the Lund-MacKay scores were compared in subjects with and without positive IgE antibodies. **RESULTS:** IgE to SEA, SEB, and TSST-1 was detected in 0/30 (0%), 24/30 (80%) and 17/30 (57%) of the patients respectively. None of the controls had IgE to any of the staphylococcal enterotoxins ( $p < 0.001$ ). IgE to streptococcal enterotoxin A and B was detected in 5/18 (28%) and 0/18 (0%) of the patients respectively. Lund-MacKay scores in patients "with" and "without" staphylococcal enterotoxin IgE antibodies were not statistically significant by T-test ( $p < 0.14$ ). **CONCLUSIONS:** A significantly greater proportion of CS patients had IgE to certain staphylococcal enterotoxins compared to controls. Evidence of IgE antibodies directed against staphylococcal and streptococcal enterotoxins in the sera of patients with CS suggests a potential role of superantigens in the pathogenesis of CS.

## 9:24 DISCUSSION

### 9:30 - Break/Poster Presentations/Visit with Exhibitors - Collier Hall 10:00

**MODERATORS: D. BRADLEY WELLING, MD\*, COLUMBUS, OH  
LAUREN D. HOLINGER, MD\*, CHICAGO, IL**

**10:00 THIRD PRIZE - PAUL HOLINGER RESIDENT RESEARCH AWARD**

**Headache: A Quality of Life Analysis in a Cohort of 1657 Patients Undergoing Acoustic Neuroma Surgery**

John M. Ryzenman, MD+, Cincinnati, OH

Myles L. Pensak, MD\*, Cincinnati, OH

John M. Tew, Jr., MD, Cincinnati, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss and be familiar with issues related to postoperative headache (POH) resultant from acoustic neuroma surgery and its impact on quality of life issues.

**OBJECTIVES:** Based on survey results of the Acoustic Neuroma Association (ANA), we report on patient ratings of their POH symptoms and its impact on their QOL and review the literature regarding POH associated with AN treatment. **STUDY DESIGN:** Cohort study of 1657 surgically treated acoustic neuroma patients who reported their experiences of POH and a review of the literature regarding POH associated with AN treatment. **METHODS:** A detailed questionnaire was mailed to members of the Acoustic Neuroma Association (ANA) to identify preoperative and postoperative symptoms, complications, and long-term effects on physical and psychosocial function. 1657 (85.4%) of all respondents answered detailed questions intended to qualify and quantify the degree to which they were affected by POH and the impact it had on their QOL. All responses were analyzed by tumor size, surgical approach, and patient age and sex. Statistical analysis was performed utilizing the SPSS software. **RESULTS:** Preoperative headache was reported in approximately 1/3 of respondents. Typical headaches were most frequently reported to be more often than once daily (46%), lasting 1-4 hours in duration (43.1%), of moderate intensity (62.6%), while the worst headaches were rated as "severe" by 77% of respondents. The treatment most often reported for typical headaches were non-prescription medications including NSAIDs (61.3% P<0.01), with only 15% of sufferers requiring narcotics regularly. Patients who underwent the retrosigmoid approach were significantly more likely to report their worst POH as "severe" (82.3%) compared to the translabyrinthine (75.2%) and middle fossa approaches (63.3%). Women and younger patients tended to have poorer outcomes with regard to postoperative headaches. **CONCLUSIONS:** In this large cohort study of AN patients, POH was a significant morbidity for those who experienced it. Treating physicians should be aware of the risk factors identified and the impact POH has on the QOL of surgically treated acoustic neuroma patients when counseling their patients regarding optimal treatment management.

**10:08 Facial Nerve Monitoring Parameters as a Predictor of Postoperative Facial Nerve Outcomes After Vestibular Schwannoma Resection**

Brian A. Neff, MD, Columbus, OH

D. Bradley Welling, MD PhD\*, Columbus, OH (*Presenter*)

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand how the stimulated amplitude and stimulus intensity of facial nerve electromyography (EMG) after tumor removal predicts clinical facial nerve outcomes one year after surgery.

**OBJECTIVES:** We will review our post-resection facial nerve EMG stimulus intensity and amplitude measurements in 54 vestibular schwannoma surgeries to see if these parameters can predict clinical facial nerve function one year after surgery. **STUDY DESIGN:** Prospective study at a tertiary care center. **METHODS:** The minimal stimulus intensity (mA) and stimulus amplitude (mV) were recorded during stimulation applied to the proximal (brainstem) facial nerve after schwannoma removal. Facial nerve outcomes at one year were evaluated using the House-Brackmann scale. Analysis was then done to evaluate whether or not these electrophysiological recordings had any predictive effect of facial nerve functional outcomes. **RESULTS:** Of the 54 patients, 47 of 54 (87%) had House-Brackmann (HB) grade I or II facial nerve function and 7 of 54 (13%) had HB grade III-VI function at one year after surgery. If we set standards for intraoperative minimal stimulus intensity of  $\leq 0.05$ mA and  $>250$ mV maximal stimulated amplitude, we were able to predict a HB grade I or II outcome in 42 of 47 (89%) patients at one year after surgery. With these same electrophysiological parameters, only 1 of 7 (14%) HB grade III-VI patients also met this standard, and thus, gave a false positive result. **CONCLUSIONS:** Minimal stimulus intensity and stimulus amplitude as individual variables were not successful in predicting long-term postoperative facial nerve function. However, if both parameters are considered together, we feel that they are a good prognostic indicator for facial nerve function one year after surgery.

**10:16 Selective Utilization of Stereotactic Radiosurgery in the Management of Facial Nerve Tumors**

Robert S. Miller, MD, Cincinnati, OH

Myles L. Pensak, MD\*, Cincinnati, OH

Mitchell K. Schwaber, MD, Nashville, TN

John F. Kveton, MD, New Haven, CT

John C. Breneman, MD, Cincinnati, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the rationale and utility of the use of stereotactic radiosurgery in the management of facial nerve tumors.

**OBJECTIVES:** Stereotactic radiosurgery (sXRT) has impacted the management strategies employed in the treatment of benign skull base tumors. Historically, facial nerve tumors, including hemangiomas and schwannomas, were managed surgically. More recently, sXRT has shown promise in controlling some of these tumors. Our objective was to analyze tumor control and morbidity in patients with facial nerve tumors treated both surgically and non-surgically. **STUDY DESIGN:** Retrospective chart review. **METHODS:** A multi-center review was completed of all patients with a diagnosis of facial nerve tumor between 1987 and 2003. **RESULTS:** Thirty-three patients were identified. Twenty-six patients had surgery. Total tumor removal was accomplished in 15 patients, subtotal tumor removal was accomplished in 8 patients, and decompression was performed in 3 patients. Perioperative morbidity was limited to 2 cerebrospinal fluid leaks and one case of deep venous thrombosis. There were no deaths. Seven patients had primary sXRT. Two patients were House Brackmann (HB) grade I, 3 patients were HB grade II or III, and 2 patients were HB grade IV or V prior to sXRT. Two patients experienced transient facial nerve paresis, and one patient had permanent progression from HB grade II to III. There has been no further degradation in volitional facial mimetic function during the study period, nor has any patient required post-radiation surgical attention. Additionally, 4 patients underwent post-operative sXRT; three of these had subtotal cytoreductive surgery and one patient had facial nerve decompression. **CONCLUSIONS:** We present a treatment algorithm for facial nerve tumors based on the changing paradigm for treatment of benign skull base tumors.

**10:24 DISCUSSION**

**10:30 Function of Laryngeal Mechanoreceptors During Vocalization**

Teofilo C. Gozaine, MD, Oklahoma City, OK

Keith F. Clark, MD\*, Oklahoma City, OK

Jay P. Farber, PhD, Oklahoma City, OK

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the classification of laryngeal mechanoreceptors during respiration and vocalization.

**OBJECTIVES:** To compare the activity of superior laryngeal nerve mechanoreceptors based on a respiration classification protocol with activities found using a vocalization

classification protocol in cats. **STUDY DESIGN:** Laboratory animal study. **METHODS:** Single fiber action potentials from the internal branch of the superior laryngeal nerve were recorded in decerebrated cats using a respiration protocol to identify laryngeal mechanoreceptors as pressure, flow, and drive receptors. A tracheal T-tube and a laryngeal mask airway were necessary modifications to perform this protocol. Then, a vocalization protocol was used to classify the activity of the same receptor. Vocalization was evoked by electrical stimulation of the midbrain in the region of the periaqueductal gray. **RESULTS:** We identified two flow receptors, a drive receptor, a frequency following receptor, and a frequency non-following receptor. Flow receptor fibers were almost silent during phonation. The drive receptor was active during the respiration protocol, but kept a high firing rate during phonation suggesting a role in the modulation of vocalization and respiration. Both frequency following and non-following receptors were only active during phonation and totally inactive during respiration suggesting a role only during vocalization. **CONCLUSIONS:** Since vocalization is an important stimulus for the activation of certain superior laryngeal nerve receptors, a classification protocol based on respiration alone is incomplete. Classification into pressure, flow and drive receptors alone is not appropriate for the study of laryngeal receptors during vocalization. Some frequency following and frequency non-following receptors may only be active during phonation and would otherwise be missed without vocalization as the stimuli to elicit their response.

#### 10:38 Sensitivity of Esophageal Biopsy in the Diagnosis of Laryngopharyngeal Reflux Causing Airway Symptoms in Children

Shjin Han, MD, Chicago, IL  
Julie L. Wei, MD, Kansas City, KS  
Lauren D. Holinger, MD\*, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the role of esophageal biopsy in determining laryngopharyngeal reflux in children presenting with airway related symptoms.

**OBJECTIVES:** To determine the role of esophageal biopsy as a marker for laryngopharyngeal reflux in children suffering from upper airway symptoms. **STUDY DESIGN:** Retrospective study. **METHODS:** Between January 1998 and December 2003, 32 patients underwent triple endoscopy with esophageal biopsy for possible reflux-related upper airway symptoms. Data was collected with regard to presenting symptoms, preoperative diagnostic evaluations, operative findings, and pathology results. Exclusion criteria consisted of any prior history of intubation or endoscopic evaluation, pH probe study, or gastroenterology consultation. Statistical analysis was performed using Fisher's exact test. **RESULTS:** The results showed 12 (37.5%) with positive and 20 (62.5%) with negative biopsy results. The most common presenting symptom was cough (62.5%). There was no association between preoperative symptoms and esophageal biopsy. Evaluation of the airway revealed poor correlation between endoscopic findings and the results of the esophageal pathology. Edema was the most common finding on laryngoscopy (n=19, 59%); however, only 7 (37%) had positive esophageal biopsy. The only statistically significant association was found between Grade II subglottic stenosis and a positive esophageal biopsy (p=0.044). Seven (22%) had positive findings on esophagoscopy, while the majority of patients 25 (78%) had negative findings. There was no significant association between esophagoscopy findings and esophageal pathology results. **CONCLUSIONS:** No correlation was found between preoperative symptoms or endoscopic findings and histopathology results. Although a positive biopsy confirms the diagnosis of reflux, a negative biopsy does not rule the diagnosis out. Esophageal biopsy is not a sensitive indicator for diagnosing laryngopharyngeal reflux in children.

#### 10:46 After T&A, What Do You Do? Use of Cine MRI and a "Sleep Team" in Evaluation of Persistent Obstructive Sleep Apnea

Sally R. Shott, MD\*, Cincinnati, OH  
Lane F. Donnelly, MD, Cincinnati, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss how to evaluate a patient with persistent sleep apnea despite previous T&A surgery. They will be able to explain the usefulness of the cine MRI in evaluating persistent airway obstruction despite previous T&A and of a "sleep team" approach to complex sleep apnea patients.

**OBJECTIVES:** Although usually successful in children, not all obstructive sleep apnea is cured by adenotonsillectomy (T&A). This is especially true in children with Down syndrome and craniofacial anomalies where there can be multiple levels of airway obstruction. This study investigates the use of the cine MRI to evaluate persistent airway obstruction after T&A and discusses the usefulness of a "sleep team" approach to these more complex patients. **STUDY DESIGN:** Retrospective chart review and cine MRI radiologic review. **METHODS:** 15 children with Down syndrome who had previously undergone T&A but continued to have abnormal, post-operative polysomnograms, underwent cine MRI evaluations. Treatment plans were frequently determined with the help of a "sleep team", a multi-disciplinary team of physicians. **RESULTS:** The cine MRI identified different areas and levels of obstruction that ultimately affected the children's treatment courses. Recurrent adenoid tissue, glossoptosis, soft palate collapse, hypopharyngeal collapse and enlarged lingual tonsils were identified. Several illustrative cases will be presented. The use of a "sleep team" is discussed, providing a multi-disciplinary approach to these patients. **CONCLUSIONS:** Cine MRI demonstrates the site(s) of persistent upper airway obstruction in children who have continued obstruction after T&A. This is particularly helpful in children with Down syndrome and craniofacial anomalies. The "sleep team" approach is helpful in these complex airway patients where treatment options are not always clear.

#### 10:54 DISCUSSION

**MODERATORS: THOMAS A. TAMI, MD\*, CINCINNATI, OH**  
**JESUS E. MEDINA, MD\*, OKLAHOMA CITY, OK**

#### 11:00 Neurologic Diagnosis and Treatment in Patients with CAT Scan and Nasal Endoscopy Negative Facial Pain

Eric P. Paulson, MD, Iowa City, IA  
Scott M. Graham, MD, Iowa City, IA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the most common neurologic diagnoses for CAT scan and endoscopy negative facial pain and efficacy of treatment.

**OBJECTIVES:** To determine the helpfulness of specialist neurology referral for patients with CT scan and endoscopy negative facial pain. **STUDY DESIGN:** Prospective identification of patients and analysis of data approved by the institutional review board. **METHODS:** The data of 104 consecutive patients presenting with CT scan and endoscopy negative facial pain as their chief complaint were reviewed. The patients presented to a single rhinologist in a tertiary care institution. All patients were referred for specialist neurological evaluation and potential treatment. Further information was obtained from a patient survey. **RESULTS:** Of the 104 patients, 81 were women and 23 were men. The average age was 45.9 years (range 22-85). 56 had clear CT scans, 48 had minimal change, and all had negative endoscopies. 22 had previous unsuccessful sinus surgery. The average follow-up was 10.5 months. 75 saw a neurologist once and 40 were seen two or more times. 4% had an unsuspected serious intracranial diagnosis. The most common diagnoses were migraine (37%), rebound headache (17%), chronic daily headache (17%), and obstructive sleep apnea (16%). Overall 58% improved on medical therapy, 61% of those with a clear CT improved; 53% of those with minimal change on CT improved (p=.9). **CONCLUSIONS:** Facial pain remains a difficult symptom to diagnose and treat in rhinologic practice. Patients often undergo surgery without help. Most patients with CT and endoscopy negative facial pain benefit from neurologic consultation. Serious intracranial pathology can be excluded and diagnosis specific pharmacologic therapy instituted with improvement in more than 50% of cases.

### 11:08 The Effect of Injection Immunotherapy on Mucociliary Clearance Time in Allergic Patients

Ryan C. Cmejrek, MD, Cleveland, OH  
Michael T. Gutman, MD, Cleveland, OH  
Augusto J. Torres, MD, Cleveland, OH  
Kevin J. Keen, PhD, Cleveland, OH  
Steven M. Houser, MD, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to 1) identify factors related to impaired mucociliary clearance in patients with allergic rhinitis; 2) discuss saccharin clearance time as a means of objective measurement of mucociliary clearance; and 3) describe possible effects of injection immunotherapy on mucociliary clearance as measured by saccharin clearance time.

**OBJECTIVES:** To assess the effect of injection immunotherapy on mucociliary clearance in allergic patients using the saccharin clearance test. **STUDY DESIGN:** Prospective cohort study with historical controls. **METHODS:** Mucociliary clearance in 42 allergic patients treated with injection immunotherapy was determined using the saccharin test. Of these patients, 23 were retested at 1 year to assess changes in mucociliary clearance times. Mean results were compared to historical controls. Saccharin clearance times were also evaluated relative to sinonasal factors and symptomatology assessment. **RESULTS:** Saccharin clearance times were initially prolonged in allergic patients receiving injection immunotherapy when compared to historical controls (one-sided  $p < 0.05$ ). However, after one year of immunotherapy, there was no significant difference in saccharin clearance times between our patients and the same controls. This finding was independent of other evaluated patient characteristics, including nasal steroid use. In our population, saccharin clearance times were prolonged in smokers when compared to nonsmokers. However, no significant difference was found relative to other evaluated patient characteristics. Allergic symptomatology did not correlate with saccharin clearance times. **CONCLUSIONS:** Mucociliary clearance in injection immunotherapy patients as measured by saccharin clearance times is significantly prolonged compared to historical controls. After one year of immunotherapy, there was no significant difference between our patient population and these same controls. Of the other factors studied, only smoking showed significant prolongation of mucociliary clearance times. To our knowledge, this is the first report in the literature documenting this effect of immunotherapy on mucociliary clearance as measured by saccharin clearance times.

### 11:16 Analysis of Post-Operative Bleeding for Coblation Tonsillectomy

Venu Divi, MD, Detroit, MI  
Michael Benninger, MD\*, Detroit, MI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare the difference in post-operative bleed rates in coblation vs non-coblation tonsillectomies. They will also be able to discuss the presence of a learning curve with regard to post-operative bleeding for a new method of tonsillectomy.

**OBJECTIVES:** This purpose of this study was to examine the incidence of post-operative bleeding after coblation and non-coblation tonsillectomy and to determine if there was a learning curve with regard to frequency of post-operative bleeding when beginning coblation as a new method of tonsillectomy. **STUDY DESIGN:** Retrospective chart review. **METHODS:** Records were examined from January 1999 to April 2003 to determine the type of tonsillectomy performed and the presence of post-operative bleeding. A chi-square analysis was used to determine a statistical difference between the post-operative bleed rate of coblation and non-coblation procedures. The data for coblation tonsillectomy was then examined in three month intervals and the post-operative bleeds were totaled for each period. The Cochran-Armitage (C-A) test of linear trend was used to determine a statistical change in the post-operative bleeds over the given time period. **RESULTS:** 1762 tonsillectomies were performed. 72 of 1216 non-coblation procedures suffered post-operative bleeds (6.1%). 31 of 546 coblation tonsillectomies had post-operative bleeding (5.7%). The difference was not significant ( $p$ -value 0.76). The post-operative coblation bleed rates for the three month periods were 11.1%, 3.6%, 5.8%, 0.0%, 4.7%, 5.9%, 6.1%, 11.0%, 6.5%, and 2.9%. Using the C-A test to analyze these numbers did not reveal differences between the various three month intervals ( $p$ -value 0.49). **CONCLUSIONS:** This study demonstrates that the bleeding rates for coblation vs. non-coblation tonsillectomies are not statistically different within this single institution. This study also determines the absence of a learning curve when examining post-operative bleeding for coblation tonsillectomy.

### 11:24 DISCUSSION

### 11:30 Speech Intelligibility and Quality of Life in Head and Neck Cancer Survivors

Tanya K. Meyer, MD+, Milwaukee, WI  
Joan C. Kuhn, MS, Milwaukee, WI  
Bruce H. Campbell, MD\*, Milwaukee, WI  
Anne M. Marbella, MS, Milwaukee, WI  
Katherine B. Myers, BSN, Milwaukee, WI  
Peter M. Layde, MD MSc, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the expected impact of head and neck cancer on survivor's speech intelligibility and related quality of life issues.

**OBJECTIVES:** To objectively measure speech parameters of long-term head and neck cancer survivors and correlate them to quality of life indices. **STUDY DESIGN:** Observational case series including both objective clinical speech testing and subjective quality of life questionnaire administration. **METHODS:** A convenience sample of five year head and neck cancer survivors was recruited to study the association between speech intelligibility and quality of life. Objective testing included sentence and word intelligibility. Subjective testing included quality of life questionnaires (UWQOL, FACT, FACT-H&N, and PSS-HN) and a locally prepared "cancer concern" question. Associations were sought between intelligibility, quality of life and demographics. **RESULTS:** Sixty-two survivors underwent testing. Lower sentence intelligibility and word intelligibility scores were associated with diminished self-perceived UWQOL Speech ( $p=0.0003$  and  $p<0.0001$ , respectively), PSS-HN Understandability of Speech ( $p=0.009$  and  $p=0.0006$ ), and increased cancer concern ( $p=0.03$  and  $p=0.0007$ ). Decreased word intelligibility was also associated with decreased UWQOL Chewing ( $p=0.004$ ), UWQOL Swallowing ( $p=0.03$ ), UWQOL Recreation ( $p=0.04$ ), PSS-HN Willingness to Eat in Public ( $p=0.03$ ), and PSS-HN Normalcy of Diet ( $p<0.0001$ ). **CONCLUSIONS:** Long-term survivors of head and neck cancer continue to have both objective and subjective deficits in speech parameters five years after treatment. Objective deficits are associated with subjective concerns about speech, eating, and cancer recurrence.

### 11:38 Prospective Surgical Outcome Study on Symptoms Following Parathyroidectomy in Patients with Hyperparathyroidism

Regina P. Walker, MD, Hinsdale, IL  
Chellam Gopalsami, PhD, Naperville, IL  
Edward Paloyan, MD, Hinsdale, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare the clinical manifestations of hyperparathyroidism before and after parathyroidectomy.

**OBJECTIVES:** The objective was to assess the change in symptoms following parathyroidectomy in patients with hyperparathyroidism. Emphasis was placed on symptoms of fatigue and sleepiness. **STUDY DESIGN:** Prospective cohort study of consecutive patients presenting with hyperparathyroidism. **METHODS:** Twenty-five patients diagnosed with hyperparathyroidism were evaluated preoperatively and postoperatively. The Functional Outcomes of Sleep Questionnaire (FOSQ), the Epworth Sleepiness Scale (ESS) and

a questionnaire of common symptoms associated with hypercalcemia were administered preoperatively, two weeks and six months postoperatively. **RESULTS:** The patients were noted to have a significant decrease in the calcium ( $p \leq 0.0001$ ), ionized calcium ( $p = 0.0017$ ), and PTH ( $p = 0.0010$ ) postoperatively. The general symptoms that demonstrated significant improvement postoperatively were muscle weakness ( $p = 0.0087$ ), joint-pain ( $p = 0.0338$ ), thirst ( $p = 0.05$ ), pruritus ( $p = 0.004$ ), and tiredness ( $p = 0.0386$ ). The FOSQ was completed preoperatively and two weeks postoperatively by all patients and six months postoperatively by fifteen patients (60%). There were no significant changes noted in the FOSQ postoperatively. The ESS also demonstrated no significant changes. **CONCLUSIONS:** The successful surgical treatment of hyperparathyroidism is associated with statistically significant improvements in many of the classic preoperative symptoms. Hyperparathyroidism is also associated with weakness and fatigue but not sleepiness based on this current study.

#### **11:46 Incidence of Level I Lymph Node Metastasis in Unknown Primary Head and Neck Cancer: Is a Complete Neck Dissection Required?**

Adam J. Folbe, MD, Detroit, MI  
Ileana I. Enamorado, MD, Detroit, MI (*Presenter*)  
John R. Jacobs, MD\*, Detroit, MI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the incidence of level I lymph node metastasis in unknown primary head and neck cancer and the need for level I lymph node dissection in the surgical treatment.

**OBJECTIVES:** The current surgical treatment for unknown primary head and neck cancer includes radical or modified radical neck dissections. Most surgeons include level I through level V lymph nodes as part of their dissections. This has not changed since Crile's initial description of a radical neck dissection. In this institution, we have observed clinically, that level I involvement is significantly lower than the other levels. This study challenges the tradition of dissecting level I as part of the surgical management of neck metastasis in unknown primary cancer by looking at level I involvement. **STUDY DESIGN:** Retrospective study, chart review. **METHODS:** Charts were reviewed from all patients diagnosed with unknown primary head and neck cancer from 1986-2003. 36 patients met the inclusion criteria, which included squamous cell carcinoma pathology and patients (undergoing) neck dissection including levels 1-5. Demographic data including gender, age, level of positive nodes, and initial stage was recorded. Each pathology report was reviewed to ascertain the level of neck involvement. Analysis of this data was performed to determine the levels of nodal involvement. **RESULTS:** The average age of our patient population is 59.7 years old, with 11 females and 25 males. Most patients had neck disease classified as N2b. The overall lymph node involvement was as follows: level I, 2 out of 36 = 5.5%, level II node 33 out of 36 = 91.7 %, level III 20 out of 36 = 55.5%, level IV 5 out of 36 = 13.9 %, Level V 4 out of 36 = 11.1%. **CONCLUSIONS:** Level I involvement was significantly lower than the other levels, raising the question of the necessity to include this level as part of the surgical treatment for neck metastasis in unknown primary cancer of the head and neck.

#### **11:54 Locally Advanced Thyroid Cancer**

Jan L. Kasperbauer, MD\*, Rochester, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the evaluation, management, and outcomes for locally advanced thyroid cancer.

**OBJECTIVES:** This study evaluates the outcomes of a contemporary group of patients with locally advanced thyroid carcinoma documenting survival, post-treatment vocal cord function, and dysphagia. **STUDY DESIGN:** Retrospective review. **METHODS:** This retrospective review was approved by the institutional IRB and all patients consented to the record review. Patient data which was recorded included age and gender. Tumor specific data collected included tumor histology, stage, grade of tumor, and procedure. Outcome data collected included date of death, date of last follow-up, vocal cord function, presence of a tracheotomy or feeding tube, and the presence or absence of dysphagia. **RESULTS:** The charts of 95 patients with thyroid cancer surgically managed in the department of otolaryngology-head and neck surgery were reviewed. 43 patients had locally invasive disease and/or recurrent disease. 44 patients were treated with thyroid cancers which were not recurrent and did not demonstrate invasion of regional neck structures. 23(68%) of the invasive carcinomas occurred in males. During a median follow-up of 5 years, 18% of patients with invasive cancer died of disease. A new long-term tracheotomy was required by 2 patients while one patient required gastrostomy feeding at last follow-up. Seven patients described persistent post-operative dysphagia. Invasive thyroid carcinoma resulted in an approximate 50% 5 year survival. **CONCLUSIONS:** Invasive thyroid cancer occurs most commonly in males and significantly reduces survival. Patients retain a high functional level with minimal effect on swallowing. Consistent with prior reports, a survival difference is noted when macroscopic disease residual is compared to microscopic residual disease.

#### **12:04 DISCUSSION**

#### **12:10 Introduction of Middle Section Vice President-Elect, Robert H. Maisel, MD\*, Minneapolis, MN**

Myles L. Pensak, MD\*, Cincinnati, OH

#### **12:15 Break - Box Lunches**

#### **12:30 PANEL: LARYNGEAL DISORDERS IN COMMON FOLK AND DIVAS**

**MODERATOR: Charles N. Ford, MD\*, Madison, WI**

**PANELISTS:** Kenneth W. Altman, MD PhD, Chicago, IL  
Henry T. Hoffman, MD, Iowa City, IA  
Albert L. Merati, MD, Madison, WI  
Gayle E. Woodson, MD\*, Springfield, IL

#### **1:45 PANEL: PERSISTENT RHINOSINUSITIS AFTER ENDOSCOPIC SINUS SURGERY: MEDICAL AND SURGICAL TREATMENT OPTIONS**

**MODERATOR: Roy Casiano, MD\*, Miami, FL**

**PANELISTS:** Brad F. Marple, MD, Dallas, TX  
Stilianos E. Kountakis, MD, Augusta, GA  
James M. Chow, Maywood, IL  
John H. Krouse, MD\*, Detroit, MI

#### **3:00 Adjourn**

#### **7:00 - Margaritaville Party - Tiki Beach**

**10:00**

**SUNDAY, JANUARY 11, 2004**

**7:00 - Registration - North Wall  
11:15**

**7:00 - Speaker Ready Room - Key West  
11:00**

**7:00 - Middle Section Business Meeting (Members Only) - Caxambus I  
7:40**

**7:00 - Exhibit Hall Open - Collier Hall  
10:30**

**7:00 - Poster Viewing - Collier Hall  
10:30**

**7:00 - Continental Breakfast with Exhibitors - Collier Hall  
7:45**

**7:45 - Scientific Sessions - Salons A - D  
11:00**

**7:45 PANEL: SURGERY FOR OBSTRUCTIVE SLEEP APNEA. CAN WE DO BETTER?  
MODERATOR: David L. Steward, MD, Cincinnati, OH  
PANELISTS: Michael Friedman, MD, Chicago, IL  
Brent A. Senior, MD, Chapel Hill, NC  
David J. Terris, MD\*, Augusta, GA  
Regina P. Walker, MD, Madison, WI**

**9:30 PANEL: CURRENT MANAGEMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA  
MODERATOR: Patrick Antonelli, MD\*, Gainesville, FL  
PANELISTS: Bruce J. Gantz, MD\*, Iowa City, IA  
John Leonetti, Maywood, IL  
Ronald G. Amedee, MD\*, New Orleans, LA  
Craig A. Buchman, MD, Chapel Hill, NC**

**11:00 Adjourn**

## POSTERS

### 1. Subacute Infratemporal Fossa Cellulitis with Subsequent Abscess Formation in an Immunocompromised Patient

Lee M. Akst, MD, Cleveland, OH  
Barbara J. Albani, MD, Cleveland, OH  
Marshall Strome, MD\*, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the relationship between the masticator space and the infratemporal fossa, explain the difficulty of diagnosing infections in this area, and document effective treatment options for infratemporal fossa infections.

**OBJECTIVES:** To present a case history of an immunocompromised patient with subacute cellulitis of the infratemporal fossa with subsequent abscess formation, and to emphasize the importance of accurately diagnosing and treating infections in this area. To discuss the relationship between the masticator space and the infratemporal fossa, the etiologies and pathways of spread of odontogenic infections. To describe the difficulty of diagnosing infections in these areas and to discuss effective treatment of these infections. **STUDY DESIGN:** Case report and literature review. **METHODS:** The case is presented of a 32 year old female with poorly controlled Type 2 diabetes and end-stage renal disease who developed subacute cellulitis of the infratemporal fossa, with subsequent abscess formation, following mandibular dental extraction. A literature review follows, with emphasis on the etiology, diagnosis, and treatment of infratemporal space infections. **RESULTS:** Careful history and physical examination revealed the etiology of unilateral facial pain, facial swelling, and trismus to be an infratemporal fossa abscess. This finding was confirmed by needle aspiration and computed tomography. Intra-oral incision and drainage, accompanied by intravenous antibiotic therapy, led to the resolution of this infection. **CONCLUSIONS:** Although rarely seen clinically, infratemporal fossa abscess is a potentially common and dangerous complication of odontogenic infections as based upon documented pathways of spread. Diagnosis is often made difficult by trismus. Knowledge of the relationship between the masticator space and infratemporal fossa can allow the otolaryngologist to more effectively diagnose and treat these infections.

### 2. Surgical Ciliated Cysts of the Maxilla Following Orthognathic Surgery

Lee M. Akst, MD, Cleveland, OH  
Zoe Koch, Cleveland, OH  
James Smith, DDS, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the pathophysiology, presentation, and treatment of surgical ciliated cysts of the maxilla.

**OBJECTIVES:** To demonstrate the pathophysiology, presentation, and treatment of surgical ciliated cysts of the maxilla, and to describe their rare occurrence following orthognathic surgery. **STUDY DESIGN:** Report of 2 cases and review of the literature. **METHODS:** The cases of two young women are presented, each of whom developed a surgical ciliated cyst of the maxilla several years following LeFort I orthognathic surgery. A literature review follows, which emphasizes the unique presentation of surgical ciliated cysts and the importance of differentiating these benign cysts from malignant conditions which may present similarly. Appropriate therapy will be described. **RESULTS:** In each of the cases described, careful history and evaluation revealed the etiology of an expansile maxillary lesion with bony destruction to be a benign surgical ciliated cyst. These cysts were treated with simple enucleation. **CONCLUSIONS:** Although well described following Caldwell-Luc approaches to the maxillary sinus, case reports of these cysts following orthognathic surgery are very rare. The aggressive growth and bony destruction of these cysts mimic malignancy both clinically and radiographically. Knowledge of the pathophysiology of these lesions can guide appropriate conservative management.

### 3. Complications with the Use of Isotretinoin Following Rhinoplasty

Brian C. Allen, BS, Milwaukee, WI  
John S. Rhee, MD, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the possible relationship between postoperative isotretinoin use and the development of nasal tip deformities following rhinoplasty.

**OBJECTIVES:** To evaluate the association of the postoperative use of isotretinoin and the formation of nasal tip bossae and irregularities following rhinoplasty. **STUDY DESIGN:** Retrospective chart review of three patients who presented for revision rhinoplasty following the use of isotretinoin. **METHODS:** Three patients were found to have taken isotretinoin following rhinoplasty and subsequently developed nasal tip irregularities. Clinic charts and operative reports were reviewed to identify predisposing factors and time intervals to complications. **RESULTS:** There were two females and one male included in the study, with follow-up ranging from one to three years. In all three cases, isotretinoin was started within two years of the primary rhinoplasty. The nasal tip deformities were first observed within six months of starting isotretinoin. Two patients developed nasal tip bossae and asymmetry, and one patient developed marked thinning of a composite graft. All three patients required revision surgery. **CONCLUSIONS:** Use of isotretinoin following rhinoplasty may lead to nasal tip deformities by thinning the dermis and accentuating the normal "shrink wrap" phenomenon that occurs during the postoperative period. Further studies are needed to establish this possible causative relationship.

### 4. Visual-Vestibular Hypersensitivity Syndrome (VVHS)

Moises A. Arriaga, MD FACS, Pittsburgh, PA  
Douglas A. Chen, MD FACS, Pittsburgh, PA

**EDUCATIONAL OBJECTIVE:** At the end of this presentation, the participant will be able to describe the diagnosis and management of VVHS.

**OBJECTIVES:** At the conclusion of this presentation, the participants should be able to: 1) define VVHS; and 2) discuss evaluation and treatment of VVHS. **STUDY DESIGN:** Retrospective chart review. **METHODS:** Records of 1000 consecutive new patients presenting with dizziness were reviewed. Patients complaining of non-vertiginous, episodic dizziness and rotational chair findings of elevated VVOR (visually enhanced vestibulo-ocular reflex) were selected for additional review of clinical symptoms, physical findings, audio-vestibular testing results, imaging, clinical treatment and clinical outcome. **RESULTS:** Over 25% of patients with episodic disequilibrium who did not have vertigo met criteria for VVHS. Despite the VVOR abnormality, only 20% of VVHS patients had abnormal results with ENG caloric testing. The most common associated condition was migraine vestibulopathy, however, VVHS was also present in patients with Arnold-Chiari malformation, vascular compression syndrome, CNS ischemia, and multiple sclerosis. Four VVHS patients were diagnosed with skull base tumors. In addition to treating any associated conditions, symptomatic management of VVHS required medical vestibular suppression and vestibular rehabilitation. **CONCLUSIONS:** VVHS is a common cause of non-vertiginous dizziness. While elevated VVOR is diagnostic, complete audio-vestibular and imaging evaluation is necessary to identify associated conditions. Vestibular suppression and vestibular retraining provide symptomatic relief.

### 5. The Long-Term Effect of Direct Round Window Application of Carboplatin and Cisplatin on Cochlear Morphology and Function

Carol A. Bauer, MD, Springfield, IL  
Christy Y. Johnston, BA, Springfield, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the effects of ototopical toxins on cochlear hair cells.

**OBJECTIVES:** The objective of this study was to determine the long-term effect of the ototoxic drugs, cisplatin and carboplatin, on cochlear morphology and function, when applied directly to the round window of the chinchilla cochlea. **STUDY DESIGN:** 24 adult chinchillas were randomly assigned to either the cisplatin or carboplatin experimental group. A predetermined concentration and volume of either cisplatin or carboplatin was topically applied to the round window. Auditory brainstem response thresholds were determined immediately before and after surgery, and at sacrifice 2 weeks later. Cochleas were examined using phase contrast microscopy and the pattern of hair cell damage for each agent was quantified. **METHODS:** Subjects were anesthetized and both bullae were exposed. After the bulla was entered, the round window (RW) visualized. Two to 4 microliters of either cisplatin (dose range 0.15 to 0.66 mg/ml) or carboplatin (dose range 2 to 16 mg/ml) was topically applied to the RW membrane. The toxin was rinsed from the membrane after 15 or 30 minutes using saline and a wick. Auditory brainstem response thresholds to clicks and pure tones (1, 2, 4, 8 and 16 kHz) for each ear was determined immediately before and after surgery. Subjects were allowed to recover for 2 weeks prior to sacrifice. Under deep anesthesia, cochleas were harvested after in-vivo perfusion with buffered fixative. The cochleas were osmicated, dehydrated, and embedded in araldite resin. Flat preparations of the entire organ of corti were dissected and viewed using phase-contrast microscopy. **RESULTS:** Individual subject and group patterns of cochlear pathology were compared to individual and group patterns of hearing threshold shifts caused by the toxin treatments. **CONCLUSIONS:** Selective hair cell damage can be induced using topical application of some ototoxic agents. This technique may be used to study mechanisms of tinnitus generation

#### 6. A Rare Case of Mucoepidermoid Carcinoma of the Thyroid

Naveen D. Bhandarkar, BS, Cleveland, OH  
James Chan, MD, Cleveland, OH (*Presenter*)  
Marshall Strome, MD\*, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe key pathologic features of mucoepidermoid carcinoma of the thyroid gland, appreciate the debate about its histogenetic origins, and recognize the importance of multimodal therapy to treat this rare, but potentially aggressive, malignancy.

**OBJECTIVES:** To report a recent case of mucoepidermoid carcinoma (MEC) of the thyroid, review the pertinent literature, and highlight the importance of multimodal treatment in this potentially aggressive malignancy. **STUDY DESIGN:** Case report and a review of literature. **METHODS:** A 42 year old female had initially presented to another hospital with a painful left neck mass. She subsequently underwent left hemithyroidectomy. Surgical pathology was significant for lymphocytic thyroiditis and MEC. One month later, she presented to us with a right neck mass. **RESULTS:** The patient underwent completion thyroidectomy and selective neck dissection. Operative findings included three lymph nodes positive for metastasis and tumor invasion of the transverse cervical vein. A three month post-operative course of chemoradiation therapy was administered. The patient remains disease free six months after the last treatment. **CONCLUSIONS:** MEC is a rare malignancy of the thyroid with less than 35 cases reported to date. The origins of this tumor are not completely understood, with debate regarding whether it arises from solid cell nests of the ultimobranchial apparatus or from follicular epithelium. Although MEC of the thyroid has frequently been reported as low grade, the aggressive presentation in our patient suggests the appropriateness of multimodal therapy.

#### 7. Percutaneous Tracheotomy: Don't Beat Them—Join Them

D. Russell Blankenship, MD, Augusta, GA  
Edward A. Porubsky, MD, Augusta, GA (*Presenter*)  
Bruce A. Davis, MD, Augusta, GA  
Amy A. Blanchard, 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 discuss the advantages and limitations of performing a multidisciplinary percutaneous tracheotomy in conjunction with a pulmonary-critical care team.

**OBJECTIVES:** The introduction of percutaneous tracheotomy (PercTrach) has resulted in a "turf battle" between otolaryngology and pulmonary medicine/critical care (PCC). We sought to determine the value of a collaborative approach to the performance of PercTrachs at the bedside in the intensive care unit setting. **STUDY DESIGN:** Pilot study of consecutive patients undergoing bedside PercTrach in conjunction with the PCC team. **METHODS:** The PCC team performed bronchoscopic guidance during the procedure, while the otolaryngology team performed the PercTrach using the Blue Rhino introducer set. In some cases, the otolaryngology resident performed bronchoscopy under supervision of the PCC attending while the PCC resident performed the PercTrach with the otolaryngology attending. Demographic data was prospectively collected. **RESULTS:** Eleven PercTrachs have been performed (6 male, 5 female) and the mean ( $\pm$ S.D.) patient age was  $52.0 \pm 8.2$  years. The procedural times ranged from 12 to 21 minutes, with a mean of  $15.7 \pm 3.2$  minutes; this represented 10.7 minutes on average to insert the tracheotomy tube, and 5.0 minutes to completely secure the tube. There were no surgical complications, but in 2 instances a ruptured tracheotomy tube cuff prompted replacement. The interval between the time of consultation and PercTrach was usually  $<24$  hours; delays beyond 24 hours were related to patient stability. **CONCLUSIONS:** There are numerous advantages to pursuing a multidisciplinary approach to performing PercTrachs, particularly the educational component. Additional incidental benefits include substantial cost savings, conservation of operating room time, and diminished interval between consultation and procedural completion.

#### 8. A Multidimensional Approach to Assessing Quality of Life Post-Botox Injection in Patients with ASD

Katherine S. Bolen, MS, Tampa, FL  
Ruth H. Bahr, PhD, Tampa, FL  
Marion R. Ridley, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify issues influencing psychosocial functioning in ASD patients post-Botox. They will also be able to describe some personality traits that are associated with more severe manifestations of ASD.

**OBJECTIVES:** The objectives of this study were to: 1) determine possible relationships between acoustic, perceptual, and psychosocial aspects of voice production pre- and post-Botox treatment for patients with adductor spasmodic dysphonia (ASD); 2) describe the individual variability noted in patient response; and 3) compare patient performances across perceptual and acoustic domains with personality traits. **STUDY DESIGN:** A pre-test, post-test design was used to quantify improvement in voice and psychosocial functioning after Botox treatment. **METHODS:** Eleven patients with ASD completed voice recordings of phrases and sustained vowels, vocal quality ratings, and the Voice Handicap Index. Post-Botox injection, the patients were reevaluated with the same measures and the short-form of the Multidimensional Personality Questionnaire (MPQ). Voice recordings were analyzed acoustically to evaluate several aberrant vocal characteristics associated with ASD. Statistical and correlational analyses were completed to evaluate differences after treatment and across speech stimuli, as well as to examine the relationships among measures. MPQ subscores were evaluated to determine if certain personality traits influenced patient's perception of treatment benefit and the occurrence of aberrant vocal productions. **RESULTS:** Improvements were noted in voice production and psychosocial functioning post-injection, despite great individual variability. High control and high stress personality traits were significantly correlated with perceptions of psychosocial functioning and acoustic measures. The high control trait was more evident for frequency shifts and aperiodic segments pre-Botox and high stress was associated with the presence of aperiodic segments post-injection. **CONCLUSIONS:** Results indicated the need for a multidimensional approach to evaluating the degree of voice improvement and patient satisfaction post-Botox injection.

**9. Vinylpolysiloxane Positive Impression Modeling of Nasal Structure: A Preliminary Study**

Gregory M. Buchalter, MD, Shreveport, LA  
Fred J. Stucker, MD\*, Shreveport, LA  
Timothy Lian, MD, Shreveport, LA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the potential benefits of vinylpolysiloxane (VPS) positive impression models of nasal structure.

**OBJECTIVES:** Surgical planning for aesthetic and reconstructive rhinoplasty relies principally on history and clinical exam, facial photographs, and understanding a patient's wishes regarding nasal surgery. An easily fashioned three dimensional (3-D) model replicating a patient's nose might be a useful adjunct for the rhinoplastic surgeon. This study evaluates the feasibility of using VPS to generate positive impression models of nasal structure. **STUDY DESIGN:** A preliminary descriptive report. **METHODS:** Five adult subjects consented to having facial digital photographs taken and VPS models made of their nose. Quantity of VPS utilized, ease of use, technical application, and cost were described. The 3-D VPS models were compared to two-dimensional digital photographs of each patient. **RESULTS:** VPS impression models were successfully created in all five subjects. 20 cc of VPS were used in each subject for the negative model; 20-30 cc for the positive model. The total cost of creating the positive model was between \$4.50 and \$5.00. From start to finish, both positive and negative models took approximately four minutes each to make. All five VPS positive impression models were near identical replicas of their respective subject's nose and correlated very well with digital photographs. **CONCLUSIONS:** VPS positive impression modeling is a quick, relatively easy, inexpensive, and precise method of creating a near identical 3-D replica of nasal structure. These models may have beneficial application in surgical planning, postoperative evaluation, resident teaching, and patient education.

**10. Anaplastic Extramedullary Plasmacytoma Without Evidence of Multiple Myeloma: A Case Report and Review of the Literature**

Michael C. Byrd, MD, Cleveland, OH  
James Chan, MD, Cleveland, OH  
Daniel S. Alam, MD, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the diagnosis and treatment of anaplastic extramedullary plasmacytoma. The participants will also have a better understanding of neck disease in this disease variant.

**OBJECTIVES:** To present an unusual case of anaplastic extramedullary plasmacytoma of the maxillary sinus. **STUDY DESIGN:** Case report. **METHODS:** 68 year old man presented with a history of left cheek swelling, numbness and dental pain. Examination revealed an expansile mass of the left maxillary sinus, which was confirmed by radiologic imaging. The initial diagnosis and work-up are presented, and the disease progression and resolution with therapy are documented. **RESULTS:** The patient underwent a surgical biopsy with pathology suggesting the possibility of a plasma cell tumor. The diagnosis of anaplastic extramedullary plasmacytoma was confirmed. Treatment included surgical resection and post-operative radiotherapy. Following 2 months of treatment, a left neck mass was noted on exam. A FNA was performed. Pathology was consistent with anaplastic plasmacytoma. The patient underwent a neck dissection. Repeat myeloma serologic testing remained normal, and patient has no clinical evidence of recurrent disease. **CONCLUSIONS:** Extramedullary plasmacytomas are rare plasma cell tumors occurring predominantly in the upper respiratory tract. These tumors make up 0.5% of all upper respiratory tract malignancies and usually remained localized. There have been reports of cervical lymph node metastasis. Current treatment consists of surgical resection, radiotherapy, or both. The anaplastic variant appears to be a slightly more aggressive tumor. Treatment of this variant has not been well described in the literature. Surgical resection, including a neck dissection, followed by post-operative radiotherapy, appears to be the ideal treatment modality for cure of this disease.

**11. The Facial Nerve in Parotidectomy: A Topographical Analysis**

C. Ron Cannon, MD\*, Jackson, MS  
William H. Replogle, PhD, Jackson, MS

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the implications of facial nerve topography as it relates to parotid surgery.

**OBJECTIVES:** Study facial nerve anatomy as it relates to facial nerve dysfunction following parotidectomy. **STUDY DESIGN:** Prospective mapping of facial nerve during parotidectomy and comparison to post-operative facial nerve function. **METHODS:** Univariate descriptive and inferential analysis of facial nerve dissection and facial nerve status. **RESULTS:** Patients with short-term facial nerve dysfunction had significantly more total nerve dissected (136.73 mm vs. 94.73 mm) than patients without short-term facial nerve dysfunction. Comparing the first quartile of total nerve dissection length (64.5 mm) to the third quartile (130.0 mm) indicates that patients at the third quartile have a relative risk of short-term nerve dysfunction that is 3.35 times greater than patients at the first quartile. The greater the amount of total nerve dissected the greater the risk of short-term facial nerve dysfunction. **CONCLUSIONS:** The total length of the facial nerve dissected relates to the likelihood of post-operative facial nerve dysfunction.

**12. The Enlarged Vestibular Aqueduct Syndrome in Adults**

Jon B. Chadwell, MD, Cincinnati, OH  
Robert J. O'Bert, BS, Cincinnati, OH  
Myles L. Pensak, MD\*, Cincinnati, OH  
John H. Greinwald, MD, Cincinnati, OH  
Daniel I. Choo, MD, Cincinnati, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the incidence and potential significance of EVAS in an adult SNHL population.

**OBJECTIVES:** Given the relevance of enlarged vestibular aqueduct syndrome (EVAS) in the pediatric sensorineural hearing loss (SNHL) population, our objective was to examine the incidence and potential significance of EVAS in an adult SNHL population and to then compare the clinical, audiologic and imaging features of this adult population with those of a large pediatric SNHL population. **STUDY DESIGN:** Retrospective chart review. **METHODS:** A retrospective review of clinical, audiometric and imaging data from 80 adult patients presenting with bilateral SNHL was performed. For the pediatric SNHL population, a database of 1528 pediatric patients with SNHL was queried to identify those patients diagnosed with radiologically-confirmed EVAS. Previously published imaging criteria were used for diagnosing EVAS. **RESULTS:** Out of 80 adult patients (160 individual temporal bones) reviewed, no cases of enlarged vestibular aqueduct were identified on computed tomography (CT) imaging and no cases of dilated endolymphatic duct and/or sac were identified on magnetic resonance (MR) imaging. In contrast, in the pediatric population, enlarged vestibular aqueduct(s) were found in 77 patients with SNHL. **CONCLUSIONS:** EVAS does not appear to be a common pathology amongst adult patients being evaluated for SNHL. This supports our hypothesis that EVAS results in progressive hearing loss early in life and is a pertinent etiology of congenital and childhood SNHL. The absence of EVAS in any of the adult patients being evaluated for SNHL suggests that EVAS does not cause later onset SNHL or that those adult patients do not seek medical care for their hearing impairment.

**13. Topical Mitomycin-C in the Management of Subglottic Stenosis in Wegener's Granulomatosis**

James Chan, MD+, Cleveland, OH  
Lee M. Akst, MD, Cleveland, OH  
Issac H. Eliachar, MD\*, Cleveland, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe and discuss the endoscopic management of subglottic stenosis in patients with Wegener's granulomatosis and the role of topical mitomycin-C.

**OBJECTIVES:** To evaluate the role of endoscopic management with topical mitomycin-C application in treating subglottic stenosis (SGS) in patients with Wegener's granulomatosis (WG). **STUDY DESIGN:** Retrospective case series at an academic center. **METHODS:** Patients with SGS associated with WG were treated endoscopically with intralésional injection of steroids, dilatation, and topical mitomycin-C. Subsequent open surgical treatment was performed when indicated. **RESULTS:** Twenty-three patients were identified. (1) Seventeen patients received only endoscopic management, while six patients required open surgical treatment. (2) Eleven WG patients had repeat procedures. (3) Among patients with multiple procedures, mean interval between procedures was 11.3 months. (4) Improvement in airway caliber was 37.4%. (5) Ten of 11 patients who received mitomycin-C required repeat dilatations. Mean interval between procedures was 12.5 months and mean increase in airway size was 36.5%. **CONCLUSIONS:** SGS can be managed endoscopically in patients with WG. In this study, the effect of topical mitomycin-C application is inconclusive and warrants further study.

**14. The Role of 2-[F-18]-Fluoro-2-Deoxy-D-Glucose Positron Emission Tomography (FDG-PET) in the Diagnosis of Unknown Primary Carcinoma of the Head and Neck**

David S. Chrzanowski, MD, Richmond, VA  
Laurence J. DiNardo, MD\*, Richmond, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the uses and limitations of FDG-PET in the detection of unknown primary sites for squamous cell carcinoma of the head and neck.

**OBJECTIVES:** The usefulness of FDG-PET in aiding diagnosis of the occult primary site in carcinoma of unknown primary was investigated. **STUDY DESIGN:** Prospective case series. **METHODS:** Eleven consecutive patients treated between August 2001 and December 2002 with metastatic cervical squamous cell carcinoma of unknown primary were investigated. These patients had no evidence of primary tumor on office exam or by computed tomography scan. FDG-PET was performed prior to operative endoscopy and directed biopsies. **RESULTS:** Overall, FDG-PET identified the primary site in five patients, including one that was missed on initial operative endoscopy. Two tonsillar sites and three base of tongue sites were diagnosed. Conversely, six of the eleven subjects had nonspecific or negative studies. Operative endoscopy with directed biopsies revealed the primary tumor in two of these six individuals, one in the base of tongue and one in the tonsil. The sensitivity of FDG-PET was 71%, the specificity 100%, the positive predictive value 100%, and the negative predictive value 67%. **CONCLUSIONS:** FDG-PET is of low sensitivity but high specificity in the detection of unknown primary carcinoma of the head and neck. Consequently, a positive scan provides reliable direction for operative endoscopy and biopsy, but a negative study does not preclude the success of directed biopsies at the accepted high yield sites. The possible reasons and further implications of these findings are discussed.

**15. WITHDRAWN--Orbital Volumetric Analysis in Allergic Fungal Sinusitis Patients with Proptosis Before and After Endoscopic Sinus Surgery**

Angela H. Chu, MD, Charleston, SC  
Rodney J. Schlosser, MD, Charleston, SC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe different methods of measuring orbital volumes and discuss orbital volumetric changes seen in allergic fungal sinusitis (AFS) patients with proptosis who undergo endoscopic sinus surgery.

**OBJECTIVES:** To examine changes in orbital volumes in allergic fungal sinusitis (AFS) patients with proptosis before and after endoscopic sinus surgery. **STUDY DESIGN:** Retrospective study of operative patients with proptosis due to AFS. Normative data was obtained using patients with chronic sinusitis without orbital involvement. **METHODS:** Orbital volume measurements were obtained using digitized images and computer software to calculate volumes (cm<sup>3</sup>) of outlined regions on 1.3 mm axial CT images. Orbital volumes were measured as total volumes and bony orbital volumes. Bony orbits were defined using 2 techniques: 1) the region posterior to a line from ipsilateral zygoma to contralateral zygoma; and 2) the region posterior to a line from zygoma to ipsilateral lacrimal bone. Four affected orbits in 3 AFS patients with proptosis were evaluated. Twenty-eight unaffected orbits in 14 patients (6 females, 8 males) were used as normal comparisons. **RESULTS:** Orbital involvement by AFS resulting in clinical proptosis decreased bony orbital volumes to a mean of 70% of normal. After successful endoscopic sinus surgery, bony orbital volumes normalize or approach normal ranges to a mean 89% of normal. Total volumes remained stable before and after surgery. **CONCLUSIONS:** Massive AFS may affect the orbit with clinical findings such as proptosis. Spontaneous orbital remodeling can be seen in AFS patient with clinical resolution of proptosis and normalization of bony orbital volumes several months after sinus surgery and aggressive medical treatment of the disease. Surgical orbital reconstruction is typically not needed once the sinus disease is adequately addressed.

**16. Unusual Presentation of Right Ear Cholesteatoma Invading the Anterior and Middle Cranial Fossa and Zygomatic Arch**

Diana D. Chuong, MD, Washington, DC  
H. Dan Sandel, MD, Washington, DC  
H. Jeffrey Kim, MD, Washington, DC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe concepts of routes of extension of invasive, aggressive temporal bone cholesteatoma and discuss the pathophysiology of the inflammatory response thought to stimulate the squamous epithelial proliferation and destruction of adjacent tissues and epithelial cell migration.

**OBJECTIVES:** To discuss the sequela of unrecognized untreated chronic OM. To demonstrate the aggressive potential of temporal bone cholesteatomas. **STUDY DESIGN:** We present a case of an aggressive middle ear cholesteatoma that invaded the squamous temporal bone into the anterior and middle cranial fossa. **METHODS:** Case report with a review of the literature. **RESULTS:** A case report of a patient with a history of chronic otitis media, followed by serial MRI and CT scans. The patient finally presented with increase in otorrhea with a zygomatic arch mass representing the invasion of the middle ear cholesteatoma into the zygomatic arch with expansion into the cranium. **CONCLUSIONS:** The potential of a cholesteatoma to mimic a neoplastic process in a hyper-proliferative and invasive manner should prompt the practicing otolaryngologist to suspect cholesteatoma in a patient with chronic otitis media.

**17. WITHDRAWN--Minimal Morbidity Approaches for Excising Parapharyngeal Space Tumors**

Seth M. Cohen, MD MPH+, Nashville, TN  
Brian B. Burkey, MD, Nashville, TN  
James L. Netterville, MD\*, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the utility of the transcervical approach to excising parapharyngeal space masses and the morbidity associated with treating parapharyngeal space tumors.

**OBJECTIVES:** This study examines the surgical techniques used to minimize the morbidity associated with removing parapharyngeal space (PPS) masses. **STUDY DESIGN:** Retrospective review in tertiary care center. **METHODS:** Medical records search for PPS masses was performed from 1990 to 2002. Age, sex, diagnosis, surgical approach, expected sequelae, complications, and outcome collected. **RESULTS:** Sixty-three PPS masses were identified with 7 (11.1%) malignant and 56 (88.9%) benign tumors. Twenty-eight (44.4%) masses were salivary gland tumors, 12 (19.0%) neurogenic, and 11 (17.4%) of miscellaneous origin. Thirteen (20.6%) lesions were vascular, and 27 (42.9%) extended to the skull base. A transcervical approach was employed in 49 (77.8%) cases and transparotid-transcervical approach in 9 (14.3%) cases. A prior biopsy necessitated a transoral-transcervical approach in 3 (4.8%) patients. One (1.6%) malignant lesion required a mandibular splitting procedure. To facilitate exposure, the digastric/styloid musculature, stylohyoid ligament, and/or styloid process was removed in 27 (67.5%) patients. Twice as many prestyloid compared to poststyloid tumors required these measures ( $p=0.001$ , Chi Square). A level 2 lymphadenectomy further improved vascular access. Eighteen (28.6%) expected neurologic sequelae, mostly vocal cord and palatal paralysis, resulted from cranial nerve involvement. Common unexpected complications were first bite syndrome, transient facial nerve paresis, and palatal weakness. Only 1 (1.6%) patient, initially presenting with recurrent cancer, had a local recurrence. **CONCLUSIONS:** Careful patient assessment and detailed surgical techniques allow the oncologically safe removal of benign and vascular tumors, including those with skull base extension. Patients should be counseled about neurologic deficits expected to result from cranial nerve involvement.

#### 18. **Indications for Canal-Wall-Down Tympanomastoidectomy**

Matt J. Conoyer, MD, Nashville, TN  
Seth M. Cohen, MD MPH, Nashville, TN  
Labadie F. Robert, MD PhD, Nashville, TN  
Sean McMenemy, MD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the indications for using canal-wall-down tympanomastoidectomy.

**OBJECTIVES:** This study examines the indications for canal-wall-down mastoidectomy in an otologic practice geared towards preserving the canal wall. **STUDY DESIGN:** Retrospective review in a tertiary care center. **METHODS:** All patients who had canal-wall-down mastoidectomy performed between 1995 to 2002. Data collected included age, sex, symptoms, physical exam findings, previous surgical procedure, type of operation, disease process, indications, surgical findings, and outcome. **RESULTS:** Of all mastoidectomy procedures, approximately one-fourth were canal-wall-down procedures. Of the canal-wall-down mastoidectomies, the majority were modified radical mastoidectomy, in which the middle ear was grafted. Unrelenting otorrhea was the most common indication for mastoid surgery. Cholesteatoma was evident in the mastoid and/or middle ear in two-thirds of the ears, and chronic suppurative otitis media (CSOM) without cholesteatoma occurred in one-third of cases. One-fifth of canal-wall-down mastoidectomies were performed as the primary procedure. Among the revision surgery resulting in modified radical procedures, approximately two-thirds were revisions of prior canal-wall-down cavities, and one-third were revisions of prior canal-wall-up cavities. Unresectable cholesteatoma (facial nerve, sinus tympani, stapes, labyrinthine fistula) and unreconstructable canal wall defects were the most common reasons for performing a canal-wall-down mastoidectomy. A high facial ridge and inadequate meatoplasty were common findings in revision cases that lead to subsequent surgery. **CONCLUSIONS:** Disease extent and patient anatomy may preclude a canal-wall-up procedure, preferred in our practice. Hence, otologic surgeons must know the indications for and be skilled in performing canal-wall-down tympanomastoidectomy.

#### 19. **Use of Computed-Tomography Angiography for Preoperative Evaluation Prior to Free Flap Reconstruction of the Head and Neck**

George L. Coppit, MD, Nashville, TN  
Derrick T. Lin, MD, Nashville, TN  
Murray T. Mazer, MD, Nashville, TN  
Steven M. Bayles, MD, Nashville, TN  
James L. Netterville, MD\*, Nashville, TN  
Brian B. Burkey, MD, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to appreciate the validity and cost savings (both professional and economic) of CT-angiography for preoperative assessment of donor site vessel status prior to microvascular reconstruction in the head and neck.

**OBJECTIVES:** To review our experience using CT-angiography for the preoperative assessment of donor sites prior to microvascular reconstruction of the head and neck, focusing on findings, outcomes, and cost factors. **STUDY DESIGN:** Retrospective chart review. **METHODS:** We retrospectively reviewed charts for the past year, selecting patients that underwent preoperative CT-angiography assessment of donor sites prior to microvascular reconstruction of the head and neck. Pertinent CT-angiography findings, intraoperative findings, surgical outcomes, and cost analysis were recorded. **RESULTS:** To date, we have preoperatively evaluated 15 patients using CT-angiography. One patient underwent evaluation of his superior mesenteric system prior to colonic inter-positioning for esophageal cancer, and the remainder of patients underwent pelvic runoff studies of the lower extremities prior to fibular free flaps. Two patients were found to have congenital dominant peroneal arteries, precluding them from fibular free flap harvest, and one patient was found to have severe atherosclerotic disease that precluded harvest. No patients had intraoperative findings different from their preoperative evaluation. There have been no cases of peripheral ischemia following flap harvest. **CONCLUSIONS:** We have found CT-angiography gives an accurate preoperative evaluation of donor site vessel status at a reduced overall cost (economic and professional) compared to traditional angiography. In addition, CT-angiography can demonstrate both congenital and acquired vascular anomalies, allowing selection of an alternate donor site preoperatively, thus improving surgical outcomes. Risk to the patient and length of procedure is also reduced compared to standard angiography techniques. We feel that CT-angiography is a safe and cost effective alternative to traditional angiography for the preoperative evaluation of microvascular free flap donor sites.

#### 20. **Fungal Biofilm Formation on Cochlear Implant Hardware After Prophylactic Antibiotic-Induced Fungal Overgrowth Within the Middle Ear**

Ricardo C. Cristobal, MD PhD+, Milwaukee, WI  
Christina L. Runge-Samuels, PhD, Milwaukee, WI  
Jill B. Firszt, PhD, Milwaukee, WI  
Charles E. Edmiston, PhD, Milwaukee, WI  
Heather A. Owen, PhD, Milwaukee, WI  
Phillip A. Wackym, MD\*, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: 1) recognize the clinical features of candida albicans colonization of a prosthesis; 2) discuss the management of chronic suppurative otitis media in cochlear implant recipients; and 3) understand the role of oral and ototopical antibiotics in fungal overgrowth.

**OBJECTIVES:** Recently some authors have advocated single stage cochlear implantation in chronic suppurative otitis media (CSOM) patients with a dry ear on otoscopy for 2 weeks before surgery and the perioperative use of topical and/or oral antibiotics. However, studies of children receiving tympanostomy tubes have demonstrated that antibiotics may select for fungal overgrowth. The purpose of this study was to determine if a fungal biofilm formed on the surface of a cochlear implant internal device and electrode array in a child who developed fungal overgrowth after treatment with prophylactic antibiotics. **STUDY DESIGN:** Prospective ultrastructural study. **METHODS:** A 2 year old female with Beckwith-Wiedeman syndrome, auditory neuropathy, and long history of CSOM underwent cochlear implantation. Oral cefdinir and topical ciprofloxacin (Floxin) were administered for two weeks of perioperative infection prophylaxis. Six weeks postoperatively, development of granulation tissue at the surgical site led to debridement and culture, demonstrating candida albicans. Implant hardware was removed and processed for scanning electron microscopy. **RESULTS:** A fungal biofilm on the

implant body and electrode array was found on ultrastructural analysis. **CONCLUSIONS:** Treatment of otitis media with antibiotics may contribute to selection of fungal species and may lead to the formation of a biofilm on the cochlear implant surface. Infection before the fibrous sealing of the cochleostomy allows extension along the electrode array. This complication requires removal of the device and puts the patient at risk for further spread of infection, including meningitis.

## 21. Medical Student Selection of Otolaryngology-Head and Neck Surgery as a Specialty: Influences and Attitudes

Judith M. Czaja McCaffrey, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to define factors that medical students perceive as influential in their decision to pursue otolaryngology and to discuss student perception of factors used in selection of resident physicians and individual student commitment to the matching process.

**OBJECTIVES:** 1) To determine factors that students perceive as influential in their decision to pursue otolaryngology; 2) to determine student perception of the importance of factors used in selection of resident physicians and individual student commitment to the matching process; 3) to identify medical student exposure to various subspecialties within otolaryngology; and 4) to study demographics of the applicant pool. **STUDY DESIGN:** Population survey. **METHODS:** A survey was administered to medical students applying for positions at a single university-based program in otolaryngology-head and neck surgery between 1999-2002. **RESULTS:** Ninety-six students were interviewed over a four-year period. Surveys were completed by 87 students (90%). The most and least common subspecialties to which the students were exposed were head and neck (97.7%) and laryngology (41%). Seventy-eight percent of students believed that the main factor influencing their decision to pursue otolaryngology was their rotation with and exposure to the resident physicians. In fact, 62% of students spent the majority (>50%) of their clinic and OR time with residents. Board scores and one-on-one interviews were considered most important factors in selection of interviewees and ranking process. Interestingly, over 20% of interviewed students believed that the match should not be early because they wanted more time to commit to ENT as a career. **CONCLUSIONS:** These data underscore the importance that resident physicians as teachers have in directing future students to our specialty. The result of the match survey may indicate a measurable attrition rate within residency programs that may be avoided if ENT were part of the "regular" match.

## 22. Cervical Heterotopic Salivary Tissue and Neoplasms: A 10 Year Experience

Elena Daniel, MD, Winston-Salem, NC

Frederick W. McGuirt, MD, Winston-Salem, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to recognize heterotopic salivary tissue in the periparotid and upper cervical lymph nodes as a more common occurrence than historically recognized. Participants should be able to include this in the differential diagnosis of an isolated neck mass and have an understanding of the management options.

**OBJECTIVES:** A review of salivary tumors arising from heterotopic salivary inclusions in the periparotid and cervical lymph nodal tissues over a 10 year span. **STUDY DESIGN:** A retrospective chart review. **METHODS:** A retrospective chart review revealed 13 patients with asymptomatic neck masses treated between 1990 and 2000, whose pathology demonstrated ectopic salivary tissue or neoplasms arising from ectopic salivary tissue. **RESULTS:** 3 cases of benign periparotid lymph node ectopic salivary tissue and 10 cases of salivary tumors were identified. Multinodal involvement of heterotopic tissue was seen in 3 patients, all of which were in the periparotid nodal system. The tumors were predominantly benign Warthin's tumor (5) and pleomorphic adenoma (1), and malignant mucoepidermoid tumors (3) and adenocarcinoma (1). These patients were treated with either a superficial parotidectomy, neck dissection or excision of the neck mass, and adjuvant radiation therapy in patients with high grade malignancies. Follow-up ranged from 1 month to 8 years. Nine patients are alive and disease free; 1 is deceased from unrelated causes. **CONCLUSIONS:** Heterotopic salivary tissue in periparotid and upper cervical nodes is probably a more common occurrence than historically recognized. Tumorigenic changes arising from such inclusions, although infrequent, should be considered in the differential diagnosis for isolated neck masses and parotid Warthin's tumor. Suggested management of these tumors, in addition to a thorough clinical exam, includes a salivary imaging survey for cervical malignant lesions with an appropriate neck dissection and/or radiation therapy as indicated. Benign lesions are adequately managed by cervical mass excision or parotidectomy.

## 23. Significance of Nasal Polyps in Chronic Rhinosinusitis: Symptoms and Surgical Outcomes

Robert T. Deal, MD, Augusta, GA

Stilianos E. Kountakis, MD PhD, Augusta, GA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: 1) understand the influence of polyps on symptoms of chronic rhinosinusitis; and 2) demonstrate the effect of polyps on CT scores in patients undergoing sinus surgery for chronic rhinosinusitis.

**OBJECTIVES:** To demonstrate the significance of nasal polyps on the symptoms of chronic rhinosinusitis and their influence on surgical outcomes. **STUDY DESIGN:** Retrospective review of prospectively collected data. **METHODS:** Retrospective data analysis comparing 2 groups of patients diagnosed with chronic rhinosinusitis with and without nasal polyps that underwent surgical management with a minimum 1-year follow-up period. Subjective scoring was performed using the SNOT-20 questionnaire. CT scans were compared using the Lund/Mackay scoring system. The 2 groups were analyzed for the need of revision surgery. **RESULTS:** Two-hundred-one patients underwent surgical management of chronic rhinosinusitis (CRS) over a 3-year period. One-hundred-four were male, 97 were female and the average age was 49 (range 18-80). Polyps were present in 78 patients with CRS while 123 patients did not have polyps. The average CT score was 18 for the polyp group and 9.5 for the patients without polyps ( $p=0.0000$ ). Non-polyp group SNOT-20 scores were 26.5 preoperatively with improvement to 5.1 at 6 months and 5.0 at 12 months postoperatively (85% improvement). Polyp group SNOT-20 preoperative scores averaged 32.2 with improvement to 9.2 at 6 months and 9.1 at 12 months postoperatively (81% improvement,  $p=0.003$ ). Nine patients required revision surgery (4.5%), 8 (10%) who had polyps and 1 who did not (0.8%,  $p=0.002$ ). **CONCLUSIONS:** The presence of nasal polyps has a significant negative impact on patients with CRS. Patients with nasal polyps have more severe symptoms with less improvement after operative intervention, higher CT scores at presentation, and a significantly higher need for revision surgery.

## 24. A Cadaveric Study of Anastomoses Between the Cervical Branch of the Facial Nerve and the Transverse Cervical Cutaneous Nerve

Michael A. Domet, MD+, Madison, WI

Nadine P. Connor, PhD, Madison, WI

Dennis M. Heisey, PhD, Madison, WI

Gregory K. Hartig, MD, Madison, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate likely locations of the anastomosis between the transverse cervical cutaneous nerve and the cervical branch of the facial nerve and understand the clinical significance of this communication.

**OBJECTIVES:** Head and neck surgeons must possess a thorough knowledge of cranial and cervical nerve anatomy to avoid inducing iatrogenic injury during surgery. Anastomoses of the cervical branch (CB) of the facial nerve and the transverse cervical cutaneous nerve (TCCN) are poorly documented in our field. Our objective was to improve understanding of facial nerve anatomy by describing these anastomoses. **STUDY DESIGN:** Prospective anatomical investigation. **METHODS:** The communicating branch between the TCCN and the CB was evaluated in 22 adult neck halves (11 cadavers). The facial nerve was exposed and the CB was traced anteriorly. The TCCN was identified and traced superiorly to its anastomosis(es) with the CB. The distance from each anastomosis to the selected landmarks was recorded. **RESULTS:** Between the CB and the TCCN, 33 anastomoses were identified, with at least 1 anastomosis per hemineck and 2 anastomoses in 11 heminecks. Anastomoses were identified along the inferior border of the submandibular gland (20 specimens) or posterior to the submandibular gland (12 specimens). Five specimens had both anastomoses near the inferior border of

the submandibular gland and 6 specimens had 1 anastomosis near the inferior border and 1 posterior to the submandibular gland. **CONCLUSIONS:** Communication between the TCCN and the CB is regularly present. Its anatomic locations are either posterior to the submandibular gland, often within the parenchyma of the parotid gland, or near the inferior border of the submandibular gland. Awareness of these anastomoses could assist in reducing inadvertent injury to the involved nerves during surgery.

## 25. **Dental Status and Quality of Life in Long-Term Head and Neck Cancer Survivors**

Rebecca L. Duke, MD+, Milwaukee, WI  
Bruce H. Campbell, MD\*, Milwaukee, WI  
A. Thomas Indresano, DMD, San Francisco, CA  
Anne M. Marbella, MS, Milwaukee, WI  
Katherine B. Myers, BSN, Milwaukee, WI  
Peter M. Layde, MD, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the problems with dental status of long-term head and neck cancer patients and explain the effects these have on their quality of life.

**OBJECTIVES:** To analyze the dental status of long-term head and neck cancer survivors in regards to their subjective quality of life. **STUDY DESIGN:** Observational case series. **METHODS:** A convenience sample of five year head and neck cancer survivors who underwent the following battery of tests: 1) a targeted head and neck exam, 2) an updated medical history, 3) dental evaluation, and 4) Quality of Life questionnaires including UWQOL, FACT, FACT-HN, and PSS-HN. **RESULTS:** Eighty-six survivors were included in the study. The following associations were identified: 1) lower Decayed/Missing/Filled scores were associated with worse pain, disfigurement, employment, chewing, swallowing, and speech, eating in public, intelligibility of speech, normalcy of diet and FACT-HN Additional Concerns scores; 2) decreased oral opening measurements were associated with worse chewing, swallowing, eating in public, normalcy of diet, FACT-HN Additional Concerns scores, and weight loss; 3) edentulous patients who did not use dentures had worse pain, activity, recreation, and eating in public scores; and 4) those who became edentulous secondary to cancer treatment and those without occlusion demonstrated worse pain, activity, recreation, chewing, swallowing, speech, physical, family, functional, eating in public, and normalcy of diet scores. **CONCLUSIONS:** Though previous studies have shown that many of the effects of cancer treatment disappear between one and three years, this study shows that the dental concerns persist in long-term survivors and impact their subjective quality of life. Persistent dental performance concerns continue to have measurable impact on five year head and neck cancer survivors.

## 26. **Foregut Duplication Cyst of the Hypopharynx**

John D. Edwards, MD, Washington, DC  
Susan Pearson, MD, Washington, DC  
George Zalzal, MD, Washington, DC  
Roma S. Chandra, MD, Washington, DC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the histopathology and pathogenesis of foregut duplication cysts in the head and neck as well as appropriate protocols for evaluation and treatment.

**OBJECTIVES:** Foregut duplication cysts are heterotopic rests of foregut-derived epithelium usually found in the abdomen and thorax but occur rarely in the head and neck. We describe the first case of a hypopharyngeal foregut duplication cyst containing both gastric and pancreatic tissue. **STUDY DESIGN:** Case report. **METHODS:** Review of a case that occurred at a tertiary care pediatric hospital. **RESULTS:** The patient was a neonate born with stridor and cyanosis requiring immediate intubation due to airway obstruction from a large hypopharyngeal mass. Magnetic resonance and computed tomography imaging were helpful in localization of the lesion. Direct laryngoscopy revealed a 4.5 by 2.5 cm mass in the hypopharynx originating 2mm above the esophageal inlet, which was excised. **CONCLUSIONS:** Foregut duplication cysts occur rarely in the head and neck yet should be considered in the differential diagnosis of pharyngeal masses in neonates. Complete surgical excision is the treatment of choice. A review of the literature and pathogenesis of foregut duplication cysts due to abnormal notochord development are discussed, including the Adriamycin induced animal model of foregut duplication cysts.

## 27. **A New Methodology for Measuring Quality of Life Outcomes in Prelingually Deafened Children That Use Manual Modes of Communication**

Robert L. Eller, MD+, Birmingham, AL  
Robert L. Baldwin, MD\*, Birmingham, AL  
J. Scott Magnuson, MD, Birmingham, AL  
Laura D. Brown, MD, Raleigh, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to apply a new method for outcomes research among patients who communicate primarily using manual language.

**OBJECTIVES:** Initial outcome measures for cochlear implantation were fundamentally audiological, but as indications broaden, quality of life measures are receiving increasing attention. We sought to develop a quality of life outcome measure for older deaf children, pre-teens, and teens that communicate manually. We felt it should be health related, reproducible, and simple. This research represents a pilot study of this methodology. **STUDY DESIGN:** Prospective case series and pilot study. **METHODS:** The Nijmegen Cochlear Implant survey (Hinderink, et. al) for postlingually deafened adults was modified with the assistance of a biostatistician, a certified translator for American Sign Language, and two professional deaf educators to enable better understanding by the targeted age groups living in a culture dominated by manual communication. The survey was then translated into American Sign Language (ASL), produced into a video, and presented to five prelingually deafened students at a residential school for the deaf. The students marked their answers to each question from a closed set of five possibilities. Results were analyzed for consistency within and across the categories of the Nijmegen survey and compared to each child's audiological performance with the implant to help judge the survey's accuracy across students. **RESULTS:** QOL results for each student paralleled outcomes from the literature for other students accessed using conventional methods. Student answers aligned with audiologic data and across sub-domains of the Nijmegen survey. **CONCLUSIONS:** Video-survey in ASL is a promising and effective method of ascertaining QOL data from younger deaf individuals who cannot reliably use another standardized method.

## 28. **Bilateral Middle Ear Myxoid Tumors: A Case Report and Literature Review**

Robert L. Eller, MD, Birmingham, AL  
Thomas L. Eby, MD\*, Birmingham, AL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to consider and recognize myxoid tumors in the middle ear and initiate appropriate diagnostics and referrals to evaluate for the potentially lethal associated disorders.

**OBJECTIVES:** We report the first case of bilateral middle ear myxoid lesions in a woman without other findings of Carney's complex. The clinical presentation, radiology and pathology of this unusual condition are described. **STUDY DESIGN:** Case report and review of the literature. **METHODS:** Case report and review of the literature. **RESULTS:** Myxomas involving the ear are rare, benign, soft tissue tumors usually found on the pinna or external ear. Isolated cases of primary and metastatic myxoma arising in the temporal bone exist in the literature, but middle ear origin has seldom been reported. Further, all reported cases of bilateral ear myxomata are associated with Carney's complex and involve the skin of the ear canal or pinna. Carney's complex is an autosomal dominant disorder characterized by variable combinations of rare conditions including myxomas, spotty skin pigmentation, and endocrine overactivity from specific hormone-producing tumors. **CONCLUSIONS:** Ear and temporal bone myxomas may allow early

diagnosis of primary cardiac myxoma or Carney's complex, thus eliminating the potentially lethal sequelae of these diseases.

**29. Diagnosis and Surgical Management of Nasopalatine Duct Cysts**

Kimberly A. Elliott, MD, Jackson, MS  
Christine B. Franzese, MD, Jackson, MS  
Karen T. Pitman, MD\*, Jackson, MS

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate understanding of the clinical presentation, radiographic and pathologic findings, as well as the surgical treatment of nasopalatine duct cysts.

**OBJECTIVES:** Nasopalatine duct cysts (NPDC) are the most common cystic lesion of nonodontogenic origin of the maxilla. The purpose of this study is to review the epidemiology and clinical presentation, to describe the radiographic and pathologic findings, and to discuss surgical management of this entity. **STUDY DESIGN:** Retrospective chart review of two cases of NPDC at a tertiary care institution with a review of the English medical literature from January 1960 to the present. **METHODS:** A 69 year old male presented with an asymptomatic swelling of the premaxilla and a 17 year old female presented with a painful swelling of the hard palate. A CT scan, fine needle aspiration, and preoperative workup were obtained in both cases. Literature was reviewed with respect to epidemiology, etiology, presentation, diagnostic studies, operative management, and recurrence rates. **RESULTS:** CT scan demonstrated midline ovoid cystic lesions in both cases. FNA of both lesions revealed no evidence of malignancy. Surgical treatment consisted of enucleation in the first case and marsupialization in the second case. Both patients did well with no evidence of recurrence. NPDC presents in the fourth to sixth decade with a male predilection. Recurrence rates range from 0-11%. **CONCLUSIONS:** NPDC occurs in approximately 1% of the population. Presentation may be asymptomatic or include swelling, pain, and drainage from the hard palate. A well-circumscribed radiolucency of round, ovoid, or heart shape is seen on CT. Pathological findings reveal squamous, respiratory, or a combination of these cell types infiltrated by inflammatory cells. Enucleation is the preferred treatment with low recurrence rates.

**30. Long-Term Hearing Results in Patients after Gentamicin Injections for Meniere's Disease**

Courtney W. Garrett, MD, Chicago, IL  
Alan G. Micco, MD, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the indications and treatment of intractable vertigo in patients with Meniere's disease.

**OBJECTIVES:** Intratympanic gentamicin injections have been shown to improve vertigo in people suffering from intractable vertigo related to Meniere's disease. **STUDY DESIGN:** This is a retrospective review looking at hearing in those patients that received intratympanic gentamicin injections and had at least a two year follow up. **METHODS:** Retrospectively charts were reviewed for patients who had received intratympanic gentamicin for intractable vertigo. Hearing was evaluated pre- and post-treatment. In addition symptoms, number of injections and ENG results were evaluated. **RESULTS:** Thirty-one charts were reviewed. Twenty-two had left ear involvement and nine had right ear involvement. The number of injections ranged from one to seven. All patients had initial resolution or improvement of vertigo. The most common complaint was that of dysequilibrium. Four of the thirty-one patients had deaf ears prior to gentamicin treatment. Hearing showed no change in 48%. Early results showed 39% of patients had worsening of hearing, but at two years only 22.5% of patients showed worsening of their hearing. Nine of the thirty-one had long-term improvement of hearing. **CONCLUSIONS:** Intratympanic injections are effective in improving patients with intractable Meniere's. Long-term follow up is needed to fully evaluate extent of hearing loss with intratympanic gentamicin. Gentamicin remains in cochlea for up to six months. Hearing loss may be related to nature of the disease.

**31. WITHDRAWN--Molecular Profiling of Squamous Cell Carcinoma of the Head and Neck: A Pilot Study**

Patricia A. Gilroy, MD, Danville, PA  
Robert K. Brown, MD, Danville, PA  
Phillip K. Pellitteri, DO\*, Danville, PA  
Amy L. Law, MD, Danville, PA  
Thomas L. Kennedy, MD\*, Danville, PA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify molecular protein markers which are expressed in head and neck squamous cell carcinoma.

**OBJECTIVES:** To investigate the expression of immunohistochemical markers in squamous cell carcinoma of the head and neck. From these preliminary results, a larger study may be directed at specific targeted immunohistochemical markers. **STUDY DESIGN:** Prospective trial of tissue selected from the pathologic archives from patients with proven squamous cell carcinoma of the tonsil. **METHODS:** The Tumor Registry was searched for 10 patients with the diagnosis of tonsillar squamous cell carcinoma. The pathology archives were searched for 10 age and sex matched control specimens from patients who underwent tonsillectomy for obstructive sleep apnea. The archived pathologic specimens were retrieved and prepared for immunohistochemical staining. The panel of markers to be tested consisted of twenty proteins from various points in the cell cycle, including cell cycle regulatory proteins, cell proliferation, signal transduction, genomic impact, and the apoptosis pathways. **RESULTS:** Final results are pending. Preliminary results have identified a signal transduction pathway marker which is expressed in 80% of the study specimens. **CONCLUSIONS:** Squamous cell carcinoma of the tonsil preferential expression of molecular markers over age and sex matched control tonsillar tissue.

**32. Bilateral Cystic Parotid Masses and a Hypopharyngeal Mass: An Unusual Presentation of Mucosa Associated Lymphoid Tissue (MALT) Lymphoma**

Michael B. Gluth, MD, Rochester, MN  
Paul J. Kurtin, MD, Rochester, MN  
Laura J. Orvidas, MD, Rochester, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to better recognize and address salivary gland MALT lymphoma. Furthermore, the participants will obtain a working knowledge of the differential diagnostic approach to cystic and/or bilateral parotid gland masses.

**OBJECTIVES:** MALT lymphoma is a low grade B cell lymphoma which was first described in gastric mucosa. Although known to present in the parotid gland, the presence of bilateral cystic masses is very unusual and associated hypopharyngeal involvement has not been described. We review a case which presented with involvement in both these areas and review recent developments in diagnosis and treatment. **STUDY DESIGN:** Case report and review of the literature. **METHODS:** Medical record, radiograph and pathologic review in a patient with MALT lymphoma. **RESULTS:** Our patient presented with a large painless facial swelling, but was otherwise asymptomatic. In particular, the patient lacked constitutional symptoms, cervical adenopathy, and facial nerve dysfunction. The patient did not have Sjogren's syndrome or an infection with human immunodeficiency virus (HIV). On axial-cut CT scan, the patient was noted to have bilateral cystic and mixed cystic/solid parotid gland masses. In the course of clinical work-up, a mass was discovered in the hypopharynx. Biopsy of this area provided the diagnosis of MALT lymphoma. Single-agent chemotherapy has been the primary treatment with a good initial response. **CONCLUSIONS:** MALT lymphoma is a non-Hodgkin's lymphoma of B-cell lineage known to occasionally originate from the salivary glands.

This disease entity should be considered as part of the differential diagnosis of cystic and/or bilateral parotid masses as well as hypopharyngeal lesions.

**33. Neuroendocrine Carcinoma of the Mandibular Foramen: A Minimally Invasive Endoscopic Approach to Excisional Biopsy**

John C. Goddard, BA, Richmond, VA  
Laurence J. DiNardo, MD\*, Richmond, VA  
Celeste N. Powers, MD PhD, Richmond, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe an endoscopic approach to a soft tissue lesion in the region of the pterygoid musculature and mandibular foramen. The participants should also be able to explain how to differentiate neuroendocrine carcinomas from similar lesions.

**OBJECTIVES:** Our objectives are to describe a rare case of neuroendocrine carcinoma in the region of the mandibular foramen and the use of a minimally invasive endoscopic approach to excisional biopsy. Furthermore, a brief description of how neuroendocrine carcinomas and similar lesions can be differentiated histopathologically and immunohistochemically will be provided. **STUDY DESIGN:** Retrospective case review. **METHODS:** Chart review and review of the current literature. **RESULTS:** We provide the first reported case of a neuroendocrine carcinoma, likely secondary to metastasis, in the region of the mandibular foramen and pterygoid musculature. We also describe a novel approach to the excisional biopsy of a lesion in this region. **CONCLUSIONS:** An endoscopic approach to the excisional biopsy of a soft tissue mass situated at the mandibular foramen may be a useful diagnostic technique. In this case, the minimally invasive approach allowed identification of a rare, neuroendocrine tumor.

**34. Post-Tonsillectomy Loss of Taste: A Significant Complication**

Michael R. Goins, MD, Winston-Salem, NC  
Dimitri Z. Pitovski, MD, Winston-Salem, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify loss of taste (ageusia) as a significant complication following tonsillectomy. Participants should be able to discuss the neurological pathways of taste and describe the possible mechanism of this complication. Participants will become familiar with methods of identifying taste disturbances.

**OBJECTIVES:** To identify loss of taste (ageusia) as a significant complication of tonsillectomy and describe the possible mechanism of this complication. **STUDY DESIGN:** Retrospective chart review. **METHODS:** This study is a retrospective chart review of patients referred with the chief complaint of loss of taste following tonsillectomy. All patients have undergone complete head and neck examinations, objective taste testing, and electrogustometry. A review of the literature and surgical anatomy was performed, and a possible mechanism for this complication is proposed. **RESULTS:** Six patients in a six month period have been referred with the chief complaint of loss of taste following routine tonsillectomy. All patients are adults with a predominance of females and each states their loss of taste occurred within two weeks post-tonsillectomy. Each patient has subjective and objective loss of taste following tonsillectomy without another identifiable cause, and all report a significant decline in their quality of life with three cases currently under litigation. From our experience it appears loss of taste following tonsillectomy is much more frequent than the literature reports. **CONCLUSIONS:** Ageusia is a rare but significant complication following tonsillectomy, and all patients should be informed of this risk prior to surgery.

**35. Malignant Odontogenic Tumors: A 22 Year Retrospective Study**

David Goldenberg, MD, Baltimore, MD  
Ralph Tufano, MD, Baltimore, MD (*Presenter*)  
James J. Sciubba, DMD PhD, Baltimore, MD  
Wayne M. Koch, MD\*, Baltimore, MD

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to better understand the diagnosis and management of these rare tumors.

**OBJECTIVES:** Malignant odontogenic tumors are exceedingly rare and arise from odontogenic epithelial residues and odontogenic cysts in the jawbones. Odontogenic malignancies have various origins: they may develop by malignant transformation of an ameloblastoma; some develop directly from the remnants of odontogenic epithelium left after completion of dental development; and some lesions may result from malignant transformation of benign odontogenic cyst. Malignant odontogenic tumors include malignant ameloblastomas, ameloblastic carcinomas, primary intraosseous carcinomas, clear cell odontogenic carcinomas, malignant calcifying epithelial odontogenic tumors, odontogenic ghost cell carcinomas (OGCC) as well as tumors of odontogenic mesenchyme origin. These lesions, with the exception of OGCC are usually locally aggressive and radical surgery is the primary mode of treatment. OGCC may at times follow an indolent course. **STUDY DESIGN:** Institutional retrospective study. **METHODS:** Twenty cases of suspected malignant odontogenic tumors were diagnosed in our institution between the years 1981-2002. All pathological slides were reviewed to reconfirm diagnosis. Malignancy was based on the following criteria: histological findings of infiltrative growth, atypical cytological features, focal necrosis or evidence of distant metastatic spread. Patient age, race, sex, treatment and outcome were recorded. **RESULTS:** Of the twenty suspected cases 8 were actually found to be malignant tumors. These consisted of 3 cases of malignant ameloblastomas, 2 cases of ameloblastic carcinoma, 1 case of malignant Pindborg tumor (calcifying epithelial odontogenic tumor), 1 case of OGCC and 1 case of SCC arising in a keratocyst. There were 7 men and one woman. Six patients were Caucasian, 1 was African-American and 2 were Asian. Five cases were located in the mandible and 3 cases in the maxilla. All cases were treated with radical surgical excision and surgical reconstruction. Two patients died of their disease. **CONCLUSIONS:** Malignant odontogenic tumors are rare and their diagnosis is not always straightforward. They require a multidisciplinary team to determine proper treatment. A pathologist with expertise in evaluating odontogenic neoplasms is essential to providing the proper diagnosis. This will help to determine the appropriate surgical intervention and postoperative care.

**36. Accident Risk and Prevention in Patients with Vertigo**

Jason M. Guillot, BS, Jackson, MS  
John M. Schweinfurth, MD, Jackson, MS

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the potential risk to vertiginous drivers for accidents and possible role of the otolaryngologist in evaluation and prevention.

**OBJECTIVES:** To assess accident risk associated with vertiginous disorders and prevalence of protocols for evaluating patient's driving ability. **STUDY DESIGN:** Nine question survey of practicing otologists. **METHODS:** A nine question survey was faxed to 487 otologists. Practitioners were asked if they had seen patients who had been involved in motor vehicle accidents (MVA) associated with vertiginous attacks, the number of these experiences, and the specific disorders involved. They were then asked about their assessment and recommendations to these patients regarding driving safety and the need for medical clearance or restrictions. **RESULTS:** Of 487 otologists contacted, 123 responses were recorded. With regards to experience with accidents, 64% were unaware of a vertigo related MVA. Of those who had obtained a history of vertigo associated MVA, 34% had 2 or fewer, 27% less than 5, 9% less than 10, and 27% over 10 patients. Diagnoses associated with MVA were distributed in frequency between Meniere's (27%), benign positional vertigo (BPPV, 27%), post-traumatic (34%), and central causes (11%). Eighty-four percent believed that vertigo placed drivers at risk for accidents. Of these, 60% believed patients required medical clearance, but only 28% routinely restricted vertiginous patients from driving. **CONCLUSIONS:** A substantial number of otologists have seen patients with a history of vertigo related MVA. Although the majority of practitioners surveyed believe vertigo may place drivers at risk for accidents, there is no consensus regarding the evaluation and management of patients who desire to continue driving. The development of guidelines may be useful in the assessment and

rehabilitation of patients with vertigo.

**37. Pharyngoesophageal Barotrauma: A Case Report of Firework Injury and Literature Review**

Christopher J. Hall, MD, Memphis, TN  
Aaron R. Morrison, BS, Memphis, TN  
Jerome W. Thompson, MD MBA, Memphis, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: 1) discuss firework injuries and their impact on society; and 2) discuss appropriate considerations and treatment of pharyngoesophageal injuries from plosive (barotrauma), caustic, thermal, and instrumental perforation.

**OBJECTIVES:** Present an interesting case of firework ingestion and discuss the multiple injuries that are encountered in management of this type of injury. **STUDY DESIGN:** A 16 year old male presented after a bottle rocket explosion in his oropharynx. The patient stated that one flew into his mouth and exploded in the back of his throat. He complained of vocal changes, odynophagia, dysphagia, but denied any respiratory difficulty. On physical exam he had no stridor or stertor. His voice was slightly muffled with a "hot potato" characteristic. His oxygen saturation was 97% on room air. The oral cavity and oropharyngeal exam revealed normal buccal mucosa but eschar of uvula, soft palate, and peritonsillar edema. There was powder tattooing of the posterior pharyngeal wall. Nasendoscopy and rigid endoscopy were performed which revealed a dusky area of the left piriform sinus; the probable site of perforation. A left neck exploration was performed with placement of a Penrose drains in the parapharyngeal and retropharyngeal spaces. The patient was started on IV clindamycin and piperacillin/tazobactam. The patient's airway was managed with intubation for a 4 day period. He was extubated on day 4 and continued to have purulent drainage from his neck until hospital day 12. A modified barium swallow on HD# 13 revealed no extravasation of contrast but mild aspiration. His drain was removed and antibiotics stopped on HD#14. The patient made a full recovery. **METHODS:** Case report and literature review. **RESULTS:** Successful management. **CONCLUSIONS:** Firework injuries have significant socioeconomic impact in this country: \$100 million and 10,000 injuries annually. Firework injury to the pharynx and esophagus can manifest through multiple mechanisms: barotrauma, caustic burn, thermal burn, and instrumental perforation.

**38. Creation of the Medialization Thyroplasty Window Using an Ultrasonic Surgical Aspiration Device**

Stacey L. Halum, MD+, Milwaukee, WI  
Nalin J. Patel, MD, Milwaukee, WI  
C. Blake Simpson, MD, San Antonio, TX  
Albert L. Merati, MD, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the potential advantages and disadvantages of using an ultrasonic surgical aspiration device for creation of the medialization thyroplasty window.

**OBJECTIVES:** To investigate the use of an ultrasonic surgical aspirator for creation of the laryngeal cartilage window during medialization thyroplasty. **STUDY DESIGN:** Basic science. **METHODS:** Forty thyroplasty windows were made in fresh, unpreserved cadaver larynges. A 6x13mm rectangular window and a 4mm diameter round window were created on each side of the larynges in symmetric fashion. A standard surgical drill with a 3mm cutting burr was used on one side; the ultrasonic surgical aspirator was used on the contralateral side. The time required for window construction was recorded, as was the status of the inner perichondrium at window completion. **RESULTS:** For creation of the 6x13mm window, a mean time of 128 seconds was required using a standard surgical drill. The mean time using the ultrasonic aspirator device was 91 seconds for the same size window (p=0.03). For the 4mm round window, drilling completed the task in a mean time of 63 seconds, compared to 40 seconds (p=0.15) for the ultrasonic aspirator. In the 6x13mm drill group, there were 4/10 perichondrial violations, compared to 0/10 using the ultrasonic aspirator for the same size window (p=0.04). The 4mm round window group had no perichondrial violations with the standard drill and only 1/10 in the ultrasonic aspirator group (p=0.50). **CONCLUSIONS:** The current study suggests that the ultrasonic surgical aspirator device may be an effective and efficient alternative to the standard drill for medialization thyroplasty window creation. Prospective clinical trials are warranted to better characterize its applicability.

**39. New Fixation Technique for Cochlear Implantation**

David S. Haynes, MD, Nashville, TN  
Sean O. McMenomey, MD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe a new technique for fixation of cochlear implant devices that is both time saving and effective.

**OBJECTIVES:** To describe a new technique for fixation of cochlear implant devices that is both time saving and effective. **STUDY DESIGN:** Retrospective review. **METHODS:** Patients: All patients undergoing cochlear implant between 1999-2003 were evaluated for this fixation method. **RESULTS:** Main outcome means: Fixation of cochlear implants is felt by most to be required to prevent device migration and subsequent movement related problems. Fixation with a dacron mesh (Surgipro mesh vs. surgical and self drilling, self tapping screws (Synthes)) has been found to be cost effective due to significant O.R. time savings. Over 200 cases utilizing this fixation method will be reviewed. Device fixation, postop infection and cost effectiveness will all be reviewed. **CONCLUSIONS:** This has been found to be a quick, reliable, cost effective method for securing cochlear implants that we have found to be a superior method to those previously described.

**40. Pachydermia as an Indicator of Active Laryngopharyngeal Reflux**

Robert K. Hill, MD, San Antonio, TX  
Nicole L. Larson, MD, Carrollton, TX  
Charles B. Simpson, MD, San Antonio, TX

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the reliability of pachydermia as an indicator of active laryngopharyngeal reflux.

**OBJECTIVES:** To determine whether pachydermia alone is an accurate indicator of active laryngopharyngeal reflux (LPR) after long-term BID proton-pump inhibitor therapy. We hypothesized that there would be no statistical difference between the grade of pachydermia found at time of diagnosis to that found after long-term treatment. **STUDY DESIGN:** Retrospective chart review. **METHODS:** Patients who were diagnosed with LPR between 1999-2001 (based on pH probe and/or clinical and physical findings) who were compliant with their medical regimen were chosen for the study. A total of 17 patients were identified who met the necessary criteria. Photo-documentation of the larynx was obtained at initial presentation and after long-term therapy (mean 2.2 years). Three blinded otolaryngologists then graded the severity of pachydermia on two separate occasions using the Wake Forest Reflux Finding Score for pachydermia. Intra-grader correlations as well as a paired t-test of data sets were then calculated. **RESULTS:** There was no statistical difference (p>.05) in degree of pachydermia between the pre-treatment and long-term follow-up evaluations despite an overall subjective improvement in all 17 subjects. **CONCLUSIONS:** Pachydermia as an isolated finding appears to be unreliable in determining the presence of active laryngopharyngeal reflux.

**41. Laryngopharyngeal Reflux in a Health Care System**

Vu T. Ho, MD, Minneapolis, MN  
Sraddha P. Helfrich, BA BS, Minneapolis, MN  
Frank G. Ondrey, MD, Minneapolis, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the incidence of laryngopharyngeal reflux and understand the common clinical criteria useful for its diagnosis and treatment.

**OBJECTIVES:** 1) To study the incidence of laryngopharyngeal reflux (LPR) in a general otolaryngology referral practice of a large health care system; 2) to examine the clinical signs and symptoms for diagnosing LPR; and 3) to evaluate the efficacy of proton pump inhibitors (PPI) for LPR treatment. **STUDY DESIGN:** Retrospective chart review of patients seen in a general otolaryngology referral practice of a large health care system from January to July 2003. **METHODS:** A retrospective review of 1275 patient visits were examined for the number of patients seen for a new diagnosis of LPR as well as those seen in follow-up. Clinical histories for LPR were taken as well as comprehensive otolaryngology exam, including flexible direct laryngoscopy in all cases. Patients with signs or symptoms of LPR, as identified by the American Broncho-Esophagological Association (ABEA), were treated with a PPI for 6 weeks. **RESULTS:** A total of fifty-six (56) patients were seen with LPR for an incidence of 4.4% of patient visits over a 6 month period. Of these, thirty-four (34) presented as newly diagnosed LPR patients for an incidence of 2.8%. For the patients with available follow-up information, 95.8% (23/24) reported improvement after a 6 week course of a PPI. Common ABEA signs or symptoms included throat-clearing, globus, change in voice quality, arytenoid erythema, and arytenoid edema. **CONCLUSIONS:** We conclude that approximately 3% of general otolaryngology referrals in a health care system may be secondary to LPR. We also conclude that flexible direct laryngoscopy greatly augments the ability to diagnose LPR clinically. Additionally, a 6 week successful empiric trial of a PPI is an effective means of confirming a diagnosis of LPR.

#### 42. Petrified Auricles: A Case Study

Michael A. Hoffmann, MD, Washington, DC  
Brian McKinnon, MD, Washington, DC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify petrified auricles and know the conditions that are often associated with their manifestation.

**OBJECTIVES:** Describe the case study of a patient with petrified auricles including presentation, physical exam, labs, and histology along with a review of the literature of petrified auricles. **STUDY DESIGN:** Case study. **METHODS:** Literature review/case study. **RESULTS:** Petrified auricles may be associated with multiple other findings or be idiopathic. **CONCLUSIONS:** Petrified auricles have been classically described in association with local trauma or systemic diseases. In this patient no associated factors could be found to account for the petrified auricles.

#### 43. Manifestations of Trigeminal Neuralgia Following Tonsillectomy in the Pediatric Population

Karin S. Hotchkiss, MD, Tampa, FL  
Peter W. Orobello, MD, St. Petersburg, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate an understanding of current theories of causation for trigeminal neuralgia. Strategies for management of symptoms with medical and surgical intervention are discussed.

**OBJECTIVES:** To review the incidence and causation of trigeminal neuralgia that manifests in the postoperative pediatric patient. **STUDY DESIGN:** Case report. **METHODS:** Retrospective review. **RESULTS:** Though etiology of trigeminal neuralgia is widely unknown and diagnosis is often based on clinical history and physical exam, authors have shown a relationship between secondary etiologies such as tumor or dental trauma, while others have indicated a vascular compressive etiology relieved with surgical ligation. We explore a possible viral etiology managed with medical intervention. **CONCLUSIONS:** We report the first case of trigeminal neuralgia to develop in the pediatric postoperative setting and discuss a possible viral etiology.

#### 44. Image Guided Surgery for Osteoplastic Frontal Sinusotomy

William P. Innis, BS, Baltimore, MD  
Patrick J. Byrne, MD, Baltimore, MD  
Ralph P. Tufano, MD, Baltimore, MD

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the options for defining frontal sinus anatomy for creation of an osteoplastic flap. They should be able to explain the benefits of image-guided surgery. They should also be able to describe how image-guided surgery is used to define frontal sinus anatomy and assist during osteoplastic frontal sinusotomy.

**OBJECTIVES:** Present our experience with image-guided surgery as a method to safely assist during osteoplastic frontal sinusotomy while allowing excellent access to the frontal sinus. The two most common methods used to elucidate frontal sinus anatomy for osteoplastic flap creation are the use of a template from a 6-foot Caldwell radiograph and transillumination. Computer-aided surgery may offer a safe and accurate alternative to these techniques in selected cases. In 1994, an early device used for computer-aided surgery allowed for accurate entry into the frontal sinus but several disadvantages were noted. With nearly a decade of technological improvements, infrared and electromagnetic systems have eliminated many of these disadvantages and are now used in a variety of head and neck procedures. **STUDY DESIGN:** Observational study. **METHODS:** We describe the use of an infrared image guidance system, the LandmarX Evolution(TM) manufactured by Medtronic Xomed, Jacksonville, Florida, for osteoplastic frontal sinusotomy (OFS) in two cases requiring open exposure of the frontal sinus. **RESULTS:** The LandmarX Evolution(TM) allowed for accurate placement of the osteoplastic flap in both cases. The exposure provided allowed for successful treatment of both a frontal sinus osteoma and recurrent inverted papilloma. **CONCLUSIONS:** We found this system to be practical and user friendly while allowing for safe and accurate entry into the frontal sinus. Image-guided surgery should be considered for select cases (i.e. opacification, altered anatomy, and recurrent disease) where performing an osteoplastic flap by standard techniques may increase the complication rate.

#### 45. Squamous Cell Carcinoma of the Nasal Septum: A Case Series and Review of the Literature

William P. Innis, BS, Baltimore, MD  
Ralph P. Tufano, MD, Baltimore, MD  
Patrick J. Byrne, MD, Baltimore, MD

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the debate over the proper mode of treatment of squamous cell carcinomas of the nasal septum. They should be able to explain the importance of a standardized method of staging and of reporting this rare tumor.

**OBJECTIVES:** Review the published literature on squamous cell carcinomas of the nasal septum. Present the 11 cases treated at our institution over the last 21 years. Propose a method of staging this tumor. **STUDY DESIGN:** Retrospective case review. **METHODS:** The pathology database at our institution was searched for all cases of squamous cell carcinoma of the nasal septum. Patient records were used to confirm that the lesion was primary to the septum. Information regarding gender, age, presenting symptoms and signs, exposure to risk factors, tumor stage, treatment, recurrence, method of reconstruction, and survival were extracted. **RESULTS:** There were 6 female and 5 male patients with squamous cell carcinoma of the nasal septum ranging in age from 33 to 69 years. 2 patients presented with T1N0. 9 patients presented with T2N0, 2 of which arose within inverted papilloma. 100% of patients are alive with a follow-up ranging from 1 to 176 months. Reconstruction was performed during the initial resection for 9 of the patients. For 2 of the patients, reconstruction was delayed 1 year to allow for radiation treatment and surveillance. **CONCLUSIONS:** There are a total of 250 cases of this lesion reported worldwide. Past attempts to compare rates of survival with tumor stage and mode of treatment had an insufficient quantity of patients to show significant differences in survival. We advocate all future reports of squamous cell carcinoma of the nasal septum report patient data in a manner that allows for future analysis, and we advocate

the use of a standardized system for staging these tumors.

- 46. SECOND PRIZE - PAUL HOLINGER RESIDENT RESEARCH AWARD**  
**Temporal Bone Fractures: Traditional Classification and Clinical Relevance**  
Stacey L. Ishman, MD+, Milwaukee, WI  
David R. Friedland, MD PhD, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: 1) understand both the traditional and petrous versus non-petrous nomenclature for temporal bone fracture classification; and 2) compare the clinical correlation between temporal bone classification systems and clinical outcomes in patients with temporal bone fractures including facial nerve weakness, cerebrospinal fluid leakage and both conductive and sensorineural hearing loss.

**OBJECTIVES:** To correlate traditional radiographic descriptions of temporal bone fractures with clinical presentation and propose an alternative classification scheme more closely reflecting clinical issues. **STUDY DESIGN:** Retrospective consecutive case series. **METHODS:** Charts and computed tomography scans of 198 patients with radiographically diagnosed temporal bone fractures at a level I trauma center were reviewed. Fracture types were correlated with clinical presentation and outcomes. **RESULTS:** The traditional fracture classification scheme (i.e., longitudinal, transverse or mixed) correlated poorly with clinical findings such as facial nerve weakness and cerebrospinal fluid (CSF) leakage. It also had limited utility in predicting conductive hearing loss (CHL) and sensorineural hearing loss (SNHL). An alternative schema distinguishing petrous from non-petrous involvement demonstrated better correlation with respect to the incidence of these measures. For example, while CSF leak was 3.5 times more common in transverse than longitudinal fractures it was 10 times more prevalent in petrous than non-petrous fractures. Similarly, facial nerve weakness, classically associated with transverse fractures, was 2.1 times more common than in longitudinal fractures but had a 3.5-fold difference using the petrous versus non-petrous nomenclature. CHL occurred 1.4 times more often in longitudinal versus transverse fractures but was 2.2 times more common with our "middle-ear" subcategory of non-petrous fractures. Interestingly, SNHL loss did not correlate with the transverse fracture classification but was 1.5 times more prevalent in petrous versus non-petrous fractures. **CONCLUSIONS:** Better correlation between radiographic fracture patterns and clinical presentation is achieved by distinguishing petrous from non-petrous involvement. This classification can better focus clinical resources and attention toward more likely sequelae.

- 47. Laryngeal Melanosis**  
Ashok A. Jagasia, MD, Chicago, IL  
Jeannie Linton, BS, Chicago, IL  
David D. Caldarelli, MD\*, Chicago, IL  
Paolo Gattuso, MD, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the clinical significance of laryngeal melanosis.

**OBJECTIVES:** Laryngeal melanosis is an uncommon clinical entity defined by the presence of melanocytes within the mucosal lining of the larynx. 17 cases of laryngeal melanosis have been published to date. We report 2 additional cases of laryngeal melanosis and discuss the clinical significance of this condition. **STUDY DESIGN:** 1097 laryngeal biopsies were performed at a medical center between 1990 and July 2003. 2 cases (0.18%) were diagnosed as laryngeal melanosis. **METHODS:** Laryngeal biopsies underwent a histochemical analysis using Masson-Fontana method and immunohistochemical studies with S-100 and HMB-45 antibodies to confirm the melanocytic nature of the cells of interest. **RESULTS:** Both patients were female, ages 42 and 60, with a history of cigarette smoking and hoarseness as the presenting symptom. Laryngoscopy showed diffuse laryngeal mucosal hyperpigmentation with histologic sections demonstrating melanin pigment deposits as well as melanocytes scattered throughout the mucosal thickness in both patients. One of the patients had an associated granular cell tumor of the larynx. **CONCLUSIONS:** Laryngeal melanosis is a rare clinical condition. However, its recognition is important given the association between tobacco use, laryngeal melanosis and possible subsequent development of laryngeal neoplasms. Patients diagnosed with melanosis of the larynx should be followed closely with regular laryngeal biopsies to monitor for the appearance of neoplastic changes.

- 48. Total Intravenous Anesthesia (TIVA): Anesthesia of Choice for Pediatric Airway Endoscopy**  
Loren M. Jones, MD, Lackland AFB, TX  
Daniel M. Roke, MD, San Antonio, TX  
Eric A. Mair, MD, San Antonio, TX

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the advantages offered by a total intravenous anesthesia technique to the otolaryngologist performing pediatric airway endoscopy.

**OBJECTIVES:** Diagnostic and therapeutic endoscopy of the compromised pediatric airway is a difficult endeavor. Success requires the closely coordinated efforts of experienced anesthesiologists and otolaryngologists. Recent advances in techniques and pharmacology have allowed optimization of safe methods for pediatric airway evaluation. We summarize the evolution of anesthesia technique for evaluation of the pediatric airway. Emphasis is placed on the advantages of total intravenous anesthesia (TIVA) with spontaneous respiration using propofol (alkylphenol sedative-hypnotic) and remifentanyl (ultra short opioid agonist). **STUDY DESIGN:** Technique description with case series. **METHODS:** The experience of an extended 15 year tertiary care hospital based clinical pediatric otolaryngology practice is used to detail the advancement of pediatric airway anesthesia from an apneic technique with paralysis, jet ventilation, and spontaneous ventilation with laryngoscopic anesthetic gas insufflation to TIVA with spontaneous respiration using propofol and remifentanyl. Specifics of this technique are detailed. **RESULTS:** TIVA with spontaneous respiration using infusion of propofol and remifentanyl offers distinct advantages over other anesthesia techniques for endoscopy of the pediatric airway. These advantages include avoidance of risk of malignant hyperthermia, no traumatic repeated intubations, elimination of risk of jet ventilation barotrauma, no scavenging of anesthetic gases in the operating room, steady depth of anesthesia not attainable with volatile agent techniques, and provision of a quick controlled emergence from anesthesia. **CONCLUSIONS:** TIVA offers benefits for the pediatric airway that are not available with other commonly used modalities and merits consideration by otolaryngologists and anesthesiologists for pediatric airway procedures.

- 49. Electrocochleography in the Meniere's Patient**  
Harold H. Kim, MD, Hinsdale, IL  
Arvind Kumar, MD FRCS\*, Hinsdale, IL  
Robert A. Battista, MD FACS, Hinsdale, IL  
Richard J. Wiet, MD\*, Hinsdale, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the role of electrocochleography in the evaluation of the patient with suspected Meniere's disease and its correlation with the 1995 American Academy of Otolaryngology/Head & Neck Surgery Committee of Hearing and Equilibrium guidelines in the classification of Meniere's disease.

**OBJECTIVES:** To determine whether there is a correlation between electrocochleography (EcoG) results and the 1995 American Academy of Otolaryngology/Head and Neck Surgery Committee on Hearing and Equilibrium (AAO-HNS) classification of Meniere's disease (MD) in the evaluation of patients for Meniere's disease. **STUDY DESIGN:** Retrospective case review. **METHODS:** Patients undergoing EcoG for MD between 1995-2003 were identified and segregated into those with "definite", "probable", and "possible" MD according to the 1995 AAO-HNS guidelines for MD classification. Those determined to have "probable" and "possible" MD were then combined to form a "less than definite" group for statistical analysis. EcoG summing potential (SP)/action potential (AP) ratios were determined and ratios greater than 0.4 were considered abnor-

mal. The 2 groups were then compared to assess for any correlation between EcoG with the 1995 AAO-HNS MD disease classification. **RESULTS:** Sixty patients with “definite” MD and 37 with “less than definite” MD were identified. Overall 59.8% had abnormally elevated SP/AP ratios. Of those with “definite” MD, 66.7% had abnormally elevated SP/AP ratios while 52.7% of those with “less than definite” MD had abnormal EcoG’s (p=0.069). **CONCLUSIONS:** A significant difference in EcoG results was not seen between the “definite” and “less than definite” MD groups. Furthermore, approximately 30% of those with “definite” MD would not be classified as having MD based on EcoG results. Due to its lack of sensitivity, EcoG should not play a decisive role in determine the presence or absence of MD.

#### 50. **Deep Plane Facelift Approach for Excision of Benign Tumors of the Anterior Parotid Gland**

Timothy A. King, MD, Minneapolis, MN  
Thomas C. Christenson, BS, Minneapolis, MN  
Peter A. Hilger, MD, Minneapolis, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the sub-SMAS (deep plane) approach to benign anterior parotid gland lesions.

**OBJECTIVES:** To determine the safety and efficacy of the sub-SMAS deep plane facelift approach for excision of benign lesions of an accessory lobe or anterior parotid gland. **STUDY DESIGN:** Retrospective chart review. **METHODS:** Three patients underwent preoperative fine needle aspiration (FNA) of anterior parotid lesions with final cytology consistent with pleomorphic adenoma. Excision was performed as follows: a modified preauricular facelift incision was made. Subcutaneous dissection was performed 1 cm anterior to the tragus. The superficial musculoaponeurotic system (SMAS) was incised vertically from the angle of the mandible to just inferior to the root of the auricular helix. Sub-SMAS dissection was then performed anteriorly, superficial to the parotid gland. At the anterior border of the parotid gland the branches of the facial nerve were carefully dissected where appropriate and preserved from injury. The parotid lesion was removed in total for all patients with a cuff of normal salivary gland tissue. Frozen section and final pathology confirmed the preoperative FNA. **RESULTS:** The three patients’ average age was 46.5 years at time of surgery. There were no immediate or delayed facial nerve injuries. Final pathology confirmed complete excision and diagnosis of pleomorphic adenoma for all patients. The average tumor size was 2.2 cm (range: 1.6 to 2.8 cm). There have been no recurrences at mean follow-up of 2.9 years (range: 3 months to 5.2 years). **CONCLUSIONS:** The sub-SMAS deep plane facelift approach for the excision of benign anterior parotid gland lesions is a safe alternative to the traditional superficial parotidectomy with no recurrences or increased risk to the facial nerve.

#### 51. **Hemophilia B and Free Tissue Transfer: Medical and Surgical Management**

Philip D. Knott, MD, Cleveland, OH  
Samir S. Khariwala, MD, Cleveland, OH  
Joseph P. Minarchek, MD, Columbus, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to thoroughly understand the genetics of hemophilia A and B. They should be able to discuss the recent successes of gene therapy, as well as the advances made in factor replacement therapy. The reader should also become well versed in the controversies regarding inhibitor development and the medical management of hemophilia in the setting of free tissue transfer.

**OBJECTIVES:** The hemophilias are inherited bleeding disorders caused by low concentrations of specific coagulation factors (VIII and IX). The objectives of this presentation are to highlight the significant improvements made in the past decade in the clinical management of this disease, as well as to review for the first time in the literature the specific management dilemmas encountered in hemophiliacs undergoing free tissue transfer. **STUDY DESIGN:** Case report and literature review. **METHODS:** The case of a male with hemophilia B (Christmas Disease) undergoing latissimus dorsi free flap reconstruction is presented with a review of the current surgical and medical management of hemophilia. **RESULTS:** Perioperative hemostasis was maintained with twice daily infusions of recombinant factor IX (Benefix®). Pre-transfusion factor levels were carefully monitored. Anti-platelet therapy was begun on the day of surgery and continued thereafter. Factor replacement was discontinued on post-operative day #5. The patient’s graft is healthy and well perfused 3 months after surgery, and he has not suffered any hemorrhagic events. **CONCLUSIONS:** Hemophilia is a rare, X-linked bleeding diathesis, which may present with life-threatening hemorrhage. Patients suffer from failure of secondary hemostasis. Patients with severe hemophilia (baseline factor concentrations less than 1% of normal) require prophylactic, specific factor replacement. All cases of hemophilia require factor infusion in anticipation of large hemorrhage in the setting of major surgery. Gene therapy is currently offering hope for long-term cure. In the setting of free tissue transfer, perioperative recombinant factor replacement is recommended, in combination with long-term anti-platelet therapy.

#### 52. **Non-Surgical Management of an Adult with an Acute Prevertebral Fluid Collection**

Todd A. Kupferman, MD, Shreveport, LA  
Clifford H. Rice, MD, Shreveport, LA  
Linda Gage-White, MD, Shreveport, LA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate on CT scan or x-ray the pathognomonic calcification associated with acute calcific tendinitis of the longus colli muscle. In addition, they should be able to discuss the management of this condition.

**OBJECTIVES:** To describe the typical presentation, laboratory findings, pathognomonic radiological findings, and appropriate management of acute calcific tendinitis of the longus colli muscle. **STUDY DESIGN:** A single case report. **METHODS:** A retrospective chart review of one patient with calcific tendinitis of the longus colli muscle and a medical literature review covering the last 50 years. **RESULTS:** Less than 40 cases of acute calcific tendinitis of the longus colli muscle have been reported. Ages range from 21 to 81 years old without male or female predilection. Patients present with a several day history of neck pain or stiffness, odynophagia or dysphagia, occasional fever, and relatively normal physical exam as our patient did. Blood and throat cultures are negative but there is usually a mild leukocytosis or elevated erythrocyte sedimentation rate (ESR). Our patient’s ESR was normal but the C-reactive protein (C-RP) was elevated. Contrast enhanced computed tomography scan and lateral soft tissue x-ray of the neck revealed the pathognomonic prevertebral amorphous calcification and an associated non-ring enhancing fluid collection. Our patient’s symptoms quickly responded to non-steroidal anti-inflammatory drugs (NSAIDs) and his leukocytosis and C-RP normalized. **CONCLUSIONS:** Calcific tendinitis of the longus colli muscle is a rare but recognizable entity that should be considered in the differential diagnosis of adults with prevertebral or retropharyngeal fluid collections. These patients can be managed appropriately with NSAIDs rather than with incision and drainage. As far as we know, we are the first to report the use of C-RP as a marker of inflammation in this condition.

#### 53. **Blastomycosis of the Parotid Gland: A Case Report and Review of Literature**

Shashidhar Kusuma, MD, Nashville, TN  
Ontario Lau, MD, Nashville, TN  
Brian B. Burkey, MD, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to diagnose blastomycosis of the parotid gland, discuss its etiology, obtain appropriate imaging and histologic studies and provide appropriate treatment for the disease.

**OBJECTIVES:** Blastomycosis is caused by blastomyces dermatitidis, a fungus endemic in the soil of the Ohio and Mississippi river valleys. It presents predominantly as a pulmonary infection. Dissemination to the skin is the most common extrapulmonary site of involvement. The larynx and the sinonasal regions are the most common head and neck sites of involvement. Blastomycosis of the parotid gland or other salivary glands is extremely rare. **STUDY DESIGN:** A retrospective chart review. **METHODS:** A retrospective chart review was conducted of a patient who presented with a right cheek and parotid mass diagnosed as blastomycosis of the parotid gland. **RESULTS:** A fifty five

year old Hispanic male without any significant medical history presented with a six month history of a gradually enlarging right parotid mass. Multiple fine needle aspirates were nondiagnostic. An MRI scan showed diffuse inflammation of the right parotid gland, with inflammatory changes of the overlying skin. An open biopsy of the parotid mass revealed broad based budding yeast and pseudo-epithelial hyperplasia consistent with a diagnosis of blastomycosis. The patient was successfully treated with itraconazole. **CONCLUSIONS:** We present a case of blastomycosis of the parotid gland which is extremely rare. Extensive literature search revealed only two other case reports. Due to the rarity of this lesion in the parotid gland, a high index of suspicion must be maintained to avoid misdiagnosis and inappropriate surgical treatment. The disease can be successfully treated with antifungal agents.

**54. Disequilibrium Following Cochlear Implantation Secondary to a Perilymphatic Fistula**

Shashidhar Kusuma, MD+, Nashville, TN

Steve Liou, MD, Nashville, TN

David S. Haynes, MD, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to include perilymphatic fistula as a cause of vertigo following cochlear implantation. They will be able to diagnose it and advocate appropriate treatment.

**OBJECTIVES:** Cochlear implantation has become a common tool for the auditory rehabilitation of the profoundly hearing impaired. Sequelae of cochlear implants range from major complications such as flap necrosis, meningitis and device failure to minor complications such as alterations in taste and transient disequilibrium. Disequilibrium and vertigo following cochlear implantation can range from 13%-50%. Most of these patients report resolution of symptoms with medical therapy and vestibular rehabilitation. We present a case of intractable disequilibrium following cochlear implantation. This patient had diagnostic evidence of a perilymphatic fistula, with immediate and complete resolution of symptoms after fistula repair. **STUDY DESIGN:** A retrospective chart review and review of literature. **METHODS:** A retrospective chart review of patients with intractable vertigo following cochlear implantation despite maximal medical and rehabilitation therapy. **RESULTS:** Diagnostic workup included a CT scan which revealed air in the right vestibule. After five months of conservative therapy, the patient was taken to the operating room for middle ear exploration and repair of the perilymphatic fistula. The patient reported immediate and complete resolution of vertigo post-operatively. **CONCLUSIONS:** We present a case of persistent disequilibrium as a result of a perilymphatic fistula following cochlear implantation that was refractory to maximal medical therapy and vestibular rehabilitation. In such cases, appropriate workup should include a temporal bone CT scan to look for air in the vestibule or other abnormalities which may indicate potential etiology. If conservative therapy fails, middle ear exploration via an exploratory tympanotomy with packing of the cochleostomy with periosteum and muscle is safe and may lead to resolution of symptoms.

**55. Tracheal Agenesis in Newborns**

Timothy A. Lander, MD, Minneapolis, MN

James D. Sidman, MD\*, Minneapolis, MN

Ellen B. Bendel-Stenzel, MD, Minneapolis, MN

Galen S. Shauer, MD, Minneapolis, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate the methods of diagnosis and the embryology of congenital tracheal agenesis.

**OBJECTIVES:** To describe a series of newborns with tracheal agenesis. The preferred methods of diagnosis and description of the clinical course will be presented. **STUDY DESIGN:** This is a retrospective study of a clinical series of referred patients from 1999-2003. **METHODS:** Chart review for clinical course and pathology specimens were done on all cases. Four patients were identified with tracheal agenesis. **RESULTS:** All four newborns died within 48 hours. All of the children underwent emergency laryngoscopy and neck exploration, and one underwent esophagoscopy. Gross and microscopic pathology was accomplished on all patients. **CONCLUSIONS:** Although tracheal agenesis is rare in the medical literature, it appears more common than previously thought. The diagnosis is not straightforward, and the prognosis is grim. The embryology of the trachea and the foregut is closely related and related birth defects are common.

**56. Subglottic Stenosis and Skeletal Dysplasias: An Illustrative Case and Review of the Literature**

Jonathan H. Lee, MD, Rochester, MN

Dana M. Thompson, MD, Rochester, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the importance of identifying, evaluating and treating airway complaints in patients with skeletal dysplasias.

**OBJECTIVES:** Acromicric dysplasia is a rare skeletal dysplasia first described in 1986. While characteristic findings include short stature, mild facial dysmorphism, short hands and feet, and radiographic findings of the hands and femoral heads, a significant number of these patients have also been noted to have disease processes of the ear, nose and throat systems. The purpose of this presentation is to report a case of acromicric dysplasia with significant airway stenosis necessitating surgical intervention, and to review the literature of ear, nose and throat manifestations of skeletal dysplasias similar to acromicric dysplasia. **STUDY DESIGN:** Retrospective chart review and literature review. **METHODS:** A case report of an 11 month old female with acromicric dysplasia who presented with biphasic stridor and tachypnea. Diagnostic endoscopy revealed a grade III subglottic stenosis. Single-stage laryngotracheoplasty with anterior autologous costal cartilage graft and posterior cricoid split was performed at age 13 months. **RESULTS:** The patient's early postoperative course was complicated by systemic inflammatory response syndrome and a failed trial of extubation on postoperative day 12. The patient was, however, successfully extubated on postoperative day 26 and was subsequently noted to have a dramatically improved airway. **CONCLUSIONS:** Formal otolaryngologic evaluation of patients with acromicric dysplasia and obstructive airway symptoms is warranted for definitive diagnosis and treatment. Given literature reports of airway symptoms in patients with skeletal dysplasias similar to acromicric dysplasia, this recommendation should be extended to include this broader patient population as well.

**57. Tumors of the Accessory Lobe of the Parotid: A Ten Year Experience**

Derrick T. Lin, MD, Nashville, TN

George L. Coppit, MD, Nashville, TN

Brian B. Burkey, MD, Nashville, TN

James L. Netterville, MD\*, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to recognize the presentation, evaluation, and treatment of tumors of the accessory lobe of the parotid.

**OBJECTIVES:** To review our experience with the management of tumors of the accessory lobe of the parotid, as well as a review of the literature. **STUDY DESIGN:** Retrospective chart review. **METHODS:** Review of records from our institution were reviewed for the past ten years. Patients with accessory lobe parotid tumors were identified. The presentation, evaluation, management, treatment, and outcome of these lesions were recorded. **RESULTS:** Five cases of accessory lobe parotid tumors were identified. Most presented as slowly growing cheek masses, just anterior to the parotid gland. Two cases were carcinoma expleomorphic, while the other three cases were benign. A standard facelift approach or Blair incision was used to approach these tumors. The parotid duct was saved in the majority of the cases. **CONCLUSIONS:** Accessory lobe parotid tumors are rare and distinct entities from standard parotid lesions. Most will present as masses anterior to the parotid gland as a cheek mass and most will exhibit slow growth. These tumors can be approached with a standard facelift type incision or Blair incision and usually do not require a formal superficial parotidectomy. Accessory lobe parotid tumors

may encompass all the same types of tumors as the parotid gland proper.

**58. Medicolegal Analysis of Injury During Endoscopic Sinus Surgery**

Alastair G. Lynn-Macrae, MD, Chicago, IL  
Rebecca A. Lynn-Macrae, JD, Chicago, IL  
Janaki L. Emani, BSc, Chicago, IL  
Robert C. Kern, MD\*, Chicago, IL  
David B. Conley, MD, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate the causes, characteristics and outcomes of malpractice litigation resulting from injuries sustained during endoscopic sinus surgery.

**OBJECTIVES:** To survey the causes, characteristics and outcomes of malpractice litigation resulting from injuries sustained during endoscopic sinus surgery (ESS). **STUDY DESIGN:** A retrospective analysis of United States state and federal civil litigation involving alleged injuries resulting from ESS. **METHODS:** Sources were state and federal court decisions and jury verdict reports accessed through a computerized legal database. The 41 cases were decided or settled between 1990 and 2003. The cases and reports were analyzed for pertinent data regarding plaintiffs, defendants, allegations of wrongdoing, resulting injury, expert witnesses, and resulting verdict or settlement. Correlation between severity of injury and case outcome was analyzed. **RESULTS:** All suits reviewed involved ESS. Many cases included multiple causes of action, or types of malpractice, including negligent technique, 31 (76%); lack of informed consent, 15 (37%); and wrongful death, 2 (5%). The defendant physician specialty was overwhelmingly otolaryngology, 40 (98%). The most common indication for surgery was chronic sinusitis (30 or 73%). The injuries sustained during surgery were frequently multiple, including: CSF leak 10 (24%); brain damage 6 (15%); diplopia 7 (17%). The majority of cases reviewed (83%) resulted in a verdict rather than settlement. The result of the verdict or settlement was 17 (41%) in favor of the plaintiff and 23 (56%) in favor of the defendant, with 1 (2%) unknown. **CONCLUSIONS:** This is the first study to review malpractice litigation resulting from injuries sustained during ESS. This analysis of injury type, verdict, and outcome will help practitioners identify avoidable complications and improve patient care.

**59. Diagnosis and Management of Posttraumatic Vertigo**

Sam J. Marzo, MD, Maywood, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to diagnose and classify, manage, and discuss guidelines for returning patients to work.

**OBJECTIVES:** Patients with posttraumatic vertigo can be difficult to treat secondary to the chronicity of their symptoms. Patients can suffer peripheral, central, and combined vestibular deficits. Furthermore, no comprehensive guidelines exist for returning these patients to work. The objectives of this presentation are to allow practitioners to accurately diagnose and classify, manage medically and/or surgically, and discuss guidelines for allowing these patients to return to work. **STUDY DESIGN:** Retrospective analysis of a tertiary referral balance clinic. **METHODS:** Between July 1997 and July 2003, 2390 patients with vertigo were analyzed. Of these 16 patients met the requirements for inclusion in this study, including head trauma and/or concussion and residual vertigo. Their inpatient and outpatient charts, audiograms, and vestibular testing were reviewed. All patients had at least 6 months of follow-up. **RESULTS:** There were 4 females and 12 males, with an average age of 42. Three patients had symptoms consistent with traumatic perilymphatic fistulas, and one patient had symptoms consistent with posttraumatic Meniere's syndrome. Surgical therapy was not beneficial. Balance testing did not predict return to work status. Eight patients were not allowed to return to work in any capacity, two patients were allowed to return to work with limited duties and five patients were allowed to return to work with no restrictions. **CONCLUSIONS:** Posttraumatic vertigo can result in chronic symptoms. Balance testing does not predict the ability of patients to return to work. Surgical intervention might not control patient symptoms. Many patients are unable to return to work.

**60. Management of the Sphenoid Sinus in Revision FESS**

Kevin C. McMains, MD, Augusta, GA  
Stilianos E. Kountakis, MD PhD, Augusta, GA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to 1) understand the different surgical approaches to the sphenoid sinus; 2) review the sinonasal diagnoses of patients requiring revision sphenoid surgery; 3) discuss revision sphenoid surgery outcomes.

**OBJECTIVES:** To describe the surgical management of the sphenoid sinus and outcomes in patients requiring revision sphenoid surgery. **STUDY DESIGN:** Retrospective analysis of prospectively gathered data. **METHODS:** Analysis of prospectively collected data of patients requiring revision FESS. Ninety patients had revision sphenoid surgery and were subdivided into groups according to their diagnosis, unilateral v. bilateral disease, and surgical approach to the sphenoid sinus. Follow-up averaged 19 months with a range of 8-28 months. **RESULTS:** Of the 90 patients who required revision sphenoid surgery 62 had bilateral sphenoid involvement. Patients with chronic rhinosinusitis (CRS) and nasal polyposis had a higher incidence of bilateral disease compared to patients with CRS without polyps (87.5 v. 62.5% respectively, chi squared=6.9, p=0.009). A combined transnasal-transethmoidal approach (as opposed to transnasal approach alone) was required in 92.2% of the sphenoid sides in patients with CRS and nasal polyps while this approach was required in 72.2% of the sphenoid sides in patients with CRS without polyps (chi squared=11.2, p=0.0008). The overall success rate was 93.3%. All 6 patients requiring further revision had CRS with nasal polyposis. There were no major complications encountered. **CONCLUSIONS:** A combined transnasal-transethmoidal approach was most often required in patients with CRS and nasal polyposis. Patients in this group had a higher incidence of bilateral sphenoid involvement and were more likely to need further revision sphenoid surgery. Overall, the sphenoid ostium remained patent after revision endoscopic sphenoid surgery in 93.3% of the patients.

**61. Multicentric Reticulohistiocytosis with Granulomatous Nodules of the Upper Aerodigestive Tract**

Faisal A. Merchant, MD, Tampa, FL  
Judith C. McCaffrey, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the diagnosis, treatment and natural history of multicentric reticulohistiocytosis.

**OBJECTIVES:** 1) To describe the signs and symptoms of multicentric reticulohistiocytosis (MRH) of the upper aerodigestive tract; 2) to describe the histopathologic findings consistent with MRH; and 3) to understand the rationale for treatment of MRH. **STUDY DESIGN:** Case report and review of the literature. **METHODS:** We report the case of a 64 year old male who developed submucosal nodules located in the posterior pharyngeal wall, pyriform sinus and aryepiglottic fold mucosa diagnostic for MRH. The patient also demonstrated multiple systemic findings consistent with MRH. The clinical presentation and evaluation of the disease process, histopathologic findings, treatment and prognosis of MRH will be discussed. **RESULTS:** Patients with MRH may develop worsening polyarthritis of the hands as well as cutaneous papular eruptions in addition to aerodigestive tract lesions. Pulmonary nodules may also develop, potentially resulting in poor pulmonary reserve. Biopsy of the nodules is diagnostic and demonstrates characteristic giant cell granulomas consistent with MRH. Treatment is escalated based on severity of the disease, utilizing methotrexate initially. **CONCLUSIONS:** Multicentric reticulohistiocytosis (MRH) is a rare rheumatologic disorder that typically affects women and presents with a crippling polyarthritis and papules involving skin of the face and hands. Upper aerodigestive tract involvement is described infrequently. Treatment is based on symptom severity, utilizing a battery of anti-arthritis medications includ-

ing methotrexate and Arava. Treatment outcome is followed clinically.

**62. Treatment Versus No Treatment in Bell's Palsy**

John G. Neely, MD\*, St. Louis, MO  
Bruce J. Schlomer, BS, St. Louis, MO  
Alexander V. Fradkin, St. Louis, MO  
Kirstin L. Abel, BA, Pittsburgh, PA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to legitimately question the validity of current treatments in Bell's palsy.

**OBJECTIVES:** The rush to judgment that steroid plus antiviral oral administration achieves outcomes in excess of the natural history of disease in Bell's palsy has not been critically tested. This work was conducted in order to explore the necessary platform of equipoise for placebo-controlled trials in Bell's palsy. **STUDY DESIGN:** Prospective cohort comparison study with historical control and critical analysis of cross sectional data and literature. **METHODS:** Peitersen's cohort of 1700 untreated Bell's subjects was taken as the criterion standard for the disease natural history. A comparison was made with current treatment outcomes data from: 1) a cohort of 21 subjects "optimally" treated; 2) a cross-sectional aggregate of 17 subjects referred for tertiary evaluation; and 3) a critical review of 26 reported clinical trials. **RESULTS:** The results reveal that treatment outcomes were not significantly better than no treatment; and, in some instances, current treatments may, in fact, impede recovery. **CONCLUSIONS:** These data establish a partial platform of equipoise in support of planning placebo-controlled trials in Bell's palsy. Placebo-controlled trials are required to test the validity of these findings and to establish parameters for advanced studies into the pathobiology of this (these) disease and appropriate treatments.

**63. Granulocytic Sarcoma of the Subglottis**

Chau T. Nguyen, MD, Tampa, FL  
Elisa S. Lynskey, MD, Tampa, FL  
Carlos Muro-Cacho, MD, Tampa, FL  
Tapan A. Padhya, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the entity of granulocytic sarcoma, including its etiopathogenesis, diagnosis, treatment, and prognosis.

**OBJECTIVES:** The following case presents a patient diagnosed with chronic myelogenous leukemia who became symptomatic with granulocytic sarcoma of her subglottis. The case presented represents the fourth reported isolated involvement of the subglottis with granulocytic sarcoma, and the sixth overall involving the larynx in the English language literature. **STUDY DESIGN:** A case report and review of the literature. **METHODS:** Retrospective chart review. **RESULTS:** A 59 year old female presented to the head and neck clinic with a two month history of hoarseness and increasing fatigue. She was currently diagnosed with chronic myelogenous leukemia, Philadelphia chromosome positive (translocation 9:22), in clinical remission. On examination, an area of mucosal fullness in the right subglottis was observed. The patient was subsequently taken to surgery where a direct laryngoscopy, bronchoscopy, and biopsy of the mass was performed. The pathology results revealed necrotic tissue with infiltration by blast cells consistent with the diagnosis of granulocytic sarcoma. **CONCLUSIONS:** Leukemic involvement of the larynx is rare, especially in cases of chronic myelogenous leukemia as an extramedullary manifestation. Maintaining a secure airway is a priority in these patients and direct laryngoscopy with biopsy and possible tracheotomy is the procedure of choice. Chemotherapy is a promising treatment option, with good response obtained in this case. Unfortunately, the occurrence of laryngeal infiltration in leukemia portends an overall poor prognosis based on review of the literature.

**64. The Incidence and Epidemiology of Hepatitis C Virus (HCV) in Patients with Squamous Cell Carcinoma of the Head and Neck (SCCHN)**

James B. Nobles, BS, New Orleans, LA  
Paul L. Friedlander, MD FACS, New Orleans, LA  
Christian J. Wold, BS, New Orleans, LA  
Mary A. Fazekas-May, MD FACS, New Orleans, LA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the incidence and implications of hepatitis C virus (HCV) infection in patients with squamous cell carcinoma of the head and neck (SCCHN) in the study population.

**OBJECTIVES:** Recently, we have noticed that a large number of patients with SCCHN are also infected with HCV. A review of the literature has revealed no published studies examining this association. The objective of this study was to determine the incidence and implication of HCV infection in patients with SCCHN. **STUDY DESIGN:** Retrospective review of the medical records. **METHODS:** A retrospective review of 283 patients with SCCHN identified patients screened for HCV. Patients were stratified into two groups (HCV positive and HCV negative). The age at onset, the site and stage of presentation were determined. **RESULTS:** 99 patients (35%) were screened, and 21 (21.2%) were HCV positive. The incidence was increased when compared to previously published data (9.9%) (p<.0038). HCV positive patients presented at an earlier age (51 years) versus the HCV negative group (60 years) (p<.0002). There were no significant differences in the site of location, but there was a trend towards presentation at an advanced stage in HCV positive patients (61%) versus HCV negative patients (52%). **CONCLUSIONS:** In this study, there was a significant increase in the incidence of HCV in patients with SCCHN compared to historical controls. HCV positive patients presented at an earlier age, had similar site of disease, and had a trend toward advanced disease when compared to HCV negative patients. More research is needed to determine if infection with HCV is a co-factor or a comorbid condition in patients with SCCHN

**65. WITHDRAWN--Meta-Analysis of Tympanoplasty Versus Tympanomastoidectomy for Chronic Suppurative Otitis Media**

Robert J. O'Bert, BS, Cincinnati, OH  
David L. Steward, MD, Cincinnati, OH (Presenter)

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss cost effective strategies in the management of noncholesteatomatous chronic suppurative otitis media.

**OBJECTIVES:** To compare the clinical and cost effectiveness of tympanoplasty (TP) versus tympanomastoidectomy (TM) for noncholesteatomatous chronic suppurative otitis media (NCSOM). **STUDY DESIGN:** Systematic meta-analysis. **METHODS:** A thorough review of the literature was performed using the Medline database (1966-2003) for comparative studies of TP versus TM for NCSOM. Primary outcome was resolution of suppuration with intact graft. Hearing was a secondary outcome. Meta-analysis used fixed effects model with Fisher's exact test. Cost-effective analysis was performed using patient charges at a teaching institution and Medicare reimbursement. **RESULTS:** No significant difference was noted between TM and TP for graft success (90.1% vs. 90.9%, p=0.762). Subset analysis for actively discharging ears also revealed no difference between TM and TP (88.2% vs. 89.6%, p=1.0). Further, no difference was noted between TM and TP for ears with antral blockade (100% vs. 96.7%, p=1.0). There was no difference in hearing results between TP and TM. The total average charge at our institution for TP (including hospital, anesthesia and surgeon charges) was \$9,563 and for TM was \$13,252, giving a cost savings of \$3,689 per patient for TP. A most conservative cost effective analysis using actual Medicare reimbursement and assuming only twenty minutes additional operating time for TM vs. TP, yielded a savings of \$350 per patient for TP. **CONCLUSIONS:** No clinical benefit of TM over TP for NCSOM was seen in this meta-analysis, even in patients with active suppuration or antral blockade. As TM may cost patients between \$350-3600 more than TP, surgeons may consider TP a

more cost-effective alternative.

**66. Adenocarcinoma of the Cervical Esophagus Arising from Ectopic Gastric Mucosa**

Joanne Pham, MD, Shreveport, LA  
Timothy S. Lian, MD, Shreveport, LA  
Fred J. Stucker, MD\*, Shreveport, LA

**EDUCATIONAL OBJECTIVE:** Participants should be able to discuss the epidemiology, presentation, workup, and treatment options for adenocarcinoma of the esophagus.

**OBJECTIVES:** We present an unusual case of adenocarcinoma of the cervical esophagus arising from an ectopic focus of gastric mucosa with associated clinical manifestations of dysphonia and bilateral true vocal fold paralysis. **STUDY DESIGN:** Case review and review of pertinent literature. **METHODS:** We present a case of a patient with cervical adenocarcinoma arising from heterotopic gastric mucosa that is unique in his atypical presentation of bilateral vocal cord paralysis. A review of literature on heterotopic gastric mucosa in the cervical esophagus is presented. **RESULTS:** A single case of cervical adenocarcinoma arising from heterotopic gastric mucosa was identified. The patient presented with odynophagia, dysphagia, globus, and bilateral true vocal cord paralysis. The incidence of ectopic gastric mucosa in the cervical esophagus is 2.4-10%, however only 19 cases have been reported. Workup includes imaging studies and endoscopy with biopsies. Treatment involves multi-modality therapy. **CONCLUSIONS:** Although most heterotopic gastric mucosa in the cervical esophagus is asymptomatic, patients with complaints of odynophagia, dysphagia, and globus with negative pharyngeal and laryngeal exam should have esophagus examined to assess for masses to include ectopic mucosa. Although rare, malignancy can result from ectopic gastric mucosa. Bilateral vocal cord paralysis can be a manifestation of this malignancy and should be considered in the differential diagnosis.

**67. Intralesional Cidofovir for Adult Recurrent Respiratory Papillomatosis**

Michael J. Pitman, MD, Nashville, TN  
Justin E. Wittkopf, MD, Nashville, TN (*Presenter*)  
Robert H. Ossoff, DMD MD\*, Nashville, TN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the benefits of cidofovir intralesional injections for the treatment of adult recurrent respiratory papillomatosis.

**OBJECTIVES:** To assess the benefit of intralesional injections of cidofovir following excision and CO2 laser photoablation of lesions of recurrent respiratory papillomatosis. **STUDY DESIGN:** A retrospective chart review of nine patients in a tertiary medical center. Charts reviewed included patients older than 18 years of age who had been treated at our institution for recurrent respiratory papillomatosis with excision and CO2 laser photoablation and then were subsequently treated with excision, CO2 laser photoablation and cidofovir injection. **METHODS:** Direct suspension microlaryngoscopy was performed. All visible papilloma were excised and/or photo-ablated. Cidofovir at a concentration of 5mg/ml was then injected until blanching, into the area from which the papilloma was excised. This procedure was repeated when recurrence of recurrent respiratory papillomatosis was documented during monthly follow-up visit. **RESULTS:** All nine patients have a decreased frequency of operation and severity of anatomic stage when compared to treatment pre-cidofovir. Five patients are currently free of disease for two to four months. **CONCLUSIONS:** Intralesional injections of cidofovir as an adjunct to debulking and CO2 laser treatment appears to be of benefit in adult patients with recurrent respiratory papillomatosis. A randomized controlled prospective study is needed to better assess the true efficacy of cidofovir.

**68. Schwannoma Within the Pterygomaxillary Fossa**

Scott A. Powell, MD, Tampa, FL  
Chau T. Nguyen, MD, Tampa, FL  
Tapan A. Padhya, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the clinical presentation of a schwannoma within the pterygomaxillary fossa and the surgical techniques for resection.

**OBJECTIVES:** 1) To describe a case of a schwannoma arising from within the pterygomaxillary fossa; 2) to describe the natural history of extradural schwannomas; and 3) to describe surgical resection techniques. **STUDY DESIGN:** Case report and review of the literature. **METHODS:** We report the case of a 55 year old female with schwannoma within the pterygoid maxillary fossa. Clinical presentation and evaluation, disease progression, and treatment will be reviewed. In addition surgical resection technique will be discussed. **RESULTS:** Schwannomas are distinguished into two main histological patterns: the Antoni A (fasciculated) or organized pattern, characterized by cells disposed in a "palisade" manner, and the Antoni B (reticular) or disorganized pattern, characterized by a looser stroma with myxoid areas and disorganized disposition of cells. **CONCLUSIONS:** Extracranial schwannomas limited to the pterygoid maxillary fossa region are rare lesions that may also involve the maxillary sinus, the orbit, and nasal cavity. Schwannomas or neurilemmomas are benign tumors deriving from the Schwann cells of nerve sheaths. While found in any part of the body, there is an increased incidence, approximately 15-35%, found within the head and neck, particularly in the acoustic nerve. The Antoni A pattern or cellular schwannoma, histologically, can be very similar to malignant tumors such as leiomyosarcoma or malignant peripheral nerve sheath tumors so that a thorough histopathological and/or immunohistochemical examination is required for a correct differential diagnosis.

**69. Synovial Sarcoma of the Head and Neck: A Diagnostic Dilemma**

Scott A. Powell, MD, Tampa, FL  
Judith C. McCaffrey, MD, Tampa, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss synovial sarcoma of the head and neck. Also, be able to compare clinical presentations within the head and neck.

**OBJECTIVES:** 1) To describe an atypical clinical presentation of head and neck synovial sarcoma; 2) to describe the immunohistochemical and electron microscopic findings of synovial sarcoma; and 3) to describe the natural history of synovial sarcoma in the head and neck. **STUDY DESIGN:** Case report and review of the literature. **METHODS:** We report the case of an 87 year old man with synovial sarcoma of the neck which was intimately associated with the thyroid gland. Clinical presentation and evaluation, disease progression, and treatment will be reviewed. Histopathologic, immunodiagnostic and electron microscopic features will also be emphasized to minimize the potential for diagnostic confusion associated with synovial sarcoma in the head and neck region. **RESULTS:** Synovial sarcoma exists in biphasic and monophasic cellular forms. The biphasic form contains recognizable epithelial and sarcomatous components and has a relatively distinctive immunophenotype that includes coexpression of mesenchymal (vimentin) and epithelial markers (cytokeratin, EMA). **CONCLUSIONS:** Synovial sarcoma is a malignant soft tissue neoplasm that arises from primitive pluripotential mesenchymal cells most commonly in the extremities of young adults. 3-10% of all synovial sarcomas arise in the head and neck. These tumors are slow growing, yet aggressive with poor long-term survival due to local recurrences and late distant metastasis, particularly to the lung. Immunohistochemistry and electron microscopy are keys to a

definitive diagnosis.

**70. Tamoxifen Therapy for Riedel's Thyroiditis**

Keith M. Pritchik, MD, Washington, DC  
Paul M. Garlich, MD, Arlington, VA  
Kenneth C. Newkirk, MD, Washington, DC  
Ziad I. Deeb, MD\*, Washington, DC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate the symptoms of Riedel's thyroiditis. Explain the pathophysiology of the disease and discuss the treatment options.

**OBJECTIVES:** We report the case of a 57 year old hypothyroid patient (TSH 8.4) who presented with acute respiratory distress; stridor; and a firm, fibrotic thyroid mass. Pre-operatively, fine-needle aspiration of the thyroid mass demonstrated chronic fibrosis. Open tracheotomy demonstrated a densely fibrotic lesion consistent with Riedel's struma. The patient was treated with tamoxifen therapy and was subsequently decannulated. The management and outcome of this patient is presented. **STUDY DESIGN:** Case report at a tertiary care center. **METHODS:** The chart of a patient treated at our institution was reviewed and analyzed for outcomes data. **RESULTS:** Our patient presented with acute respiratory distress and underwent an open tracheotomy. She was diagnosed with Riedel's thyroiditis. Postoperative the patient began twice a day tamoxifen therapy and was decannulated within 18 months. The patient has been breathing without the need for a tracheotomy since decannulation. **CONCLUSIONS:** Decannulation is possible after tracheotomy for Riedel's thyroiditis with Tamoxifen therapy.

**71. Coronoid-Temporalis Pedicled Rotation Flap for Orbital Floor Reconstruction of the Total Maxillectomy Defect**

Shepherd G. Pryor, MD, Rochester, MN  
Scott E. Strome, MD, Rochester, MN  
Jan L. Kasperbauer, MD\*, Rochester, MN  
Eric J. Moore, MD, Rochester, MN  
Richard E. Hayden, MD\*, Scottsdale, AZ

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants will be provided with another possible option in the reconstruction of the orbital floor after total maxillectomy.

**OBJECTIVES:** Total maxillectomy creates a significant defect in the supporting framework of the orbit. Successful reconstruction of the deficit requires repair of the orbital floor to prevent early and late stage complications. This paper describes the recreation of the orbital floor using a coronoid-temporalis sling. **STUDY DESIGN:** Retrospective review of two patients who underwent total maxillectomy and subsequent coronoid-temporalis sling reconstruction of the surgical defect. **METHODS:** The charts of two patients who underwent coronoid-temporalis reconstruction of the orbital floor were retrospectively reviewed. The outcomes were evaluated. The authors present a method for reconstruction of the orbital floor and discuss the advantages and disadvantages of this method. **RESULTS:** Two patients underwent successful reconstruction of the orbital floor with a coronoid-temporalis sling procedure. Neither of the patients suffered typical complications of previously described reconstructive procedures in this area including ectropion. Both patients display acceptable functional and cosmetic results. **CONCLUSIONS:** Coronoid-temporalis sling is a readily available and easily modified tissue for reconstruction of the orbital floor. It offers similar results to previously described techniques in this area without need for further extensive surgery.

**72. WITHDRAWN--An Improved Technique of Closure After Translabyrinthine Removal of Acoustic Neuroma Using Hydroxyapatite Cement, Fibrin Glue and Artificial Dura**

Jack L. Pulec, MD\*, Los Angeles, CA  
Steven L. Giannotta, MD, Los Angeles, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the method of closure described and know the advantages of avoiding the use of autograft fat and fascia.

**OBJECTIVES:** To describe the technique, advantages and preliminary results of closure after translabyrinthine removal of acoustic neuroma of using hydroxyapatite cement, artificial dura and tissue glue. **STUDY DESIGN:** A prospective study of this new technique was compared to our previous method of using an abdominal fat graft and temporary closure of the protympanum with temporalis fascia. **METHODS:** Fibrin glue was used to seal and adhere artificial dura medial to the posterior fossa dural defect and over the open vestibule, epitympanum and sinus tympani. Fast setting hydroxyapatite cement was used to fill the entire space in the petrous apex and mastoid to hold the dural closure firmly in place. **RESULTS:** Early results reveal no cerebral spinal leak, infection or delayed healing. Duration of surgery was slightly shortened. There was total absence of pain and discomfort from an abdominal wound and no cosmetically objectionable abdominal scar. A postauricular depression did not occur postoperatively. **CONCLUSIONS:** The use of hydroxyapatite cement, fibrin glue and artificial dura for surgical closure of the translabyrinthine approach reduces morbidity and is a major advance in the surgical treatment of acoustic neuroma.

**73. Diagnosis and Management of Spontaneous Cerebrospinal Fluid Otorrhea**

Arvin K. Rao, MD, Morgantown, WV  
Daniel M. Merenda, MD, Morgantown, WV  
Stephen J. Wetmore, MD MBA\*, Morgantown, WV

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to 1) discuss the clinical presentation, diagnosis, and operative management of adult spontaneous cerebrospinal fluid otorrhea; and 2) compare the indications for transmastoid and temporal craniotomy approaches for repair.

**OBJECTIVES:** The purpose of this study is to review the clinical presentation, diagnosis, surgical management, and outcome of patients with spontaneous cerebrospinal fluid otorrhea. **STUDY DESIGN:** Retrospective case series. **METHODS:** Office and hospital charts of all previously unreported cases of cerebrospinal fluid otorrhea at our institution were reviewed. Acquired cases of cerebrospinal fluid otorrhea were excluded. 10 cases were identified among 9 patients. **RESULTS:** Each of the nine patients presenting with spontaneous cerebrospinal fluid otorrhea were women. Ages of the women ranged from 34 to 79 years. Seven women presented with serous otitis media, two women with meningitis. High resolution computed tomography demonstrated a sensitivity 78%. Nine tegmen defects were repaired using transmastoid approach without recurrence. One patient with a contracted mastoid and meningocele herniating from the tegmen tympani into the attic required temporal craniotomy approach for repair. **CONCLUSIONS:** The diagnosis of spontaneous cerebrospinal fluid otorrhea requires clinical suspicion in the setting of persistent serous otitis media. High resolution computed tomography can be used to confirm the diagnosis and for surgical planning. Transmastoid approach to repair is effective if tegmen defect can be widely visualized.

**74. Unusual Paratracheal Masses Presenting with Vocal Cord Paralysis**

Evan R. Reiter, MD, Richmond, VA  
Celeste N. Powers, MD, Richmond, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to recall the differential diagnosis of paratracheal masses that may present

with vocal cord paralysis.

**OBJECTIVES:** To present two cases of unusual paratracheal masses causing vocal cord paralysis. **STUDY DESIGN:** Case series. **METHODS:** Retrospective chart review. **RESULTS:** Case 1: A 35 year-old male presented with several weeks of hoarseness and left lower neck mass. Evaluation using CT showed a large homogeneous superior mediastinal mass extending above the clavicle, displacing the thyroid gland posteriorly, and compressing the cervical trachea. Fine needle aspiration (FNA) revealed a predominant spindle cell pattern with scattered lymphocytes, suggesting a spindle cell neoplasm such as thymoma. A surgical biopsy specimen subsequently led to a diagnosis of malignant lymphoma (large cell, diffuse, B cell type) using flow cytometry and immunohistochemistry. Case 2: A 53 year-old male presented emergently with a left paratracheal mass and hemoptysis. CT showed bilateral pulmonary nodules and a markedly enlarged left thyroid lobe. The adjacent cervical trachea was irregular, suggesting invasion. FNA of the thyroid mass indicated the presence of a neoplasm with cytologic features consistent with adenoid cystic carcinoma. This diagnosis was confirmed by incisional biopsy. **CONCLUSIONS:** While the majority of paratracheal cervical masses will be of thyroid origin, a broad differential diagnosis must be considered. Unusual paratracheal masses presenting with vocal cord paralysis may mimic thyroid malignancies, posing both diagnostic and therapeutic challenges. Fine needle aspiration biopsy is often helpful, although incisional biopsy may be needed for definitive diagnosis and treatment planning.

**75. Novel Therapy of Radiation Induced Sensorineural Hearing Loss with N-acetylcysteine (NAC): A Case Report**

Arnold L. Rivera, MD, Washington, DC  
Brian J. Mckinnon, MD, Washington, DC

**EDUCATIONAL OBJECTIVE:** 1) Understand the mechanism of radiation induced hearing loss; 2) understand the proposed mechanism of NAC as rescue agent; and 3) explore new treatment modalities for NAC in sensorineural hearing loss.

**OBJECTIVES:** Case presentation of elderly patient with radiation induced sensorineural hearing loss that after unsuccessful outpatient oral steroid therapy was treated using n-acetylcysteine (NAC) as a rescue agent. NAC, a well-known antidote for acetaminophen poisoning, has been proposed as a therapy for noise induced sudden sensorineural hearing loss. As a reactive oxygen species scavenger it may shield inner ear vital structures from insult and help stabilize cochlear damage. **STUDY DESIGN:** Case report. **METHODS:** Case report of outpatient treatment with N-acetylcysteine. **RESULTS:** Following the treatment with NAC, the patient's hearing returned to pre-radiation therapy baseline, no adverse reactions to her therapy were noted. **CONCLUSIONS:** The value of NAC as therapy for noise induced sensorineural hearing is actively being researched. Those patients unresponsive to conventional therapy may benefit from NAC. NAC may act as an intracellular scavenger of reactive oxygen species (ROS) by maintaining or restoring the glutathione (GSH) levels. The management of radiation induced hearing loss is challenging and often unsuccessful. NAC may reduce cochlear dysfunction by decreasing trauma induce by ROS. Further study will be needed to clarify the exact mechanism, efficacy and future role of NAC in radiation induced hearing loss.

**76. Isolated Plexiform Neurofibroma: Treatment with 3-D Conformal Radiotherapy**

Thomas C. Robertson, MD, Richmond, VA  
David A. Buck, MD, Richmond, VA  
Patrick J. Gibbons, MD, Roanoke, VA  
Rupert K. Schmidt-Ullrich, MD, Richmond, VA  
Celeste N. Powers, MD, Richmond, VA  
Evan R. Reiter, MD, Richmond, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the potential role that three-dimensional conformal radiotherapy has in the treatment of certain benign neoplasms of the head and neck.

**OBJECTIVES:** To present a case of an unusual benign tumor of the tongue treated successfully with radiotherapy. **STUDY DESIGN:** Case report. **METHODS:** Retrospective chart review. **RESULTS:** A sixty year old male presented with a painful submucosal lesion of the tongue base. CT showed an infiltrative soft tissue mass lesion involving the left base of tongue. Operative biopsy revealed plexiform neurofibroma. Because of the patient's operative risk and the potential morbidity of surgical resection, he was treated with three-dimensional conformal radiotherapy (3DCRT). His treatment was accomplished using a five-field arrangement treating exclusively the mass lesion to a total tumor dose of 60 Gy. Following treatment, the patient's tongue pain completely resolved, and he noted only minimal transient xerostomia. Serial follow-up radiographic examinations showed the base of tongue mass to be slightly smaller 4 months following treatment. The patient is now over 3 years out from treatment. The most recent follow-up MRI reveals a further decrease in size of the mass. **CONCLUSIONS:** Solitary plexiform neurofibroma of the tongue base is a rare tumor. These benign neoplasms are usually treated with either observation or surgical excision. This case demonstrates that, when significant symptoms necessitate active management, these lesions may be successfully treated with minimal morbidity using 3DCRT. The ability of this technique to deliver a conformal radiation dose to the tumor volume while sparing the surrounding normal tissues may expand the applicability of radiotherapy in the treatment of these benign lesions of the head and neck.

**77. Central Mucoepidermoid Carcinoma: Case Report and Review of the Literature**

Sarah C. Rodriguez, MD, Galveston, TX  
Anna M. Pou, MD, Galveston, TX

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the diagnosis of central mucoepidermoid carcinoma affecting the mandible and explain the characteristic presentation and potential etiologies.

**OBJECTIVES:** The objective is to make the reader aware of the unusual entity of central mucoepidermoid carcinoma. **STUDY DESIGN:** The design of the study is a case report with review of the literature. **METHODS:** A literature search for publications pertaining to central mucoepidermoid carcinoma was carried out and the results are reviewed. A case of mucoepidermoid carcinoma of the mandible is described with review of pertinent imaging and treatment. **RESULTS:** The results of the literature search are presented as well as pertinent photographs, histological data and imaging studies relating to the case report. **CONCLUSIONS:** Primary intraosseous carcinomas are extremely rare and include several histologic types. The most common primary intraosseous carcinoma is mucoepidermoid carcinoma and is histologically indistinguishable from mucoepidermoid carcinoma arising in the salivary glands. This entity is termed central mucoepidermoid carcinoma. On review of the literature, central mucoepidermoid carcinoma appears to have a characteristic location, variable presentation and prognosis and an uncertain etiology. A case of central mucoepidermoid carcinoma is reported and a brief review of the literature is presented.

**78. Endoscopic Management of CSF Leak After Pneumatic Nail Gun Injury**

Michael J. Rossi, BS, Charleston, SC  
Rodney J. Schlosser, MD, Charleston, SC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss both traumatic penetrating injury to the sinuses and base of skull and subsequent surgical management and repair.

**OBJECTIVES:** A 19 year old Caucasian male presented with chief complaint of an occipital headache and decreased field of vision after a fall from a scaffolding at a construction site one day prior. **STUDY DESIGN:** The patient presented with a small, circular laceration on his right cheek from which there had been minimal bleeding and complained of a brief syncopal episode at the time of injury. Upon further questioning it was discovered that the patient had been holding a pneumatic nail gun at the time of his

fall. **METHODS:** On physical examination the patient was noted to have right homonymous superior quadrantic anopsia. A computerized topography (CT) scan of the head and sinuses was ordered, revealing a three-inch nail imbedded within the head. It extended from the superior aspect of the right maxillary sinus through both sphenoid sinuses, penetrating the skull base at a point just anterior to the sella turcica and terminated in the left temporal lobe parenchyma. The patient was then transferred to a tertiary medical center for definitive surgical care. **RESULTS:** Endoscopic exploration of the wound was performed. In order to retrieve the foreign object, a right Caldwell-Luc, endoscopic total ethmoidectomy, maxillary antrostomy, septoplasty and bilateral sphenoidectomy were performed, with further repair of the skull base defect and resultant CSF leak. **CONCLUSIONS:** The patient was transferred to the intensive care unit where he remained stable with minimal headache and was discharged home nine days later.

#### 79. Management of Combined Tracheobronchial and Cardiovascular Anomalies

Derek J. J. Schmidt, MD, Minneapolis, MN  
Wendy L. Sydlewski, DDS, Minneapolis, MN (*Presenter*)  
Frank L. Rimell, MD, Minneapolis, MN  
John E. Foker, MD PhD, Minneapolis, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to recognize a child diagnosed with a major cardiovascular anomaly and the use of endoscopy for the evaluation of airway patency. In addition, recognize possible surgically correctible cases before consideration of tracheotomy.

**OBJECTIVES:** To determine the nature and association of cardiovascular anomalies which are associated with significant tracheomalacia or are the cause of airway compromise. To recognize the various treatment options in this potentially complex patient population. **STUDY DESIGN:** A chart review of children treated for tracheomalacia and an associated cardiovascular anomaly was performed. Children were then classified according to the relation of their airway compromise and cardiac disease. **METHODS:** Between 1980 and 2002, 82 children (age: birth-18 years) diagnosed with tracheomalacia and a concomitant cardiovascular anomaly were evaluated for surgical intervention. Using patients' records and operative reports, results were analyzed retrospectively. **RESULTS:** In 55/82 (67%) of the cases, an otolaryngologic procedure was done to address the airway compromise. Twenty one (25%) children were in the Class I group, with 52% (11/21) requiring a tracheotomy. There were 32 (39%) children in Class IIa, with 9% requiring a tracheotomy, while 38% (11/29) in the Class IIb group required a tracheotomy. **CONCLUSIONS:** Children with tracheomalacia should undergo a cardiovascular work-up including endoscopic guided bronchoscopy and airway imaging. Correction of the abnormal cardiac physiology and correction of the vascular tracheal compression with endoscopic guidance shows a significantly reduced rate of tracheotomy.

#### 80. Mirror Image Reversal of Coronal Computed Tomography Scans

Derek J. J. Schmidt, MD, Minneapolis, MN  
Rick M. Odland, MD PhD, Minneapolis, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify specific findings on computed tomography (CT) scans which reveal the possibility that a mirror image reversal of a printed CT scan has occurred.

**OBJECTIVES:** Mirror image reversal of coronal CT scans can be a significant problem in patient care, potentially leading to wrong-sided surgery and malpractice suits. There is no literature describing the problem of mirror image reversal of coronal CT scans. Generally, medical errors are not widely published; however, with the emphasis on reduction of errors in medicine, this topic should be openly discussed. **STUDY DESIGN:** Retrospective review of patient care and an assessment of current CT scan labeling methods. **METHODS:** We reviewed two cases of mirror image reversal of coronal CT scans and found that each case represented a different type of error. In the first case, the error was recognized in the operating room. The second case resulted in wrong-sided surgery, and a lawsuit was filed. These two separate occurrences led to a review of the methods for determining right versus left side for orienting and labeling of CT scans. **RESULTS:** Orientation of coronal scans is dependent upon whether the patient is prone or supine. Thus, technician input is required. If a labeling mistake is made, radiologists may not readily catch the mistake because of the symmetry of the head and neck anatomy. A review of the frame markings on each CT scan should provide the otolaryngologist with enough information to determine if the scan is mislabeled. **CONCLUSIONS:** The incidence of mislabeled coronal CT scans is unknown. This error can result in inappropriate patient care and lawsuits for wrong-sided surgery. Awareness of the potential problem and open discussion of interpretation and prevention is necessary.

#### 81. The Role of Intrathyroidal Calcifications Detected on Ultrasound as a Marker of Malignancy

Kristin A. Seiberling, MD, Chicago, IL  
Jose Dutra, MD, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to further appreciate the significance of calcifications demonstrated on thyroid ultrasound as an independent risk factor for malignancy.

**OBJECTIVES:** Clinically palpable thyroid nodules are present between 4-7% of the population with only a small percentage of those patients harboring malignancy. Thus, it is important to find a cost-effective way to determine which nodules are more likely to be malignant. This is especially important in those patients who have fine needle aspiration findings that are indeterminate or consistent with follicular adenoma or hurthle cell adenoma. In those patients malignancy is not excluded and further workup is needed. In this study we evaluated the use of intrathyroidal calcifications detected on ultrasound as an independent risk factor for malignancy. **STUDY DESIGN:** This is a retrospective study evaluating 159 patients selected from a thyroid ultrasound database from 1995-2002. All patients included in the study had both a preoperative thyroid ultrasound and surgery for final tissue histopathology. At the time of selection tissue pathology was not known. Patients were excluded only if they did not have both thyroid surgery and a preoperative ultrasound. **METHODS:** One hundred and fifty nine patients with thyroid disease, including 66 with cancer were included in this study. Patients were selected from a thyroid ultrasound database. Charts were then reviewed and only those who underwent surgery for final histopathologic tissue diagnosis were included in the study. **RESULTS:** Of the 159 patients, 66 had a final histopathologic diagnosis of malignancy. Of those with cancer, 47 (64.4%) had calcium detected on ultrasound. 19 (28.8%) of the patients with cancer showed no evidence of intrathyroidal calcifications on ultrasound. 93 patients in this study had benign thyroid disease. Of those 93 patients, 27 (36.9%) had ultrasound findings positive for calcifications and 66 (71%) were negative. Statistical analysis using chi-squared test showed a strong association between cancer status and calcifications detected on ultrasound with a p value <.0001. The sensitivity of the test in our study is 71% (false negative 29%) with a specificity of 71% (false positive 29%). The positive predictive value is 64%. **CONCLUSIONS:** Thyroid ultrasound is a good inexpensive imaging tool for evaluating thyroid disease. The presence of calcifications detected on ultrasound should raise the suspicion for malignancy and further workup should be pursued. This finding may be used in combination with other known risk factors for thyroid cancer to help decide on the most appropriate treatment plan.

#### 82. Skin Testing in Predicting Nasal Response to Provocation with Alternaria

Anand G. Shah, MD, Detroit, MI  
John H. Krouse, MD PhD\*, Detroit, MI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the true clinical significance of low-level intradermal positivity in patients who are Multi-Test negative for allergy to Alternaria but are positive to the antigen at intradermal SET dilution #2.

**OBJECTIVES:** Skin endpoint titration (SET) has been used as a method for the testing of inhalant allergy for over 70 years. In recent years, however, commercial products have been developed that offer an alternative to SET. One question is how to manage positive intradermal tests at very low dilutions, such as #2 (1:500) and #1 (1:100). The purpose of this research is to assess the true clinical significance of low-level intradermal positivity in patients who are Multi-Test negative for allergy to Alternaria but are

positive to the antigen at intradermal SET dilution #2. **STUDY DESIGN:** The sample consists of 42 adult patients with a history of perennial allergic rhinitis. This sample will consist of three groups: 1) 15 subjects who are positive to Alternaria by Multi-Test II; 2) 7 subjects who are negative to testing with Multi-Test II but positive to Alternaria at a SET dilution of #2; 3) 20 subjects who are negative to testing for Alternaria by both Multi-Test II and at SET dilution #2. **METHODS:** Each subject will then undergo nasal challenge testing with progressive dilutions of Alternaria extract. Acoustic rhinometry and nasal antigen provocation will be assessed. Each subject will also complete a visual analog scale, reflecting his/her global allergic symptomatology. **RESULTS:** Multi-Test II has good sensitivity in predicting response to challenge with Alternaria mold. Subjects positive to intradermal testing to Alternaria but negative with Multi-Test II can respond positively to nasal antigen challenge, but only with dilutions of 1:100 w:v or stronger. **CONCLUSIONS:** These results suggest that following a negative Multi-Test II skin test to Alternaria mold, ID testing may yield positive and clinically important results. These findings confirm the importance of the end-organ of low-level skin sensitivities to mold antigens.

### 83. **Sarcomatous Transformation After Radiation for a Juvenile Angiofibroma**

Douglas M. Sidle, MD, Chicago, IL  
Barry L. Wenig, MD MPH\*, Evanston, IL  
Jason Meier, MD, Chicago, IL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss in an informed manner the pros and cons of different treatment options for nasopharyngeal angiofibromas.

**OBJECTIVES:** The malignant transformation of a juvenile angiofibroma is, indeed, a rare occurrence. This report describes the case of a 26 year old male who developed spindle cell sarcomatous transformation of a previously irradiated juvenile angiofibroma. **STUDY DESIGN:** Description of a case of malignant transformation in a previously irradiated juvenile angiofibroma and a review of the pertinent literature. This is followed by a thorough evaluation and proposal for proper management of these lesions. **METHODS:** Description of a case of malignant transformation in a previously irradiated juvenile angiofibroma and a review of the pertinent literature. **RESULTS:** At the age of 13, our patient received 3000 cGy over 15 fractions. A review of the literature shows that radiation therapy likely plays a role in causing malignant change in these tumors. In previously reported cases, the radiation dose delivered ranged from 6600 to 9000 cGy and was substantially higher than the dose used in our case. **CONCLUSIONS:** Complete surgical excision of these lesions can ultimately prevent such malignant transformation as well as local recurrences.

### 84. **The Use of Subgaleal Flaps to Establish a Healthy Osseo-Integrated Implant Interface**

Mary C. Snyder, MD, Madison, WI  
Gary F. Moore, MD\*, Omaha, NE

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss a new method of establishing a healthy skin-abutment interface around osseo-integrated implants.

**OBJECTIVES:** Several methods have been proposed for establishment of the skin-abutment interface around osseo-integrated implants, but none has been found to be superior. We recently reported a high complication rate associated with the original method of placing a split-thickness skin graft around bone-anchored hearing aids. The purpose of this study is to review the preliminary results of a new method to establish the skin-abutment interface around osseo-integrated implants. **STUDY DESIGN:** Retrospective chart review. **METHODS:** A total of six osseo-integrated implants were placed in four patients from April 2003 through July 2003 in single stage procedures. All implants were placed in the hair-bearing postauricular region by elevating a curvilinear subgaleal flap. Care was taken to leave periosteum on the bone except where the implant was placed. Aggressive subcutaneous tissue reduction was used to thin the flap and remove hair follicles. Patient charts were reviewed for complications and outcomes. **RESULTS:** There were no perioperative complications experienced and no flaps or implants were lost. One patient had a minor complication of tissue overgrowth around one implant, which resolved with local treatment. The average time from implantation to device use was 78.5 days in the patients out far enough to be fitted. **CONCLUSIONS:** The ideal method for establishment of the skin-implant interface around bone-anchored hearing aids implants has yet to be determined. The preliminary results of this study suggest the subgaleal flap method may prove to be superior in establishing a healthy skin-abutment interface and shortening the time between implantation and device use.

### 85. **Intracranial Complications of Otitis Media: Standards of Care in Otolaryngology and Internal Medicine**

Michele B. St. Martin, MD, Minneapolis, MN  
Vu T. Ho, MD, Minneapolis, MN  
Samuel C. Levine, MD\*, Minneapolis, MN

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to identify early warning signs of intracranial complications of otitis media, to discuss the current standard of care for such complications, and to compare otolaryngology and internal medicine literature regarding treatment of intracranial complications of otitis media.

**OBJECTIVES:** The objectives of this paper are to familiarize the reader with the numerous types of intracranial complications of otitis media, as well as their signs and symptoms, and to discuss the current standard of care for such complications. **STUDY DESIGN:** The study consists of a case report and literature review. **METHODS:** Review of all otolaryngology and internal medicine publications over the last four decades was conducted to elucidate the standard of care for intracranial complications of otitis media, as well as to compare recommended treatment between the two fields. **RESULTS:** Otolaryngology literature supports immediate myringotomy in all cases of intracranial complications of otitis media and supports simple versus radical mastoidectomy either immediately or after up to forty-eight hours of treatment with IV antibiotics without improvement. The internal medicine literature to date contains less information regarding management of intracranial complications of otitis media and does not emphasize the importance of myringotomy or surgical intervention. **CONCLUSIONS:** Early involvement of the otolaryngologist is essential in cases of intracranial complications of otitis media. Otolaryngologists should endeavor to educate primary care providers on the early warning signs of intracranial complications, as well as on the importance of early referral.

### 86. **A Prospective Study of Pantoprazole for Treatment of Acid Reflux and Sleep Disordered Breathing**

David L. Steward, MD, Cincinnati, OH

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the effect of proton pump inhibitor therapy for patients with symptoms of acid reflux and obstructive sleep disordered breathing.

**OBJECTIVES:** To determine the effectiveness of proton pump inhibitor therapy for patients with symptoms of acid reflux and obstructive sleep disordered breathing. **STUDY DESIGN:** Prospective pilot study. **METHODS:** 19 adult subjects (74% male) with symptoms of acid reflux disease and obstructive sleep disordered breathing were enrolled for a three month study of Pantoprazole (40 mg daily). Primary outcome measures included subjective change in daytime sleepiness (Epworth Sleepiness Scale, ESS), reflux symptoms (reflux questionnaire), and bed partner assessment of snoring. Secondary outcomes included change in snoring quantification and apnea/hypopnea index (AHI) with SNAP home sleep study, and global symptom improvement. **RESULTS:** On average, patients at baseline had evidence of mild to moderate sleep apnea (mean AHI=16) with daytime somnolence (mean ESS=12.7). Following three month treatment with Pantoprazole, a statistically significant improvement was noted in daytime sleepiness (p=0.01), reflux symptom severity and frequency (both p<0.001), and bed-partner assessment of snoring improvement (p<0.01). Global symptom improvement was reported for 78% of patients (p<0.001), with significant reduction in frequency and severity of reflux awakening from sleep (both p<0.002). However, no significant improvement was noted in snoring quantification or AHI. **CONCLUSIONS:** This prospective pilot study suggests significant subjective improvement in daytime sleepiness, reflux symptoms

(including reflux awakening from sleep), and bed partner assessment of snoring change following Pantoprazole therapy. Improvement in daytime somnolence may result from reduction in reflux arousals during sleep, but further controlled study with objective measurement of arousals or reaction time testing is needed to confirm these findings.

#### 87. Endoscopic Approaches to the Thyroid Compartment

David J. Terris, MD\*, Augusta, GA  
Brian M. Haus, BA, Stanford, CA  
Kartik A. Nettar, BA, New York, NY  
Shawn A. Cieccko, BA, Buffalo, NY  
Christine G. Gourin, MD, Augusta, GA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the advantages and limitations of a number of endoscopic approaches to the thyroid compartment.

**OBJECTIVES:** To systematically explore several endoscopic surgical approaches to the thyroid compartment. **STUDY DESIGN:** Prospective, non-randomized experimental investigation in a porcine model. **METHODS:** A consecutive series of thirteen endoscopic thyroidectomies were performed using 5 distinct approaches. The procedure differed by the direction of the approach, incision placement, and use of facilitative maneuvers. The parameters assessed included procedure duration, EBL, HR, BP, temperature, O2Sat, and ABG values. The thyroid specimens were weighed and examined histologically. **RESULTS:** Four of the endoscopic approaches were successfully used for the resection of the thyroid (12 of 13 animals). The precordial approach (n=1) required 47 minutes, and then open conversion was necessary to accomplish thyroid removal. The mean operative time for the superior approach (n=4) was 47.8±14.6 minutes, the axillary approach (n=1) took 84 minutes, and the mean operative time for the lateral axillary approach (n=4) was 67±11.8 minutes, and for the superficial axillary (n=3) was 67.7±22.3 minutes. The overall median estimated blood loss was 0cc (range 0-100cc). The mean change in blood pressure and pH from the beginning to the end of the procedure was -0.5±24.1 mmHg and 0.16±0.07, respectively. The thyroid glands weighed 4.3±0.9 grams, and had normal glandular architecture with no significant trauma or thermal injury. There were no cases of pneumothorax, subcutaneous emphysema or air embolism. **CONCLUSIONS:** A number of approaches to the thyroid compartment are conceivable. The superior approach proved to be the fastest and easiest, while the lateral axillary and superficial axillary proved to be the best approaches from a cosmetic and clinical standpoint.

#### 88. Vocal Cord Paralysis in Parkinson's Disease

Joel D. Thibodeaux, MD, Shreveport, LA  
Shengguang G. Yin, MD, Shreveport, LA  
Cherie-Ann O. Nathan, MD\*, Shreveport, LA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss a proposed mechanism for the vocal paralysis sometimes seen in Parkinson's disease and a possible treatment for this problem.

**OBJECTIVES:** Bilateral vocal cord paralysis is seen most commonly in a postsurgical setting. Central causes of bilateral paralysis leading to airway compromise are less frequently encountered. Our objective was to determine the cause of airway obstruction in patients with Parkinson's disease. **STUDY DESIGN:** Case reports on two patients. **METHODS:** We present two cases of patients with Parkinson's disease that presented with airway obstruction. Patients underwent videostroboscopy and laryngeal EMG testing. Botox injections into the thyroarytenoid on one side were attempted to allow for the unopposed action of the abductor, the posterior cricoarytenoid to try to increase the airway aperture. **RESULTS:** Videostroboscopy revealed that the vocal cords were in paramedian position with glottic apertures of 2-3 mm. In both cases the vocal cords showed some residual ability to adduct, although limited. EMG tracing was consistent with a central pattern of recurrent nerve weakness. Injection of Botox into the thyroarytenoid did not result in any notable increase in the size of the airway. Hence both patients eventually required tracheotomy. **CONCLUSIONS:** Parkinson's disease is a central nervous system disorder which, through loss of normal regulation of movement, causes overstimulation of affected muscle groups. This in turn leads to "upper motor neuron signs" such as increased resting tone and spastic paralysis. In patients with laryngeal involvement, it seems that all of the intrinsic muscle groups should be simultaneously affected since they share the same innervation pathway. Our hypothesis is that the severe limitation of vocal cord abduction in this setting is due to overactivity of the multiple adductor groups. This was supported by our videostroboscopy and EMG findings. To test this hypothesis we attempted to weaken the forces of adduction by injecting Botox into the thyroarytenoid muscle in one patient. Though our initial attempt did not improve the patient's airway, we feel that this potential therapy warrants further investigation.

#### 89. T Cell Immunotherapy for Head and Neck Malignancy

Adrian E. Varela, MD, Durham, NC  
Amy C. Hobeika, PhD, Durham, NC  
H. Kim Lyerly, MD, Durham, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss requirements for antitumor T cell responses. Describe methods for: 1) generating antitumor T cells with known tumor antigens; 2) detecting tumor specific T cells; and 3) assessing functionality of tumor specific T cells.

**OBJECTIVES:** Generate highly specific T cells that recognize and destroy head and neck tumor cells. **STUDY DESIGN:** Basic science laboratory investigation. **METHODS:** 1) In vitro generation and expansion of antigen specific T cells; 2) MHC-antigen tetramer stain and flow cytometry for detecting tumor specific T cells; 3) intracellular interferon-gamma stain and flow cytometry for detecting tumor specific T cell activation; and 4) high speed cell sorting for selecting tumor specific T cells from culture. **RESULTS:** Using an Epstein-Barr virus tumor model, T cells were generated and expanded which recognized and were activated by tumor cells in an MHC and antigen specific manner. These T cells were successfully sorted from culture for potential use in adoptive transfer for tumor therapy. **CONCLUSIONS:** T cell immunotherapy targeting known tumor antigens is feasible for head and neck malignancies.

#### 90. Effect of MRI on Internal Magnet Strength in Med-El C40+ Cochlear Implants

Phillip A. Wackym, MD\*, Milwaukee, WI  
Michelle M. Smith, MD, Milwaukee, WI  
Kristin L. Banks, BSRT, Milwaukee, WI  
Jill B. Firszt, PhD, Milwaukee, WI  
Robert W. Prost, PhD, Milwaukee, WI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to: 1) discuss the optimal parameters necessary to avoid demagnetization of a cochlear implant magnet while in a MRI scanner; and 2) explain the potential risks associated with cochlear implant recipients undergoing MRI scans.

**OBJECTIVES:** Magnetic resonance imaging (MRI) has been contraindicated when cochlear implants containing an internal magnet are in place, due to concerns regarding torque, force, demagnetization, artifacts, induced voltages, and heating. The objective was to determine the magnetic field strength of Med-El Combi 40+ cochlear implant internal magnets after MRI studies. **STUDY DESIGN:** Prospective cadaver and clinical studies. **METHODS:** Two fresh cadavers were used to study demagnetization using a repeated measures design and a magnetometer. Pre- and post-MRI measurement of magnetic field strength was completed. Five complete T1 and T2 0.2 Tesla MRI head sequences were completed for the device up and down conditions. Fifteen complete T1 and T2 1.5 Tesla MRI head sequences were completed; five each with the head at 80,

90, and 100 degrees. Subsequently, three patients completed 0.2 Tesla MRIs. For these patients, subjective and objective assessment of cochlear implant performance was performed. **RESULTS:** In the cadaver studies, ANOVA analyses showed no significant difference in the magnetic field strength after the 0.2 Tesla or 1.5 Tesla scans. There was no significant difference in the magnetic field strength for the three patients undergoing 0.2 Tesla MRIs, and no adverse consequences, including: change in telemetry; auditory sensations; non-auditory sensations; or change in sound quality. **CONCLUSIONS:** No significant demagnetization of the internal magnet occurred during repeated 1.5 Tesla MRI scans with the head orientations used in this study. In the patients, no significant demagnetization of the internal magnet occurred in a 0.2 Tesla MRI.

#### 91. Minimally Invasive Surgery for Parotid Pleomorphic Adenoma

Robert L. Witt, MD\*, Wilmington, DE

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to reduce transient facial nerve dysfunction, Frey's syndrome, facial deformity and numbness during parotid surgery for pleomorphic adenoma.

**OBJECTIVES:** Partial superficial parotidectomy (PSP) dissecting the facial nerve and removal of a 2 cm margin of normal parotid parenchyma except where the tumor abuts the facial nerve decreases transient facial nerve dysfunction, Frey's syndrome, operative time and decreases facial deformity without increasing recurrence rates. Hypothesis: Removal of a 1 cm margin of normal parotid parenchyma using PSP with preservation of the posterior branches of the greater auricular nerve (GAN) will further reduce morbidity of parotidectomy without increasing recurrence rates. **STUDY DESIGN:** Retrospective review. **METHODS:** Matched pairs of 30 PSP followed on average for nine years were compared. One surgeon's practice compares 15 cases of PSP with a 2 cm margin of normal parotid parenchyma (Group A) with 15 cases of PSP using a 1 cm margin and preservation of the posterior branch of the GAN (Group B). **RESULTS:** There were no cases of recurrence, permanent facial nerve dysfunction or capsule rupture. Group A had 2/15 (13%) and Group B had 3/15 (20%) rate of transient facial nerve dysfunction. Subjective Frey's syndrome occurred in 1/15 (7%) in Group A and B. No patient in either group felt reconstructive surgery for neck deformity was necessary. Lobule and infra-auricular numbness was present in all patients in Group A and in 7/15 (46%) cases in Group B. **CONCLUSIONS:** Reducing normal parotid parenchyma margin below 2 cm for PPA did not alter morbidity. Preservation of the posterior branches of the GAN does not assure freedom from sensitivity alterations in all cases.

#### 92. Outcome Measures and Efficacy of Phenol-Based Topical Sinonasal Treatment in the Pharmacoresistant Chronic Rhinosinusitis Population

Simon K. Wright, MD, West Des Moines, IA

Timothy C. Simplot, MD, West Des Moines, IA

Douglas R. Hoisington, DO, West Des Moines, IA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the differential antimicrobial and tissue effects of phenol; understand the history of topical agents for rhinosinusitis; discuss treatment options for pharmacoresistant chronic rhinosinusitis patients; understand research instruments utilized for outcomes research in the chronic rhinosinusitis population.

**OBJECTIVES:** To assess treatment outcomes of phenol-based topical sinonasal treatment among pharmacoresistant chronic rhinosinusitis patients. **STUDY DESIGN:** Prospective nonrandomized clinical study. **METHODS:** Thirty-two consecutive chronic rhinosinusitis patients who failed treatment with nasal steroids, antihistamines, and antibiotics underwent three monthly treatments with phenol-based topical sinonasal treatment following symptom quantification using the statistically validated Rhinosinusitis Disability Index (RSDI) (5 point scale) and the Sino-Nasal Outcomes Test-20 (SNOT-20) (4 point scale). Outcomes instruments were repeated at the time of the third treatment. The pre/post-outcomes measures were compared using the single sample t-test for significance of outcomes. In addition, taste and smell were assessed and compared. Rates of symptom improvement and complications were calculated. **RESULTS:** Thirty of the thirty-two patients correctly recorded data on the research instruments. For both instruments, each individual symptom index demonstrated statistically significant improvement (RSDI: 0.58-1.78, median 1.41 points; SNOT-20 0.55-1.10, median 0.888 points). For patients with symptom-specific complaints, the average RSDI improvement was 1.39 points for the Emotional Symptom Score (SE 0.344, p<0.004); 1.31 points for the Functional Symptom Score (SE 0.322, p<.0072); and 1.41 points for the Physical Symptoms Score (SE 0.319, p<0.0014). The symptom-specific average improvement on the SNOT-20 was 0.86 points (SE 0.227, p<0.002). For the SNOT-20, an overall 71.1% rate of symptom improvement occurred. For taste and smell, an average improvement of 0.650 and 0.611 points were noted (SE 0.16, 0.24; p<0.00048, <0.011, respectively, 4 point scale). No complications occurred. **CONCLUSIONS:** Phenol-based topical sinonasal treatment is an effective treatment for chronic rhinosinusitis in the pharmacoresistant patient population.

#### 93. Coablation-Assisted Tonsillectomy Versus Electrocautery Tonsillectomy

Ramzi T. Younis, MD, Miami, FL

David Lehman, MD, Miami, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to assess the value of coablation-assisted tonsillectomy.

**OBJECTIVES:** To discuss advantages, disadvantages, outcomes and quality of life in pediatric patients undergoing coablation-assisted tonsillectomy versus electrocautery tonsillectomy. **STUDY DESIGN:** Retrospective chart review of all pediatric patients who underwent tonsillectomy and adenoidectomy (T&A) by the senior author between July 1, 2002, and June 30, 2003. **METHODS:** Ninety-eight pediatric patients who underwent T&A using either coablation technique or electrocautery technique between July 1, 2002, and June 30, 2003, were reviewed. The outcomes were measured by assessing readmission rate, postoperative bleeding, dehydration, resuming normal activity, intake of pain medication, resuming normal diet, patient's/parent's satisfaction, intraoperative blood loss and operative timing. The data were collected and compared for each group. **RESULTS:** The use of postoperative painkillers, resuming normal activity and diet was noted to be significantly favorable in patients who underwent coablation-assisted tonsillectomy. There were no significant differences when comparing other variables. The number of patients reviewed was too small to allow for any significant statistical analysis. **CONCLUSIONS:** Coablation-assisted tonsillectomy seems to provide a new alternative to the surgical armament of T&A. It may provide a better quality of life and morbidity by allowing a decrease in the postoperative pain and expedited normalcy. Further studies may be required to verify these conclusions.

#### 94. Mitomycin-C: Adjunctive Therapy for Laryngotracheal Stenosis

Ramzi T. Younis, MD, Miami, FL

David Lehman, MD, Miami, FL

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to highlight the importance, use and dosage of Mitomycin-C in patients with laryngotracheal stenosis.

**OBJECTIVES:** To discuss the effectiveness and use of Mitomycin-C in patients with laryngotracheal stenosis following laryngotracheal reconstructions (LTR). **STUDY DESIGN:** Retrospective chart review of 5 pediatric patients who developed symptomatic laryngotracheal scarring following LTR were successfully treated using an increasing dose protocol of Mitomycin-C. **METHODS:** Five pediatric patients who developed symptomatic laryngotracheal stenosis 10-60 days following LTR were successfully treated using a progressively increasing dose of Mitomycin-C application starting up with 0.2mg/mL for 2 minutes and progressively increased 2mg/mL for 2 minutes. **RESULTS:** One patient had glottic stenosis requiring 5 sessions, another had posterior subglottic stenosis (SGS) requiring 3 sessions. One had anterior SGS requiring one session, one had tracheal stenosis requiring 3 sessions, and one had 2 lateral subglottic scars requiring 2 sessions. The stenosis ranged from 50-70%. All patients were decannulated with a mean fol-

low-up pending 3 months. **CONCLUSIONS:** Mitomycin-C in a progressively increasing repeated application appears to be a safe and effective adjunctive therapy of laryngo-tracheal stenosis otherwise. The above cases would have required a revisional surgery or a tracheotomy.

**95. Laryngeal Abscess Following Injection Laryngoplasty with Micronized AlloDerm**

Philip E. Zapanta, MD, Washington, DC

Steven A. Bielamowicz, MD, Washington, DC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to list the alternatives for management of vocal cord paralysis and be cognizant of potential complications with injection laryngoplasty.

**OBJECTIVES:** Patients with unilateral vocal cord paralysis usually present with dysphonia, vocal fatigue, and occasionally swallowing problems. Operative management includes Type I thyroplasty, injection laryngoplasty, arytenoid adduction, and reinnervation. Recent reports have documented the safety of micronized AlloDerm for injection laryngoplasty, but we report the first documented case of a laryngeal abscess following injection laryngoplasty with AlloDerm. **STUDY DESIGN:** Single case report of a laryngeal abscess following injection laryngoplasty with micronized AlloDerm. **METHODS:** A middle aged lady's clinical course is presented and discussed. **RESULTS:** Prompt hospital admission with intravenous antibiotics and steroids helped resolve this airway emergency. Follow-up visits showed a significantly improved post-operative voice with a nonobstructive airway. **CONCLUSIONS:** A review of the literature reveals that this case of a laryngeal abscess following injection laryngoplasty with micronized AlloDerm is the first of its kind. Studies have shown that the use of AlloDerm in the head and neck region is safe, but otolaryngologists need to be cognizant of potential complications when working with this material.